POSTER PRESENTATIONS
THURSDAY, JUNE 28 AND FRIDAY, JUNE 29
MCCORMICK PLACE CONVENTION CENTER,
CHICAGO, IL
**Poster Presentations**

The poster session was held on Thursday, June 28 and Friday, June 29 at the McCormick Place Convention Center in Chicago, IL. The authors/presenters were present on Friday from 11:00 am – 2:00 pm only. The interactive poster session offered CE credit on Saturday from 11:00 am – 2:00 pm.

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**Binocular Vision**

**Poster 1**

**Mal de Debarquement Syndrome**

Sandra Farnham, O.D.

Mal de Debarquement syndrome is a rare disorder of persistent movement after being on a cruise, water travel or motion experience. Symptoms include a persistent sensation of motion such as rocking, swaying, tumbling, and/or bobbing. This sensation of motion is often associated with anxiety, fatigue, difficulty maintaining balance, unsteadiness, and difficulty concentrating. Quality of life can greatly be diminished with this condition, as there is no known cure for Mal de Debarquement syndrome. Some success in managing symptoms has been realized with medications and vestibular rehabilitation.

J.C. presented to the primary care clinic with the complaint of poor depth perception and a "swaying" motion. Results of a comprehensive vision exam were normal except for a small vertical horizontal phoria. Prism in the subjective Rx alleviated some of the depth perception problems. Vision therapy has been initiated, and has made the most impact on alleviating symptoms.

Vision therapy can greatly improve the quality of life in patients with Mal de Debarquement syndrome. Proper referrals within optometry specialties should be considered in the primary care setting, even when the eye health exam is normal.

**Poster 2**

**Successfully Treated Horizontal Diplopia Returns with Subsequent Traumatic Brain Injury**

Joseph Pruitt, O.D.

A 47-year old white female presented to the Minneapolis VA Medical Center Traumatic Brain Injury (TBI) Eye Clinic complaining of horizontal diplopia for the last 5 years after having hit her head during a motor vehicle accident. Her diplopia was successfully treated with 12 weeks of vision therapy. However, patient returned to clinic approximately 1 year later complaining of diplopia once again ever since falling and hitting her head on a flight of stairs.

Examination was unremarkable except for the following: cover test yielded 8 prism diopeters intermittent alternating exotropia at distance and 18 prism diopeter constant alternating exotropia at near. Maddox Rod at near yielded 18 prism diopeters exophoria without the presence of a vertical phoria. Prism bar fusional vergences and near point convergence (NPC) were attempted, but immediate diplopia was noted with each test. Subjective refraction revealed compound hyperopic astigmatism refractive error and presbyopia of each eye. The patient was once again diagnosed with convergence insufficiency and was prescribed vision therapy. Similar to the treatment regimen implemented 1 year prior, vision therapy was started. The patient’s convergence insufficiency was once again successfully resolved, but this time with only 6 weeks of vision therapy.

Achieving success with a vision therapy treatment plan does not absolve the patient from potentially suffering from future binocularity issues. As seen with this patient, a subsequent head injury led to the recurrence of convergence insufficiency; thus double vision. However, resolution only took half the amount of vision therapy and/or time as it did 1 year prior. That suggests "not all is lost," so to speak, when post-vision therapy events result in the re-emergence of binocular vision issues. The most important thing is to approach the treatment in the same manner as during the first time treating the condition.

**Poster 3**

**Fusional Vergence Dysfunction: A Case of Mistaken Identity**

Shannon Dehesa, O.D.

Fusional vergence dysfunction (FVD) is defined as a condition where a patient presents with reduced positive and negative fusional vergence ranges, but has a normal AC/A, and phorias within expected values at distance and near. The patient also has a very unstable binocular vision system. The negative and positive relative accommodation can also be reduced in this condition. Patients can present with serious visual complaints, such as eyestrain, headaches after work, sleepiness, inability to concentrate, blurred vision, and loss of comprehension while reading. Here we present a patient with fusional vergence dysfunction, with symptoms very similar to convergence insufficiency.

A 12-year-old female presented to the NOVA Southeastern University Pediatric Eye Clinic with complaints of headaches while reading, loss of place when reading, eyestrain, and blurry vision. The patient came in wearing an Rx of +0.50 OD, +0.50 OS with 2 BI prism in each eye, for a total of 4 BI. The patient had previously been diagnosed as having convergence insufficiency, and was given base-in prism as treatment for the condition. The patient's last eye exam was 1 year ago, when he had received the Rx with prism. Upon further questioning, the patient reported he was still getting headaches a short time after work, and seemed to have blurry vision at distance and near. He
did not feel that the Rx with prism was helping his symptoms. Medical history and family ocular history were unremarkable. Upon examination, distance visual acuities were 20/20 OD, 20/20 OS and 20/20 OU at distance; 20/20 OU at near. EOMs were smooth, accurate, full and extensive. Finger counting fields were full. Pupils were equal, round, responsive to light and no afferent papillary defect was present OU. Cover test with current correction was orthophoria at distance, and 2 exophoria at near. Manifest refraction was +0.50 OD, +0.50 OS. NPC with correction was 7 cm break/9 cm recover. Ocular health was unremarkable. Positive fusional vergence ranges at distance were X/9/4. Negative fusional vergence ranges at distance were X/6/5. Near positive fusional vergence ranges were 4/7/5 and near negative fusional vergence ranges were 5/10/6.

NRA/PRA results were +1.50/-1.00 respectively. Based on these findings, the patient was diagnosed with fusional vergence dysfunction, not convergence insufficiency, and vision therapy was recommended. We did not recommend an Rx at that time, but discussed the benefits of vision therapy. The patient seemed relieved that we were optimistic about his condition, and was excited to begin vision therapy.

Fusional version dysfunction is a condition that is frequently undiagnosed in patients. It is very important to be able to recognize this condition in clinical practice. Symptoms of FVD, if left undiagnosed, can be detrimental to visual comfort for patient. It also can have a negative impact on learning.

**Poster 4**
**Visual Findings in Waardenburg Syndrome**
Christine Allison, O.D., and Melissa Sigler, O.D.
Illinois College of Optometry

Waardenburg Syndrome is a rare autosomal dominant condition with a prevalence of ~1/42,000-1/50,000. There are four variations, with Type I and II occurring most commonly. The major signs of Waardenburg Syndrome are sensorineural hearing loss, iris pigmentary abnormality, skin and hair hypopigmentation, and dystopia canthorum. Other signs can include medial eyebrow flare, a broad nasal root, underdevelopment of the wings of the nose, and prematurely gray hair.

Three African-American female sisters ages 5, 6, and 8 were brought to the clinic for comprehensive eye exams. All 3 had histories of their mother smoking throughout the pregnancies, prematurity, and learning disabilities. The older 2 were both diagnosed with Waardenburg Syndrome, and both had sensorineural hearing loss, a broad high nasal root, and dystopia canthorum. The older child exhibited bright blue irises OU, compound hyperopic astigmatism OU, orthophoria, accommodative insufficiency, and had a history of Attention Deficit Hyperactivity Disorder. While the other child had dark brown irises OU, compound hyperopic astigmatism, accommodative insufficiency, an intermittent exotropia of 17 pd at distance and 35 pd at near, and a history of spina bifida. Anterior and posterior ocular health was normal. The girls were given refractive correction to enhance their classroom abilities and vision therapy was recommended for the exotropia and accommodative insufficiencies.

Waardenburg Syndrome is a rare condition that can affect both the hearing and the visual system. While most published reports have examined the genetics of the condition and treatment options for the hearing loss, awareness of possible connections to eye posture issues, accommodative issues, and refractive issues need to be further investigated. The importance of good visual care in any patient with a history of a deficit in the other senses cannot be overlooked, and any enhancements to the visual system can improve their overall quality of life significantly.

**Poster 5**
**Pediatric Contact Lens Management of Aphakic and Phakic Prescriptions for Bilateral Lens Subluxation**
Angela To, O.D.

Ectopia lentis can be the result of trauma, a systemic condition like Marfan’s syndrome or homocystinuria, or an isolated idiopathic condition. Ocular complications from a subluxed lens in children may result in lenticular myopia, an increase in astigmatism, amblyopia, phacolytic glaucoma, uveitis or the lens may be displaced either into the anterior or posterior chamber. Typically, if contact or spectacle lenses cannot suitably correct the ametropia, atropine can be used to increase the size of the aphakic zone or a lensectomy may be considered.

A 4-year-old white girl presented for a comprehensive exam with a chief complaint of sitting exceptionally close to reading material and the television. She was born full term with an unremarkable medical history. Her mother reported having aphakia OU. Her uncorrected entering VAs were 20/200 OD and 20/400 OS at distance and health was positive for bilateral lens subluxation inferiorly temporally. Cycloplegic retinoscopy yielded 2 different refractions: -15.00-3.00x180 OD, -15.50-4.50x180 OS through her lens, which yielded acuities of 20/125 OD and 20/100 OS and +15.00-1.00 x180 OD, +14.00-1.00x180 OS in her aphakic zone with acuities of 20/60 OD, OS. She prefers her aphakic prescription over her phakic prescription and has been fit with Proclear contact lenses for full-time use with a +3.00 DS pair of reading glasses. Her blood work was in the normal range for homocysteine at 5 μmol/L.

This case is unusual, as this patient preferred to use her aphakic zone to see, despite expectations that the larger, central phakic zone be used. Her corrected acuities were better in the aphakic zone by 4 lines OD and 3 lines OS. In the future, as her pupils decrease in size, the addition of atropine may be necessary to maintain her vision through her aphakic zone. Although this patient tested negative for homocystinuria, genetic testing is advocated to further rule out other systemic disease, like Marfan’s syndrome, especially in light of a family history of ectopia lentis.

**Poster 6**
**Depth of Focus Evaluation of Multifocal and Monovision Contact Lenses**
Alexis Vogt, Ph.D., and Gerry Cairns, Ph.D.
Bausch + Lomb

The purpose of this study was to evaluate, both clinically and experimentally, the depth of focus of contact lenses worn in multifocal and monovision modalities. The evaluation included measuring lens design differences and binocular vision performance of PureVision® Multi-Focal High Add lenses worn in both eyes compared to PureVision®2 HD SYS lenses worn in monovision.

Sixteen (16) presbyopic wearers of soft, spherical contact lenses were enrolled in this randomized, bilateral, single-visit study comparing PureVision® Multi-Focal High Add lenses worn in
both eyes to PureVision®2 HD SVS lenses worn as monovision. Depth perception was assessed at different distances (2m, 1m, 67cm, 50cm and 40cm) with the Frisby Stereoaucuity Test (Frisby Stereo Test, UK). Additionally, power profiles of PureVision® Multi-Focal High Add lenses and PureVision®2 HD SVS lenses were gathered using a high resolution Hartmann-Shack wavefront sensor to characterize the optical design of the contact lenses.

The results revealed a difference between baseline spectacles, multifocal and monovision modalities (ANOVA; p<0.05). The multifocal modality was shown to provide better overall Frisby Stereoaucuity than the monovision modality, and was no different from spectacle correction (spectacles = 46.8 arcsec; PureVision® Multi-Focal High Add lenses = 56.0 arcsec; PureVision®2 HD SVS lenses = 75.4 arcsec; Tukey's HSD, p<0.05). Power profiles of the lenses demonstrated PureVision® Multi-Focal High Add lenses provide power over a wider range of vergences than the PureVision®2 HD SVS lenses.

Clinical evaluation confirmed stereopsis was significantly better with multifocal correction than with monovision correction over a range of distances. The additional asphericity demonstrated in the PureVision® Multi-Focal High Add lens design provides depth of focus for both eyes that cannot be achieved with a monovision design that provides alternating focus between eyes.

**Poster 7**

The King-Devick Test as a Reading Fluency Training Program

Megan Allen, O.D., Valerie Kattouf, O.D., Rachel Beatty, O.D., and Huynh Doan

Illinois College of Optometry

Reading fluency is an important factor in the reading process. Children with higher reading rates tend to excel in academic performance. Saccadic eye movements are utilized approximately every 250 ms while reading. Thus, the precise control of saccades is essential in normal reading and academic performance. It is thought that saccadic training or therapy may increase children’s ability to process information through an improved reading rate and decreased fixations. This study looked at the reading rates of children prior to and after undergoing King Devick computer therapy (KDCT), a potential saccadic therapy program.

Seventeen of 45 2nd, 3rd, and 4th grade students at St. Elizabeth School (Chicago, IL) were randomly selected for this study. The subjects were randomly assigned to receive KDCT or placebo treatment. Fourteen received KDCT and 3 received placebo treatment. All subjects were masked, while examiners were not. The subjects were screened through a comprehensive eye examination. All patents requiring refractive correction were given glasses. The King Devick Test (KDT) of Ocular Motility was administered after refractive correction was given, if needed.

The results of the Wayne Saccadic Fixator proaction test demonstrate a statistically significant difference between the test and retest results (p=0.01). The 2nd trial scores reveal an increase in visual motor performance. The results of the Wayne Saccadic Fixator hand-speed release time indicated no statistical significance between the 2 trials (p=0.01). The 2nd trial scores reveal an increase in visual motor performance. The results of the Wayne Saccadic Fixator hand-speed release time indicated no statistical significance between the 2 trials (p=0.01).

The Wayne Saccadic Fixator proaction and hand motor speed tests demonstrate a learning curve between the 1st and 2nd trials. For this reason, multiple trials are required to determine an accurate baseline. Single evaluations may not adequately reflect visual skills in athletes. Further investigation is needed to determine how many trials are necessary to establish a reliable baseline. This has implications for sports vision screenings as well as any enhancement programs that are instituted.

**Poster 8**

Test-Retest Reliability on the Wayne Saccadic Fixator in Professional Soccer Players

Katie Foreman, O.D., Eric Baas, O.D., Barclay Bakkum, D.C., Ph.D., and Navjit Sanghera, O.D.

Illinois College of Optometry/Illinois Eye Institute

There has been considerable research to determine the relationship between visual skills and athletic performance. One of the most important factors in visual skills testing is that tests be reliable. The Wayne Saccadic Fixator has historically been used to assess eye-hand coordination, perceptual reaction time, and hand speed in athletic populations. The purpose of this investigation was to determine the test-retest reliability of the proaction and hand-speed programs on the Wayne Saccadic Fixator. These programs evaluate the speed of a motor response to visual stimuli.

Twenty male members of a Major League Soccer team, ages 17-35, participated in a comprehensive sports vision screening based on the American Optometric Association Sports Vision Section protocols. Each athlete performed 2 consecutive trials of the proaction and hand-speed Wayne Saccadic Fixator test. The proaction test score represented the number of lit targets pressed within a 30-second testing period. The hand-speed test score represented both the release time and motor time it takes to press the lit target.

The results of the Wayne Saccadic Fixator proaction test demonstrate a statistically significant difference between the test and retest results (p=0.01). The 2nd trial scores reveal an increase in visual motor performance. The results of the Wayne Saccadic Fixator hand-speed release time indicated no statistical significance between the 2 trials (p=0.01). The motor speed test indicated a statistical significance between the 2 trials (p=0.01), with the 2nd trial demonstrating quicker motor speed.

The Wayne Saccadic Fixator proaction and hand motor speed tests demonstrate a learning curve between the 1st and 2nd trials. For this reason, multiple trials are required to determine an accurate baseline. Single evaluations may not adequately reflect visual skills in athletes. Further investigation is needed to determine how many trials are necessary to establish a reliable baseline. This has implications for sports vision screenings as well as any enhancement programs that are instituted.

**Poster 9**

The Spectrum of Fundus Auto Fluorescent (FAF) Patterns in Inherited Retinal Degenerations as Revealed with Ultra-Wide Field Imaging

Jerome Sherman, O.D., Sherry Bass, O.D., Sanjeev Nath, O.D., and Navjit Sanghera, O.D.

SUNY College of Optometry

FAF is a novel, non-invasive procedure which has been shown to reveal retinal disorders which are often invisible to ophthalmoscopy. Very recently, Ultra-Wide Field FAF has become...
available. Here we document the myriad patterns of hypo- and hyper-FAF in inherited retinal degenerations.

A retrospective analysis of 400 ultra wide field fundus autofluorescent images obtained with an optomap autofluorescent camera (CAF) was performed. Of these, 31 images were identified as having patterns that most likely represented an inherited retinal degeneration. Charts of these 31 patients were reviewed and in some cases, patients were recalled for additional testing including flash ERGs and peripheral visual fields. Family members were evaluated whenever possible. Genetic analysis was offered to many of these patients.

A wide array of FAF patterns were identified. These included normal, hypo- and hyper-FAF of the macula, hypo- and hyper-FAF within the arcades, hypo- and hyper-FAF of the mid-periphery and far-periphery. In retinitis pigmentosa (RP), many patients had bull’s eye maculopathies that were often invisible to ophthalmoscopy and mid-peripheral zones of hypo-FAF. Some RP patients had a completely normal FAF within the arcades. Stargardt disease was characterized by macular hypo-FAF and mid-peripheral hyper-FAF associated with fundus flavimaculae flecks. Hypo-FAF zones in all diseases correlated highly with absence of the IS/OS junction, or photoreceptor integrity line (PIL) on SD-OCT. Patients with larger areas of hypo-FAF correlated with constricted peripheral visual fields and reduced or flat ERGs. Within the same family, FAF patterns were very similar. Certain FAF patterns emerged that correlated with specific genetic mutations.

Ultra Wide Field FAF images revealed a spectrum of abnormal patterns, most of which could not be predicted by binocular indirect ophthalmoscopy. The patterns may correlate with structural and functional abnormalities as well as with specific genetic mutations in some cases.

**Contact Lenses**

**Poster 10**

**Duette Hybrid Contact Lens in the Treatment of Irregular Astigmatism from Radial Keratotomy**

Melanie Frogozo, O.D.

Radial keratotomy (RK) is a type of refractive surgery that corrects for myopia in which full thickness radial incisions are made in the cornea thus causing peripheral steepening and central flattening. Long-term, those who have undergone RK experience unpredictable hyperopic and astigmatic shifts in their refractive error. This is a case report in which a 20-year status post-RK patient was referred for a therapeutic contact lens fit to correct for irregular astigmatism in both eyes.

A 52-year-old white male was referred for a therapeutic contact lens fit to correct irregular astigmatism that had developed 20 years after RK surgery in both eyes. The patient was complaining of poor and fluctuating vision in both eyes with his current corneal gas permeable lens. His refractive errors were +5.00-6.25x160 in the right eye and +0.50-0.75x078 in the left eye. Primarily, a large diameter reverse geometry and multicleave corneal gas permeable contact lens were fitted in the right and the left eyes respectively with no success in either eye. Due to the patient’s irregular corneal topography, stable lens centration was not achieved after several attempts in modifying the design of both of these lenses. With a standard aspheric design soft contact lens, good centration was achieved in both eyes. However adequate vision correction was reached in the left eye only. The Duette (SynergEyes Inc, Carlsbad, California) hybrid contact lens provided good centration, comfort and vision in the patient’s right eye. The patient was able to attain a stable 20/20 visual acuity in his right eye with the hybrid contact lens.

RK eventually causes refractive instability leading to unpredictable shifts towards hyperopia and astigmatism. The Duette hybrid contact lens can be used off-label, as it is indicated for normal corneas, to treat irregular astigmatism in long-term status post-RK.

**Poster 11**

**Vaulting the Oversized Graft**

Perla Najman, O.D., Arnie Patrick, O.D., and Andrea Janoff, O.D.

Nova Southeastern University

Penetrating keratoplasties are performed on keratoconic patients when acceptable acuity cannot be achieved due to corneal steepening, irregularity, or scarring; when the cornea becomes so thin that perforation is a significant risk; and in the case of contact lens (CL) intolerance. Postsurgical complications include graft rejection, recurrence of keratoconus within the donor cornea, and progressive increase in myopia and/or astigmatism. Possible mechanisms for the latter two include oversized donor buttons or progressive misalignment of the graft-host interface.

A 71-year-old male presented for his annual CL fitting with a chief complaint of CL intolerance, OS>OD. His ocular history was remarkable for keratoconus OU with bilateral full-thickness keratoplasties performed 40 years earlier, and for open-angle glaucoma controlled by Timoptic 0.25% BID OU. He was wearing a Dyna Intra-limbal® with Quad Sym® gas permeable (GP) CL OD, and a severely warped bitoric GP CL OS. Because his CLs were designed for near vision correction, the patient wore spectacles over them to achieve his entering distance acuities of 20/30 OD, and 20/20 OS. Slit lamp biomicroscopy revealed that the habitual CL positioned extremely high in a lid attachment fit. An oversized (10 mm) clear corneal button with no signs of graft rejection was observed OU. Pupils were equal, round, and reactive to light without an afferent pupillary defect. All other ocular findings were unremarkable. The patient’s medical history was positive for hypertension, acid reflux, rosacea, and hypercalcemia, all controlled by medication. After multiple lens trials, the patient was refit to a semi-scleral lens, OS.

Fitting post-graft patients with CLs can be especially challenging due to graft size, high corneal curvature, irregular astigmatism, graft interface irregularities, and CL intolerance. Although graft size is determined by the extent of corneal damage, most of today’s buttons are smaller than the ones used in the past because of improvements in surgical techniques. The Digiform K1® Semi-scleral GP CL, a design which allows for the manipulation of up to four curves beyond the back optic zone, provided a successful fit over this atypically large corneal graft.
Rigid Gas Permeable Fitting on a Toddler with Aphakia

Brandy McGraw, O.D.

Infantile cataracts, including congenital and early postnatal cataracts, occur in about 0.4% of newborns. However, many of these do not cause significant visual disturbances. Congenital cataracts can present as bilateral dense, bilateral partial, unilateral dense and partial unilateral. About two-thirds of congenital cases are bilateral. Bilateral dense cataracts, as presented in this case, require surgical intervention by approximately 6 weeks of age to prevent deprivation amblyopia in infants. Common post-operative visual aids for infants include spectacles, contact lenses and intraocular lens implantation. Aphakic spectacles produce optical distortions. Accurately selecting an intraocular implant by predicting future refractive shifts in an immature visual system is challenging. Contact lenses often serve as an appropriate choice. This option allows for changes to refractive error correction as the eye develops with the possibility of intraocular lens implantation upon visual maturity.

A 2-year-old Navajo girl presented with her parents for a rigid gas permeable (RGP) contact lens fitting. The patient’s ocular history included bilateral congenital cataracts, which were removed at 6 weeks old OD and 8 weeks old OS, leaving the child with an aphakic refractive status. The child had previously been fitted for RGP lenses with another provider, but the lenses had become too small and were often dislodging from her eyes. Most visual acuity measurements were not possible, but the patient was able to fix and follow small objects. Pupils and eye motility were normal, and confrontation fields were full to presentation in both eyes. The patient’s eye alignment was orthophoric at distance and near. Intraocular pressures were soft and equal by palpation in both eyes and all anterior segment findings were normal. The parents agreed to cycloplegia and the child was cooperative for automated refraction testing. A dilated fundus examination was attempted with normal fundus appearance, but no peripheral retina views due to patient cooperation. Using retinoscopy results from before and after cycloplegia, automated refraction and topography results, along with parameters from prior lenses, updated RGP lenses were ordered. Naturalens, a spherical RGP lens from Advanced Vision Technologies, was ordered with lenticulation and plasma appearance, but no peripheral retina views due to patient cooperation. Using retinoscopy results from before and after cycloplegia, automated refraction and topography results, along with parameters from prior lenses, updated RGP lenses were ordered. Naturalens, a spherical RGP lens from Advanced Vision Technologies, was ordered with lenticulation and plasma treatment. With great effort, the ordered lenses were inserted and evaluated. The patient was able to fix and follow small objects with both eyes and was also able to perform the near task of drawing on paper. The lenses centered and moved well in both eyes, and the larger overall diameter accommodated the child’s increasing intrapalpebral area more effectively.

RGP contact lenses can be an essential tool in management of childhood aphakia. Provider skill and knowledge is imperative in determining appropriate refractive error correction in young, minimally verbal children. This may be a long-term solution, or an acceptable choice until intraocular lens implantation is pursued at a later time. It is important to regularly evaluate the patient’s ocular health, evolving refractive status and corneal status through examination and topography analysis in order to make appropriate RGP changes or surgical recommendations as necessary.

Scleral Lenses in Pediatric Patients

Muriel Schornack, O.D.

Most of the literature that has been published to date on the prescription and management of scleral lenses has described the use of these devices in adult or general populations. A single study has described the use of proprietary devices in a pediatric population. The purpose of this study is to describe the use of commercially available Jupiter™ scleral lenses (Visionary Optics, Front Royal, VA) in pediatric patients.

A retrospective chart review identified 7 patients under the age of 18 who have been fit with Jupiter scleral lenses from July 2008-August 2011. The following data were collected: condition for which scleral lenses were prescribed, visual acuity prior to lens fitting, visual acuity with scleral lenses, summary of fitting process, and outcome/follow-up.

Average patient age was 9.5 (range 6-15). A variety of conditions were treated with scleral lenses, including neurotrophic keratopathy, exposure keratopathy, keratoconus, alacrima, Meesmann corneal dystrophy, and corneal scarring secondary to microbial keratitis. All patients experienced improvements in visual acuity with the devices. Completion of the fitting process required an average of 3.14 visits (range 2-4) and 1.6 lenses/eye (range 1-3). Follow-up ranged from 3 to 42 months. Two patients discontinued scleral lens wear within 3 months and one patient discontinued lens wear at 15 months (after surgical intervention). The remainder of patients continued to wear the devices.

Jupiter scleral lenses can be used successfully in the management of a variety of conditions in pediatric patients. Indications for the prescription of scleral lenses in children are similar to indications in the adult population.

Issues and Symptoms Experienced While Using Hydrogen Peroxide Solutions for Soft Contact Lenses

Marjorie Rah, O.D., Ph.D., Sue Atkinson, and Carla Mack, O.D. Bausch + Lomb

Hydrogen peroxide (HP) care systems represent 10% of the U.S. market. Eye care professionals primarily recommend peroxide systems for good cleaning and disinfection, for sensitive eyes, and patients for whom multi-purpose solutions are not working. Research was undertaken to understand to what extent current hydrogen peroxide soft lens care systems meet the needs of soft contact lens wearers.

One hundred and fifty soft contact lens wearers in the United States, who wore contact lenses 4 days a week or more and used a hydrogen peroxide solution, completed an online survey. The survey included questions regarding issues and symptoms experienced during lens wear and how these problems were dealt with.

Better cleaning and disinfection were primary reasons 34% of the patients reported for using a hydrogen peroxide solution. Fifty two percent of respondents reported issues while wearing contact lenses during activities such as long hours at a computer screen, in air-conditioned or smoky environments, or while watching TV or a film. In addition, 25% of patients experienced
dry eyes, and 25% of patients reported vision issues such as blurry or hazy vision, or poor vision. Moreover, 31% of hydrogen peroxide users felt the need to use eye drops regularly.

Although it has been believed that usage of a peroxide regimen will help patients who have tolerability, dryness or irritation issues while wearing lenses, it is clear that for many users the current marketed HP solutions do not fully resolve the problems. Future peroxide products need to be able to address the issues and improve patients’ lens wearing experience.

1. GfK data year ending Sep 2011, in sales value.

**Poster 15**
**Visual Performance of Silicone Hydrogel Multifocal Contact Lenses in Presbyopic Subjects**
Stacie Cummings, O.D., Douglas Benoit, O.D., and Wilson Movic, O.D.

To assess the visual performance of lotrafilcon B versus comfilcon A multifocal contact lenses in presbyopic subjects.

In this prospective, randomized, subject-masked, sponsor-masked-to-the-subject, cross-over study, subjects with spectacle adds between +0.50D and +2.50D received one product on a daily wear basis bilaterally at dispense. During the follow-up visit after 1 week, subjects were crossed over to the second product bilaterally and followed up for an additional 1 week. Visual acuities and visual ghosting, were measured at each visit, while satisfaction with comfort was asked at the final visit.

One hundred subjects with a mean age of 49.0±6.3 years were enrolled. Monocular and binocular visual acuity at distance were significantly higher with lotrafilcon B (0.04±0.08 LogMAR, monocular; p<0.001 and -0.00±0.07 LogMAR, binocular, p=0.032) than with comfilcon A lenses (0.06±0.10 LogMAR, monocular, and 0.00±0.06 LogMAR, binocular). Visual acuity (binocular) at near and intermediate distances was similar between the study lenses. The frequency of visual ghosting at night and overall visual ghosting were also similar between the study lenses. Similarly, no significant differences were measured on ratings of satisfaction with comfort between the study lenses.

Both silicone hydrogel multifocal lenses achieved high levels of acceptance with similar ratings on satisfaction with comfort, visual ghosting and comparable visual acuities at near intermediate distances. However, monocular and binocular visual acuities at distance, which are critical to the success of multifocal contact lenses, were measured significantly higher for lotrafilcon B lenses.

**Poster 16**
**U.S. Survey of Patient Satisfaction with a New Multi-Purpose Disinfecting Solution**
Jessie Lemp and Jami Kern, Ph.D.
Alcon Research Ltd

A patient satisfaction survey was administered to soft contact lens wearers by a large number of practices in the United States to describe acceptability of a new multi-purpose disinfecting solution (MPDS).

Patient satisfaction outcome surveys were provided to more than 3,000 practices in the U.S. Demographic information, current care solution and lens brand, and current dryness/discomfort and lens wear experience were collected from patients in the office. Participants were provided with the new solution (OPTI-FREE® PureMoist® MPDS; Alcon Laboratories), instructions, lens case and a questionnaire to complete after two weeks online or via postcard. The questionnaire assessed all-day comfort, end-of-day comfort, dryness and vision, lens moisture, and whether lenses feel like new or patient forgets they are wearing lenses.

A total of 8,761 complete surveys were collected. Average age of the respondents was 37.4 years with 74% being female. Approximately 71% wore silicone hydrogels during the survey period and 50.2% reported prior dryness and/or discomfort. At the two-week follow-up survey, the percentage who agreed or strongly agreed with the survey statements indicated a high level of satisfaction with the new solution: 89% for ‘all day comfort’; 79% for ‘lenses feel moist from insertion to removal’; 78% for ‘end of day clear vision’; 77% for ‘end of day comfort’; 69% for ‘lenses feel like new’; and 67% for ‘forget wearing lenses’. Only 19% reported ‘end of day dryness’ after use of the new solution. Similar results were found in the global analysis of the survey including 5 other countries.

The survey obtained a large, geographically diverse sample regarding acceptance of the new lens solution. Asymptomatic participants and those expressing prior discomfort/dryness indicated a high level of satisfaction with the new MPDS.

**Poster 17**
**Clinical and Comfort Benefits with a Multi-Purpose Disinfecting Solution in Two Global Multicenter Studies**
Christopher Lievens, O.D., Gina Wesley, O.D., Damon Ezekiel, and Glenn Corbin, O.D.

Clinical and subjective outcomes were evaluated with use of OPTI-FREE® PureMoist® multi-purpose disinfecting solution (MPDS) in contact lens wearers previously using an MPS containing PHMB.

In two single-arm multicenter studies, subjects who had habitually cared for their lenses with a biguanide-preserved solution were enrolled at 5 clinical sites in the United States, and at 7 sites in Australia, Sweden, and The Netherlands. At the baseline visit, subjects received a new pair of their habitual lenses and the study MPDS to use for 30 days. Contact lenses were replaced according to the manufacturer’s recommended schedule during the study. Corneal fluorescein staining (type and area) and subjective comfort (Likert-style questionnaire) were assessed at baseline and after 30 days of using OPTI-FREE PureMoist MPDS.

Outcomes are reported for 104 subjects in the U.S. and 171 subjects in Australia and Europe. Average age was 32.9 years and 37.5 years respectively for each study. From baseline to Day 30, corneal staining type and area decreased significantly with use of OPTI-FREE PureMoist MPDS in both studies (p<.001). Likert responses in both studies showed significantly reduced feeling of dryness, clearer vision, and improved comfort at the end of the day (p<.05, baseline vs. Day 30). At the end of both studies, subjects preferred the study solution to their previous solution (p£0.01).
After use of OPTI-FREE PureMoist MPDS for 30 days, two global multicenter studies revealed significant improvements in corneal staining and comfort for silicone hydrogel and soft contact lens wearers.

**Poster 18**  
**Is There a Link Between Contact Lens Satisfaction and Patient Retention/Referrals to the Eye Care Practitioner?**  
Giovanna Olivares, O.D. and Jordin Alford  
VISTAKON®, Johnson & Johnson Vision Care, Inc.

It is hypothesized that satisfaction with contact lenses has value beyond the benefits gained by the patient; satisfaction or lack thereof may affect the perceived value of the eye care practitioner and the practice. The purpose of this study is to report the correlation of patient satisfaction with contact lenses (CLs) with patient retention within the eye care practice, perceived expertise of the Eye Care Practitioner (ECP) and the likelihood of patients’ recommending their ECP to others.

A masked Internet survey of 1,086 spherical reusable or daily disposable hydrogel or silicone hydrogel CL wearers was conducted in the USA. The survey asked respondents about CL satisfaction with subsequent questions regarding perceived ECP expertise, and referral of and return to the ECP. Analysis of self-reported agreement with statements ("strongly" or "somewhat agree") across CL modality and Brand via Chi Square test followed by a Z test for independent proportions at 95% CI.

Respondents were 18-39 years of age, 69% female with 319 daily lens wearers (29%), 337 2-week wearers (31%), 429 monthly wearers (40%). Of the entire sample, 18% wore ACUVUE® OASYS® Brand Contact Lenses, 17% wore 1•DAY ACUVUE®MOIST® Brand Contact Lenses. Among all CL wearers, 84% of satisfied CL wearers would recommend their ECP vs. 55% of unsatisfied patients (P<0.05), while 88% of satisfied wearers would return vs. 53% unsatisfied (P<0.05). Perceived expertise of the ECP among satisfied wearers was 92%. Two-week and daily disposable patients reported high satisfaction (89%, 82%), mirroring ACUVUE® Brand CL satisfaction; 93% for ACUVUE® OASYS® and 83% for 1•DAY ACUVUE®MOIST®. Referral and retention among satisfied ACUVUE® OASYS® wearers was 82% and 87% respectively, and 90% and 89% for 1•DAY ACUVUE®MOIST® satisfied wearers. ECP expertise rated by satisfied ACUVUE® OASYS® and 1•DAY ACUVUE®MOIST® wearers was 91% and 93%.

Ninety-two percent of satisfied CL wearers perceive their ECP as an expert. Satisfied patients are more likely to recommend their ECPs and remain with the practice than patients unsatisfied with their CLs. Both ACUVUE® OASYS® (2-weekly modality) and 1•DAY ACUVUE®MOIST® (daily disposable modality) were reported as having high satisfaction levels and subsequently high intention to recommend and remain with their ECP.

**Poster 19**  
**Loyalty of Vision Care Patients is High Across Practice Locations**  
Cristina Schnder, O.D.

Regardless of practice location (independent practice, optical chain, or mass merchandiser), optometrists have an interest in patient retention. “Loyal” patients who return for future eye exams and who make purchases at the practice location are desirable.

During September and October of 2010, 7,500 adults ages 18-60 years old who wear glasses or contact lenses were asked about their purchasing decisions and impressions of vision care channels in a 60-minute Internet-based survey. To participate in the survey, respondent had to have had an eye exam and have purchased a vision care product in the previous 18 months. The sample was balanced as to age, gender, and income. Independent eye care providers (IECPs) enjoy the highest degree of patient loyalty, with 93% of patients stating an intent to return to the IECP for their next exam. However, loyalty to optical chain locations and mass merchandisers is also high, with about 7 in 10 intending to return to the same location for their next exam. Four out of 5 patients purchase contact lenses from the same location as their eye exam, regardless of location type. Among those who purchase contact lenses elsewhere, most (52%-55%) purchase online, but the Internet share of Rx walking has declined from earlier surveys. Contact lens patients make purchases every 6 months, vs. every 30 months for spectacle wearers, so opportunities for retention are higher.

Vision care patients are quite loyal, with the intention to return for exams and purchase product from the same location as in the past.

**Poster 20**  
**Knife Edge Analysis of Multifocal Contact Lenses**  
Alexis Vogt, Ph.D., and Kristen Hovinga  
Bausch + Lomb

To provide insight into pupil size dependency of multifocal contact lens designs by using the knife edge analysis technique.

Multifocal contact lenses manufactured by Bausch + Lomb, Ciba Vision, CooperVision and Vistakon were characterized using the knife edge technique. The optical setup involves a wet cell, laser source, contact lens, focusing lens, knife edge (razor blade) and camera. A collimated light source illuminates a contact lens in a wet cell and with the addition of a focusing lens, the light is focused onto a camera.

PureVision Multi-Focal Low Add has a smooth, continuous power profile shown by the lack of zones in the knife edge image; the High Add has a central region of greater plus power progressing toward a distance zone in the periphery. Air Optix Aqua Lo Add appears to have a relatively progressive change in power; the Med and Hi Adds show more of a power shift toward the center of the lens. Center distance Frequency 55 Multifocals demonstrate a central distance zone of approximately 3mm diameter surrounded by a near zone. Center near Frequency 55 Multifocals show a central near zone of approximately 2mm diameter surrounded by a distance zone. Biofinity Multifocals demonstrate a similar design to Frequency 55. Acuvue Oasys for Presbyopia shows the presence of concentric rings, however, asphericity within the lens is observed with less distinct transitions between neighboring zones.

Regions of discrete power transitions gathered from the knife edge analysis provide insight into potential pupil size dependency of multifocal contact lenses. One critical role in multifocal...
contact lens design and fitting is pupil size, which is greatly affected by illumination. In a dimly lit room, pupils enlarge to let in more light, thereby exposing the eye to a larger portion of the contact lens optical zone. In bright conditions, pupils decrease in size and potentially lose important features in the optical design, such as near or distance vision portions of the lens.

**Poster 21**

**Considerations in Design of Optimal Astigmatic Contact Lens Diagnostic Kit**

Cristina Schneider, O.D., and Angel Alvarez

ABB CONCISE

In fitting soft contact lenses, it is essential to have trial lenses in the office to assess fit, vision, and patient comfort. A unique challenge in fitting toric lenses is that the number of stock-keeping units (SKUs) required to cover every possible prescription is much higher than for spherical lenses. Toric fitting sets typically include 30% or fewer of the commercially available SKUs, for a total of 700-1,200 SKUs.

Unit order data for all brands of toric soft contact lenses supplied in 2011 by ABB Concise, the largest U.S. contact lens distributor, were analyzed. One SKU was considered to be a single sphere/cylinder/axis combination, regardless of brand. SKUs were ranked from top to bottom by unit order volume. SKUs ordered were compared to the SKUs available in major manufacturers’ fitting sets.

Order volume confirms that astigmatic prescriptions are not distributed equally. A large majority of toric contact lens orders are low sphere/low with-the-rule astigmatism. Two cylinder powers (0.75 D and 1.25 D) and 6 axes (180/90/170/10/160/80) account for 70% of order volume. Of the commercially available toric SKUs, the top 250 SKUs represent 42%-47% of all toric lens volume; the top 500 SKUs, 55%-65%; the top 750 SKUs, 70%-76%; and the top 1,000 SKUs, 80%-83% of order volume. Some trial lens sets with 1,100-1,200 diagnostic lenses can fit 89%-90% of all prescriptions.

Toric fitting sets of 700-1,200 SKUs provide sufficient coverage to ensure that 80%-90% of astigmatic patients can be fit with trial lenses from the diagnostic fitting set.

**Poster 22**

**Using a Novel Optical Bench Technique to Understand Dehydration Blur in Daily Disposable Lenses**

Rosa Lee, Amanda Kingston, and Gary Richardson

Bausch+Lomb

Using a novel optical bench technique to analyze the image stability and predicted logMAR retinal image resolution of 1 investigational and 3 commercially available daily disposable contact lenses as the lenses dehydrate.

Twenty -3.00D lenses of each lens type (etafilcon_A [AV Moist], narafilcon_B, nelfilcon_A, test lens) were analyzed on an optical imaging bench that uses a 7.8mm radius PMMA model cornea that relays the retinal plane image of a target (US Air Force) to a CCD camera. Each lens was blotted to remove excess packaging solution and images were acquired every 10s, as the lens is dehydrated, up to 180s following application of rewatting drops to simulate the tear film. A pattern-matching algorithm was used to calculate the predicted logMAR score of the images relative to the time-zero image.

A one-way ANOVA showed a statistically significant difference (p<0.001) between the test lens compared to nelfilcon_A, narafilcon_B and etafilcon_A, where the overall predicted mean logMAR scores were -0.099, 0.116, 0.136 and 0.182. Analyzing the time-0 images, there was a statistically significant difference between the test lens and nelfilcon_A (p<0.03) with mean predicted logMAR scores of -0.11 and -0.05, respectively. For the time-10s images (shorter than blink rates associated with reading/computer use), there was a statistically significant difference (p<0.001) between the test lens compared to nelfilcon_A and etafilcon_A with mean predicted logMAR scores of -0.10,-0.02,-0.03, respectively.

This novel in-vitro method quantitates the predicted logMAR score based on the measured optical image quality as lenses dehydrate. The test lenses exhibited better optical image quality than the 3 commercially available daily disposable lenses. The test lens showed a more consistent and slower reduction in predicted retinal image quality over time compared to narafilcon_B and etafilcon_A lenses. Within 10s, there was a predicted 4 letter difference between the test lens and nelfilcon_A and a 3.5 letter difference for etafilcon_A. Further research is under way to understand the clinical impact of dehydration blur/visual stability as well as to determine the correlation between bench-work and clinical outcomes.

**Poster 23**

**Comparing Lens Shape Changes During Off-Eye Dehydration of Contact Lens Materials with Varying Water Content**

Rosa Lee

Comparing lens shape changes during off-eye dehydration for a novel lens material and 3 commercially available daily disposable contact lenses.

Four -3.00D lenses of each lens type (water content) (etafilcon_A [AV Moist], 43%; narafilcon_B, 48%; nelfilcon_A, 69%; investigational lens, 78%) were taken out of the package and allowed to dehydrate under the same ambient conditions of approximately 72°F with a relative humidity of ~30%. A photo was taken every 2 minutes over the 20-minute period. Photos for each lens type (time 0 and time 20 min) were presented to 12 subjects who rated whether the lens shape of image A compared to image B was similar or different, using a 10-point rating scale where “1” corresponded to “Extremely Similar” and “10” corresponded to “Extremely Different”.

Shape changes occurred throughout the 20-minute period. All 3 commercially available contact lens materials showed significant edge “fluting” as a result of lens dehydration at the end of the 20-minute test period, while the investigational lens material did not. A one-way ANOVA showed a statistically significant difference (p<0.0001) between the investigational lens compared to nelfilcon_A, narafilcon_B and etafilcon_A, where the mean rating scores were 1.9, 8.8, 8.4, 6.8, respectively.

Research has indicated that higher water content lenses dehydrate more than lower water content lenses. In this study, the novel lens material demonstrated a more consistent lens shape over the 20-minute dehydration period compared to
narrow and spaced-out; nelfcon A, 69%; and etafilcon A, 43% lenses, suggesting that the investigational material has unique properties relative to water retention. Further research is under way to understand the impact of dehydration-driven lens shape change on vision, comfort and fitting performance in-vivo.

Poster 24
A Randomized Clinical Evaluation of the Efficacy of Artificial Tears for the Relief of Dry Eye Symptoms following Implantation of Multifocal Intraocular Lens Implantation
Marc Bloomenstein, O.D.

The purpose of this study is to evaluate the safety and efficacy and overall patient satisfaction of artificial tear use in patients implanted with a diffractive multifocal IOL.

In a three month prospective, randomized multi-center study of 38 patients undergoing cataract surgery, Group A received (PEG 400 0.25%) Blink Tears q.i.d. and group B did not receive artificial tears postoperatively. Both groups received the Tecnis Multifocal IOL (Abbott Medial Optics, Inc., Abbott Park, IL).

At month 3, postoperative UCVA was better in Group A than Group B (Logmar 0.0 vs. 0.2; 20/20 vs. 20/32, respectively, P=.858). Group A also exhibited less staining and greater TBUT. Patients reported greater satisfaction with their visual outcomes in Group A than Group B.

Blink Tears may optimize the ocular surface, relieving the signs and symptoms of tear film insufficiency and improving visual outcomes in cataract surgery patients. Patients reported an overall greater satisfaction after cataract surgery with use of Blink Tears.

Poster 25
Contact Lens Patient Satisfaction with Biotrue MPS in 3,412 Subjects
Mohinder Merchea, O.D., Ph.D., Kristen Bednar, Marianne Doktor, and Kirk Bateman Bausch + Lomb

Eye care practitioners often do not actively prescribe changes in lens care. The introduction of MPS products may face resistance in adoption due to ECP assumptions of high patient satisfaction with currently used solutions in the absence of explicit discussion of lens-wearing symptoms. Additionally, patients may not report dissatisfaction because they ascribe it to their lifestyle or poor compliance. The purpose of this patient survey was to evaluate acceptance of a novel multi-purpose solution (Biotrue) through the use of an out-of-office Internet survey in a large sample of DW SCL patients.

Three hundred independent eye care practitioners not previously recommending Biotrue switched patients from their habitual lens care MPS or peroxide products into Biotrue. Patients continued to use their habitual contact lenses. Patients were instructed to complete an Internet survey after about 7 days to assess satisfaction with a standard agree/disagree 6-point scale. Means and 95% CI are reported.

Internet surveys were completed by 3412 patients who were switched to Biotrue. Habitual MPS products included RepleniSH (n=892), PureMoist (n=225), Express (n=565), Revitalens (n=59) and Clear Care (n=254). 96.5% (CI 95.9%-97.1%) of patients indicated overall satisfaction with their lens wearing experience, 96.1% (CI 95.5%-96.8%) of patients reported their lenses feeling moist and comfortable, 89.8% (CI 88.8%-90.8%) of patients reported better end of day comfort than their habitual solution and 89.6% (CI 88.5%-90.6%) of patients reported that wearing lenses was easier on their eyes than with their habitual solution, regardless of their habitual MPS. Preference for Biotrue over the habitual MPS was reported for about 9 out of 10 patients using either RepleniSH, Express or Revitalens. Preference for Biotrue over PureMoist was reported in about 8 out of 10 patients. Preference for Biotrue over Clear Care was reported in about 7 out of 10 patients.

Patients reported a high level of satisfaction and comfort when switched to Biotrue MPS in a large patient sample based on an out-of-office Internet patient satisfaction survey. Biotrue was also preferred over other MPS products, including a peroxide solution.

Poster 26
Enhancing the Cinema Experience: A Comparison of Contact Lenses and Spectacles
William Reindel, O.D., Gerard Cairns, Ph.D., and Jagannath Ghosh Bausch + Lomb

Consumers can experience low light conditions in a variety of situations including cinemas, restaurants, and driving at night. This study compared the cinema experience when viewed through spectacles (SP) and balafilcon A contact lenses (PureVision2) with high definition aspheric optics (HDCL).

Subjects with no previous contact lens experience were randomly assigned to wear SP or HDCL during the first segment of an HD movie at the Dryden Theater. A movie experience survey was completed at intermission. Subjects then crossed-over to complete the movie experience with the other refractive correction. Another subject survey including preference questions was completed at the end of the movie.

Fifty-seven eligible subjects completed the cinema experience. HDCL was non-inferior to SP High Contrast VA. Performance ratings (measured as level of agreement) favored HDCL regarding vision (p<0.03): clearer and crisper vision (HDCL[96.4%], SP[82.1%]), Enhanced field of vision (HDCL[96.4%], SP[76.8%]), Provide HD color and images (HDCL[90.6%], SP[64.3%]). Subject preference favored HDCL 6.1 over SP for provided superior vision (HDCL[69.6%], SP[10.7%]) and made the experience more enjoyable (HDCL[64.3%], SP[8.9%]), p<0.001. There was no preference difference regarding which option was more comfortable to wear (HDCL[42.9%], SP[35.7%]).

HD and 3D techniques are used by film makers to enhance the cinema experience, but aberrations associated with low light and limitations of SP can impact the experience. Although high-contrast VA was the same between the two refractive corrections, the HDCL provided more favorable ratings regarding image and color quality and was preferred for making the movie experience more enjoyable.
A healthy, 24-year-old male presented with decreased vision. Best-corrected visual acuity was 20/125 OD, OS. Pupils, EOMs and confrontational fields were normal OU. Dilated fundoscopy was unremarkable with the exception of a subtle small circular hyperpigmentation of the macula OU. The OCT revealed a bilateral subfoveal hypopigmented “punch out” zone with disruption of the PIL, characteristic for achromatopsia. In addition, color vision testing and ERG 30hz flicker was done to confirm diagnosis. Given the clinical presentation, a diagnosis of congenital achromatopsia was made and the patient was recommended to have a low vision evaluation to help with functionality.

Although congenital achromatopsia is a rare condition, it is associated with severe visual impairment. Macular appearance varies from a normal macular appearance to an atrophic macular lesion, making the diagnosis clinically challenging. Ancillary testing such as ERG have traditionally aided in the diagnosis. However, since the advancement of OCT technology and the understanding of the anatomical structural impact of the disease, less invasive diagnostic tools used today may help to confirm the congenital achromatopsia.

A 58-year-old Colombian-American male diagnosed with Hallermann-Streiff Syndrome presented for a low vision evaluation. His medical history included non-insulin dependent diabetes, hypertension, and anemia. His ocular history included a chronic retinal detachment, strabismic amblyopia, congenital nystagmus, high myopia, microphthalmia, and aphakia. Upon his initial clinic visit, the patient denied having cataract surgery despite his aphakic presentation in both eyes. His best-corrected visual acuity was 10/80 in the right eye and 10/40 in the left eye. Visante anterior segment OCT revealed microphthalmic eyes with no crystalline lens or remnants of a lens capsule in either eye. Both eyes were white and quiet and vision was stable over the last 2 visits. Limited fundus views were obtained upon an ineffective response to 1% tropicamide and 2.5% phenylephrine. B scan ultrasonography revealed the longstanding retinal detachment in the right eye with no additional findings. The patient was fit with a 2.8x binocular telescope and a 12 diopter stand magnifier.

This case represents a review of the rare condition known as Hallermann-Streiff Syndrome and a documented occurrence of spontaneous lens resorption of congenital cataracts. We review the common ophthalmic findings in this congenital condition and the low vision rehabilitation of the patient.

Bilateral optic neuropathy following the use of ethambutol usually causes painless, progressive vision loss, as well as color vision defects. This case will highlight the benefit of low vision devices to maximize functional vision.

A 76-year-old white male presented for a low vision exam with complaints of extreme glare, severely blurred vision, and difficulty recognizing colors for the past 6 weeks. Six weeks prior to the exam he had discontinued ethambutol, which was taken approximately 8 months for treatment of mycobacterium avium intercellulare. The ethambutol was discontinued 10 days after visual symptoms were noticed. His visual acuities at this exam were OD: 5/300; OS: 5/100, through his habitual Rx of +0.75 -1.75 x 090/+2.50 OD and +1.50 -2.50 x 090/+2.50 OS. Best-corrected near acuity was 0.4/6.3M OU (20/320). No improvement in visual acuity was obtained with trial frame and 11 mmHg OS. Fundus exam showed healthy, pink optic nerve heads with C/D 0.25 OD, OS, and no pallor noted. The patient’s visual goals were to decrease glare and to improve near vision. He noticed significant improvement in glare with 49% orange NoIR fit-overs. A portable CCTV allowed him to read 4/1.6M (20/80). Non-optical aids that help with detecting colors include a talking color identifier, marking clothing with safety pins or clothes pins to help separate and organize colors, and for patients with smartphones, a downloadable color identifier app.

Toxic optic neuropathy can cause profound, irreversible vision loss. The use of low vision devices can assist patients with reading, severe glare, and activities of daily living, maximizing their functional vision and improving quality of life.
Flecked retina syndromes have commonalities in terms of ocular history and findings; however, they also have distinct prognoses that require different management strategies. Early ocular and genetic testing is imperative in order to provide the patient with proper diagnosis and visual rehabilitation.

A 13-year-old Hispanic patient first presents to the Feinbloom Rehabilitation Center with a chief complaint of moderate vision loss at distance and near, and nyctophobia. Previous ocular history was remarkable positive for amblyopia; systemic history was unremarkable. Best-corrected acuity was 20/40 OD and 20/30 OS with a refractive error of +3.75-2.50x045 OD and +3.00-2.50x145 OS. Cover test revealed one diopter of esophoria at distance and near. Pupils were equal, round, and reactive to light, with no afferent defect. Confrontation fields were full to finger count OD and OS. Extraocular muscles were full and smooth OU. Color vision testing with Ishihara plates revealed no color defects OD, OS. Slit lamp examination revealed healthy, unremarkable findings OU. Intraocular pressures were 10 mm Hg OD, 12 mm Hg OS using Goldmann Applanation Tonometry. The patient was cyclopleged with no significant change of refractive error. Dilated fundus examination reveals optic disc hyperplasia OU, macular edema OU, and multiple white flecks located through the posterior pole and mid-periphery OU. Cirrus-OCT reveals macula edema OS greater than OD. The patient was referred for a retinal consultation, an ERG, and genetic testing to rule out several white dot syndromes. The ERG revealed decreased rod and cone function in both eyes; mixed ERG amplitudes were within normal range in both eyes. Our patient is still undergoing genetic testing. Based on the ocular history and findings, our differentials included: (i. Retinitis punctata albescens (RPA) (ii. Fundus albipunctatus (FA). In young patients, RPA can be clinically indistinguishable from FA, posing a considerable differential diagnostic challenge. The first distinction between FA and RPA was made by Lauber in 1910. Recent evidence for compromised cone function and macular dystrophy in FA, as early as in childhood, has also challenged the classical notion that FA itself is a benign, fully stationary disease. Our patient had a fundus presentation that could be classified as either an early stage of RPA or an atypical form of FA. The presence of hypopigmented lesions anterior to the arcades and within the posterior pole could have been consistent with a possible diagnosis of RPA; however, no vessel attenuation or pigment clumping was noted. Thus, there are serious implications and visual rehabilitation strategies that will greatly differ depending on whether or not our patient's acuity and field will worsen over time, or stay consistent. Further testing is crucial in helping to determine the correct diagnosis. Electrodiagnostic testing, fundus autofluorescence, and genetic testing have all been used to better differentiate between the two conditions and provide insight to the progressive nature and expectations of the disease process. Upon further research, FA with cone dystrophy appears to be the likely diagnosis as studies have shown macular swelling as a possible ocular finding.

Preparing a family and patient who may continue to lose vision over time requires proper guidance and support. Providing this information equips individuals and empowers them with the knowledge necessary to make decisions that are appropriate for their personal and family circumstances. Additionally, early genetic testing information and proper diagnosis can qualify the patient for benefits that can provide educational, medical, and vocational assistance. Our patient was previously diagnosed with amblyopia, which was explained to the family as the cause of vision changes. It is an important take away to recognize that patients are capable of having more than one underlying cause of visual complaints and recognizing that night vision complaints deserve proper work-up and diagnostic testing to determine the cause. Fundus albipunctatus (FA) is an autosomal recessive condition. It has been reported that most FA is caused by mutations in the RDHS gene, which encodes 11-cis retinol dehydrogenase (11-cis-RDH). Studies have shown that patients with FA with the RDHS mutation had extensive cone dysfunction, typically found to be more severe in older patients. This condition is characterized by congenital stationary night blindness and delayed dark adaptation after exposure to bright light, which typically presents during early childhood. The fundi of affected individuals contain multiple small, white or pale yellow dots in the retinal pigment epithelium, which may or may not involve the macula. These dots can remain unchanged, become more prominent, or can fade during aging; new dots may also appear. The dark-adaptation curve of affected individuals features prolonged recovery of cone and rod sensitivity and ERG cone and rod amplitudes are markedly reduced after 30-40 minutes of dark adaptation; however, they may come to normal or near-normal levels after many hours of adaptation. A patient diagnosed with FA would not be expected to produce progressive visual loss. However, new research has indicated that there are variants of FA that are associated with cone dystrophy, and may worsen over time.

**Poster 30**
**Flecked Retina Syndromes; Similar in Appearance, Greatly Different in Prognosis**
Sara Shkalim, O.D.

**Poster 31**
**The Curious Case of the Functionally Legally Blind Patient with 20/25 (6/7.5) Visual Acuity**
Joseph Pruitt, O.D.

A 86-year old white male presented to a Department of Veterans Affairs Low Vision (LV) Eye Clinic complaining of a decreased ability to perform daily activities (ADLs). More specifically, the patient identified improved reading as the primary goal. His history was remarkable for having been diagnosed with Non-Exudative Macular Degeneration approximately 15 years prior.

Initial examination revealed best-corrected distance acuities of the following: OD: 20/25 (6/7.5), OS: 20/400 (6/120). In addition, Goldmann Visual Field revealed relatively normal results OD, OS, OU. Therefore, given the great visual acuities achieved in clinic by way of the trial-frame refraction, a single-vision reading-only prescription was released to address the patient's primary goal. Through the near-only prescription, the patient was able to read 0.5 M. Approximately 2 months later, the patient's daughter requested the patient be re-examined because the patient "does not act like he has 20/25 (6/7.5) vision."

Therefore, the patient was re-examined, but results similar to the initial examination were found. However, due to the patient's daughter's vehement plea that the patient functions like someone with much poorer vision, further investigation was warranted. Two weeks later, the patient returned to the Low Vision Clinic for the administration of a micro-perimetry field test via the Nidex MP-1 Micro-perimeter. The test results identified a small, 40’ central island of retinal sensitivity, which was bounded by large areas of geographic atrophy. The
The Social Security Administration defines “Legal Blindness,” also known as statutory blindness, as the following: “Visual acuity of 20/200 (6/60) or less in the better eye with the use of a correcting lens or a visual field limitation such that the widest diameter of the visual field subtends an angle no greater than 20 degrees.” Due to an essentially insignificant PRL, with regard to the correlation between vision and functionality, the patient was not identified as “Legally Blind,” the patient therefore was not initially considered to be an individual in need of significant Low Vision intervention. Unfortunately, this proved to be to the detriment of the patient. Therefore, it is crucial that low vision practitioners not limit the care provided by strict adherence to rigid definitions, which inherently lack the capability of being all-inclusive.

Poster 32
Rehabilitation of Homonymous Hemianopia through Scanning Therapy and Eli-Peli Field Expansion Lenses
Sonal Pandya O.D.

One-third of all survivors of cerebrovascular accidents (CVA) have a homonymous hemianopia. As a result, patients will have difficulty with peripheral field awareness limiting their mobility. Eli-Peli expansion prism (EP) is an effective therapy in these patients by providing obstacle avoidance and overall improved mobility, allowing up to 30 degrees of binocular visual field expansion.

A 71-year-old African-American male presents for a low vision evaluation with a chief complaint of “bumping into things on his left side.” Pertinent medical history is significant for multiple cerebrovascular accidents of the right occipital lobe in 2004 and 2011. Best-corrected visual acuity is 20/20 in both eyes and his ocular health examination is unremarkable. Goldmann visual fields demonstrate a left incongruous incomplete hemianopia attributed to his multiple CVAs. After the low vision exam, treatment recommendations began with scanning therapy and EP field expansion lenses. Initially, $40^\Delta$ base-out Fresnel prism was adhered to the upper portion of the lens, on the side of the visual field defect. After scanning therapy and successful adaptation, another $40^\Delta$ base-out Fresnel prism was adhered to the lower portion of the lens. Prior to dispensing, the patient was trained to focus through the central prism-free portion of the lens while detecting peripheral images induced by the prism. Six weeks after the application of the Fresnel prism, he had successfully adapted to the lenses, noting improvement in obstacle avoidance as well as peripheral awareness. Due to his good outcome, permanent ground-in prism segments were made into his habitual prescription.

The Eli-Peli lens design offers field expansion by inducing peripheral diplopia through the upper and lower prismatic segments. In a community based trial of the lenses, researchers found 74% of patients were successful and rated improved mobility in various situations. Therefore, in patients with a history of a homonymous hemianopia, scanning and expansion prism therapy should be considered as a treatment during their vision rehabilitation exam.

Poster 33
Functional Vision Evaluation after Hemispherectomy for Seizure Control Secondary to Hemimegalencephaly
Elizabeth Knighton, O.D., and Bindi Desai, O.D.
University of Houston College of Optometry

Hemimegalencephaly is sporadic congenital dysplastic malformation of the central nervous system with unknown etiology. The major characteristics are macrocrania and hemigigantism, along with the classic neurological triad of psychomotor retardation, contralateral motor deficit and epilepsy. Typically these cases of epilepsy are untreatable with medication. Ophthalmic manifestations include hemianopia contralateral to the malformed hemisphere, optic nerve atrophy, strabismus and cranial nerve palsies.

Hemispherectomy is the best treatment option for seizure control in these patients and involves removal of some of the malformed hemisphere and complete disconnection between the two hemispheres. The survival rate in patients who underwent hemispherectomy was significantly better than those untreated, and was also correlated with significant neurological improvement. Homonymous hemianopsia in the infant and toddler population is typically treated by teaching scanning strategies. The option for more complex low vision aids, such as scanning prism and less commonly reverse telescopes, are made available as the child develops the cognitive or motor ability to use them.

A 19-month-old white female presented to clinic for a functional visual assessment. Her past medical history includes hemimegalencephaly at birth, intractable seizures at 4 months old, status post hemispherectomy at 8 months old, and eczema. Her current medications include oxcarbazepine (Trileptal). Visual acuity, measured with Teller acuity cards, was 6.5 cycles/cm at 55 cm or a Snellen equivalent of 20/94 OU. Hirschberg/Krimsky revealed 10-15 prism diopter intermittent left esotropia and she responded to 480 seconds of arc on Stereo Smile. Confrontation visual fields from non-seeing to seeing with both eyes open revealed full fields to the right and restriction to midline on the left. She exemplified excellent scanning strategies to her left side. Extraocular motility testing measured full range of motion with +0.5 over-action of the left inferior oblique muscle. Contrast sensitivity, measured with Hiding Heidi, was 1.25% and she passed both cards of the Pease Allen color vision testing with both eyes open. Mild compound hyperopic astigmatism in the right eye and simple hyperopic astigmatism in the left eye was measured upon cycloplegic retinoscopy. Internal ocular health was normal, with no optic nerve pallor. A spectacle prescription was not indicated at this time and we advised the parents and vision teacher to continue working on scanning strategies with the patient at home.

Hemimegalencephaly can be a life-threatening condition from catastrophic seizures, which requires hemispherectomy for best therapeutic treatment. A functional optometric evaluation can determine if hemianopsia, optic nerve pallor, strabismus or cranial nerve palsies are present. Treatment for hemianopsia includes scanning strategies, prisms, or reverse telescopes. Strabismus can be managed with prism, occlusion therapy, or surgical intervention. Recommendations based on visual findings are particularly helpful in educational settings, which involve parents, teachers, and therapists who may not be aware of visual deficits.
**Poster 34**  
Low Vision Rehabilitation for Homonymous Hemianopsia secondary to Cerebrovascular Accident to the Right Occipital Lobe  
Faheemah Saeed, O.D.

Homonymous hemianopsia refers to a visual field loss that respects the vertical midline and presents on the same side of both eyes. Common causes include cerebrovascular accident (stroke), traumatic brain injury, tumors, infection and surgery. A stroke to the occipital lobe presents as a congruent defect which may be macular-sparing. Visual field (VF) loss compensation may be achieved either by field expansion via peripheral monocular prism (EP design) or by means of field relocation with binocular prisms. Other tools for low vision rehabilitation for homonymous hemianopsia include clip-on mirrors, filters/tinted lenses, typoscopes and lighted magnifiers.

A 62-year-old male presented for a low vision exam after being diagnosed with an unspecified visual field defect secondary to a stroke 1 year ago. He was mainly concerned about running into things on his left side and perceived reduction in contrast and brightness. Goldmann Visual Field test confirmed a left-sided homonymous hemianopsia with macular splitting. He was fitted with the EP design of 40 prism diopters in temporary press-on Fresnel prism segment. The temporary design helped increase awareness of his surroundings in unfamiliar places. A low-powered lighted hand-held magnifier and yellow filters were prescribed to address his concern of reduced contrast and brightness.

The EP lens design offers a novel treatment method for actual field expansion that is measurable by standard perimetric techniques. The results of the Expansion Prism (EP) study multisite clinical trial reported a 74% success rate (at 6 months) with this design. This specific case illustrates an example of success with this prism system.

**Poster 35**  
Optometrist’s Role in Multi-Disciplinary Management of Achromatopsia: A Case Report  
Saysha Blazier, O.D.

Achromatopsia is a congenital visual disorder characterized by a complete absence or reduction in cone function. The condition is inherited in an autosomal recessive manner and is also referred to as rod achromacy or total colorblindness. Many achromatopic patients have some residual cone function that provides some central vision and minimal color vision. Three genes have been identified with this condition: CNGA3, CNGB3, and GNAT2. It is on these genes where mutations disrupt the cone phototransduction. Common clinical presentations of patients with Achromatopsia include reduced VA, nystagmus, photophobia, small central scotomas with normal peripheral vision, and reduced color vision.

A 27-year-old black female presented to our clinic with reduced central vision and extreme light sensitivity. Upon further questioning this young lady had struggled throughout her entire life with schooling, and just recently her mother informed her that she had an eye condition that should be evaluated. Upon our examination acuities were 2M/16 (20/160) using the ETDRS charts and reduced color vision was detected. Funduscopic evaluation revealed mild foveal hypoplasia and bull’s-eye appearance. Final recommendations included CL and glasses tinted to match Corning photochromic medical filters in 550 nanometers and a dome magnifier for continuous text at near. Electronic devices were recommended for all prolonged reading. In addition, referrals to social work services and career counseling within our facility were made to enhance this young lady’s quality of life.

This case exemplifies the role optometrists play in the multidisciplinary approach that individuals with congenital conditions should receive and serves as an example of services optometrists can offer. In addition, the advanced fit of tinted contact lenses on this individual offers greater visual function and improved comfort, both physically and socially. This case highlights the value of basic optometric skills and knowledge, and the impact properly prescribed lenses, filters, and devices can have on an individual’s vision and quality of life.

**Ocular Disease**

**Poster 36**  
Ocular Hypertension in a Patient with Osteopetrosis  
Heather McLeod, O.D. and Scott Richter, O.D.  
SUNY State College of Optometry

Osteopetrosis is a rare inherited disease characterized by increased skeletal mass and bone density. Osteoclasts fail to resorb bone leading to abnormally dense bones that are brittle and prone to fractures. The most common ocular complication is optic atrophy. Optic atrophy can develop from optic nerve compression due to narrowing of the optic foramina or due to increased intracranial pressure from cerebral venous outflow obstruction leading to chronic papilledema. The challenge of differentiating optic atrophy from glaucomatous optic atrophy and when to institute treatment is illustrated by this case.

A 20-year-old white female with a known history of bilateral optic atrophy due to osteopetrosis presented for a consult. Examination revealed BCVA 20/200 OD and count fingers OS with only subjective improvement with refraction of +1.25-2.00x090 OD, OS. There was a positive APD OS and bitemporal defect on confrontation visual fields. Left exotropia and small amplitude nystagmus was noted. Intraocular pressures were 22mm Hg OD, 24mm Hg OS. Fundus evaluation revealed C/D ratio of 0.7 with diffuse pallor of the optic nerves OU. The retina was unremarkable. Follow up examinations revealed consistently elevated IOPs with anatomically open angles and Goldmann visual fields revealed overall constriction that was greater inferior temporal OS > OD. The patient’s pressure is currently managed with Alphagan TID OU. Visual fields and optic nerve heads have remained stable during 5 years of follow up.

This is a unique case of osteopetrosis with ocular hypertension which is unreported in the literature. Visual loss from osteopetrosis has been reported from optic atrophy and possibly a primary retinal degeneration in the infantile form. This patient was treated with ocular hypotensives, in part due to her already compromised optic nerves.
**Poster 37**

**Orbital Metastatic Disease**
Heather McLeod, O.D. and Scott Richter, O.D.
SUNY State College of Optometry

Orbital metastases are unusual, occurring less frequently than metastases to other sites of the body due to the small amount of blood that travels to the orbit. They most frequently metastasize from primary cancers of the breast, lung, and prostate. The clinical signs of orbital metastases are the same as those associated with other orbital disease, the most common presenting signs being proptosis and ocular motility disturbances. Unfortunately, metastatic orbital disease is associated with a poor prognosis since it is usually a sign of advanced disease.

A 60-year-old black female presented for a complete eye exam. Her medical history was significant for breast cancer for which she reported to be in remission. Examination revealed BCVA 20/25- OD, OS. Extraocular motilities OD were full and OS restriction was noted as 30% restriction superior, 40% superotemporal, and 20% superonasal. The patient denied diplopia. Pupils and color vision were normal. Exophthalmometry revealed a mild proptosis and resistance to retropulsion OS. Proposis was absent in old photos. Biomicroscopy and IOP were unremarkable. Fundus evaluation revealed pink and distinct optic nerve with C/D 0.3 OD and blurred margins greater nasally with mild elevation with C/D 0.2 OS. The visual fields revealed non-specific defects that did not clearly fit a diagnostic pattern. MRI revealed lesions in the intraconal and extracanal space of the left orbit and left parietal lobe that were consistent with metastasis. Calvarial lesions within the right parietal bone and left frontal bone were also noted, which are suggestive of metastatic bone disease. Although she initially reported that she was in remission, she later admitted to receiving monthly treatments of IV Zometa which is indicated for the treatment of bone metastases.

Orbital metastases are uncommon and are usually associated with advanced disease. This case demonstrates the importance of considering orbital metastases in the differential diagnosis in patients who present with orbital disease.

**Poster 38**

**Dramatic Decrease in Intraocular Pressure in a Glaucoma Patient After Cataract Surgery**
Anne Rozwat, O.D. and Bruce Teitelbaum, O.D.
Illinois College of Optometry

Cataracts and glaucoma are common co-morbidities. Studies have shown a mean intraocular pressure (IOP) reduction of approximately 3mm Hg after cataract surgery. We present a case of a large decrease in IOP in a glaucoma patient which allowed her to discontinue the majority of her medications.

An 84-year-old black female with a long history of primary open-angle glaucoma presented for follow-up. Her baseline IOP was 31 OD and 30 OS. She had been managed over the past 15 years with a variety of medications and was currently using Xalatan qhs OU and Combigan bid OS with an IOP of 15 OD and 15 OS. Best corrected visual acuity was 20/60 OD and 20/50 OS. Biomicroscopy revealed 3+ nuclear and 1+ cortical cataracts in both eyes. Gonioscopy showed trabecular meshwork in all 4 quadrants of both eyes. After surgical consultation, the patient elected to have phacoemulsification cataract surgery in both eyes, which was uncomplicated. Approximately 4 months after the initial surgery and 2 months after the second surgery, the patient presented for glaucoma follow-up. The patient misinterpreted the surgeon’s instructions and instead of discontinuing only the medication associated with cataract surgery, she had also discontinued her glaucoma medications 1 week prior to the appointment. Her IOP at this visit was 15 OD and 15 OS. Intraocular pressure 1 month later was 14 OD and 15 OS and 2 months later was 16 OD and 17 OS without treatment. Because of a possible progression in the visual field in OS, Xalatan was restarted in the OS only.

The visual benefit of cataract surgery is self-evident, but a secondary benefit of lowered IOP in primary open angle glaucoma patients may allow some patients to reduce their medications. This poster discusses the possible mechanism of action for the large decrease in IOP which remains speculative but includes anatomic changes to the angle, inflammatory of immunological effects, and fluid forces.

**Poster 39**

**Vitreomacular Traction Syndrome: Diagnosis and Treatment**
Zakiya Nicks, O.D., and Lindsay Elkins, O.D.
Southern College of Optometry

Vitreomacular traction syndrome describes preretinal tissue proliferation and incomplete posterior vitreous detachment resulting in direct traction on the macula. Effect of this traction on visual acuity can be dramatic, but highly varied depending on extent of the traction and the resulting retinal damage. Use of optical coherence tomography allows determination of active traction and extent of retinal damage, which can greatly influence management options.

Case One: A 71-year-old white female presented with a complaint of blurry vision OU, of gradual onset x 1 month. Best achieved distance acuity was OD: 20/60, OS: 20/200. Retinal findings included a large macular hole OS with an edema cuff. Fundus photos and Stratus OCT revealed a stage 1b macular hole OD, epiretinal membrane OD, and vitreomacular traction with retinal elevation and separation from RPE OS. The patient was referred to a retina specialist, who had a pars plana vitrectomy, internal limiting membrane peel, and fluid-gas exchanged resulting in a persistent macular hole and fluctuating vision, ultimately achieving distance visual acuity of 20/70-. The right eye progressed to develop a full-thickness hole and acuity of 20/70-. At last follow-up, the patient had not pursued surgery OD.

Case Two: An 81-year-old black male presented with a complaint of moderate glare, OU, x 6 months. Best achieved distance acuity was OD: 20/25, OS: 20/40. Dilatation revealed cataracts of equal severity OD/OS, and large epiretinal membranes in both eyes. Cirrus OCT revealed the presence of an ERM without traction OD, as well as vitreomacular traction OS with macular elevation and separation of sensory retina from RPE without a macular break. After risks and benefits of surgery were discussed, the patient chose not to pursue surgery.

Vitreomacular traction syndrome can have a significant yet varied effect on vision. The complex nature of surgical revision necessitates careful consideration of patients’ individual factors including best acuity, effect on activities of daily living and
A 63-year-old white male presented to the optometry clinic complaining of bilateral redness and watering of the eyes for 4 weeks. One week after onset, the patient noticed a blind spot in the right eye and inferior vision loss in the left eye. Upon further questioning, the patient revealed he had been experiencing multiple systemic complications, including weight loss, loss of appetite, joint and muscle pain, fatigue, and jaw pain. He also reported recent associated scalp tenderness, but that had resolved. Clinical examination revealed mildly decreased left eye visual acuities, a left afferent papillary defect, a left pale and neovascular optic disc, a left inferior altitudinal defect, scattered visual defects in the right eye with sparing of central vision and elevated pressures in both eyes. The patient was started on a 3-day course of intravenous steroids followed by a high-dose oral steroid regimen. The patient was also started on topical glaucoma medications to lower and maintain the intraocular pressure during the prolonged course of steroid treatment. Erythrocyte sedimentation rate and C-reactive protein testing confirmed the suspected giant cell arteritis.

Once proper treatment was initiated the systemic symptoms resolved, the visual loss in the primary eye stabilized, the visual defects in the fellow eye improved and the intraocular pressure stabilized. Although this patient’s condition never progressed beyond mild vision loss, it is important to understand that the delay in seeking treatment in light of the systemic symptoms could have led to significant visual impairment. The concurrent management of the ocular hypertension was an integral component to this case.

Poster 40
Atypical Giant Cell Arteritis with Ocular Hypertension
Lisa Niven, O.D., James Eddis, O.D., and Abby Vanderah, O.D.
U.S. Army, Ft. Jackson

Giant cell arteritis is a potentially visually devastating condition that affects approximately 1 in 150,000 patients over the age of 60 annually. Without prompt diagnosis and systemic steroid treatment, there is a high risk of severe bilateral visual impairment as approximately 90% of patients will suffer vision loss in the fellow eye. This case will demonstrate an atypical presentation of giant cell arteritis with mild decrease in visual acuities and elevated intraocular pressures in a patient who delayed seeking treatment.

Central retinal artery occlusion is unusual in young patients, necessitating a timely and thorough systemic evaluation. Unfortunately, only a few anecdotal treatments exist for patients presenting promptly after the occlusive event. Beyond the acute phase, there is no treatment for CRAO and visual prognosis is poor. The optometrist plays an essential role in the prevention of further vascular events through patient education and referral for physical examination. Extensive laboratory and cardiac work-up is indicated for the detection and treatment of any underlying systemic pathology.

Poster 42
Treatment of Penicillin-Hypersensitive Ocular Syphilis Patient
Erica Ittner, O.D.

Penicillin G is the treatment of choice for ocular and neurosyphilis. Although alternate treatments are available, they are considered to be less effective at eradicating spirochete infection. Prevalence of penicillin allergy among the general population is suggested to be 10%. For penicillin-allergic syphilis patients, drug desensitization is recommended. Drug desensitization involves stepwise introduction of sub-therapeutic doses of the offending medication under medical supervision until therapeutic levels are reached and maintained, inducing temporary drug tolerance. Primary eye care providers should be aware of this treatment option for hypersensitive syphilis patients and be prepared to pursue proper desensitization treatment.

A 52-year-old black female presented with a painful red eye. Her medical history was remarkable for hypertension and penicillin hypersensitivity. Best-corrected vision was 20/20 OD, OS. Slit lamp examination demonstrated sectoral episcleritis OS. Subsequent follow-up examinations revealed recurrent inflammation despite appropriate topical steroid and anti-inflammatory treatments. Blood work was ordered to help rule out systemic causes. RPR and MHA-Tp were reactive providing diagnostic evidence of active ocular syphilis. The patient was referred and treated with appropriate intravenous (IV) penicillin G desensitization and has exhibited full resolution of ocular inflammation.

This case is representative of the various possible presentations of ocular syphilis and the importance of proper therapeutic treatment in those who are drug hypersensitive.

Successful penicillin desensitization protocols have been described in the literature concerning continuous IV infusion pump as well as a combined protocol of oral, subcutaneous, and intramuscular methods of administration. As the incidence of syphilis is rising, it is important to keep in mind all options regarding treatment, even those that may have more inherent risks due to drug hypersensitivity.

Poster 41
A Curious Case of Central Retinal Artery Occlusion
Lanae Knapp, O.D. and Christian Thompson, O.D.
Chinle Hospital

Occlusion of the central retinal artery causes acute, painless monocular vision loss with retinal infarction due to hypoxia. The most common etiology of a retinal occlusion is an embolic event related to atherosclerotic plaque in older patients. The occurrence of a central retinal artery occlusion in a patient under the age of 40 is particularly rare and raises concern for a cardiogenic embolus.

A 19-year-old Native American male with a history of substance abuse presented 5 days after the onset of sudden, profound monocular vision loss coincident with an episode of binge drinking. Upon diagnosis of central retinal artery occlusion, a laboratory work-up revealed abnormal liver function. He was airlifted from our rural emergency department to a major medical center where a hepatic embolus was ruled out. No systemic etiology aside from substance abuse was ultimately elicited. This patient did not regain vision beyond the hand motion acuity present at his initial visit.
**Poster 43**
**Spectral-Domain OCT Fluorescence Scan: A Novel High-Resolution Technique in Confirming Diagnosis of Optic Nerve Head Drusen**
Dejana Grk, Anna Moore, and Vladimir Yevseyenkov, O.D., Ph.D.
MWU Arizona College of Optometry

Optic nerve head drusen (ONHD) are globules of mucoproteins and mucopolysaccharides that present as degenerative calcifications in the optic disc. They present in 0.3% of the population with 91% bilaterality. The presence of drusen may cause elevation in the papilla and as a result may often be mistaken for papilledema. The gold standard to diagnosis of ONHD is B-domain ultrasonography. However, with its high-resolution imaging capabilities, the spectral-domain OCT Fluorescence Scan presents a novel alternative in confirming ONHD diagnosis.

A 27-year-old white female presents to the Midwestern University Eye Institute (MWU EI) complaining of mild blur at distance. No other visual or comfort complaints were elicited. Medical history was unremarkable. Ocular history revealed hypermetropia OU and the patient was currently without correction. Entrance VA was 20/25 OD and 20/30 OS, sc. All other entrance tests were unremarkable. Anterior segment was unremarkable. Posterior segment revealed unilateral elevation of the right optic nerve. Visual field revealed small nasal depression OD, which was coincident fundoscopically with the optic nerve head findings. Patient was given the diagnosis of pseudo-papilledema, OD. Patient returned to the MWU EI one week later for further testing including B-scan ultrasonography and Spectralis OCT Fluorescence Scan. Both tests confirmed the diagnosis of ONHD OD.

In the past, the diagnosis of ONHD was confirmed with the gold standard of B-scan ultrasonography, but today the Spectralis OCT Fluorescence Scan presents a novel alternative in its diagnosis.

**Poster 44**
**Case of Unilateral Sickle Cell Retinopathy in a Pediatric Patient**
Paula McDowell, O.D.

Sickle cell disease is prevalent in approximately 5–10% of African-Americans in the United States. There are three main types of sickle cell disease related to retinopathies: homogenous sickle cell disease (SS type), sickle cell C disease (SC type) and sickle cell-Thalassemia disease (S-Thal type). Around 40% of those patients with SC type are expected to develop proliferative sickle retinopathy. Typical findings of sickle cell retinopathy include salmon patches and sunburst lesions, and proliferative retinopathy may show sea fan neovascularization or vitreous hemorrhages. In pediatric patients, a large range of sickle cell retinopathy has been reported; anywhere from 17 to 96%.

A 9-year-old black male with known history of sickle cell disease (SC type) presents for his yearly comprehensive eye exam. Previous examination a year prior revealed no retinopathy in either eye. At this visit, visual acuity was best corrected to 20/30+2 OD and 20/20 OS. Entrance testing, including color vision, EOMs, pupils, visual fields, and external health were unremarkable. A dilated fundus exam revealed no retinopathy OD, but two distinct salmon patches nasally OS. There were also several small areas of regressed fibrovascular proliferation, OS only. There were no signs of proliferative retinopathy in either eye. A follow-up visit with the retinal specialist 3 months later revealed a small area of regressed fibrovascular proliferation OD as the only change in retinal findings. Visual acuities were stable, with no subjective changes, but the patient had been scheduled for an upcoming spleen surgery following a recent primary care visit.

While several studies recommend screening for sickle cell retinopathy in children at 9 years old, it is possible that retinopathy may occur sooner in those with the disease, specifically SC type 2.3. This patient is on a 6-month follow-up schedule, alternating visits with a pediatric optometrist and a retinal specialist. All patients with sickle cell disease should be followed at least annually with a careful dilated fundus exam, regardless of age.

**Poster 45**
**Non-Arteritic Anterior Ischemic Optic Neuropathy (NAION) and Optic Disc Drusen**
Mayur Bhavsar, O.D., Karen Dunlap, O.D., and Catherine Chiu, O.D.
The Wilmer Eye Institute, The Johns Hopkins School of Medicine

Optic disc drusen (ODD) is usually a benign condition caused by abnormal axonal metabolism that leads to intracellular mitochondrial calcification. This calcification can make optic nerve assessment difficult and often causes visual field loss. Anterior ischemic optic neuropathy is thought to be an ischemic process affecting the vessels supplying the optic nerve at its exit from the eye. This ischemia causes sudden vision loss and optic disc swelling. Although no cause has been identified, it is often associated with systemic conditions. The following case illustrates a case of NAION associated with ODD.

A 79-year-old white male presented for a routine eye exam exhibiting a new onset left APD. He had an ocular history of narrow angles and ocular hypertension for which he had bilateral peripheral iridotomies, and he also had a history of optic nerve drusen OS. His systemic history included hypertension but no history of vasculitis. He presented with best correctable visual acuities of 20/20 OD and 20/25 OS. Color vision and red cap desaturation were normal. His intraocular pressures measured 14 OD and OS and both peripheral iridotomies were patent. Dilation revealed a healthy 0.35 right optic nerve and an elevated 0.2 left nerve with buried drusen more prominent superiorly. Visual field testing exposed non-repeatable scattered defects OD and a repeatable dense inferior arcuate defect and mild superior arcuate defect OS. B-scan ultrasonography confirmed optic nerve drusen in the left eye only. A CT scan showed left disc drusen but no evidence of acute intracranial pathology. Subsequent visits revealed left optic nerve pallor. Lab work including ESR, CRP, CBC, and RPR were all normal/negative. Based on these findings the patient was diagnosed with NAION associated with ODD.

Although rare, optic disc drusen may be associated with AION. The mechanism of action is not well understood. It is thought that small scleral canals may contribute vascular compromise secondary to axonal crowding, so disc drusen could have a similar effect by increasing disc crowding. Another theory is that drusen bodies themselves act directly on healthy optic disc vessels to cause infarction. This case represents a typical
presentation of NAION with a not-so-typical association with optic disc drusen. One can argue that his hypertension may be culprit for the NAION but one can not rule out the ODD from playing a role or even being the main cause.

**Poster 46**

**Bilateral Peripapillary Choroidal Neovascularization Presenting as Polypoidal Choroidal Vasculopathy**

Shelly Byun, O.D., and Stephanie Klemencic, O.D.
Illinois College of Optometry

Polypoidal choroidal vasculopathy (PCV) is characterized by abnormal branching of vascular networks with polypoidal lesions located in the inner retina. Its incidence is higher in patients with hypertension, diabetes, sickle cell disease, melanocytoma, and darkly pigmented individuals. Choroidal lesions vary in size and location, but are most commonly found in the peripapillary region, followed by the macular and midperipheral regions. Once considered a rare condition, it has been reported that PCV may actually account for up to 10% of age-related macular degeneration diagnoses and up to 85% of patients with pigment epithelial detachments. We present a case of polypoidal choroidal vasculopathy presenting as bilateral peripapillary choroidal neovascularization and later developing macular serous detachment.

An 87-year-old black female presented to the clinic for a comprehensive eye exam with no ocular complaints. Her history was significant for systemic hypertension which was controlled with medication. Best corrected visual acuities were 20/20 OD, OS. Upon dilation, bilateral peripapillary choroidal neovascularization was present with no macular involvement. Fluorescein angiography revealed abnormal vascular leakage with globular aneurysmal changes deep to the retina in the late phase of the angiography, confirming the diagnosis of polypoidal choroidal vasculopathy. As the lesions were not macular-threatening, the patient was monitored closely. Two months later, the patient reported a thumbnail-shaped distortion OD. Best corrected visual acuity was 20/30 OD and 20/20 OS with macular serous detachment OD. The patient was referred to ophthalmology and focal argon laser was performed OD. One month post-laser, the serous detachment resolved and vision returned to 20/20.

Polypoidal choroidal vasculopathy is a condition that was once considered a rare disease. However, the prevalence is often underestimated due to the rate of misdiagnosis. It is important to consider the differential diagnoses and properly diagnose PCV as the treatment modalities may differ from other disease processes. The recurrent nature of the abnormal choroidal vessels creates a challenge in managing and treating patients with PCV.

**Poster 47**

**White Dots and Cells and Streaks, Oh My!**

Joseph Pizzimenti, O.D., and Maria Mandese, O.D.

The “white dot syndromes” are a heterogeneous group of conditions affecting the retina and the choroid. Multifocal choroiditis and panuveitis (MCP) is characterized by multifocal chorioretinal lesions with anterior and posterior segment inflammation. It occurs predominantly in myopic females, with a mean age of onset of 33 years. Patients usually present with an acute onset of blurred vision, photopsias, and scotomata.

Bilateral involvement is present in the majority of patients. Sight-threatening complications include choroidal neovascularization (CNV) and cystoid macular edema (CME). Initial treatment of MCP centers on corticosteroids. Long-term systemic immunomodulation may be required, with methotrexate and mycophenolate. Treatment of CNV may be accomplished with photodynamic therapy or anti-VEGF agents.

A 27-year-old Asian female optometry student presented with moderate bilateral distance blur of gradual onset. Ocular history was positive for recurrent uveitis. In each eye, which began 4 years earlier. She reported being under the care of a retina specialist for an “idiopathic condition.” The patient was using prednisolone acetate 1% suspension 1 gt bid in each eye. Best corrected distance visual acuities were 20/20 OD and OS. Clinical findings included white/yellow dots and linear chorioretinal streaks, along with anterior and posterior chamber cells. Based upon the patient’s history, demographics, and clinical features, a diagnosis of Multifocal Choroiditis and Panuveitis (MCP) was established. We performed fundus photography and OCT to document the MCP and the absence of CNV and CME. She returned to our clinic for central and peripheral threshold perimetry. We advised the patient to continue with her topical steroid treatment and her regularly-scheduled visits to the retinal specialist.

Multifocal Choroiditis and Panuveitis is a bilateral, chronic condition characterized by multiple punched-out chorioretinal lesions similar to those observed in ocular Histoplasmosis. Immunosuppressive drug therapy appears to reduce the risk for sight-threatening complications.

**Poster 48**

**Horner’s Syndrome Induced by Iatrogenic Treatment for Uveitis**

Catherine Chiu, O.D., and Mayur Bhavsar, O.D.
VA New Jersey Healthcare System

Horner’s Syndrome is usually an acquired condition resulting from disease, but it can also be congenital or induced by medical treatment. There are 3 clinical features that are commonly associated with Horner’s syndrome: ptosis (drooping of the eyelid), miosis (constriction of the pupil) and anhydrosis (decreased sweating on the affected side of the face). These features indicate a problem with the sympathetic nervous system. We present a case of a male who developed Horner’s syndrome as a result of treatment for uveitis when he was a teen.

A 35-year-old male presented complaining about a lid droop in his left eye since the age of 17, seeking to pursue surgical repair. He stated he was treated for an episode of pink eye in the left eye at the age of 17 and after treatment a lid droop developed. The lid droop is worse in the morning and in the late evening. He has had no other episodes of similar symptoms since this initial onset. He has no history for any significant medical conditions. His best corrected acuity was 20/20 right eye and left eye. Pupil examination showed the left pupil slightly smaller than the right one. There was a marked ptosis of the left eye and the rest of the anterior and posterior ocular findings were unremarkable for both eyes. A ptosis screening was done, which showed reduced peripheral field of the left eye and normal findings with the lid taped. The patient was referred for a neuro-ophthalmology evaluation, which diagnosed a third order
Horner’s through pharmaceutical testing. The patient tested positive for anhidrosis, which he was not aware of. The patient was also imaged with MRI of the cavernous sinus and MRA of the neck, which were normal. The findings indicate the patient most likely developed Horner’s after treatment for uveitis in the past.

Appropriate clinical testing is necessary to make a diagnosis for Horner’s Syndrome. Reduced sympathetic activity of a few neurons along the autonomic nervous system will cause this condition. Various factors are involved in causing a Horner’s Syndrome and it can be benign or a serious disease condition. This poster reviews the neurological pathway of Horner’s syndrome, pharmaceutical agents to determine the location for the condition and causes for Horner’s Syndrome.

Poster 49
An Unusual Case of Bilateral, Not So Central, Central Serous Retinopathy Revealed by OCT
Kenneth Seger, O.D., Pravina Patel, O.D., and Melanie Crandall, O.D.

Central Serous Retinopathy (CSR) is typically an accumulation of serous fluid under the macular region. This condition is usually unilateral. It often spontaneously resolves but can recur up to 10 years after the initial incident. Optical coherence tomography (OCT) is used for imaging the retina. We present a case of long-standing, bilateral CSR, 1 eye of which was affected in the perimacular region. OCT showed the unusual location of the fluid leakage.

A 46-year-old Hispanic male presented to our clinic with a previous history of central serous retinopathy in the left eye. His chief complaint was decreased vision in both eyes for the past 2 years. The symptom fluctuated, worsening with stress. Following a full workup including Fluorescein angiography, a diagnosis of CSR was made 9 years prior. The most recent eye exam, 4 years prior, revealed no signs of CSR. The patient claimed to be in good health and denied use of any medication. His last physical exam was 1 year prior. Best corrected VAs were OD: 20/15 OS: 20/50. Blood pressure, pupils, confrontation fields, extra-ocular motility, and intraocular pressure were all normal. Amsler grid testing showed a round grayish scotoma centrally OS. There was no metamorphopsia or scotoma present OD. With fundus examination the right eye appeared to have an area of slight elevation superior to the macula. In the left eye, there was 2/3DD macular mottling and retinal thickening. OCT was performed on each eye. Macular thickening was apparent in both eyes. OCT OS showed large focal macular thickening in the fovea. The fluid-filled space OD was moderately superior to the macula (OCT images will be included). The patient was referred but lost to follow-up. OCT was able to pick up a subtle lesion in an atypical location which was missed by Amsler Grid testing. Periodic screening with OCT may be useful for monitoring CSR.

Poster 50
Anemic Retinopathy In a Patient With Acute Myeloid Leukemia
Matthew Hochwalt, O.D.

Acute myeloid leukemia is a rapidly progressive neoplasm which is derived from hematopoietic precursors (myeloid stem cells). This disease causes myeloblasts, which are immature white blood cells. As the immature white blood cells proliferate, they displace and interfere with the production of normal blood cells. Pancytopenia eventually follows, leading to severe anemia and acute retinopathy.

A 78-year-old white male who had been followed for several years presented with a significant amount of bilateral intraretinal hemorrhages. The patient had been followed in the past for mild primary open angle glaucoma, cataracts and an occasional hypertensive retinal change. On the day the patient presented with acute retinopathy, he was sent to the emergency room following examination because he began to feel lightheaded and dizzy. Over the next week, labs showed that patient had developed acute myeloid leukemia. Complete blood cell counts from before ocular presentation to several months after show a significant change in patient’s blood chemistry, giving a serial view of the development of the leukemia. Due to several other health problems, including COPD, patient declined treatment and passed away 3 months later.

This case illustrates the possible acute and severe changes that occur in a patient who has developed leukemia. The patient and primary care provider were unaware of its development at the time of the eye examination. Optometrists play a key role in identifying these changes prompting initiation of medical treatment, increasing the patient’s chances of survival. This case clearly depicts how a change in blood chemistry can manifest itself into retinal changes.

Poster 51
Idiopathic Optic Neuritis with Atypical Symptoms
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Optic neuritis (ON) is the inflammation, infection, and/or demyelization of the optic nerve head (ONH). It is most often associated with multiple sclerosis (MS) and normally affects whites within their 3rd to 6th decades. Patient symptoms commonly include: mild to severe unilateral vision loss, pain on eye movement, and a central scotoma visual field defect. Associated signs may or may not involve visible edema of an ONH and an afferent papillary defect (APD). The Optic Neuritis Treatment Trial (ONTT) revealed a 22% risk of MS over 10 years if no white matter lesions were noted on magnetic resonance imaging (MRI) and a 56% risk of MS over 10 years if one or more white matter lesions were identified. ONTT also found ON will reoccur in 28% of patients within 5 years of the first episode and 35% within 10 years. Intravenous steroid treatment is sometimes used when acuity is compromised as it is proven to hasten recovery, but overall visual outcome is not influenced.

A 29-year-old white male, new patient reported to the Battle Creek VAMC with a complaint of a new onset large floater OS for 5 days. Distance visual acuities were OD 20/20 and OS 20/20 without correction. Extraocular muscles were full and patient denied any pain upon eye movement. Pupils were equal, round, and reactive to light with no APD. Anterior segment findings were unremarkable. Dilation revealed an edematous left ONH. Photos were taken for documentation. The staff neurologist was consulted and an MRI, Lyme disease, and syphilis tests were ordered. A neurology appointment was scheduled 2 weeks later; where the MRI and lab results were reviewed. The impression of the MRI was developmental asymmetric ventricles and left posterior ethmoid sinus disease, but no signs of MS were discovered. All lab tests were within normal limits. Patient
was seen at Ann Arbor VAMC Ophthalmology for his 1-month follow up and then back at Battle Creek VAMC Optometry for his 2-month evaluation. Examinations showed gradual improved appearance of the ONH swelling OS with only residual edema nasally, no significant visual field loss through Humphrey Visual Field 24-2 testing, and no reduction in acuities or color vision. The patient's next scheduled follow up is at the three-month mark, as he will continue to be followed until his ONH edema has completely resolved. The patient has been educated on idiopathic ON and told to return to the clinic sooner than his monthly checks if any changes are noted.

It is vital to investigate all possible explanations to chief complaints as not all patients will present with typical symptoms and classic appearances of disease states. Important caveats to the management of this case are working closely with neurology to rule out systemic diseases that may have caused the ON and to initiate treatment as necessary. Also, it is essential to educate the patient on the findings in the ONTT for risks in the years to come.

**Poster 52**

**Giant Intracavernous Internal Carotid Artery Aneurysm Presenting as Isolated Cranial Sixth Nerve Palsy**

Mandy Dailey, O.D.

An internal carotid artery aneurysm can compress, some, or all of the surrounding cranial nerves that course within the cavernous sinus. Since the abducens nerve is located lateral to the internal carotid artery, it is most susceptible to compression from an enlarging aneurysm, which causes palsy. The types of cranial sixth nerve palsies are: nonisolated, traumatic, congenital, vasculopathic, nonvasculopathic, and progressive or unresolved. The etiology of each type of sixth nerve palsy must be assessed when a patient presents in this manner. In this particular case, the patient presented with an isolated, nonvasculopathic cranial sixth nerve palsy. Subsequent neuroimaging revealed a giant intracranial internal carotid artery aneurysm. Said aneurysm is a weak area in the wall of a blood vessel that bulges to a size of at least 2.5 centimeters in diameter. These aneurysms infrequently occur in patients under 45 years of age without any predisposing vasculopathic factors, and rarely present as an isolated sixth nerve palsy case. These types of palsies require immediate neuroimaging for further evaluation.

A non-hypertensive, non-diabetic 26-year-old white female with mild, longstanding headaches presented for a second opinion concerning progressive binocular diplopia and a constant left esotropia that had plagued her since August 2011. Upon examination, her best-corrected visual acuity was 20/20 in each eye with a moderate myopic correction. Both pupils reacted normally without any sign of anisocoria under bright and dim conditions. Color vision and confrontation visual fields were normal. On ocular motility testing she had an abduction deficit of the left eye. The cover test revealed 30 prism diopters of left esotropia in primary gaze. The patient denied facial numbness, motor weakness, and tingling in her lower extremities. There was no chemosis, proptosis, or ptosis. The anterior and posterior segments were unremarkable. Humphrey visual field demonstrated a reliable and normal test in both eyes. MRI of the brain and orbit was performed with T1 and T2 weighted sagittal, coronal, and axial images. There was an extra-axial heterogenous “mass” with a diameter of approximately 4.0 centimeters in the left petrous apex/cavernous sinus region representing a giant left ICA aneurysm. A diagnostic cerebral angiogram was performed to further delineate the vascular anatomy, which demonstrated a thrombosed giant fusiform petrocavernous left ICA aneurysm with a densely stenotic portion distally on the vessel.

Treatment of giant intracavernous internal carotid artery aneurysms should be carefully considered and tailored towards the patient. Treatment options include conservative management with serial imaging, endovascular ICA balloon occlusion, endovascular coil placement, the placement of a flexible covered stent, or surgical trapping and revascularization with a high-flow bypass. The latter is the likely option for the patient. Fortunately, in many patients the cranial sixth nerve palsy resolves when the underlying disorder is treated. Most importantly, clinicians should understand the different types of cranial nerve palsies, possible etiologies, proper testing, differential diagnoses, and the urgency of neuroimaging, if necessary.

**Poster 53**

**Multidisciplinary Management of Complicated Panuveitis**

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Nova Southeastern University College of Optometry

Panuveitis is often associated with inflammatory granulomatous disorders. Vogt-Koyanagi-Harada (VKH) syndrome is a multi-organ, autoimmune disorder of melanocyte proteins that affects eyes, skin, inner ears, and meninges.

A 32-year-old black female presented for a second opinion. She reported a sudden, bilateral, progressive decrease in vision, OS worse than OD, during the prior few days. A day earlier, she was diagnosed with an “iritis,” for which the provider prescribed a “steroid drop.” Medical history was positive for a non-specific headache 2 months prior that lasted for 2 weeks. Acuities with correction were 20/50 OD and 20/200 OS with no improvement on pinhole. Biomicroscopy revealed bilateral keratic precipitates and anterior chamber cells. Dilated funduscropy revealed bilateral vitreous cells, disc edema, and exudative retinal detachments that extended to the macula. Optical coherence tomography (OCT) showed undulations of the retinal pigment epithelium, and multilobular serous detachments of the sensory retina. An ocular diagnosis of bilateral panuveitis, with sight-threatening sequelae, was established. The patient was promptly referred to a uveitis subspecialist. Fluorescein angiography showed multiple hypofluorescent areas at the level of the retinal pigment epithelium. An etiology of VKH was established, based upon patient demographics and history, ocular and physical examination, and laboratory studies. Aggressive treatment with oral prednisone was initiated.

Panuveitis may include exudative retinal detachment, optic nerve swelling, and atrophy of the retinal pigment epithelium. VKH should be considered as a potential etiology when uveitis presents with concurrent neurologic or cutaneous signs and symptoms.
Progressive outer retinal necrosis (PORN) can be a visually devastating disease. Most often associated with varicella zoster virus and seen in immune-compromised hosts, possible complications of PORN include rapid necrotizing retinopathy with macular involvement, optic neuropathy, and ultimately, secondary retinal detachment. If diagnosed early and treated aggressively, visual complications can be prevented; however, there is no current consensus on the most appropriate antiviral regimen.

A 32-year-old black male presented to the Illinois Eye Institute Urgent Care Service with a chief complaint of floaters OU of two weeks duration. He denied flashes, curtain vision, or other vision loss. His medical history was positive for diabetes and was recovering from a recent bout of “chickenpox” with facial scarring secondary to lesions. Entering visual acuities were 20/20 in each eye and all entrance tests were within normal limits. Dilated fundus exam showed confluent areas of peripheral retinal necrosis with trace vitritis in both eyes. A presumptive diagnosis of PORN was made and the patient was immediately admitted to the hospital where he was promptly started on intravenous acyclovir. The patient disclosed to hospital staff he was HIV-positive and currently undergoing HAART therapy. Blood work revealed CD4+ count of 84. A vitreous tap uncovered the presence of varicella zoster, confirming the presumed diagnosis of PORN. Intravitreal foscarnet and ganciclovir were administered OU in addition to oral antiviral therapy. Prophylactic barricade laser photocoagulation was applied to the peripheral retina in each eye shortly after resolution of retinopathy. At follow-up visits, visual acuities were unchanged and peripheral retinas were quiet and attached.

This case demonstrates that if diagnosed and treated quickly, visual complications of PORN can be avoided. Due to the low incidence of PORN, consensus has not been reached on the most appropriate antiviral treatment regimen or the efficacy of prophylactic vitrectomy or peripheral laser photocoagulation on preventing secondary retinal detachment. Even if early visual complications are prevented, patients and primary eye care providers need to be aware of the continued risk of retinal detachment secondary to retinal atrophy.

Optic disc melanocytoma is a rare, benign lesion that is a variant of melanocytic nevus. The tumor can be confined to the optic disc or extend to the peripapillary choroid and retina. While visual acuity is generally unaffected, vision loss can occur due to subretinal fluid, retinal vein obstruction, tumor necrosis or malignant transformation.

A 47-year-old white male presented for his first eye exam. Best corrected visual acuities were 20/20 OD, OS. Pupils were normal with no afferent pupillary defect. A darkly pigmented, elevated lesion was found obscuring most of the optic disc in the left eye. The superior temporal rim showed feathery borders consistent with retinal extension. On B-scan ultrasonography the lesion measured 1.5 mm in height. Visual fields were full in both eyes. The patient was diagnosed with an optic disc melanocytoma.

Although the diagnosis of melanocytoma can usually be made by ophthalmoscopic appearance alone, care must be taken to rule out juxtapapillary choroidal melanoma and primary melanoma of the optic nerve. Melanocytoma can slowly grow in 10-15% of cases, while rapid growth is more suspicious for malignancy. Only 1-2% of melanocytomas will convert to melanoma. Annual examination with fundus photography is recommended.

Optic neuropathy occurs when there is damage to the anterior visual pathway. This can result in retinal nerve fiber layer (RNFL) loss, changes in vision, visual field defects and pallor or edema to
the optic nerve. There are several etiologies including infiltrative, compressive lesions, ischemia, hereditary, trauma, mechanical, or toxic/nutritional deficiencies. Each etiology has unique characteristics, treatment options and prognostic factors.

This case is that of a 60-year-old male who presented to a clinic for a routine eye exam with complaints of difficulty reading. Systemic medical history included type 2 diabetes mellitus (DM), hypertension, hypothyroidism, sleep apnea and vitamin B12 deficiency. The patient's pertinent medications included: insulin, Metformin (which was later discontinued), Synthroid and vitamin B12 supplements. Best corrected visual acuity was 20/20 in both eyes. Dilated examination revealed optic disc pallor with severe retinal nerve fiber layer loss greater in the right eye. Subsequent examinations of this patient included visual acuities, visual fields (repeated for accuracy), pupils, color vision, brightness comparison, fundus examination, fundus photography, lab testing and neuro-imaging. After careful review of patient history and all clinical data collected, the patient's presumed diagnosis is a combination of nutritional optic neuropathy secondary to vitamin B12 deficiency and diabetic neuropathy, resulting in the atypical presentation. This patient is currently being followed by serial eye exams, which include visual fields and quarterly systemic health evaluations.

Optic neuropathies are common and can be seen in patients of all ages. It is important to obtain a complete history, in addition to performing all the necessary testing to determine the exact etiology. Long term use of Metformin was the likely cause of decreased absorption of B12 resulting in nutritional optic neuropathy and contributing to the metabolic cause of diabetic neuropathy.

**Poster 58**

**Ocular Manifestations of Blunt Trauma**

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Blunt trauma is most often a result of motor vehicle accidents, sports related injuries, and physical assault. The most common complaint after an orbital trauma is diplopia. Blunt trauma to the eye can result in a multitude of manifestations such as orbital floor fracture, extraocular muscle (EOM) restriction, diplopia, conjunctival and retinal hemorrhages, and choroidal rupture. Initial examination by an optometrist should consist of determining the nature of the trauma, if there is a life- or sight-threatening occurrence, and if referral for imaging or surgical intervention is needed.

A 25-year-old Hispanic male presented with a swollen, red right eye. He was punched in the eye 5 days prior, and was experiencing pain on eye movement, photosensitivity, blurry vision, and diplopia. On initial examination the patient's visual acuity was count fingers in the affected eye, he had a positive APD with a traumatic mydriatic pupil, restriction in superior visual field, and EOM restriction which suggested an orbital floor fracture with muscle entrapment. The trauma also resulted in ecchymosis of the eyelids, a 360-degree sunconjunctival hemorrhage, commotio retinae, choroidal rupture, subretinal and pre-retinal hemorrhages, and a serous retinal detachment. OCT and fundus photos demonstrate the findings. The patient was referred and underwent open reduction internal fixation (ORIF) surgery with insertion of a mesh plate for treatment of the floor fracture, 10 days after the injury. Upon follow-up examination, the patient had residual diplopia secondary to muscle congestion and a chorioretinal scar, but the vision had remarkably improved to 20/40 in the affected eye.

Orbital blunt trauma can affect any and all structures of the eye. It's important to determine if the trauma is penetrating or nonpenetrating, if there are entrapped EOMs, and if there are any possible sequelae such as angle recession, rosseeta cataract, traumatic glaucoma, or choroidal neovascular membrane (CNVM). CT scan is the gold standard for detection of bone fractures and metallic intraocular foreign body. Timing for treatment of an orbital floor fracture is based on severity of symptoms, entrapment of muscles or surrounding soft tissue, the magnitude of the fracture, and whether the patient is improving with time. Treatment for commotio retinae and choroidal rupture is often observation, with possible oral steroids to help decrease the inflammation. Muscle entrapment, orbital congestion and nerve damage can lead to diplopia, which can be treated with surgery, prism, occlusion or monitoring. Management of patients with orbital trauma is lifelong with careful monitoring for possible sequelae.

**Poster 59**

**Headache as the Presenting Symptom of Cerebral Venous Sinus Thrombosis**

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Cerebral venous sinus thrombosis (CVST) is an uncommon cause of pseudotumor cerebri (PTC). CVST has been identified in up to 9.4% of PTC cases. Patients are often undiagnosed at initial presentation due to the variability in clinical presentation. Risk factors, clinical signs, and clinical symptoms are similar between CVST and idiopathic intracranial hypertension (IIH). An important distinction between CVST and idiopathic intracranial hypertension (IIH) is an increased mortality rate secondary to cerebral hemorrhage, pulmonary embolism, and brain herniation in patients with CVST. Magnetic resonance venography is the investigation of choice to confirm the diagnosis. CVST and IIH are treated similarly with a carbonic anhydrase inhibitor and weight loss. However, patients with CVST may require additional treatment with antithrombotic agents.

A 42-year-old black female presented to the clinic with a frontal headache that began 4 months prior. Her systemic history was significant for hypertension which was controlled with medication and an allergy to sulfa medication. Best corrected vision was 20/20 OD and OS with no afferent pupillary defect. Fundus examination revealed bilateral disc edema with small cup-to-disc ratios and no hemorrhages. Optical coherence tomography demonstrated significantly thickened nerve fiber layer and C-shaped edema OS. Visual field testing was normal. An MRI/MRV was ordered ruling out a space-occupying lesion. The MRV showed a left venous sinus thrombosis. The neurologist initiated treatment with Topamax and the patient was placed on a weight-loss program with a nutritionist.

It is difficult to differentiate between idiopathic intracranial hypertension and cerebral venous sinus thrombosis based on clinical signs and symptoms alone. The variability in clinical presentation for CVST patients lends to the difficulty in diagnosis. And, although the treatment is similar for both conditions, it is important to differentiate the conditions with an MRI and MRV to minimize the risk of mortality in patients with CVST.
Poster 59
Complications of Chlamydial Conjunctivitis
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Chlamydia is the most commonly sexually transmitted disease in the United States and Europe. Approximately 1 in 300 individuals with genital chlamydial disease develop inclusion conjunctivitis. Diagnosis and management of inclusion conjunctivitis can be challenging and delayed. Clinical presentation may be atypical and frequently mimics other causes of conjunctivitis and even pre-septal cellulitis. Recent review of the literature shows that management may be complicated due to inadequate medical dosing, decreased antibiotic susceptibility, and patient non-compliance.

A 23-year-old Navajo male presented to the eye clinic with a red, itchy, and painful left eye, which he reported was "matted" in the morning upon awakening for 2 days. The initial case history precluded a sexually transmitted disease, and clinical findings lacked the typical presentation of mucopurulent discharge, superior pannus, and swollen pre-auricular lymph node. Specific treatment for inclusion conjunctivitis was delayed until subsequent follow-up showed no change in clinical presentation and case history revealed previous treatment for chlamydial genital infection 3 months prior. Culture of the conjunctiva and a laboratory testing for STD infection were performed with patient consent. Laboratory findings were positive for chlamydia trachomatis. The conjunctivitis improved after treatment with 1 gram Azithromycin, suggesting inadequate dosing of initial treatment or re-infection due to poor patient compliance.

Diagnosis and management of inclusion conjunctivitis may be initially delayed since case history and clinical presentation may preclude a sexually transmitted disease infection.

Complications may arise in the management of inclusion conjunctivitis due to antibiotic resistance, inadequate antibiotic dosage, and patient non-compliance. New research suggests multiple treatments of the standard 1 gram Azithromycin may be needed to fully eradicate the infection. Being aware of these complications, practitioners can successfully manage cases of inclusion conjunctivitis and prevent further spread of this "silent epidemic."

Poster 60
Idiopathic Intracranial Hypertension (IIH)
Heather Miller, O.D., and Andrew Gurwood, O.D.

Idiopathic Intracranial Hypertension (IIH) is a rare neurological condition occurring in approximately 1/100,000 people in the general population.

A 24-year-old, black female presented to the emergency service complaining of worsening cloudy vision in both eyes of 1 week's duration. She noticed that her side vision was missing and explained she was bumping into the walls. She also complained of a headache. She denied diplopia or tinnitus but described neck pain while standing, along with intermittent episodes of nausea. Her best-corrected visual acuity was 20/25 OU. External examination found smooth extra-ocular muscle movement, no evidence of afferent defect, no evidence of color or brightness deficit but significantly constricted visual fields. Biomicroscopic examination was unremarkable with Goldmann applanation pressures measuring 14mm Hg OD and 16mm Hg OS. Dilated examination uncovered bilateral disc edema without the presence of a spontaneous venous pulse. An emergent neurological referral was made with suggested testing that included magnetic resonance imaging (MRI), magnetic resonance arteriography (MRA), magnetic resonance venography (MRV), blood urea nitrogen (BUN to insure no gadolinium contraindications), lumbar puncture (LP), complete blood count with differential and platelets, Lyme titer, fluorescent treponemal antibody absorption (FTA-Abs), reactive plasma regain (RPR), angiotensin converting enzyme (ACE) along with toxic nutritional testing to rule out space-occupying lesions, venous sinus thrombosis, aneurysm, aqueduct stenosis, meningitis, idiopathic intracranial hypertension, inflammatory, infectious and toxic/nutritional etiologies. The medical work-up confirmed the diagnosis of idiopathic intracranial hypertension without hydrocephalus. The patient was placed on a calorie-restricted diet and actazolamide 500 po b.i.d. The patient was subsequently enrolled into the National Institutes of Health's (NIH) Idiopathic Intracranial Hypertension Treatment Trial (IIHTT).

IIH is a diagnosis of exclusion. Today, the Modified Dandy's criteria is used to certify suspected cases: signs and symptoms of intracranial hypertension in an alert and-oriented patient with no localizing neurologic findings (abducens deficit excepted), all neuro-imaging normal, normal cerebrospinal fluid (CSF) composition, opening pressure CSF pressure of > 200 mm of H2O in non-obese patients or > 250 mm H2O in obese patients in the absence of another explanation. IIH has a strong association with obesity or recent weight gain, although the exact pathogenesis is still unknown. Corticosteroid withdrawal, Addison's disease, hyper-vitaminosis A, thyroid therapy, chronic kidney disease, sleep apnea, defective cerebrospinal fluid absorption, Behcet's Disease and systemic lupus erythematosus have all been associated. Medications such as birth control pills, isotretinoin, lithium, tetracyclines, or anabolic steroids have also been linked with IIH.

The mainstay of treatment is weight management with azetazolamide prescribed to decrease the volume of cerebrospinal fluid. Severe cases warrant shunts or optic nerve sheath fenestration. Patients with optic disc edema should have immediate visual fields, photos and a MRI to rule out space-occupying lesions. They should be sent for lumbar puncture to determine the opening pressure and CSF composition. Other causes for increased intracranial pressure should be eliminated. IIH patients should be monitored closely to decrease risk of deterioration of vision. Early diagnosis of any neurological conditions greatly increases the prognosis.

Poster 61
Chronic Unilateral Conjunctivitis
Nicole Le, O.D.

Ocular cicatricial pemphigoid (OCP) is a chronic autoimmune disease affecting mucous membranes; more often affecting the elderly (with an average age of 64) and a female predilection. It is a rare disease, with an incidence of up to 1 in 20,000 cases. Patients complain of a unilateral or bilateral chronic conjunctivitis, eventually involving both eyes within 2 years after the first eye. Conjunctival biopsies are the only definitive evidence; showing linear deposition of immunoreactants of IgG, IgA and IgM at the epithelial basement membrane zone (BMZ).
Subepithelial fibrosis of the involved tissue leads to ocular sequelae of symblepharon, inferior fornix shortening, ankyloblepharon, entropion, trichiasis and finally corneal perforation. Even when patients are treated, the prognosis is poor due to multiple ocular complications leading to vision loss and chronic immunosuppressive or steroid therapy. Patients are usually treated systemically with Dapsone or immunosuppressive agents on a weekly to monthly cycle with laboratory analysis. Ocular management ranges from lubrication, punctal plugs, electrolysis for trichiasis, transplants and lid surgeries. Common mimickers are ocular rosacea, atopic keratoconjunctivitis, Sjogren's syndrome, sarcoidosis, scleroderma and other mucous membrane diseases. Pseudo-pemphigoid caused by topical and systemic drugs will look similar to OCP, but is unilateral and symptoms are resolved when medications are removed.

A 62-year-old white female presented complaining of a unilateral red eye and dryness. We treated her with topical steroid therapy until we received her previous records revealing a chronic summer conjunctivitis starting 2 years prior. A combination of this history and observation of a mild symblepharon made us suspicious of ocular cicatrical pemphigoid. This diagnosis was confirmed through a referral to a corneal specialist with a positive lab test and conjunctival biopsy. Her symptoms are currently being managed with extensive lubrication and bandage contact lenses. She has started to develop similar symptoms in the fellow eye and is taking systemic immunosuppressives due to systemic steroid intolerance.

Patients suffering from chronic conjunctivitis should be investigated for systemic etiologies such as OCP due to its destructive effect on the mucous membranes. These patients are also at risk for developing dental complications involving their esophageal and trachea. Our key role is to identify and protect the cornea from vision loss as well as refer to a corneal specialist and chemotherapist to prevent death.

**Poster 63**

**Nd:YAG Laser Treatment of Epithelial Ingrowth After LASIK Enhancement: A Case Report**

Tina Kreutzer, O.D.

Interface epithelial ingrowth is a potential complication with laser in situ keratomileusis (LASIK). This describes the proliferation of epithelial cells between the corneal stroma and flap created during surgery. It is especially common after enhancements involving a flap lift. Typically, circular opacities are observed at the edge of the flap, but can extend into the visual axis. Several treatment techniques have been explored, most commonly involving a flap lift and manual removal of the epithelial cells. However, with each flap lift, additional ingrowth may occur. To avoid this flap manipulation, a new technique is currently being evaluated, involving the use of a neodymium yttrium-aluminum-garnet (Nd:YAG) laser. This report illustrates a successful case of epithelial ingrowth treated with Nd:YAG.

A 42-year-old white female presented with a foreign body sensation, epiphora, and decreased vision progressively worsening over the prior 6 months. Her ocular history is remarkable for LASIK treatment to both eyes 12 years prior. She subsequently experienced regression, and underwent LASIK enhancement to the left eye 5 years ago. The goal was to leave her slightly nearsighted in the right eye and thus benefit from monovision. Best-corrected distance visual acuity was slightly reduced in the left eye due to a moderate amount of cylinder. Clinical evaluation revealed significant epithelial ingrowth, resulting in an elevated and rough ocular surface. Corneal topography, anterior segment OCT, and photography were performed. The patient was treated with 2 sessions of low energy Nd:YAG laser; applied to the epithelial cells between the cap and interface. The patient returned 6 weeks following the second treatment. Corneal topography and photography show a more regular and smooth surface. Corneal thickness in the area of treatment was reduced by up to 60 microns. Keratometry readings and refraction also show an improvement in astigmatism.

Nd:YAG laser has been shown to be very safe and effective in the treatment of epithelial ingrowth. This technique has superiority to the traditional therapy in that it does not involve lifting the corneal flap. We are encouraged by the outcome of this case, and given the promising study results, foresee this becoming the primary mode of therapy for epithelial ingrowth in the near future.

**Poster 64**

**An Atypical Presentation of a Frontal Sinus Mucocele Leading to Diplopia and Ocular Pain**

Nicole Kosciuk, O.D.

An orbital mucocele is a benign, slowly expanding, chronic cyst of the sinuses that secretes mucus. It accounts for 2 to 8 percent of all sinus tumors and has been associated with ocular symptoms such as diplopia, ophthalmoplegia, proptosis, orbital displacement, reduced visual acuity or color vision, orbital pain, and headache. Ocular involvement may be the first sign of a mucocele.

A 66-year-old white male presented with complaints of diagonal binocular diplopia at distance and near for 6 months when looking left or right. He also reported a period of several days with dull pain around the right eye. Pertinent medical history included sinus congestion. The patient had a restriction of the right eye in superior and medial gazes with normal motility in the left eye. Maddox rod indicated a greater deviation in up and left gazes, and forced duction testing was positive for a restriction. Visual acuity, color vision, ocular health, and visual fields were all normal. Differential diagnoses prior to imaging included orbital mass, thyroid orbitopathy, and orbital pseudotumor. Thyroid lab testing was normal. MRI of the brain and orbit revealed severe pansinusitis worse on the right side. Given its unusual location, the mucocele was originally missed on CT scan. Upon second review, it was found in an extreme posterior portion of the frontal sinus with associated bony erosion of the orbital roof and compression of the right superior rectus and possibly optic nerve. The patient underwent an external-endoscopic surgery to remove the mucocele, and complaints of diplopia were resolved.

Orbital sinus mucoceles should be a differential diagnosis in patients with signs and symptoms consistent with an orbital mass who have a history of chronic sinusitis. Treatment involves complete surgical removal of the mucocele as well as management of sinusitis.
Anterior scleritis is a disease characterized by scleral inflammation that presents with classical symptoms and diagnostic findings. Except for scleromalacia perforans, anterior scleritis is characterized as having a symptom of extreme orbital pain.

A 41-year-old black male with a history of traumatic uveitis, glaucoma suspected, hypertension, eczema, asthma, allergies, and angina presented to the eye clinic with complaints of red eyes for 2 weeks and eyelid edema for 4 days. He reported no pain, but noted mild tenderness of his eyelids. Examination showed significant deep ocular redness in the right eye with a blue hue inferior and blanching of the left eye except for trace injection temporal after dilation. Dilated fundus examination was unremarkable. The patient was tentatively diagnosed with atypical anterior scleritis. Laboratory workup was unremarkable. Despite treatment, the patient's clinical findings continued to worsen while still maintaining no complaint of pain. An MRI and B-scan revealed diffuse thickening of the sclera, confirming the diagnosis of anterior scleritis. An underlying etiology of sarcoidosis is suspected based on chest x-ray findings, although laboratory tests suggest no active disease. While other more aggressive treatment options were considered, ocular injection started to decrease after 2 months of indomethacin treatment.

This case illustrates a unique presentation of anterior scleritis and discusses typical presentations, etiologies, and treatment options.

Deprivation Amblyopia Secondary to Optic Nerve Hypoplasia
Christina Twardowski, O.D.

Amblyopia is a unilateral or bilateral condition that results in the reduction of visual acuity. Amblyopia can result from strabismus, anisometropia or high isometric refractive errors, and stimulus deprivation. Although deprivation amblyopia is the least common of all the types, it is the most damaging and difficult to treat. Frequently, deprivation amblyopia is overlooked because it can coexist with other forms of amblyopia. There are a variety of conditions that can cause deprivation amblyopia, this case report will focus on stimulus deprivation resulting from an ocular pathology.

Patient DF, a 4-year-old male, presented to the clinic with complaints of blurry vision. Mother reported his birth and medical history were unremarkable. Entering acuities were 20/40 OD and 20/200 at 6 ft OS. Cover test was orthophoric at distance and near. Cycloplegic retinoscopy uncovered plano OD and -9.50+0.50x090 OS. Dilated fundus exam revealed normal retinal architecture OD and a small optic nerve with normal vasculature and a positive foveal reflex OS. At this time, patient DF was diagnosed with optic nerve hypoplasia and amblyopia OS. His amblyopia was secondary to anisometropia and concurrent ocular pathology of optic nerve hypoplasia. The patient began full-time occlusion and after a year and a half of treatment his visual acuity improved to 20/25 in the left eye.

It is important to understand that reduced vision from an ocular pathology is considered a form of amblyopia and treatment for this condition is pertinent. The refractive status of the eye with an ocular pathology should always be evaluated first and corrected prior to beginning amblyopia treatment. Deprivation amblyopia is commonly associated with structural ocular abnormalities and clinicians should be aware that the resultant reduction in vision can easily be managed with timely intervention and appropriate treatment.

Systemic Hypertriglyceridermia Manifested as Lipemia Retinalis Discovered During Teleretinal Imaging
Jordan Kuipers, O.D.

Lipemia retinalis is a rare condition associated with elevated serum triglyceride levels. It manifests in the retina as creamy white blood vessels and a salmon-colored fundus. Lipemia retinalis appears clinically when triglyceride levels exceed 2,000 – 2,500 mg/dL. It is commonly caused by genetics and metabolic factors including diabetes, and is associated with acute pancreatitis. Lipemia retinalis is visually asymptomatic, and is usually discovered incidentally. The clinical presentation completely resolves when triglyceride levels are lowered.

A 49-year-old white male presented to the clinic for a diabetic fundus exam. No ocular or visual complaints were noted. Vision was 20/20 OU. Ocular motilities and confrontation fields were full OU. Pupils were round and reactive OU. Slit lamp examination revealed normal findings including posterior chamber intraocular lenses OU. Posterior segment findings revealed healthy optic nerve heads, normal vessels and no retinopathy OU. The patient returned 10 months later for diabetic teleretinal imaging. Images revealed milky white vessels, without vasculitis, and a salmon-colored fundus OU. Systemic labs from 7 months prior showed triglyceride levels elevated to 1,283 mg/dL (normal, 40-150 mg/dL). The patient was referred to primary care for laboratory testing, which revealed triglyceride levels of >3,000 mg/dL. Medications were altered and triglyceride levels were lowered to 573 mg/dL. Upon follow-up, the patient presented with no complaints, posterior segment evaluation revealed healthy retinal findings, including deep red vessels and a normal fundus color.

Due to the asymptomatic nature of lipemia retinalis it is often discovered during routine evaluation. Although it does not threaten vision, it is important to understand that hypertriglyceridermia can lead to acute pancreatitis and can have lasting effects on the cardiovascular system. Eye care professionals need to understand this condition and make proper referrals to primary care providers for laboratory testing, systemic evaluation and appropriate treatment.
anomalous vitreo-retinal adhesions and specifically vitreo-macular adhesions (VMA). This may lead to persistent attachment at the macula and VMT resulting in disruption of the retinal layers, macular edema, decrease in visual acuity and metamorphopsia. VMA can cause a multitude of other macular disorders including macular hole formation and epiretinal membrane, which must be differentiated from VMT. Fundoscopically these may appear essentially identical, making it difficult to separate these diagnoses. However, the use of spectral domain OCT (SD-OCT) has allowed better visualization of the vitreo-retinal interface and has become an essential tool when differentiating VMAs and monitoring for change. Additionally, recent advances in pharmacologic vitreolysis may offer a new, less-invasive treatment option for patients with VMT.

A 56-year-old black female presented with symptoms of decreased vision in the right eye for 6 months’ duration. Best corrected visual acuity was 20/25 OD and 20/20 OS. Fundus examination revealed a small, well-circumscribed, red ring at the macula OD. SD-OCT revealed partial PVD in the peri-macular area and persistent vitreo-retinal adhesion at the macula OD. At the 3 month follow-up, she reported improved vision OD. Best corrected visual acuity was 20/20 OU. Fundus examination revealed a normal macula OD with resolution of the original red appearance. Subsequent SD-OCT showed PVD at the macula, resolution of the vitreo-macular adhesion and return of the normal macular and foveal retina contours.

We present a case of VMT with spontaneous resolution after 3 months observed with SD-OCT. In the literature, spontaneous resolution of VMT is infrequent; however, observation in cases of VMT with limited visual and structural disturbance is appropriate owing to the spontaneous resolution as documented in this case. For persistent VMT, the traditional treatment of choice has been pars plana vitrectomy with membrane peel for concurrent epiretinal membrane. Recent innovations in vitreolysis agents used as an intravitreal injection have shown to induce complete PVD. These pharmacologic vitreolysis agents are an emerging treatment option that may change the future treatment and management of patients with VMT.

Poster 69
“Doc, I Thought Low Pressure Was a Good Thing”: A Case Report on Hypotony Maculopathy Management Monitored with Serial OCT Imaging
Candice Tolud, O.D., and Michael Trottini, O.D.
Seidenberg Protzko Eye Associates

Hypotony maculopathy is most frequently seen as a complication of glaucoma filtration surgery either from overfiltration or a bleb leak. Use of antimetabolite therapy during surgery increases risk of bleb complications. Hypotony maculopathy is difficult to treat and the best time to surgically intervene is unclear. There are several conservative and invasive treatment options available.

A 70-year-old white female with advanced primary open angle glaucoma, uncontrolled with maximal medical therapy underwent trabeculectomies in both eyes. The right trabeculectomy was uncomplicated with adequate IOP control. Early in the post-operative phase of the left eye her IOP was elevated at 48mmHg. Her sutures were removed earlier than anticipated to help lower the pressure and she subsequently developed hypotony with a pressure of 1mm Hg. As a result of the low IOP, our patient developed choroidal detachments. She was started on Durezol and Atropine to help raise the pressure, which improved the choroidals initially. One month post-operative, her vision began to deteriorate. She was still hypotonous and developed choroidal folding extending into the macula. An OCT was performed that showed undulating retinal and retinal pigmented epithelial lines representing chorioretinal folding. Therapy with Durezol and Atropine was continued; however, after 1 month of treatment her clinical findings did not improve. She then underwent bleb revision, which resulted in better IOP control, improved choroidal folding and vision. A follow-up OCT was performed to document the improvement of her maculopathy.

Hypotony maculopathy is a complication that can cause visual loss following glaucoma filtration surgery. Optical coherence tomography can be a useful tool in the diagnosis of hypotony maculopathy and can help monitor patients’ response to treatment.

Poster 70
Diagnostic Features Of Corneal Intraepithelial Neoplasia Utilizing Lissamine Green Dye
Steven Potwin, O.D., and Michael Saidel, M.D.
University of Chicago

The most common tumors of the ocular surface are corneal and conjunctival intraepithelial neoplasias (CIN). Depending on geographic location, the incidence ranges from 0.13-1.9 per 100,000 people. Clinical features include leukoplakic or gelatinous lesions with associated feeder vessels. Corneal findings appear granular or frothy in either large geographic patterns or smaller island-like patches. Vital dye testing with Lissamine green dye is essential for unknown conjunctival and corneal lesions. This dye stains damaged membrane cells, including keratin, which may be seen in cancersous lesions such as CIN. These lesions slowly progress and very rarely develop into malignant squamous cell carcinomas. Treatment includes excision followed by adjunctive treatment of cryotherapy, radiation or chemotherapies. The most common adjunctive therapies today are mitomycin-C, 5-fluorouracil and interferon-α-2b (INFα2b).

A 39-year-old white male presented for a corneal consultation. A detailed history revealed no systemic health conditions and LASIK surgery in both eyes in 1996. Several years of clear vision were reported until 3 years prior. Visual acuity was 20/20 OD and 20/40 OS. Slit lamp evaluation revealed, a faint LASIK flap scar in the right eye and a large granular, geographic corneal lesion measuring 11mm wide by 6mm tall was noted in the left eye. Initial differential diagnoses were diffuse lamellar keratitis versus stem cell irregularity. Uptake of Lissamine green dye added corneal intraepithelial neoplasia to the differentials. Corneal scraping/biopsy was performed 1 week later. The pathology report stated: Squamous hyperplasia with vireoplastic (human papillomavirus) features. The patient was prescribed INFα2b 1 million units/mL 4 times daily and was followed on a 2 to 3 week basis. After 1 month of INFα2b, the corneal lesion was reduced to 0.5mm x 0.5mm and 1 month later the lesion had completely resolved.

Lissamine green dye, although not diagnostic by itself, may strongly influence proper diagnosis in conjunction with other
ancillary testing. After the correct diagnosis was made, the use of INFo2b 1 million units/mL proved to be an effective treatment and completely resolved the cancerous lesion within 2 months.

**Poster 71**
**Diagnosis and Management of a Giant Pituitary Adenoma First Presenting With Visual Symptoms**
Esla Speth, O.D., and Jim Williamson, O.D.
Veterans Affairs Medical Center, Memphis, TN

Pituitary adenoma is a benign tumor of the pituitary gland. Accounting for 10-15% of intracranial neoplasms, it is the most common to manifest neuro-ophthalmological changes. Pituitary adenomas are categorized as secreting and non-secreting. Eye care professionals may be the first to detect the latter due to the lack of systemic symptoms. Pituitary adenomas of less than 10 mm are classified as microadenomas, those greater than 1 cm are considered macroadenomas, and those greater than 4 cm in any direction are relatively rare and are called giant adenomas.

A 63-year-old white male presented complaining of blur and peripheral vision disturbances in both eyes for 6 months. Previous ocular history was unremarkable and medical history was positive for hypertension and hyperlipidemia. On initial examination, best-corrected visual acuity was 20/30 in the right eye and 20/40 in the left eye. Pupils were equal, round and reactive to light without a relative afferent pupillary defect. Ocular motility was full with no pain or diplopia. Confrontation visual field testing revealed a bitemporal hemianopia. Slit lamp examination was significant for mild nuclear sclerosis in both eyes. A dilated fundus examination was unremarkable, revealing flat and healthy optic nerves without pallor. Automated perimetry (Humphrey Visual Field 24-2) confirmed a bitemporal hemianopia. Magnetic resonance imaging (MRI) revealed a giant pituitary adenoma measuring 5.7 x 6.0 x 8.8 cm. There was evidence of displacement of the optic chiasm and the third ventricle, as well as erosion of the sphenoidal sinus with extensions into the ethmoidal and cavernous sinuses. The patient was sent for endocrinological work-up and was also promptly referred to the neurosurgery department. He underwent successful trans-sphenoidal surgery at 2 weeks and at 3 months after initial diagnosis. He was monitored with dilated fundus examinations and automated visual field examinations post-surgically by our optometry department. Five months after initial diagnosis, there was a slight improvement of the visual field in the inferior temporal quadrant of the left eye, and a mild improvement in the best-corrected visual acuity of the left eye.

Although pituitary adenomas are benign neoplasms, early diagnosis and referral for neuroimaging is crucial in preventing further visual loss and systemic complications caused by local spread of the tumor, compression of adjacent structures, and hormonal secretions. Vision loss from a pituitary adenoma may be reversible and depends on early diagnosis and management. In this case, the significance of prompt diagnosis and early intervention increased given the invasive nature of this rare, non-secreting giant adenoma measuring 5.7 x 6.0 x 8.8 cm. By aiding in the initial diagnosis of this condition, as well as monitoring ocular health post-surgically, optometrists can actively participate in the co-management of these patients with other health care branches such as neurology, neurosurgery, ENT and endocrinology. This poster includes images of visual field examinations pre- and post-surgery as well as magnetic resonance imaging of the lesion.

**Poster 72**
**A Case of Recalcitrant Filamentary Keratitis Managed with Extended Full Time Contact Lens Wear After Failure to Respond to Multiple Treatment Modalities Including Compounded Acetylcysteine 10%**
Michael Merry, O.D.

Filamentary keratitis is a condition characterized by strands of epithelial tissue and mucus adhered to the cornea, which can cause considerable pain and reduction in vision. It is associated with various ocular surface diseases. Treatment of this disease typically consists of mechanical removal of the filaments and then addressing the underlying etiology.

The patient had a remarkable systemic history of type 2 diabetes controlled on diet alone and polymyalgia rheumatica treated with methotrexate and plaquenil. She had been a patient of ours for several years, with an ocular history of dry eye syndrome and cataract surgery with posterior chamber IOLs performed in 2006 without complication. In January of 2011, she suffered her first onset of filamentary keratitis in her right eye. The filaments were removed and she was placed on Tobradex QID and preservative-free artificial tears every hour. She had a recurrence several days later, which would set the pattern for the next year. The filaments would recur in several days despite treatment with aggressive lubrication, steroids, punctal occlusion of the upper and lower lids, Restasis, doxycycline, sodium chloride 5%, and fish oil supplementation. Even when compounded acetylcysteine 10% dosed q.i.d., the filaments recurred. The only treatment that would delay their onset was a bandage contact lens. We decided that due to lack of response to any other treatment we would keep her in a bandage contact lens indefinitely. Currently, she has been in an Oasys bandage lens for 3 months that we replace every 2 weeks. She has not had any contact lens-related complications and no recurrences of filaments during this period.

Filamentary keratitis is a relatively common ocular condition. It typically responds well to treatment of the underlying ocular surface disease. However, in more persistent cases, treatment protocol is poorly established. Commonly suggested modalities of treatment have very little data supporting their efficacy or proper use. This case demonstrates that contact lenses can be a valuable tool in the treatment of these patients.

**Poster 73**
**Complicated Cranial Nerve Six Palsy Due to Head Trauma**
Jessica Condie, O.D., and Puja Desai
Illinois College of Optometry

A 25-year-old black female presented for sudden-onset horizontal, binocular diplopia, beginning after head trauma. She reported intermittent loss of consciousness and reduced hearing from her right ear. The patient denied any medical conditions or current medications, and reported being a current, every-day smoker.

Initial clinical examination revealed entrance testing that was within normal limits, with the exception of a constant right esotropia (20Δ distance, 16Δnear). A comprehensive neurologic
evaluation was consequently performed and confirmed a cranial nerve 6 palsy, which demonstrated a negative forced duction test, as well as asymmetric cranial nerve eight involvement. Gross external evaluation was positive for an ocular ecchymosis to the left eye and a “battle sign,” also known as a mastoid bone contusion, behind the right ear. All other slitlamp exam findings were found to be unremarkable. The dilated fundus examination was within normal limits, with no hemorrhaging, commotio retinae, or retinal breaks present. At this point a differential diagnosis was created that included: a basilar skull fracture, subdural hemorrhage, direct medial rectus muscle insult, or simply a traumatic cranial nerve 6 palsy of unknown neural etiology. The patient was referred for emergency imaging that included an immediate computerized axial tomography, and a neurologist consultation. The patient was initially treated with alternating lid taping to relieve the binocular diplopia. Review of the CT scan was negative for skull fractures, acute intracranial hemorrhaging, and extra ocular muscle entrapment. A magnetic resonance imaging study was also performed that was within normal limits. After the patient was cleared by her neurologist, she returned for additional diplopia treatment options. The patient’s cover test was repeated and measured at 25Δ CRET at distance and 16Δ CRET at near. The patient was presented with several treatment options which included: continued alternate lid patching/taping, Fresnel prims application to her spectacle prescription, or a consultation for botulism toxin injection. The patient was then fit in-office with press-on Fresnel prisms, with 12Δ BO placed over each eye. Over the next 2 months the patient was seen at regular intervals to reduce the amount of applied prism until complete resolution was detected 3 months and 3 days after the initial trauma.

When a patient presents with ocular sequelae after significant head trauma, it is important to perform a comprehensive ocular examination that includes a complete neurologic evaluation. Neuroimaging is indicated to rule-out life- and sight-threatening complications, as well as offer some assistance in determining a patient’s recovery prognosis. When the patient has visual involvement after head trauma it is important to treat the approach treatment with a conservative nature initially. Often traumatic cranial nerve palsies improve or resolve over time, and therefore, need short-term symptom-based relief treatment. Patients with traumatic cranial nerve palsies should receive reversible treatment options early on and save surgical intervention once the ocular findings have been stable for a minimum of 6 months or longer.

**Poster 74**

**Septo-Optic Dysplasia Diagnosed in a Teenage Female**

Andria Phos, O.D., and Wendy Stone, O.D.
Illinois College of Optometry

Septo-optic dysplasia (SOD), also known as de Morsier Syndrome, is a rare congenital anomaly that is associated with a combination of optic nerve hypoplasia (ONH), midline brain defects, and pituitary hormone abnormalities. The diagnosis of SOD is usually made clinically when 2 or more of these features are present, but it is a highly phenotypically variable disorder. ONH may be unilateral, or more commonly bilateral, and is often the first presenting feature. The midline neuroradiological abnormalities include agenesis of the corpus callosum, absence of the septum pellucidum or both. The endocrine defect is more likely to have a later onset, and ranges from isolated growth hormone deficiency to complete panhypopituitarism. An ophthalmologic evaluation is necessary for these patients and should specifically assess the degree of visual impairment, the presence of strabismus, the presence of nystagmus and its laterality, the signs of optic nerve hypoplasia, and if optic nerve dysplasia, microphthalmia, or coloboma are present.

A 19-year-old developmentally delayed, short-statured female presented for an eye exam with complaints of decreased vision. Her ocular history was significant for longstanding poor vision with use of a spectacle prescription since infancy. Medical history revealed her birth as 2 to 3 months premature. She was under the care of an endocrinologist for an unknown endocrine disorder, for which she was taking both growth hormone and cortisol. Her last comprehensive eye exam was reported as 6 to 7 years prior. Entering corrected visual acuities were 20/100 OD and 20/100+ OS, which did not improve with refraction. The patient had a constant, large-angle right esotropia as well as a constant, bilateral horizontal nystagmus. Confrontation visual fields were full OD, OS, and extraocular motilities had full range of motion OU. Dilated fundus exam revealed bilateral optic nerve hypoplasia. A spectacle prescription was released to the patient for full-time wear. Low vision services were recommended to the patient and she was referred for an in-house neuro-ophthalmic consult, disc photos and an MRI. Optical coherence tomography was attempted but unsuccessful due to the nystagmus. The MRI revealed the absence of a septum pellucidum, as is consistent with the diagnosis of septo-optic dysplasia.

Septo-optic dysplasia is associated with multiple congenital abnormalities and is often diagnosed in infancy; however, it can go unnoticed until growth failure occurs. SOD has been identified with varying degrees of visual impairment and thus, these patients are likely to seek eye care for their presenting symptoms. Optometrists need to be aware of this condition and have an understanding of the multi-disciplinary approach to its management in the event that an undiagnosed case presents. Facilitation of early diagnosis could minimize the additional neurodevelopmental burden placed on a patient with untreated hormonal abnormalities and reduce the risk of less common, but potentially fatal, features such as hypoglycemia and adrenal crisis.

**Poster 75**

**Conjunctival Ulcer as the Presenting Finding in Granulomatosis with Polyangiitis**

Lindsey Jendrasko, O.D., James Patrick Smith, O.D., and Laura Dowd, O.D.
VA Maine Health Care Services

Conjunctival ulcers are an ocular rarity associated with various diseases including granulomatosis with polyangiitis (also known as Wegener’s granulomatosis). Ocular involvement occurs in up to 50% of cases and may affect any part of the eye.

A 76-year-old white male presented with a red, irritated right eye that was unresponsive to topical steroid and antibiotic therapy initiated by another provider. Ocular history was significant for open angle glaucoma OU, lamellar macular hole OD and cataracts OU. Medical history included hyperlipidemia, atherosclerosis, COPD, and osteoporosis. Ocular medications were Cosopt, Travatan, and Alphagan. Systemic medications were simvastatin and alendronate. Visual acuity was 20/25 OD, 20/30 OS. Slit lamp evaluation revealed 3+ bulbar injection and a 4x2 mm ulceration of the right superior bulbar conjunctiva. A culture was obtained and an excisional biopsy was subsequently
Adult Coats’ Disease is a rare, idiopathic, non-hereditary disease of the retina characterized by telangiectasias, aneurysms, lipid deposits, and intraretinal/subretinal exudation. Coats’ Disease can progress to partial or total exudative retinal detachments with secondary glaucoma. The adult form of the disease has a slower progression and a limited area of involvement compared to the more common form typically found in young males. Long-term vision loss in adult Coats’ Disease is typically due to persistent macular edema, lipid exudation at the macula, and epiretinal membrane formation.

A 61-year-old black female presented with distance and near blur in the left eye for a duration of 3 weeks. She was taking medications for type 2 diabetes and hypertension. Best corrected vision was 20/25 OD and 20/200 OS, with no improvement on pinhole. Dilated fundus examination revealed telangiectatic blood vessels, peripheral exudation and pigmented lesions OD, and a serosanguineous retinal detachment, telangiectatic blood vessels and extensive peripheral exudation OS. Fluorescein angiography showed hyperfluorescence, indicative of subretinal fluid, and areas of capillary nonperfusion. Based on these findings, the patient was diagnosed with Coats’ Disease of adult onset. She was treated with 2 intravitreal Avastin injections OS over an 8-week period. A reduction in subretinal fluid and exudation was seen and vision in the left eye improved to 20/25 with pinhole.

This case represents a retinal vasculopathy with a major exudative component, a condition rarely found in adults. Coats’ disease is diagnosed based on the clinical appearance of the retina. Although the majority of Coats’ disease cases present in childhood, we must also recognize the clinical retinal findings in adult patients. Fluorescein angiography and a thorough fundus examination are important in aiding in diagnosis. An appropriate retinal referral for treatment should be made, which could include cryotherapy, laser photocoagulation, retinal detachment surgery, or more recently, anti-VEGF therapy. These treatments aim to reduce telangiectasia and decrease exudation, with the ultimate goal of preserving vision.

**Poster 76**

**Adult Onset Coats’ Disease Treated with Intravitreal Avastin**

Michelle Malchow, O.D.

Adult Coats’ Disease is a rare, idiopathic, non-hereditary disease of the retina characterized by telangiectasias, aneurysms, lipid deposits, and intraretinal/subretinal exudation. Coats’ Disease can progress to partial or total exudative retinal detachments with secondary glaucoma. The adult form of the disease has a slower progression and a limited area of involvement compared to the more common form typically found in young males. Long-term vision loss in adult Coats’ Disease is typically due to persistent macular edema, lipid exudation at the macula, and epiretinal membrane formation.

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**Poster 77**

**An Atypical Presentation of a Pyogenic Granuloma Following a Dacryocystorhinostomy**

Amy Dinardo, O.D., Philip Walling, O.D., and David Barrett, M.D. Michigan College of Optometry

A dacryocystorhinostomy, or DCR, is a surgical procedure performed when the nasolacrimal duct is blocked or does not otherwise function properly. The goal of a DCR is to reduce epiphora and restore the flow of tears by creating a tract between the lacrimal sac and nasal mucosa. Crawford silicone tubes are widely used postoperatively to temporarily stent the nasolacrimal system. This increases the potential of long-term patency by preventing the mucosal lining in the newly formed channel from adhering during the healing processes. Crawford silicone tubes have been associated with inflammatory granulation. Although a DCR has a high success rate of 93-95%, occasional complications can occur. Pyogenic granulomas, also known as lobular capillary hemangiomas, are benign vascular tumors commonly found in the head and neck region. They are a result of aberrant wound healing and the vasoproliferation of capillaries accompanied by inflammation. Clinically, pyogenic granulomas present as rapidly growing, pedunculated or wide-based red nodules that can easily rupture and bleed. They can be found on the eye and adnexa in locations such as the eyelid, conjunctiva, and lacrimal sac. They are usually a result of ocular or adnexal surgery, chalazia, or trauma. Pyogenic granulomas have been reported as complications of scleral buckling procedures, strabismus surgery, excision of pterygium or pinguecula, plastic surgery of the eyelids, and surgery of the nasolacrimal system. They have been reported to occur in the lacrimal sac following a DCR. We believe that a pyogenic granuloma arising from bulbar conjunctiva is a rare but potential complication of a DCR.

A 77-year-old female underwent a dacryocystorhinostomy and Crawford silicone tube insertion for a nasolacrimal obstruction. One month later, she presented with a chief complaint of discharge and irritation OD. An external examination revealed the emergence of a pyogenic granuloma in an atypical location on the temporal bulbar conjunctiva of the right eye. All other elements were within normal limits. The pyogenic granuloma was excised successfully. Tobradex was prescribed t.i.d. for 7 days, then q.d. for 7 days along with warm compresses. One week later, when the patient presented for follow-up, the symptoms had subsided and the excision site was well-healed.

Pyogenic granulomas are vascularized tumors which occur in and around the eye are usually as a result of ocular surgery or trauma. A pyogenic granuloma located on the bulbar conjunctiva is a rare but possible complication of a dacryocystorhinostomy and Crawford silicone tube insertion. The standard treatment for a pyogenic granuloma is surgical excision.
**Poster 78**

**Sturge-Weber Syndrome**
Kathleen O’Leary, O.D.

Sturge-Weber Syndrome occurs sporadically in approximately 1/50,000 births. It is a neurocutaneous syndrome that has a classic triad consisting of benign facial, leptomeningeal and ocular hemangiomas. Ocular hemangiomas can occur in the conjunctiva, choroid and episclera. Patients can develop glaucoma and also may develop ocular hemangiomas that can compromise ocular health and visual function.

A 5-year-old female diagnosed with glaucoma in the left eye, secondary to Sturge-Weber Syndrome. She underwent a trabeculotomy at 7 weeks old. Due to an inability of the trabeculotomy alone to sustain an acceptable IOP, she was put on Travatan Z, 1 drop at night, in the left eye at 4 years old. She was initially diagnosed with Sturge-Weber based on facial and leptomeningeal hemangiomas. Ocular manifestations include increased corneal diameter, increased axial length, choroidal hypervascularity, increased IOP and increased cup-to-disc ratio relative to the contralateral eye. IOP is stable and dilated fundus examinations reveal no apparent elevated diffuse choroidal hemangiomas that could compromise ocular health or visual function. Visual acuities are 20/20 in the right eye and 20/200 in the left eye with no strabismus or refractive anisometropia. The cause of the amblyopia is unknown. It is hypothesized that chorioretinal folds compromising the macula could have occurred during the trabeculotomy secondary to hypotony.

Patients with Sturge-Weber Syndrome who are unable to sit for certain diagnostic testing such as visual fields and OCT should undergo careful fundus examinations to look for the presence of choroidal hemangiomas that could compromise ocular health or visual function. Regular IOP checks, fundus photos and b-scans can also be implemented in follow-up care.

**Poster 79**

**Congenital Rubella Retinopathy Discovered During Care for Anterior Uveitis**
Scott Moscow and Jason Duncan, O.D.
Southern College of Optometry

Rubella retinopathy is a common finding in patients who have contracted rubella from transplacental transmission of the virus. Anterior uveitis, deafness, and arthritis are among the potential findings. Our case demonstrates the recognition of associated and potentially confounding findings, along with an ongoing case history to arrive at the diagnosis of congenital rubella. We also discuss the differential diagnoses and potential complications associated with such a patient.

A 47-year-old black female presented for a second opinion after being treated for anterior uveitis for the previous 3 weeks. She had discontinued treatment with FML OU 1 day prior to her visit. Reported family history was positive for hypertension. Patient history was positive for rheumatoid arthritis, deafness, and uveitis. Medications were Tylenol PRN. There were NKDA. Visual acuities were 20/20 OD and OS, at distance, without correction. Extraocular motilities were full as were confrontation visual fields. Pupils were equal, round, and reactive with no defect. Intraocular pressures were 18/16 @ 14:26. Slit lamp examination revealed clear cornea OU, trace NS OU, and trace cell with grade 2+ flare (OU). Dilated fundus examination revealed retinal pigment epithelial damage consistent with a “salt and pepper” presentation, as captured on fundus photography. Maculae and papillae were flat. C/D ratios were 0.45/0.4 OD and 0.4/0.4 OS. There was an approximately 2 disc diameter CHRPE lesion of the inferior retina OS. Further questioning of the patient revealed that her mother did contract the rubella virus during her pregnancy and that the patient’s deafness was longstanding.

This patient was being treated for anterior uveitis. We were able to use the fundus presentation together with the associated ocular and systemic findings and ongoing case history to reach a diagnosis of congenital rubella. We reinstituted her topical steroid therapy with prednisolone acetate and set observation for 2 weeks. In the absence of a strong case history, differentials include: congenital syphilis, acquired syphilis, retinitis pigmentosa, panuveitis, and toxicities related to thioridazine. Visual prognosis is excellent in congenital rubella barring the development of subretinal neovascularization. Thus, the patient with rubella retinopathy must be followed at regular intervals.

**Poster 80**

**Ocular Manifestations Of Childhood Inflammation**
Steven Potwin, O.D., and Alicia Nehls, O.D.
Illinois College of Optometry

Approximately 6% of all cases of uveitis occur in children. Ocular signs may present as circumlimbal injection, cells/flare, keratic precipitates, miotic pupil, iris nodules and/or high or low intraocular pressure. Sight-threatening complications associated with severe uveitis include cystoids, macular edema, glaucoma, cataracts, and/or papillitis. If uveitis is gone untreated in children, development of amblyopia may occur. Aggressive treatment with close follow-up should be elicited.

A 10-year-old Hispanic male presented to clinic complaining of decreased vision in the right eye (OD) more than left eye (OS). In addition, the mother noticed whitening inferiorly of both corneas since 9 months of age. Entering non-corrected VAs were OD: 20/125 and OS: 20/50. On refractive examination, there was no improvement in vision OD and good improvement in vision OS to 20/25. Upon slit lamp examination, the corneas had extensive calcium deposits in a circumlinear presentation from temporal limbus to nasal limbus passing inferior to the visual axis greater OD than OS. Anterior chamber evaluation displayed 2+ cells OD and trace cells OS. Crystaline lens inspection presented with 1+PSC in both eyes. Dilated examination revealed 2+ vitritis OD and 1+ old vitritis OS. The initial diagnosis was anterior and intermediate uveitis with band keratopathy OU. Durezol 4 times a day in both eyes was prescribed. Referral to pediatric rheumatologist was made for blood work and physical examination. The pediatric rheumatologist report stated no clear etiology secondary to negative lab results for rheumatologic or infectious disease. However, an aggressive treatment regimen of methotrexate was initiated secondary to the severity of the condition. The patient has been followed closely and blood work will be repeated.

A young child with presenting with band keratopathy and decreased vision should be investigated for chronic inflammation. This case discusses the ocular manifestations of severe ocular inflammation in a child, the differentials for childhood uveitis, and the importance of co-managing for proper patient care.
Poster 81
Extensive Inverted (Schneiderian) Papilloma of the Sinus with Orbital Invasion
Julia Dombek, O.D., Sara Mach, O.D., and Steven Grondalski, O.D.
St. Louis VA Medical Center (UMSL School of Optometry)

A inverted (Schneiderian) papilloma is a benign sinonasal tumor comprised of epithelial tissue that grows into the underlying intranasal mucosal tissue. Histology shows a thickened epithelium that invades the underlying stroma. Inverted papillomas are considered rare and may transform into aggressive squamous cell carcinoma. It is usually a unilateral finding that is common in white males around 50 years old. The etiology is not completely known, though it may stem from cells that are precursors to neoplasm or be the result of damaged tissue after injury or viral infection. Most commonly this lesion occurs in the lateral nasal wall and presenting symptoms include nasal obstruction, pressure and pain, rhinorrhea, proptosis and epiphora. It is rare to have ocular complications and extension into the orbit. There is a wide range of recurrence rates depending on the type of treatment.

A 61-year-old white male presented to the St. Louis VA Medical Center eye clinic complaining of a generalized soreness to his left medial canthus for approximately 2 months. He was treated with oral antibiotics for a presumed dacryocystitis. Further neuroimaging revealed a large invasive sinonasal mass extending from the left nasal cavity into the left medial orbit and frontal sinuses. Histopathology revealed an inverted schneiderian papilloma with dysplasia. Treatment included surgical resection of the mass by via lateral rhinotomy. The lesion partially excised and showed no histological signs of invasive squamous cell carcinoma.

Conclusion: Inverting sinus papillomas, although rare, may be misdiagnosed upon ocular examination. Ocular findings may include generalized eye pain, unilateral proptosis, and epiphora. Recent studies suggest endoscopic resection for small, localized masses. With a recurrence rate of 40-80%, and high potential for malignant transformation, it is necessary to monitor these patients closely with imaging to monitor for recurrence.

Poster 82
Previously Diagnosed Central Serous Retinopathy Determined to be Polypoidal Choroidal Vasculopathy
Scott Moscow, Jason Duncan, O.D., and Mike Dorkowski, O.D.
Southern College of Optometry

Polypoidal choroidal vasculopathy (PCV) is characterized by aneurysmal polyps of the choroidal vasculature. Typically, the choroidal polyps are peripapillary, some being paramacular. Signs are often bilateral yet may be asymmetrical or may present at different times. The leaking polyps may lead to recurrent and multiple exudative pigment epithelial detachments, hemorrhagic pigment epithelial detachments, and serious retinal detachments. Our case describes a patient who manifested a sensory retinal detachment OD and was diagnosed with CSR approximately 6 months prior. At the most recent visit, prior findings along with our findings, to include IVFA and OCT, led us to diagnose polypoidal choroidal vasculopathy.

A 52-year-old black male presented with a complaint of decreased vision OS over the past 2 days. Family and patient medical histories were reported as negative. The patient was taking no medications and reported no allergies. The patient's ocular history was positive for diagnosed CSR 6 months prior. Visual acuities at that exam were 20/25 OD, 20/20 OS, at distance without correction. A serous retinal detachment had been demonstrated via OCT at the prior visit. The retinal detachment (OD) had resolved as of the most current visit. Visual acuities at the current examination were 20/20 OD and 20/70 OS, at distance without correction. Intraocular pressures were 18/18 @15:59. Anterior segment examination was normal OU. Dilated fundus examination revealed choriotireal lying superior temporal to the optic disc with peripapillary reddish-orange choroidal nodules (OD). The OS fundus examination revealed multiple, exudative, serous retinal detachments approximately 1 disc diameter from and superior - temporal to the optic disc. These detachments were continuous with a large serous detachment involving the macula OS. OCT and digitally enhanced IFVA reinforced multiple serous retinal detachments and polypoidal aneurysmal choroidal leakage OS. Evidence of choroidal polyps was also made evident via IVFA OD.

Treatment options for polypoidal choroidal vasculopathy include observation as, in our patient's previous manifestation OD, the detachments may spontaneously resolve. Anti-VEGF drugs, photocoagulation, and macular photodynamic therapy are also treatment options. Our patient received intravitreal anti-VEGF (OS). The need for photocoagulation of the polyps will be determined.

Poster 83
Management of Third Nerve Palsy
Brandi McGraw, O.D.

Palsies of the third nerve most commonly occur with trauma, vascular disease, aneurysms or idiopathically. Less common causes include tumors, syphilis and vasculitis. Signs can include motility impairment, ptosis, pain, and pupil involvement. Presented are 2 cases of third nerve palsy, one from hypertension and another from diabetes mellitus, discussion of the condition, and treatment and management options pertaining to these cases.

Case Summary 1: A 37-year-old black male noticed an eye turn and droopy lid after a hypertensive transient ischemic attack 1 month earlier. His history is positive for systemic hypertension and 2 hypertensive medications. He admitted chronic medication and follow-up noncompliance. Entering uncorrected acuities were 20/20 OD and 20/40 OS. The left eye findings were lid ptosis, inability to adduct or elevate the eye and a poorly reactive, mid-dilated pupil. Intraocular pressures were 18 mmHg in both eyes and all other anterior and posterior segments findings were normal. The diagnosis was third nerve palsy with ptosis and pupil involvement. A follow-up examination 1 month later showed stable vision, intraocular pressures of 14 mmHg OU, and a resolving third nerve palsy with increased adduction abilities, no pupil defect and decreased ptosis. His hypertension was better controlled, vision and intraocular pressures were stable, and the palsy was near resolution 2 months later when he was lost to follow-up.

Case Summary 2: A 62-year-old Native American female presented with double vision for 4 days. Systemic history includes type 2 diabetes mellitus with uncontrolled glucose levels and hyperlipidemia, with oral medications for both. Uncorrected acuities were 20/30 OU, but both eyes were refracted to 20/20. The diplopia complaints were relieved by
occluding the left eye. Left eye findings showed an early third nerve palsy. Intraocular pressures were 15 mmHg OD and 17 mmHg OS. Anterior segment findings were normal in both eyes. Posterior segment evaluation revealed early atrophic macular changes and a posterior vitreous detachment in the left eye, but no diabetic retinopathy in either eye. A diagnosis of pupil-sparing third nerve palsy was made. The patient elected to patch the left eye until resolution to prevent diplopic side effects. The first 1 month follow-up visit revealed uncorrected acuities of 20/20 in both eyes, left eye abduction only and all other findings were stable. Diplopia remained and the patient continued patching the left eye. Another month later, the patient reported resolution of diplopia a week earlier and better controlled glucose levels. Her vision and intraocular pressures were stable and no motility defects were noted. The patient is being followed every 6 months and has had no recurrent palsies to date.

Third nerve palsies are important to understand as an eye care provider. Although this is generally a self-limiting condition with resolution within 6 months, it can be quite alarming for patients and devastating if systemic causes are not ruled out or properly diagnosed. Identifying systemic causes, patient education and temporary vision aids are imperative for management of third nerve palsies and the patients affected by them.

Poster 84
Case Series: Progressive Cone-Rod Dystrophy Associated with Myopia in Three Adult Siblings
Phu Nguyen and Maryke Neiberg, O.D.
Western University College of Optometry

Progressive cone-rod dystrophy is an inherited disorder that typically presents between the ages of 10 and 30 years of age. It is characterized by decreased acuity, central scotomas and concentric constriction of the visual fields. In addition, high myopia, significant protan- or deutanopia, abnormal cone and rod dark adaptation as demonstrated by abnormal ERG, are present. Typical posterior segment findings include blood vessel attenuation, tapeto-retinal sheen, temporal optic atrophy and pigment clumping of the retina. Foveal densitometry shows impairment early in course of the dystrophy and may assist in earlier diagnosis. Foveal cone photopigment density can be variably involved, causing a “bull’s eye maculopathy” that is reminiscent of chloroquine retinopathy. In this bull’s eye variant, the photopic ERG is variable and progressively worsens with time. Fine micro-nystagmus and marked color abnormalities are noted when the acuities drop below 20/50. In addition to severe photophobia, some patients may experience nyctalopia as a late feature of the disorder. The dystrophy is mainly X-linked inherited, but cases presenting with autosomal dominant or recessive inheritance have been documented in the literature. Several novel genetic mutations have been identified. Autosomal dominant inheritance shows no preference for gender. Some of the recessively inherited mutations were associated with additional findings, reflecting the particular genetic locus, such as faulty glutathione metabolism.

We present the case findings of a family of three siblings, 2 females (age 53 and 52) and 1 male (age 49) diagnosed with progressive cone dystrophy associated with high myopia. The data on these patients span several decades and demonstrate the progression in myopia while acuities stabilized at 20/200 in all 3 siblings. All 3 siblings were successfully fitted with soft contact lenses and specifically tinted glasses to enhance visual function.

Over the course of time, 2 of the 3 siblings developed staphylomas. The male sibling showed the most significant increase in myopia, while his acuities stabilized at 20/200 by the age of 17. Low vision rehabilitation, pedigree analysis and genetic counseling should be recommended for families affected by this dystrophy.

Poster 85
Toxic Optic Neuropathy in a Glaucomatous Nerve
Naida Jakirlic, O.D.

A 60-year-old Hispanic male with longstanding reduced BCVA OU and history of glaucoma treatment was found to have bilateral optic nerve pallor and large C/D ratios OU. This case report presents the challenge of diagnosing and properly managing 2 different optic neuropathies that are likely present in the same eye. A review of the appropriate workup in the presence of suspected non-glaucomatous optic neuropathy is discussed.

A 60-year-old Hispanic male presented to clinic complaining of near vision blur. His ocular history was positive for glaucoma treatment in the Dominican Republic 15 years prior to presentation. The treatment was aborted 3 years afterward in the U.S. because his doctor determined that the patient did not have glaucoma. His medical history was positive for hypertension, which was well-controlled with medication. Best corrected distance acuity was 20/200 in each eye. Upon further questioning, the patient reported that he had always had reduced vision in both eyes since he was a child and that it had not changed over the years. EOMs were full and pupillary functions were normal in both eyes. Slit lamp exam was remarkable for bilateral pingueculae. Goldmann applanation tonometry was 16 mm Hg in each eye. Upon dilation, the media was found to be clear and did not account for reduced vision in either eye. Retinal vasculature was normal and the maculae were flat and clear in both eyes. The cup-to-disc ratio was found to be 0.8 in the right eye and 0.75 in the left eye with thin inferior rims in both eyes. Both nerves demonstrated pallor that was most prominent temporally. The patient was diagnosed with glaucoma and scheduled to return in 2-4 days for a second baseline IOP reading and glaucoma workup. The need to rule out an ischemic optic neuropathy was also noted due to bilateral optic nerve pallor. Upon return, the patient’s visual acuities remained 20/200 in both eyes. IOP was found to be 15 mm Hg in both eyes. Gonioscopy was unremarkable OU. Pachymetry was 587 in OD and 595 in OS. GDx revealed superior and inferior NFL thinning OU. Sita-Standard 24-2 visual fields were conducted. Both eyes had excellent reliability and revealed bilateral centro-cecal defects without any evidence of glaucomatous visual field damage. Based on the visual field results, causes for the observed optic nerve pallor were postulated to be either toxic or nutritional in nature. The patient denied alcohol or drug abuse. When inquired about nutrition, he reported that he had a “modest” upbringing, but that he never experienced periods without proper nutrition. He reported frequent and abundant consumption of cassava fruit as a child and a history of bush tea drinking. Bloodwork was ordered and results were unremarkable. Color vision testing was performed and the patient could not distinguish any of the plates with either eye. Based on the exam findings, the patient was determined to have a toxic optic neuropathy in each eye.
Although the etiology of the neuropathy is not clear based on negative history and unremarkable blood tests, it is postulated that it was caused by cassava plant and bush tea consumption.

Although the causative factor for bilateral optic nerve pallor in this patient was not definitively determined, the most likely cause is a history of cassava plant and bush tea ingestion. The patient will continue to be monitored periodically with visual fields to ensure stability. He will also continue to be monitored as a glaucoma suspect based on large cup-to-disc ratios and history of glaucoma treatment. While there is little evidence in literature regarding optic nerve toxicity from cassava plant ingestion, in this patient that is the most likely etiology as all other more likely causes were ruled out.

Poster 86
Preseptal Cellulitis: The Importance of Accurate Diagnosis and Treatment
Naida Jakirlic, O.D.

Distinguishing between preseptal and orbital cellulitis is critical because the treatment and morbidity varies significantly between the two. In the setting of a severe preseptal cellulitis, making the appropriate diagnosis is often difficult, and it is always more prudent to err on the side of caution. However, knowing the appropriate testing and signs of both conditions allows the clinician to make the right diagnosis in order to avoid unnecessary testing and treatment, as well as prevent dangerous sequelae that could result if the wrong diagnosis is made. Also, knowing and implementing the appropriate treatment for both is crucial for timely resolution and restoration to health in these patients.

A 28-year-old Hispanic female presented to clinic with severe upper left eyelid swelling and pain. She reported having a pimple on that eyelid about 1 week prior to presentation, which she'd attempted to manipulate, but reported that no material was expressed from the lesion. She reported that the swelling increased over the week and she sought professional care a day prior to presenting to our clinic. An outside provider prescribed Azithromycin 250 mg PO for the eyelid pain and swelling. The patient presented to our clinic the next morning, reporting an increase in both edema and pain in the left eye. Upon examination, visual acuities were found to be 20/20- in both eyes. The entire left upper lid was taut and erythematous with areas of broken epithelium. The swelling was so severe that the patient had a difficult time opening her left eye and could only manage to open it 2-3 mm with manual help. Pupillary reaction was normal in each eye, EOMs were full and the conjunctiva was quiet OU. The patient was diagnosed with preseptal cellulitis of the left eye. She was told to discontinue Azithromycin. Due to the severe presentation, the ER was instructed to give 1 gram of intra-venous Ceftriaxone prior to discharging the patient from the emergency department. She was also prescribed Augmentin 875 mg PO every 12 hours for 10 days. She was instructed to start hot compresses in 10-15 minute sessions 6 times per day and was instructed to return in 24 hours. Examination the following day revealed stable visual acuities, EOMs, and pupillary function in both eyes. Left upper lid swelling had progressed, however, and epithelial breaks were clearly visible. A stab incision was performed by an attending ophthalmologist and the abscess was expressed without adverse sequelae. The patient was advised to continue Augmentin 875 mg PO BID and hot compresses 6 times per day. Upon return to clinic 3 days later, the left eyelid swelling had significantly subsided and the patient could easily open her eye. Because the abscess was still draining, the patient was prescribed bacitracin/polymyxin B ointment q.i.d. and was told to return in 2 weeks. Upon return, her left upper eyelid had returned to its normal size and shape with complete resolution of the preseptal cellulitis.

Making the appropriate diagnosis of preseptal versus orbital cellulitis constitutes half of the proper patient management. The other important half has to do with instituting the appropriate treatment. In this patient with a preseptal cellulitis, treatment with azithromycin was insufficient. Once she was started on the appropriate antibiotic, one would have expected a rapid resolution of the cellulitis. Our patient, however, showed progression of edema because the disease process had come so far along that drainage of the abscess was deemed necessary to aid in the healing and recovery. This case is important in demonstrating that the most crucial elements of emergent clinical care have to do with the appropriate diagnosis as well as treatment of any condition.

Poster 87
A Case of Central Serous Chorioretinopathy (CSCR) with Cause and Resolution Dependent upon Oral Prednisone
Eileen Bush, O.D., Christine Burke, O.D., and Sean McLoughlin, O.D.

CSCR is characterized by a local serous detachment of the sensory retina at the macula. The exact etiology is controversial. However, reported inducing factors include: type A personality, male predilection, stress, hypertension, alcohol, systemic lupus erythematosus, gastro-esophageal reflux, Cushing's Disease, and steroids. Increased cortisol levels have been associated with and may play a role in the breakdown of the blood-retina barrier in CSCR. It is typically a self-limiting disease with spontaneous resolution within 3-6 months. Therefore, most cases do not require treatment. Nonetheless, there are some cases which take longer to recover and may necessitate treatment. These chronic cases lasting longer than 12 months and other cases with complications may benefit from argon laser photocoagulation, photodynamic therapy (PDT), and/or intravitreal anti-vascular endothelial growth factor (VEGF).

A 34-year-old male presented with complaints of decreased vision of his left eye with “a black spot” in his central vision for 1 week. His systemic history was remarkable for gout and “knee problems” for which he was taking oral prednisone. His ocular history was significant for optic neuritis OS of unknown etiology 8 years ago. His best corrected visual acuities were 20/20 OD, 20/50 OS which reduced to 20/100 OS with pinhole. Pupils were equal, round, and reactive to direct and consensual testing. Extraocular muscle motilities were full OU. Color vision tested with Ishihara pseudoisochromatic plates was full (14/14) OD and significantly reduced (0/14) OS. Confrontational field testing was full OD, OS with central metamorphopsia OS. Humphrey visual field testing showed a generalized depression OD, however it was unreliable. Testing of the left eye was reliable and revealed a relative central scotoma. Anterior segment evaluation with slit lamp was unremarkable OD, OS. Posterior segment evaluation of the left eye revealed a round, serous detachment of the retina at the macula. The fundus of the right eye was unremarkable. This case is supplemented and supported with Humphrey visual fields, fundus photos, and optical coherence tomography (OCT).
The presenting symptoms of CSCR may mimic optic nerve disorders due to unilateral decreased vision, afferent papillary defect (APD), and reduced color vision. Therefore, a dilated fundus examination is imperative. Ancillary tests including visual field testing, OCT, fluorescein angiography (FA), and indocyanine green (ICG) angiography are useful to determine a definitive diagnosis. In addition, it is crucial for the eye care professional to know the background, symptoms and ocular characteristics to aid in accurate diagnosis of this condition. Once the diagnosis of CSCR is determined it is important to address precipitating factors. As previously stated, CSCR has been associated with steroid use and has been shown to be reversible upon discontinuation of the medication. Therefore, a multidisciplinary approach is typically needed to manage these patients.

**Poster 88**

**Treatment and Management of Retinal Arterial Macroaneurysms Based on Clinical Presentation**

Annah Fox, O.D., Nirali Patel, O.D., and Troy Fox, O.D.

New England College of Optometry

Retinal arterial macroaneurysms (RAM) are unilateral acquired arteriole dilatations typically within the first 3 orders of bifurcation. RAM is typically found in patients over the age of 60 with a marked female preponderance. It has also been consistently associated with systemic hypertension. Clinical presentation of macroaneurysms can be highly variable depending on if they are hemorrhagic or exudative in nature. The exact pathogenesis of the disease is unknown; however, there have been many postulated theories. The majority of patients are asymptomatic, and consequently the diagnosis is often accidental. Macroaneurysms clinically appear in a circinate lipid pattern typically in the temporal retina. Ancillary testing such as fluorescein angiography as well as indocyanine green angiography is often needed to rule out other similarly presenting diseases. Current treatment options include observation and direct laser photocoagulation. Treatment and management of macroaneurysms depends on the retinal location and subsequently the risk of vision loss. Studies have shown that the majority of patients have favorable visual outcomes.

A 70-year-old black female presented to the Dimock Center Eye Clinic for a complete examination without complaints. Her systemic history included hypertension, diabetes and asthma, all of which are well-controlled with medications. She was a glaucoma suspect and had cataract surgery 4 years prior. Best corrected visual acuity was 20/30 in each eye. Pupils, confrontation fields and versions were normal OD and OS. Anterior segment examination was normal and the intraocular pressures were 18mm Hg OD and OS. Dilated fundus examination revealed a clear and centered posterior chamber intraocular lens OU. Retinal examination of the right eye showed a 4 disc diameter circinate exudation in the superior temporal arcade. The bottom edge of the exudate ring was about 500 microns from the fovea. Other posterior segment findings included moderate cupping of the optic nerves and a mild epiretinal membrane in both eyes. At that time the differential diagnoses for the circinate exudate were exudative diabetic or hypertensive retinopathy, retinal arterial macroaneurysm and retinal vasculitis. The patient was referred for a retinal consult. The patient was seen 2 weeks later; fundus photos, optical coherence tomography and fluorescein angiography were performed. The circinate pattern of exudates had transformed into a textbook retinal arterial macroaneurysm. Since the retinal edema was threatening the fovea the specialist proceeded with laser photocoagulation treatment directly to the macroaneurysm.

Retinal arterial macroaneurysms are particularly fascinating because of their presentation variability. Each one is unique, and because of this each case needs to be managed individually, based on clinical presentation and prognosis. This case report discusses the most common presentations of retinal arterial macroaneurysms and their respective treatment plans.

**Poster 89**

**Potential Complications of Central Retinal Vein Occlusions in the Absence of Proper Treatment**

Carl Harder, O.D.

Central retinal vein occlusions occur when an artery compresses on a vein causing turbulent blood flow and thrombus formation (at lamina cribosa) which leads to ischemia and VEGF release. It can result in a visual acuity of 20/200 or worse if the ischemic type is present and is associated with hypertension and diabetes. Signs and symptoms of a central retinal vein occlusion include blood in all 4 retinal quadrants, macular edema/ischemia, neovascularization which can lead to vitreous hemorrhage, neovascular glaucoma, tractional retinal detachment, and diffuse optic disc edema with the formation of collateral veins.

A 60-year-old white male presented for a general eye exam. His chief complaint was reduced visual acuity, OS. His medical history was positive for diabetes, hyperlipidemia, controlled hypertension, tobacco use, and chronic back pain. Fundus exam in the left eye revealed indistinct disc margins with hemorrhages, neovascularization of the disc, attenuated/tortuous vessels with venous beeding, extensive hemorrhages with exudates in all 4 quadrants, NVE along the inferior arcade with fibrosis, and midperipheral preretal hemorrhages. A chorioretinal neovascular membrane with clinically significant macular edema was confirmed with optical coherence tomography. Gonioscopy revealed neovascularization in the temporal angle. Slit lamp exam later revealed mild anterior uveitis, OU. The patent was treated with Pred Forte QID, OU and later received panretinal photocoagulation, OS.

The aim of this poster is to increase awareness of ischemic central retinal vein occlusion. This poster will describe the various classifications of central retinal vein occlusion, treatment options, and how to distinguish them from other vessel occlusions. This presentation will include fundus photography, fluorescein angiography, and OCT images.

**Poster 90**

**A Diagnosis of Multifocal Choroiditis vs. Toxoplasmosis...With Just One Lesion?**

Deborah Consbruck, O.D., and Kelly Thompson, O.D.

Cincinnati VA Eye Center

Multifocal choroiditis (MFC) presents bilaterally in otherwise healthy individuals typically in the third decade. Eighty percent of these are female, 66% are white, 80% are myopic, and 90% have vitritis. Presenting acuities average 20/100. It can be challenging to differentiate between MFC and toxoplasmosis since punched out chorioretinal lesions, anterior chamber/vitreous inflammation, and choroidal neovascularization can be present in
both conditions. However, it is important to make the proper diagnosis, as the management of MFC and toxoplasmosis differ tremendously.

A white male, age 68, with a history of POAG, retinal break, and BRVO was referred for a dilated fundus exam to monitor a single elevated yellow-white retinal lesion, OS. The patient’s chief complaint was a gradual decrease in distance and near vision, counting fingers, OU. Dilated examination revealed macular atrophy, pigment scarring, and RPE disruption with a sensory retinal detachment. A diagnosis of Multifocal choroiditis with juxtafoveal CNVM vs. Toxoplasmosis was made. Given the best corrected visual acuity of 20/20 OU and lack of significant edema, glycemic control and observation is recommended with a follow-up every 4 months.

This case demonstrates the importance of maintaining IJRT as a differential diagnosis for retinal findings, an overlooked entity in light of more common conditions such as diabetic retinopathy and age-related macular degeneration. Clinical management can differ widely among such conditions. Therefore, staying familiarized with the morphological characteristics of IJRT on clinical and imaging exams can guide the primary care optometrist with diagnosis and clinical management, including treatment and appropriate referral timeline.

Poster 92
Ocular Manifestations of Antiphospholipid Syndrome: A Case Report
Naida Jakirlic, O.D.

Antiphospholipid syndrome is an autoimmune disorder that results in a hypercoagulable state. The disorder is caused by antibodies that are directed against cell membrane phospholipids, resulting in thrombosis that can occur in both arteries and veins. It can affect various organs including the eye. Ocular manifestations of this disorder include, but are not limited to, amaurosis fugax, transient ischemic attack, retinal hemorrhages and cotton wool spots, CRVO, CRAO, BRAO, non-arteritic anterior ischemic optic neuropathy, and ophthalmic and cilio-arterial artery occlusions.

A 42-year-old black female with a long-standing history of antiphospholipid syndrome presents to clinic with sudden painless vision loss in the left eye. Ocular health prior to presentation was unremarkable as per patient. Medical history is positive for antiphospholipid syndrome. The patient reports history of stroke in the late 1980s. She has a history of multiple limb amputations due to her autoimmune disease, including both legs below the knee, her right hand, and two fingers on her left hand. Entering acuities were 20/20- in both eyes with slight eccentric viewing in the left eye. EOMs were full. Pupils were round and reactive to light. An RAPD was noted in the left eye. Anterior segment findings were unremarkable. Dilated fundus exam revealed clear media in both eyes. Examination of the right fundus was unremarkable. Examination of the left fundus revealed inferior NFL edema extending from the nerve along the inferior arcades. No hemorrhages were noted. The patient was diagnosed with an inferior BRAO. She was started on Alphagan TID OU. She returned several weeks later for fluorescein angiography. Visual acuities, EOMs, and pupillary reactions remained stable in both eyes. Gross visual field testing with a red light revealed severe constriction of the superior and temporal hemifields, and moderate constriction of the inferior and nasal hemifields in the left eye. Visual field in the right eye appeared grossly intact. Fluorescein angiography was unremarkable in the right eye. Fluorescein angiography of the left eye revealed intact perfusion of the retinal vasculature with narrowing of one artery in the inferior arcade. It also revealed areas of choroidal non-perfusion as well as non-perfusion of the optic nerve extending from 5 o’clock until 12 o’clock. The FA findings were consistent with an old BRAO as well as non-arteritic anterior ischemic optic neuropathy in the left eye. The

Poster 91
Idiopathic Juxtafoveal Retinal Telangectasis: An Overlooked Differential Diagnosis?
Marion Hau, O.D.

Idiopathic juxtafoveal retinal telangectasis (IJRT) is a condition associated with compromised capillaries, resulting in disruption to the central retina and/or retinal pigment epithelium. IJRT is classified into several types, and usually presents during the fifth or sixth decade of life. It is associated with a range of effects on visual acuity and metamorphopsia. Variations in clinical findings may often include right-angled capillaries, macular edema, retinal atrophy, RPE hyperplasia, perifoveal hemorrhages, and/or secondary choroidal neovascular membrane. These features can be mistaken for more common conditions such as diabetic retinopathy, central serous retinopathy, and age-related macular degeneration.

A 67-year-old white male with type II diabetes presents to an urban community health optometry clinic with complaints of a unilateral, constant scotoma resembling “a backwards Tennessee” in the right eye, just temporal to central vision. Onset of the constant scotoma was 1 month with no change in size or shape since then. Best-corrected visual acuity is 20/20 OD and 20/20 OS, and on dilated fundus examination, right-angled, tortuous parafoveal vessels are noted with isolated microaneurysms adjacent to the macula OU, with no evidence of CSME OU. Amsler grid OD and Humphrey visual field 10-2 OD corroborates the patient’s symptoms and retinal findings. IVFA angiography and OCT images, this poster will describe the unusual lesion appearance, differentials considered and treatment options.

Poster 90
Overlooked Differential Diagnosis?
Marion Hau, O.D.

Amsler grid OD and Humphrey visual field 10-2 OD parafoveal vessels are noted with isolated microaneurysms OS, and on dilated fundus examination, right-angle, tortuous since then. Best-corrected visual acuity is 20/20 OD and 20/20 in the right eye, just temporal to central vision. Onset of the urban community health optometry clinic with complaints of a
This case shows the unfortunate ocular manifestations of antiphospholipid syndrome in a very young patient. A thorough review of this syndrome, as well as the ocular manifestations, are discussed. The optometrist’s role in managing these patients are reviewed.

**Poster 93**

**Maintenance Injections vs. Observation Following Initial Treatment in Exudative Macular Degeneration**

Christine Kroll, O.D., and Richard Chiu, D.O.

The management of exudative age-related macular degeneration (ARMD) with anti-VEGF injections has revolutionized the management of the disease over the past decade. While highly efficacious in stabilizing and improving vision, current treatments are a significant emotional and practical burden for many patients and families due to the need for frequent, and often indefinite treatment to maintain vision. A significant proportion of patients are unable to meet the demands for frequent injection and follow-up after initial treatments with intravitreal ranibizumab or bevacizumab. Therefore, the clinician must consider the risks of alternately observing (PRN treatment) inactive exudative ARMD instead of maintenance injections.

A retrospective chart analysis evaluated the efficacy of observation/as needed therapy versus maintenance injection therapy in wet macular degeneration patients after initial induction/treatment. Subjects received 3 monthly loading dose injections of either ranibizumab or bevacizumab, totaling 34 eyes in 27 patients, with at least 11 months of follow-up. Subjects were designated into two categories, maintenance or observation. The maintenance group received scheduled injections, followed closely with OCT and clinical examination. Observation subjects were followed with OCT and treated only if relapse occurred. Two-thirds of patients were kept on maintenance injections of ranibizumab, whereas one-third of patients were observed.

Of those on maintenance therapy, 34.8% had a relapse versus 65.2% with no recurrence. Relapse occurred in 44.4% of observation-only patients, with 55.6% having no relapse. Overall, visual acuity was stable (within 3 lines of presenting visual acuity) in 95.6% of maintenance therapy patients, with 39.1% improving more than 3 lines of vision. In observed patients, 88.8% had stable vision, with more than 3 lines of improvement in 44.4%.

It is well-known that recurrent choroidal neovascularization frequently occurs upon cessation of anti-VEGF treatment for exudative ARMD. Visual outcomes of the MARINA trial where patients received monthly injections for 24 months are comparatively better than PRN dosing such as that in the PRONTO trial. However, the recent CATT study demonstrated equivalent visual outcomes when comparing monthly to PRN dosing after initial treatment. Currently, there is no consensus among clinicians upon the dosing schedule following the initial treatment phase, although a large proportion of patients receive long-term injections following a “treat and extend” strategy. This relatively small case series would suggest that both strategies are viable options, although very close follow-up would be advised for patients being observed.

**Poster 94**

**Vascular Fundus Changes Observed In Patients With A High Probability of CCSVI**

Diana Driscoll, O.D., Richard Driscoll, O.D., and Clair Francomano, M.D.

With the advent of research indicating patients with multiple sclerosis are much more likely to others to exhibit chronic cerebrospinal venous insufficiency (CCSVI), the authors hypothesize that poor venous drainage through internal jugular veins may be visualized by close observation of vessels on the fundus of the eye. CCSVI has been implicated in Alzheimer’s disease, multiple sclerosis (MS) and other neurodegenerative conditions potentially involving poor brain perfusion. Through clinical observation, the authors noticed that patients with Ehlers-Danlos Syndrome (EDS, a disorder of connective tissue) are especially prone to CCSVI and stenosis of veins in other areas of their bodies. EDS patients are known to have weakened and abnormal collagen affecting their ligaments, organs and vessels. Patients with EDS are also more prone to developing multiple sclerosis than the general population, and a simultaneous diagnosis of EDS and MS is not unusual. The investigators hypothesize that patients with EDS, MS, or both EDS and MS will show vascular fundus irregularities, offering credence to the theory of CCSVI. Such objective data can be elusive, excepting fMRI, sonograms, MRV’s and the results of venous angioplasty. Direct observation of vessels as is allowed by viewing the ocular fundus may be an invaluable tool in the diagnosis of CCSVI and/or poor oxygen perfusion of tissues and organs in the skull. Because CCSVI is a vascular disorder, the investigators hypothesize that they are able to screen candidates for CCSVI with thorough examination of the vessels of the fundus.

In this double-blind pilot study, detailed fundus images of 60 patients–30 affected patients and 30 age-matched “normals” were obtained. The “blinded” investigator attempted to identify the affected patients by evaluation of the vessels of the fundus. The “blinded” doctor was able to differentiate the patients with EDS/POTS or EDS/POTS/MS over age-matched controls with 90% accuracy. This accuracy dropped to 68% for patients with multiple sclerosis only.

The results of this pilot study indicate that the retinal vascular changes identified appear to be predictive of patients that are likely to have CCSVI. Findings of this pilot study clearly invite further research into the vascular changes occurring in both EDS and MS patients.

**Poster 95**

**The Widening Spectrum of Findings in Retinoschisis**

Richard Madonna, O.D., Jerome Sherman, O.D., Nicholas Beaupre, O.D., and Sanjeev Nath, M.D.

SUNY College of Optometry

Traditionally, the diagnosis of retinoschisis (RS) would typically be made in an adult with a large bullous-like lesion in the peripheral retina. In addition, occasional cases of RS would be diagnosed in young males with reduced visual acuity. With the advent of SD OCT numerous cases of RS have been documented that go far beyond the traditional diagnoses. Here we utilize a series of case reports to illustrate and underscore the importance of RS since select cases can now be diagnosed and successfully treated.
Retrospective analysis of 24 patients with a diagnosis of RS, including X-linked, acquired, and those associated with congenital anomalies. All patients were imaged with 1 of 4 commercially available SD OCTs. Images were taken around the optic nerve, macula and retinal periphery.

SD OCT imaging revealed a wide spectrum of findings in RS, ranging from those invisible to ophthalmoscopy to those clearly visible on fundus examination and affecting large areas of the retina. Myopes greater than 6 diopters, who made up 12 of the 24 patients, presented with the most unexpected findings and often presented with schisis invisible to ophthalmoscopy. One of our patients, an asymptomatic 8 diopter myope, had 20/20 visual acuity without a macular schisis but with multiple splits at different retinal levels along the inferior and superior arcades, nasal to the disc and temporal to the macula extending to the ora. Other patients presented with 360 degree peripapillary schisis, schisis associated with retinal detachment, and foveal schisis, all invisible to ophthalmoscopy. The retinoschises found in the patients with high myopia appear to be related to vitreoretinal traction along the vascular arcades, revealed as vascular microfolds on SD OCT, along with global elongation of the eye.

Imaging with SD OCT has shown that RS is a much more common group of diverse disorders than previously believed. Imaging findings have provided keys to understanding the pathophysiology of the condition and insight into more effective treatments for those requiring it.

**Poster 96**

**Global RevitaLens Experience and Acceptance Trial (GREAT Trial)**

Paul Karpecki, O.D.

This study is designed to assess the ocular safety, efficacy, patient acceptance and physician recommendation of RevitaLens OcuTec® (in Europe COMPLETE® RevitaLens) Multipurpose Disinfecting Solution (MPDS) in patients currently wearing soft contact lenses and using a MPDS for lens care.

The study is a multi-center, open-label, non-comparative study, with 2,979 patients from individual sites in Europe and U.S. recruited for the study. Inclusion criteria were: 1) patients wearing soft contact lenses for 12 months or more, 2) patients wearing same CL brand, fit and correction for at least 6 months and 3) patients using MPDS for CL care. Exclusion criteria were 1) patients that did not fit the inclusion criteria, or 2) patients using a peroxide cleaning system or Complete® MPS. All patients underwent clinical examination based on the physician’s standard clinical practice. The physician also recorded the severity of signs (ocular redness) and symptoms (burning, irritation, and discomfort) at the initial baseline and final visits. A series of questions regarding patients’ current MPDS/MPS were recorded at the initial and final visits. After the trial was completed the physician’s overall impression of the RevitaLens OcuTec® MPDS was obtained.

The mean ± SD age of patients was 35.9 ± 13.2 years and the mean ± SD treatment days were 37.5 ± 18.06 days. Within the study cohort, 25.4% of patients had astigmatism, 74.8% of them wore silicone hydrogel CLs and 25.2% wore conventional hydrogel CLs. There was a significant improvement in the severity of the patients signs and symptoms after using RevitaLens OcuTec® MPDS (paired t-test, p<0.001). Of the patients, 93.5% found RevitaLens OcuTec® MPDS was effective in keeping their contact lens clean. Some 90.2% found RevitaLens OcuTec® MPDS was effective in keeping their CL feeling comfortable and 87.3% of patients said they would use RevitaLens OcuTec® MPDS in the future. The study found 76.2% of patients surveyed preferred RevitaLens OcuTec® MPDS over their previous MPDS and 87% of doctors surveyed recommend RevitaLens OcuTec® MPDS.

Statistically significant clinical differences were observed in the ocular signs and symptoms after using RevitaLens OcuTec® MPDS. A low rate of adverse events, a high level of patient satisfaction and physician recommendation demonstrates that RevitaLens OcuTec® MPDS is safe and efficacious.

**Poster 97**

**Panoramic Autofluorescence Identifies Pan-Retinal Degenerations in Patients with Reduced VA**

Jerome Sherman, O.D., Sarah Maclver, O.D., and Sanjeev Nath, M.D.

School of Optometry at the University of Waterloo

Fundus Autofluorescence (AF) is an indicator of retinal pigment epithelium (RPE) activity, with Hypo-AF indicating loss of RPE cells, and hyper-AF indicating RPE stress. Ultra-Widefield (Panoramic) AF (PAF) imaging with the Optos 200Tx captures a 200° retinal expanse in a minimally invasive, time-effective, manner. This study utilizes PAF in patients with reduced visual acuity (VA) (a) to determine whether PAF images correspond with color optomap® images and (b) to determine the scope and symmetry of retinal degeneration.

A retrospective review of 100 PAF and 100 color optomap images from 50 patients with either reduced VA or unusual visual symptoms was conducted in an ocular disease clinic. Based on patterns of AF, the images were categorized as normal (N) or abnormal, further designated by location: Abnormal centrally (AC), abnormal peripherally (AP), or abnormal centrally & peripherally (ACP). The central region was defined as the posterior pole, within 1 DD anterior to sup/inf arcades and around optic nerve. The images were analyzed for (a) PAF/color optomap correspondence and (b) OD/OS PAF pattern symmetry within each patient. Spectral domain optical coherence tomography (SDOCT) was used to confirm retinal abnormalities in all cases.

Sixty of the 100 PAF images reviewed had AF abnormalities: 18 (29.5%) were AC only, 10 (16.4%) were AP only, and 33 (54.1%) were ACP. Five patients had AP in 1 eye with ACP in the fellow eye. Of the 61 abnormal PAF images: (a) 44 (72.1%) did not match the appearance of corresponding color optomap image. (b) 48 (78.7%) had symmetric patterns OD and OS, suggesting retinal degeneration. Bilateral, previously undetected bull’s-eye maculopathy was discovered in 12 of the 61 images. SDOCT confirmed RPE defects in the posterior pole via evaluation of the outer retina (i.e. Photoreceptor integrity line (PIL) and RPE) in all AC and ACP eyes.

The study found that: 1) PAF is a fast, non-invasive procedure that can effectively detect outer retinal pathology in patients with vision defects. 2) Pan-retinal AF abnormalities are more common than those isolated to the central or peripheral retina. However, isolated AP may precede ACP as several asymmetric cases suggest. 3) PAF reveals abnormalities throughout the retina that may be invisible to binocular indirect.
ophthalmoscopy, fundus photography or similar imaging modalities. 4) Abnormality in PAF is more extensive than in color images when the changes are in the outer retina. 5) PAF may be used in the early detection of bull's-eye maculopathy, which is known to occur in retinitis pigmentosa, cone-rod dystrophy, and drug toxicity (e.g. Plaquinil, Accutane). 6) SDOCT analysis of the outer retina confirms RPE involvement in areas of hyper/hypo AF.

Primary Care

Poster 98
The Many Faces of Ocular Toxoplasmosis: A Case Series
Joseph Pizzimenti, O.D., Diana Shechtman, O.D., Sherrol Reynolds, O.D., and Laura Falco, O.D.
Nova Southeastern University

Posterior segment manifestations of ocular toxoplasma gondii infection primarily involve the inner retina. The inflammatory response can extend to the outer retina and the choroid. Characteristic findings include a white fundus lesion with overlying vitreous cells, sometimes described as “headlights in a fog.” The retinochoroiditis has a predilection for the posterior pole. Ocular toxoplasma gondii infection is the most frequent cause of posterior uveitis.

We present three serologically confirmed cases of ocular toxoplasmosis and discuss the variable clinical presentations. Three patient cases illustrate the wide spectrum of ophthalmic findings associated with ocular toxoplasmosis, from common to atypical. These patients vary in age groups, gender, ethnicities, and clinical features. The diverse signs that presented include acute anterior uveitis, hemorrhagic vasculitis, branch retinal vein occlusion and the more frequently encountered retinochoroiditis.

Atypical presentations of ocular toxoplasmosis pose a clinical challenge. Proper diagnosis can be established by carefully evaluating patient demographics and the overall clinical picture, often utilizing serologic testing. Our 3 cases illustrate the spectrum of disease and various treatments.

Poster 99
Corneal Ulcer Masquerading Syphilitic Interstitial Keratitis
Melissa Misko, O.D., Alexandra Espejo, O.D., and Julie Tyler, O.D.
Nova Southeastern University

Syphilis infections are on the rise, with approximately 12 million new cases every year across the world. Populations most affected are those who are HIV-positive, or men who have sex with men (MSM). While ocular manifestations of syphilis may be rare, the long-term, irreversible consequences can be significant.

A 19-year-old male presented to The Nova Southeastern University Eye Care Institute due to pain and redness OS. The patient was diagnosed with a corneal ulcer secondary to contact lens overwear. At his 1-day follow-up, a significant anterior chamber reaction was noted. Over the next 2 weeks, the corneal ulcer resolved with mild interstitial keratitis. The inflammation in the anterior chamber persisted with aggressive topical steroid treatment. Additionally, optic nerve head edema was noted in the right eye. Blood work was recommended and subsequently, the patient was diagnosed with systemic syphilis.

Syphilis is the “great masquerader” and may present with a variety of ocular symptoms. With the incidence of new infections on the rise, it should be considered a top differential diagnosis in patients with uveitis, scleritis, episcleritis, or optic neuritis - and especially in populations most at risk.

Poster 100
Are those Horner-Trantas Dots? VKC Full-Circle in a Young Patient
Shannon Dehesa, O.D., and Greg Fecho, O.D.
NOVA Southeastern University

Vernal keratoconjunctivitis (VKC) is a chronic, bilateral, allergic and inflammatory response of the ocular surface. It is often common in children between the ages of 5 months-10 years, particularly males. Typically, VKC presents with photophobia, hyperemia, eye watering, eye rubbing, and Horner–Trantas dots. Here we present a unique case of VKC with the presence of Horner-Trantas dots 360 degrees circumlimbal in a young patient.

A 7-year-old Afro-Caribbean male presented to the NOVA Southeastern Pediatric/BV Eye Clinic with complaints of very red, irritated, itchy eyes with light-sensitivity OU. The patient also has noted sticky, matted eyelids in the mornings. He has been rubbing excessively for the past 1-2 months. He also reports eye watering on a daily basis. Patient medical history was positive for allergies associated with pollens, and dry, itchy skin. Visual acuities were 20/25 OD, 20/25+2 OS, 20/20 OU at distance, and 20/20 OU at near. Keratometry readings were 40.12/41.00@090 OD, 40.75/41.25@090 OS. Manifest refraction revealed +0.50-0.75 x 90 OU, 0.25 with add OU. Pupils were equal, round, responsive to light with no afferent papillary defect OU. Upon slit lamp exam, the adenexae were positive for some scabbed, rough skin temporal on the face on both sides, possibly a sign of atopic disease. The eyelids showed multiple catted glands and mild debris. The bulbar conjunctiva was positive for a grade 2-3+ diffuse injection OU, and 2+ echemosis OU. The palpebral conjunctiva was significant for grade 2 papillae superior and inferior. The cornea was clear OU. The most notable finding while examining the anterior segment was the presence of large Horner-Trantas dots 360 degrees circumlimbal in both eyes. Anterior chamber was dark and quiet OU. The lens was clear OU. IOP with Goldmann tonometry results were 15 mmHg OD, 16 mmHg OS at 12:32pm. Posterior segment health was unremarkable. Based on our clinical findings, we diagnosed our patient with vernal keratoconjunctivitis OU. Due to the patient's economic situation, we prescribed generic prednisolone sodium phosphate 1% suspension every 2 hours during waking hours for the first 4 days. The patient was instructed to return for follow up in 4 days. We also recommended using cold compresses twice a day, along with sunglasses when outside. At the follow-up visit, Pataday 1 time per day OU will be added, as well as non-preserved artificial tears q.i.d OU. Based on the degree of improvement, the steroid would be tapered at follow-up. Upon follow-up 4 days later, the patient presented with dramatic improvement in ocular symptoms and appearance.

Recognizing the ocular signs and symptoms of vernal keratoconjunctivitis in children is extremely important. VKC is a common condition that warrants immediate medical attention. Close follow-up with the patient is also important due to the association of VKC with keratoconus and acute hydrops. This is a condition that nearly all optometrists will see in their career.
Poster 101

Classic Findings of Noonan Syndrome in 5-Year-Old Twins with Refractive Amblyopia
Paula McDowell, O.D.

Noonan Syndrome is an autosomal dominant condition with a prevalence of approximately 1:1000 to 1:2500 live births. It has a high correlation with ocular and systemic abnormalities, including (but not limited to) face and eyelid anomalies, high refractive error, congenital heart defects, short stature, and developmental delays. There is little in the literature regarding ocular findings of twins with Noonan Syndrome.

Five-year-old black twins (one male and one female) present with parent complaints of squinting, sitting close to the television, and poor school performance. They both have a diagnosis of Noonan syndrome, and positive family history of a father with Noonan Syndrome. They both have a gestation age of 34 weeks, motor and cognitive delays, and are in the process of special education evaluation. Retinoscopy revealed high myopia and high but variable astigmatism in each child, and subjective refraction was attempted but unsuccessful. Binocular function was adequate, showing global stereopsis, although the female exhibited a large exophoria at near. Hypertelorism, downward slanting palpebral fissures, and a flat nasal bridge was noted for both upon external exam. Dilated internal exams revealed abnormally large cup-to-disc ratios for both the male and female (.7/.7 OD, .8/.8 OS and .65/.6 OD, .6/.6 OS, respectively). A 1-month post-dispense follow-up visit showed good reported compliance of glasses wear, and improved visual acuity, but still reduced from average for both patients. Additional myopia was observed with no improvement in acuity with addition of minus lenses. Both children have been diagnosed with refractive amblyopia, and are being closely monitored.

While most ocular abnormalities in Noonan Syndrome are evident in external structures and become less prominent with age, associated findings of high refractive error and abnormal fundoscopy need to be considered. In the case of these patients, frequent follow-up is important to monitor visual acuity, stability of refractive error, change in optic nerve cupping, and possibly initiating vision therapy. For patients with classic Noonan Syndrome signs but no formal diagnosis, referral for genetic testing should be considered.

Poster 102

Neurological vs. Glaucomatous Defects, Reliability, Repeatability, and Overcoming a Macular Hole: A Case Report in Challenging Perimetry
Lindsay Elkins, O.D., James Grant, and Carrie Lebowitz, O.D. Southern College of Optometry

Glaucomatous visual field defects follow the anatomy of the retinal nerve fiber layer, respect the horizontal midline, and are relative defects. Neurological defects are absolute and respect the vertical midline. The delineation may be more challenging in advanced glaucoma. This is further complicated if visual fields of both eyes cannot be reliably quantified.

A 67-year-old black female was diagnosed with primary open angle glaucoma after complete examination revealed enlarged C/A 67-year-old black female was diagnosed with primary open angle glaucoma. This is further complicated if visual fields of both eyes cannot be reliably quantified.

Poster 103

Blunt Force Trauma Resulting in Corneal Abrasion and Commotio Retinae
Heather Miller, O.D., and Andrew Gurwood, O.D.

Blunt force ocular injury has the potential to damage both anterior and posterior segment structures by stretching and compressing the globe. Transmitted forces radiate throughout all ocular structures. This results places all tissues at risk.

A 16-year-old male presented to the emergency service with a chief complaint of pain, redness, photophobia and decreased vision after being hit in the left eye with an 8 mm rubber pencil eraser. External ocular health was normal. Biomicroscopy revealed a large corneal abrasion in left eye. Dilated fundus examination demonstrated whitening and opaqueness of the retina (commotio retinae) covering the entire posterior pole of the left eye. The patient was acutely treated with topical cycloplegia, topical 4th generation fluoroquinolone antibiotics and lubrication. Eventually, topical steroids resolved the residual external and internal inflammation. The commotio retinae (CR) was observed and resolved over a week's time without intervention.

Blunt force ocular trauma frequently incites contrecoup injury to the retina (180 degrees from the cite of impact). The affected retinal area may initially appear normal, though patients often complain of decreased vision. CR may take hours to develop. The histopathology of commotio retinae was first thought to be a disruption of the blood-retinal barrier, but has since been reported to represent disorganization at the level of the photoreceptor layer. Initially fluorescein angiography was used...
as a tool for monitoring its resolution, as the edema would block the background choroidal fluorescence. Today, optical coherence tomography (OCT) is used in the same capacity with the advantage of offering noninvasive imaging. OCT imaging of commotion retinai demonstrates hyper-reflectivity at the level of the outer segments of the photoreceptors. Newer technology has crystallized evidence that damage occurs in both the outer and inner photoreceptor segments as well as in the retinal pigment epithelium (RPE). Commotion retinai is usually self-limiting and resolves on its own. Severe cases may incur permanent damage and loss of photoreceptors through photoreceptor death. We provide the literature with an additional retrospective sampling of OCT imaging chronicling the resolution of CR.

**Poster 104**

*Identifying and Remediating High Risk Scheie Retinopathy – Three Case Reports*

Abby Nelson, O.D., and Stuart Richer, O.D., Ph.D.

Captain James A. Lovell Federal Health Care Center

Optometrists have a unique opportunity and responsibility to identify high-risk systemic cardiovascular disease (CVDz) during ophthalmoscopy. Retinopathy signs are independently associated with angiograms and coronary artery calcification (i.e. Agaston Scores), supporting the concept that common physiological processes underlie both micro and macrovascular disease. (Wong TY et al, Am J Epidemiol 2008 1; 167(1): 51-8) In this poster we identify and simplify historic retinal blood vessel grading systems (i.e. Scheie and Academy Series). In clinical practice, it is crucial to identify specific high-risk potentially life-threatening stage 3 retinal signs and patterns such as early silver wiring, severe a/v nicking and localized exudates and hemorrhages that are often present at an earlier age in diabetics, and often confused with diabetic retinopathy, yet are present in non–diabetics having a family history of premature parental death. In this poster we evaluate pulse pressure, the EKG result, simple lipids (total cholesterol, LDL, HDL and triglycerides) and family history with respect to what we see in the retina of 3 typical patients in their late 40s to mid 50s. We move beyond the “cholesterol hypothesis” in our work-up of these patients by incorporating the work of preventative cardiologist William Davis, M.D., of Wauwatosa, WI (www.trackyourplaque.com). We describe a 9 factor workup: 1) 25 (OH) vitamin D liver reserve capacity against vascular calcification 2) Genetic LP(a) – vitamin C relationship 3) Apolipoprotein B series- small dense hard LDL surrogate 4) B vitamin deficiency factor – homocysteine, 5) hsCRP – the systemic anti-inflammatory marker along with elevated WBC 6) Ferritin - a systemic iron (oxidation) marker 7) Fibrinogen – a blood viscosity factor 8) Red Blood Cell magnesium – a vasospastic factor 9) Hypo thyroid disease screening.

A 57-year-old with a medical history positive for hypertension was found to have 2+ Scheie retinal vascular changes in addition to elevated homocysteine labs and known vitamin D deficiency. In the second case, a morbidly obese 47-year-old found to have asymmetric 3+ Scheie changes and a wide pulse pressure was found to have both elevated LP(a) and B series apolipoprotein ratios. Lastly, we review the labs of a 55-year-old that revealed elevations in LP(a) and fibrinogen. Furthermore, this patient, diabetic for 7 years, had a history of congestive heart failure and ischemic cardiomyopathy with incidence of myocardial infarct in the past. Retinal findings included a 2+ Scheie changes, wide arterial light reflex and silver wiring of the vasculature. Each of these patients show the early and subtle signs of retinal vascular changes that upon further investigation of their systemic health revealed abnormal cardiobiomarkers consistent with high-risk cardiovascular disease.

By increasing our awareness of retinal changes due to cardiovascular disease, and educating ourselves about many factors beyond simple cholesterol levels, we can effectively rectify nutritional deficiencies leading to premature death.

**Poster 105**

*Acute Corneal Hydrops in Pellucid Marginal Degeneration*

Marian Longo, O.D., and Jennifer Harthan

Illinois College of Optometry/Illinois Eye Institute

Acute corneal hydrops is corneal edema that is the result of a rapid influx of aqueous humor secondary to a spontaneous break in Descemet’s membrane and the underlying endothelium. It occurs with corneal ectasias, most commonly keratoconus, but rarely also presents with pellucid marginal degeneration, keratoglobus, posterior keratoconus, and terrien’s marginal degeneration. Possible predisposing factors include allergic eye disease, steeper keratometry readings at the time of diagnosis, rapid progression of ectasia, eccentric cones, and Down Syndrome.

A 48-year-old black female presented with symptoms of mild discomfort, marked injection, and a foreign body sensation in her right eye for the prior 8 days. The patient reported no contact lens wear, no previous episodes, and a self-reported eye exam history remarkable for a “lazy eye” OD. Best corrected spectacle correction was CF @ 1 foot OD and 20/25+1 OS. Biomicroscopy revealed epithelial and stromal edema with multiple bullae, an intrastromal cleft, and a Descemet’s break OD. OS was unremarkable. RTVue Anterior-Segment Optical Coherence Tomography (AS-OCT) confirmed the biomicroscopy findings. Topical treatment was initiated, and the patient was followed closely over a period of 5 weeks with an uncomplicated resolution. Upon complete resolution, ReSeeVit Corneal Topography revealed corneal steeping indicative of keratoconus/advanced pellucid marginal degeneration OD and a characteristic pattern of pellucid marginal degeneration OS. Her BCVA with spectacle correction was now 20/100-1 OD and 20/20-3 OS. The patient refused a specialty contact lens fitting despite being educated that it would improve her BCVA.

Acute corneal hydrops is a rare presentation in routine eye care settings that is often easily managed topically. The risk for infection and/or perforation is uncommon, but all cases still require close observation. Hydrops is secondary to a corneal ectasia that patients may not be aware that they have; illustrating the importance of regular eye exams and proper diagnosis. Most patients demonstrate improved or stable visual acuity post-hydrops with specialty contact lenses, but central scarring and/or non-resolving cases may require surgical intervention to achieve BCVA.

**Poster 106**

*Post-Operative Management of Implantable Collamer Lenses*

Tara Vacharkulksemsuk, O.D.

Implantable collamer lenses (ICL) are placed between the posterior iris and anterior crystalline lens of an eye to correct
typically large amounts of myopia in patients who are not good
candidates for other types of refractive surgery, such as laser-
assisted in situ keratomileusis (LASIK) or photorefractive
keratectomy (PRK). Pre- and post-operative management of
patients undergoing implantation brings about a unique set of
considerations that differs from other refractive procedures.

A 26 year-old male exhibits high intraocular pressures (IOP)
post-implantation of bilateral ICLs. In managing the elevated
pressures, the status and position of the ICL must be carefully
observed at each visit and ruled out as the etiology of the
pressure increase. Typical post-operative complications such as
inflammation are common. In addition, poor vaulting of the
implant resulting in rapid cataract formation or excessive
vaulting which can lead to angle closure are also serious
complications that can arise. This patient was followed every
few days over a period of 2 months post-operatively to
resolution, as IOPs continued to spike with the use of topical
anti-glaucoma drops alone, and could only be controlled with
oral Diamox. After careful evaluation at each visit, the elevated
IOPs in this case were determined to be secondary to general
post-operative inflammation and an ocular steroid response.

IOP needs to be controlled as in any other case of acute IOP
spikes, but additional etiologies should be considered and
managed appropriately when examining a patient who has
undergone ICL implantation, either recently or in the distant
past. Frequent follow-up is necessary to ensure proper
recovery and stability from the surgery and any possible
complications that may develop over time.

Poster 107
Developing Management Guidelines for Epiretinal
Membrane
Tara Vacharkulksemsuk, O.D.

Epiretinal membranes (ERM) lie between the posterior hyaloid
of the vitreous and inner limiting membrane (ILM) of the retina.
ERMs consist of vitreous collagen and various cells found
throughout the retina, and are not an uncommon finding among
older patients. Presentation and visual consequence of ERMs
can vary greatly from minimal to severe. Likewise, treatment
can range from home-monitoring with an Amsler grid to surgical
peeling of the ERM combined with vitrectomy and peeling of the
ILM. Although there are no definite criteria for when a patient
should undergo surgical treatment, current research focuses on
exploring predictive factors that may help in identifying patients
who are good candidates for surgical treatment. Factors that
most correlate to a good surgical outcome include the retinal
layers containing cone outer segment tips and the inner
segment/outner segment junction. Instruments such as either a
time- or spectral-domain optical coherence tomographer
(OCT) can image these layers and can be helpful in diagnosing,
quantifying, and monitoring the progression of ERMs.

A 69-year-old male presented with complaints of
metamorphopsia in his left eye. Evaluation by a retina specialist
revealed a grade 1 ERM in that eye and best-corrected acuity of
20/30-2 and metamorphopsia localized to an area superior to
fixation. This patient was not offered surgical removal of the
ERM, but instead, was told to monitor at home with an Amsler
grid and to return for re-evaluation in 3 months time. The
above case is contrasted with that of a 64-year-old female with
bilateral ERMs, grade 0 in her right eye, and grade 3 in her left
eye with an associated pseudohole. Although she had similar
acuities in both eyes (20/25), extensive traction caused by the
ERM in her left eye was accompanied by a pseudohole and
severe metamorphopsia. This patient would benefit greatly from
surgical removal, and currently awaits clearance for surgery
through her county hospital. Although the visual acuities
between the two patients was very similar, the metamorphopsia
varied significantly, and thus, management varied significantly.
Imaging by OCT revealed the varying degrees of traction and
integrity of predictive layers in both cases.

ERMs are a well-established ocular entity, but management
guidelines are not well-established. Current research provides
some insight into prognostic factors that may aid in predicting
surgical outcome, in hopes that criteria for proper management
can be more refined. Surgical options are also under close
scrutiny, as there may be some benefit to combining an ILM peel
with the ERM peel when surgical removal is indicated.

Poster 108
Acute Onset Oculomotor Nerve Paresis Secondary
to Presumed Ophthalmoplegic Migraine
Ketan Bakrivala, O.D. and Michael Huang, O.D.
VA San Diego Healthcare System

Twenty-to-forty-year-old patients presenting with sudden onset
3rd nerve palsy are considered emergencies due to the
likelihood of an aneurysm of the posterior communicating
tertery. Patients presenting with an isolated 3rd nerve palsy
warrant a thorough systemic work-up including appropriate
blood work and neuroimaging to rule out underlying infectious,
inflammatory, ischemic, or vasculopathic causes. It is estimated
that nearly 40% of 3rd nerve palsies are the result of an
aneurysm or tumor and another 40% from vasculopathic or
infectious disease. However, the remaining 15% of 3rd nerve
palsies are idiopathic. Ophthalmoplegic migraine is a rare and
often overlooked cause of sudden onset 3rd nerve palsy in both
children and adults. It is defined as recurrent migrainous
headaches with an associated paresis of an ocular cranial nerve,
most commonly cranial nerve 3. Patients often complain of
preceding nausea and vomiting with difficulty in near focusing.
Neuroimaging of such patients may reveal swelling of the
affected nerve, especially in the cisternal portion. Occurrence
of ophthalmoplegic migraine is 0.7 per 1 million and has a higher
predilection in males and children. Most patients have a positive
family history of migraine disorder. The disease is self-limiting
and usually responds well to a short dose of steroids.

A healthy 26-year-old male patient with no history of systemic
illness presented to the optometry clinic complaining of
diplopia, ptosis and a headache, which began 2 days prior and
gradually became worse. Examination revealed a superior
division right 3rd nerve palsy with possible pupillary
involvement. The patient was sent to the emergency
department for neuroimaging and blood work, both of which
yielded normal results. Examination by neurology confirmed 3rd
nerve palsy. The patient was prescribed migraine medication
with a diagnosis of ophthalmoplegic migraine. One week follow-
up by neurology demonstrated improvement in ptosis and
superior rectus function. The patient no-showed for subsequent
examinations by neurology and optometry but telephone
contact indicated that his symptoms resolved shortly after his
follow-up visit.

Ophthalmoplegic migraine is a rare condition with an unclear
etiology. It was thought to be caused by vascular changes in the
internal carotid artery that resulted in compression of cranial nerve 3 along its pathway. However, neuroimaging often revealed swelling of the 3rd nerve, which caused the condition to be redefined as a cranial neuralgia.

Recent studies indicate that there may be 2 separate variants that affect children and adults. The childhood variant typically has a younger age of onset, recurrent episodes of 3rd nerve palsy with severe migraines, and enhancement of affected nerves on MRI. The adult onset variant, as in our patient, presents with a single attack preceded by a severe migraine and shows no enhancement of the affected nerve on MRI.

**Poster 109**

Management of Non-Penetrating Blunt Trauma in a Child

Brandi McGraw, O.D.

The United States Eye Injury Registry reports blunt trauma is most common in males under 30 years old with 6 percent occurring from BB pellets. Complications from non-penetrating injuries can include corneal abrasion and edema, hyphema, iridodialysis, iritis, cataract, posterior vitreous detachment, commotio retinae, choroidal rupture, retinal detachment and optic nerve damage. Visual outcomes can vary from no defect to permanent blindness. A thorough anterior and posterior segment evaluation is necessary when such cases present.

An 11-year-old Hispanic male presented with his mother complaining of blurry vision and tearing 1 day after being struck in the left eye with a silver, metallic BB pellet. No significant medical or ocular history, allergies or family history was reported. Uncorrected acuity in the left eye was 20/40 with pinhole acuity of 20/25. Biomicroscopy examination revealed a 2 millimeter abrasion with significant surrounding edema inferonasally and conjunctival injection. Intraocular pressures were 17 mmHg in both eyes. Dilated examination showed grade 3+ cells and flare in the anterior chamber and less than 1 disc diameter of commotio retinae with a single hemorrhage inferonasally in the peripheral retina. No retained pellet or suspicion of one was present. He was prescribed Lotemax 4 times a day for 10 days to aid in decreasing inflammation and corneal healing. At the first follow-up visit 3 days later, uncorrected vision was 20/25 OS and intraocular pressures were 18mm Hg in both eyes. Iridodialysis and a posterior synechiae were visible under the resolving corneal edema. His iritis and commotio retinae were resolving. One drop of Atropine was instilled to break the posterior synechiae and provide patient comfort. The third examination revealed 20/20 uncorrected vision OS, intraocular pressures of 14mm Hg OD and 12mm Hg OS, complete resolution of commotio retinae, minimal residual inflammation and mild iridodialysis. He was then lost to follow-up.

Eye trauma can lead to varying degrees of ocular injuries. It is important to be well-versed in proper examination, treatment and education for penetrating and non-penetrating injuries. This knowledge will allow timely and appropriate intervention, and provide patient reassurance in a stressful moment.

**Poster 110**

Utilization of Ocular Coherence Tomography and Electoretinogram in the Diagnosis of Myopic Macula Schisis

Mindy Nguyen, O.D.

Myopic macula schisis is the separation of the inner layers of the retina from the outer layers due to progressive physiological elongation of a myopic eye as result of a posterior staphyloma formation. Although the development of macula schisis in a myopic eye is not uncommon, the condition often goes unrecognized because it is difficult to detect based on examination alone. However, technological advances in the development of the ocular coherence tomography (OCT) have provided assistance in the detection of the condition. An electoretinogram (ERG) is also helpful in detecting the extent of damage to the various layers of the retina involved in this condition.

A 66-year-old black male presented for his comprehensive examination with complaints of floaters in both eye. The symptoms were longstanding and stable. His best corrected visual acuity, with a significant myopic prescription, was 20/30 in the right eye and 20/70 in the left eye. Entrance testing was unremarkable. Slit lamp examination revealed moderate nuclear sclerosis and cortical cataracts in both eyes. Dilated posterior examination was limited due to media opacity, but showed posterior staphyloma in both eyes along with retinal thinning nasal to the macula in the left eye. There was no clinically significant elevation or holes noted in the macula in either eye. An OCT performed revealed normal findings in the right eye but the presence of a macula schisis in the left eye. An ERG was also performed and the results were consistent with findings of a retinoschisis.

High myopia predisposes patients to degenerative conditions, such as myopic macula schisis. Without proper detection and management, this condition can lead to progressive decrease in visual acuity due to the disruption of the neurosensory elements. This case demonstrates the importance of considering OCT in the workup of myopic patients presenting with visual problems, specifically, in the absence of clinical findings during examination. An ERG is also useful in the understanding of the extent of involvement and visual consequences to the various layers of the retina involved in this condition.

**Poster 111**

Purtscher Retinopathy Secondary to Acute Alcoholic Pancreatitis

Sylvia Sparrow, O.D., Jennifer Jones, O.D., and Mary Kathryn Wilson, O.D.

Southern College of Optometry

Purtscher retinopathy is a hemorrhagic and vaso-occlusive disease most commonly associated with head and/or chest trauma, but can be due to conditions such as acute pancreatitis, preeclampsia and lupus. When Purtscher-like signs are detected in a patient lacking a previous history of trauma, it is prudent to thoroughly inquire regarding the patient's medical and social history, including excessive alcohol consumption.

A 46-year-old black female presented with a complaint of intermittent blurry vision in both eyes of 1 day's duration. Medical history was positive for a recent emergency room visit
Objective Estimation of Refraction: iTrace vs WAM-5500
Kelly Meehan, O.D., and Balamurali Vasudaven
Arizona College of Optometry

The purpose of this study is to compare the objective refraction of the eye using 3 different techniques, i.e., iTrace (Tracey Technologies, Inc.), WAM-5500 (Grand Seiko Co., Ltd.) and hand-held retinoscopy in a young adult population.

Twelve young adult subjects (24 eyes) participated in the study. Retinoscopy was performed in both the eyes, in addition to the open field autorefraction with both WAM-5500 and iTrace. All the measurements were obtained on the same day within the same session in a counter-balanced manner. Spherical component of the refraction was isolated and used for analysis. One-way ANOVA intra class correlation coefficient (ICC) and limits of agreement (LoA) were performed to compare the spherical component between these 3 techniques.

One-way ANOVA statistics and correlation coefficient (ICC) of spherical refraction were performed between iTrace and WAM-5500 (t=0.83, p>0.05; ICC=0.97), WAM and retinoscopy (t=0.02 p>0.05; ICC=0.95), and iTrace and retinoscopy (t=0.81, p>0.05; ICC=0.96). No significant difference was shown between the 3 techniques [F(23)= 0.45, p=0.63] Bland-Altman analysis of the spherical component between the iTrace and WAM, WAM and retinoscopy, iTrace and retinoscopy demonstrated a 95% LoA of -0.71 to 1.44D, -1.21 to 1.19D, -0.59 to 1.29D, and a mean difference of -0.01D, 0.36D and 0.35D, respectively.

Currently there are no comparison studies between these instruments. The spherical refraction between the 3 techniques was not significantly different in young adults. The open field accommodative response obtained using the 2 autorefractors are identical and can be used interchangeably.

Poster 113
Accuracy and Time Efficiency of the Manual Versus Automated Phoropter with Refraction and Binocular Vision Testing
Kelly Meehan, O.D., Kayla Nervick, Chaula Patel, and Camille Singh

Refraction and binocular vision testing are part of the everyday exam process for an optometrist and his/her patients. Streamlining procedures and processes to be the most efficient and effective are beneficial in any field of work. The purpose of this study is to investigate the accuracy and time efficiency of the Reichert manual phoropter versus the MARCO Nidek RT-5100 automatic phoropter with regards to refraction and binocular vision testing.

Thirty-six student subjects participated in the study. Pre-screening tests were performed to determine subject eligibility. An auto-refraction was taken using the Nidek auto-refractor to determine a baseline value for refraction. Binocular vision testing was performed and recorded on each subject and the duration of time was noted for both the manual and automatic phoropter techniques. Each component of refraction (sphere, cylinder and axis) and binocular vision testing was isolated and used for statistical analysis. Paired-t test and correlation analysis were performed to compare the 2 techniques for statistical difference.

Paired-t test and correlation analysis of refraction and binocular vision testing were performed between the Reichert manual phoropter and the MARCO Nidek RT 5100 automatic phoropter. The spherical component for both eyes (t=0.7645, p>0.05; r=0.9921, p<0.0001) showed no statistical difference between techniques. Other components of refraction (cylinder and axis) and binocular vision testing (near vertical and horizontal Von Grafe phoria, BI vergences at near, BO recovery at near, NRA, PRA and FCC) were found to have no statistical difference as well. However, the BO break finding was found to be different statistically (t=3.670, p>0.05; r=0.8129, p<0.0001). The time needed to complete testing between the two types of equipment was also shown not to be statistically significant (t=1.013, p>0.05, r=0.2195, p<0.0001).

The subjective refraction and binocular vision testing (with the exception of BO break findings) were not statistically different between the 2 techniques. The length of time to perform procedures was also not statistically different. Therefore, the Reichert manual phoropter and the MARCO Nidek RT 5100 automatic phoropter are equivalent in binocular vision testing and subjective refraction.
**Poster 114**  
**A New Method for Performing Refraction Utilizing a Subjective Point Spread Function Refractor**  
Mile Brujic, O.D. and David Geffen, O.D.  
Gordon Weiss & Shanzlin Vision Institute

The purpose of this study is to review the initial user experience and patient perception of a new refraction system that utilizes point spread function (PSF) technology to reduce or eliminate higher-order aberrations in the subjective refraction.

The Vmax Subjective PSF Refractor (Vmax Vision, Maitland, FL) was used to perform standard manifest refraction measurements, based on visual acuity results. Patient and clinician satisfaction was also assessed using the Likert scale that includes speed of exam, ease of use, fatigue, and ability to respond confidently.

Nine hundred patients at 5 clinical sites were included in the analysis. When compared to a standard phoropter manifest refraction, the PSF refractor obtained equal or better visual acuity results (63% and 28%, respectively; p < 0.001). Overall, PSF refraction was found to be faster, easier to use, and less tiring for patients.

This initial clinical evaluation found that this new PSF refractor is a useful tool that provides better or equal in accuracy and reliability in refractive end points, compared to a standard phoropter. Patients subjectively reported a strong preference to the Vmax PSF refractor compared to standard refraction techniques.

**Public Health**

**Poster 115**  
**Diabetic Vision Loss Prevented via Telemedicine**  
Lanae Knapp, O.D.

Diabetes is the leading cause of blindness among adults of working age in the United States. The early detection and treatment of diabetic retinopathy is essential in the prevention of vision loss. Telemedicine can be used as a public health tool to increase accessibility to retinal screening for patients with diabetes. Due to the high prevalence of diabetes among Native Americans, telemedicine has been particularly useful in the timely detection of retinopathy within this population.

This is an example of a 54-year-old Native American male screened by tele-imaging during his visit to an internal medicine clinic. He was diagnosed with high-risk proliferative diabetic retinopathy in the right eye and very severe non-proliferative diabetic retinopathy in the left eye. Despite extensive patient education, he declined prophylactic treatment. Two weeks later, he experienced a vitreous hemorrhage in the right eye. Correspondingly, visual acuity decreased from 20/30 to count fingers OD, restricting his ability to operate heavy equipment under a commercial driver’s license. Subsequently, the patient underwent a vitrectomy with endolaser in the right eye and prophylactic retinal photocoagulation in the left eye. Final visual acuity was 20/60 OD and 20/40 OS.

Implementation of telemedicine has increased the percentage of diabetic patients who receive screening for retinopathy within our remote community served by the Indian Health Service. Retinal imaging performed during a patient’s outpatient clinical visit is essential in capturing patients who do not seek routine ocular care. Screening leads to the early detection and treatment of diabetic retinopathy for the prevention of vision loss.

This case is an example of a patient who may have avoided loss of work time, as well as a more invasive and costly medical procedure, if he had elected prophylactic treatment at the time of detection.

**Poster 116**  
**A Three Year Quantitative Analysis of Anti-Infective Ophthalmic Prescription Writing by Optometrist**  
Agustin Gonzalez, O.D. and Clarissa De Paz, O.D.  
Inter American University - Optometry

It could be argued that the tendency of optometrists in the U.S. to manage and prescribe ophthalmic drugs for the treatment of infections has significantly increased over the years. To date, there is no literature available that supports this statement. This study describes the trend of optometrists to prescribe ophthalmic medications linked to the treatment and management of ophthalmic infections. It is important to note that the data are being interpreted in a directional manner and the authors in no way believe this reflects absolute values.

Three-year prescribing data were obtained by a pharmaceutical tracking company monitoring prescribing habits of physicians by specialty. Data analyzed for this study was limited to topical ophthalmic anti-infective medications used in the treatment and management of ophthalmic infections. It is important to note that the authors in no way believe this reflects absolute values.

Anti-infective medications were divided into 5 categories: Ophthalmic Broad Spectrum, Combination Anti-infective representing a combination of two or more molecules, Anti-virals and Sulfos-based Anti-infectives and a fifth category called other for products that were not readily identified. The Broad Spectrum category totaled 776,646 prescriptions for 2007, 821,324 for 2008 and 933,304 for 2009. The Ophthalmic Combination Anti-infectives decreased from 23,386 to 20,282 from 2007 to 2008 and increased to 24,385 in 2009. The Ophthalmic Anti-virals increased steadily from 19,562 in 2007 to 21,638 in 2008 and 23,467 in 2009. The Sulfos-based Anti-infectives represented the least-prescribed group with 1,795 prescriptions in 2007, 1,671 in 2008 and 1,706 in 2009. The “Other” Ophthalmic Anti Infective category was but a small percentage and accounted for less than .005% of prescriptions written.

The analysis indicates a positive growth trend in the various categories measured during the period. Although further information should be gathered, this data may be indicative that optometrists in the United States have become more comfortable toward the medical aspect of the profession and prescribing ophthalmic drugs for the treatment and management of infectious disorder. It has been argued that prescription habit audits can be used to reflect a groups’ competence in pharmacological therapy and may be useful in determining management paradigms.
Expert Consensus on Important Touchpoints of the Eye Care Patient Experience
Ronald Krefman, O.D.

Prior works identified many potential touchpoints that could be measured in standardized patient self-reports of the eye care experience. The goal of this work is to find consensus among experts as to which touchpoints of the eye care patient experience are most important to measure. Consensus on importance adds validity evidence to developing measures of the eye care experience within a standardized survey instrument.

The Delphi method, used to solve an array of problems in health care, was selected for its efficiency and efficacy in gaining consensus among experts. Potential experts were identified from their relevant work in academia, committees, clinical practice, managed care organizations, ophthalmic retailers, optometry journals, eyewear manufacturers, presentations or publications. The experts completed a questionnaire asking them to rate the importance of 114 touchpoints of the eye care experience on a 5-point scale. Criterion was set at mean rating 4 or higher (‘important’ or ‘very important’); that at least 75% of the experts rate the item 4 or 5; and that rounds of questioning repeat until at least 4 items met the criteria for each dimension.

Fourteen of 26 participating experts were optometrists with expertise in clinical affairs (6), outcomes (10), practice advancement (3), public health (5), and quality improvement (2). The criteria were met in the first round as consensus was that 91 of the 114 touchpoints were important (M = 4.219, 95% CI ± 0.265), with 87% of the scores ≥4. Important touchpoints by dimension were “access to eye doctor’ (n=12); ‘eye doctor communication and care’ (n=13); ‘staff communication and care’ (n=13); ‘access to vision plan and choices’ (n=17); ‘plan communication and care’ (n=12); ‘access to eyewear and choices’ (n=9); and ‘eyewear communication and care’ (n=15).

The qualifications, diversity and number of participating experts validate the credibility of the consensus opinions derived, which deemed 79% of the touchpoints as important. This work supports inclusion of measures of these touchpoints for field testing a new survey instrument.

Optometry School Graduates Self-Perception of Confidence Upon Graduation and 1 Year Later: Does Residency Training Truly Increase Confidence?
Elyse Chaglasian, O.D.

Optometry students decide to pursue a post-graduate residency program for a variety of reasons; increasing knowledge base, improving proficiency in optometric procedures, exposure to a specific area of specialty, the opportunity for teaching, lecturing and student supervision, gaining an advantage in a saturated job market, and the greater likelihood to subsequently enter academia or hospital-based care. Additionally, there is also the perception that the additional year of training will boost the confidence level of a new graduate. To prove or disprove this last hypothesis, a survey was sent to the members of the Illinois College of Optometry Class of 2010 to determine their self-perceived level of confidence upon graduation and after 1 year in various modes of practice.

A 7 question Zoomerang survey was sent to 155 members of the 2010 class of the Illinois College of Optometry in order to assess their level of confidence in their patient care and management skills upon graduation and after 1 year in practice. 19.6% of this class was accepted into a residency program. 40 of 155 surveys were returned (25.8%). Of those, 7 had pursued a residency, mostly in Primary Care/Ocular Disease (67%). Upon graduation, those 7 rated themselves primarily as Often Confident (71.4%) and Very Often Confident (14.3%), while the 33 who did not go on to a residency program rated themselves primarily as Often Confident (63.6%) and Very Often Confident (24.2%). Interestingly, 1 year later, the residency trained members had a significant shift to Very Often Confident (71.4% from 14.3%), while those who entered a different mode of practice (optometric, ophthalmological, commercial-based or hospital setting) had a much smaller shift to Very Often Confident (36.45% from 24.2%). The majority of graduates who did not enter a residency program were employed by commercial optometry (58%).

This survey appears to justify the widely held belief that a post-graduate optometric residency does increase self-perceived confidence in patient care and management skills of the new graduate.

MRSA Carriers in Contact Lens Wearers at Southern College of Optometry
Stacey Canton and William Edmondson, O.D.
Southern College of Optometry

Utilizing chromogenic culture media, we were able to identify Staphylococcus aureus and Methicillin-resistant S. aureus (MRSA) carriers among contact lens wearers at Southern College of Optometry. Contact lens wearers are susceptible to microbial keratitis.

Because MRSA is resistant to many ophthalmic antibiotics, it may be difficult to treat if not correctly diagnosed. Using a combination of 2 media allowed us to identify whether S. aureus was present and if it was MRSA positive. Mannitol Salt agar was used to determine presence of S. aureus. The high salt content of this media only allows Staphylococcus species growth. S. aureus is distinguished from other Staphylococci because it metabolizes mannitol sugars, causing the agar to turn from red to yellow. The specimens were cultured using Remel’s new Spectra MRSA agar to determine whether the colonies were methicillin-resistant. Enzymatic activity by MRSA on β-lactam rings of the penicillin family will turn colonies denim blue.

Nasal and conjunctival specimens were obtained from 40 contact lens wearers associated with Southern College of Optometry. The specimens were then cultured on Mannitol Salt agar and Spectra MRSA agar according to the manufacturer’s instructions. The cultures were incubated for 48 hours and evaluated at 24 hours and 48 hours for growth. All subjects were nasal carriers of Staphylococcus species. Twelve subjects were carriers of S. aureus and 6 of those were MRSA positive. None of the conjunctival cultures were MRSA positive. There were also 3 other methicillin-resistant cultures, including Staphylococcus epidermidis (MRSE), Bacillus cereus, and one ambiguous Staphylococcus.

MRSA has been estimated to be among the natural flora of about 1.5% of the population in the United States. Of contact
Pre-concussive levels. Baseline for comparison after an athlete is concussed to scrutinize, this battery of sports vision tests can serve as a management of concussions in sports becomes more optimum athletic performance at the elite level. As the diagnosis determines how deficits in these visual skills may interfere with this visual performance testing demonstrated problems with acuity, ocular health, binocular balance, Wayne Saccadic Fixator proaction and hand speed, Frequency Doubling Technology C-20-5 screener, iCare Tonometry, external eye health evaluation and internal eye health evaluation. Protocols for each test followed the standard procedures of the American Optometric Association Sports Vision Section.

The results of the screening indicate that 6.25% of these athletes failed visual acuity, 26.3% displayed abnormal ocular health findings, 6.25% exhibited binocular vision problems and 28.6% complained of at least 1 visual symptom related to, and/or one previous incident involving head trauma or concussion. Normative values and standard deviations were established for these sports vision performance tests.

Clinically significant numbers of these professional athletes demonstrated problems with acuity, ocular health, binocular vision and visual symptoms. This visual performance testing established normative data for this population and may help determine how deficits in these visual skills may interfere with optimum athletic performance at the elite level. As the diagnosis and management of concussions in sports becomes more scrutinized, this battery of sports vision tests can serve as a baseline for comparison after an athlete is concussed to determine if and when he/she is ready to return and perform at pre-concussive levels.

Several studies have shown a relationship between visual skills and athletic performance. Epidemiological studies suggest that the athletic population has a significant need for vision care. The goal of this investigation was to define normative values for sports vision testing and establish a comprehensive baseline that can be used to determine the effects of concussion on the visual system as it relates to athletic performance.

A recently introduced SD-OCT offers a single program that quantifies retinal thickness measurements as well as Ganglion Cell Complex (GCC) thickness in a single scan. As such, this program can be used to identify both retinal and optic nerve problems simultaneously. Since the scan only takes several seconds, the information made available can be used to screen large numbers of patients for both retinal and optic nerve disorders including glaucoma.

Two groups of patients were examined in order to determine the sensitivity and specificity of the iWellnessExam™ SD-OCT program. A “Confirmed Normal” (CN) cohort for the specificity aspect of the study, and a “Confirmed Disease” (CD) cohort for the sensitivity aspect of the study. In this study, 105 of the 111 CN and 102 of the 108 CD subjects were included for analysis. Of the CD patients, 68 had retinal pathology; 50 had ON pathology. (Sixteen (16) fell into both categories, with both retinal and ON pathology.) All subjects were screened on the iWellnessExam™ protocol. Screen shots of the OD, OS, and OU comparison data were obtained and deidentified for reviewer analysis by a well-trained eye care clinician. Based on these data alone, each subject was sorted into 1 of 4 categories: (1=Normal, 2=Retinal disease, 3=ON disease, 4=Retinal+ON disease).

Of the CNs, 104 of 105 were identified as normal (Specificity =99%). Of the CDs, 97 of 102 were properly identified with retinal and/or ON disease (sorted as category 2, 3, or 4), 63 of 68 of the retinal pathology subjects were detected (sorted as category 2 or 4), and 45 of the 50 ON pathology subjects were detected (sorted as category 3 or 4), (Sensitivity of 95%, 93%, and 90%, respectively). None of the Category 2 subjects were mis-sorted as Category 3, and none of the Category 3 subjects were mis-sorted as Category 2.

The iWellnessExam™ screening protocol provides data for the efficient, effective identification of both retinal and ON pathology, with high specificity and sensitivity when reviewed by a well-trained eye care clinician.

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Informational

Helpful Use of Smartphones for Patients with Low Vision
So-Yeon (Sharon) Lee, O.D.

Many low vision patients carry a large number of aids to help with various daily tasks. Downloadable applications are available on smartphones that can provide similar functions. Examples include magnifiers, contrast, color and currency identifiers, voice recorders, medication trackers. While they should not replace the optimal devices prescribed during low vision exams, they can reduce the load, and aid with daily living activities, cosmesis and psychological factors.