Selected Abstracts from the Orthoptics Australia 76th Annual Scientific Conference held in Sydney, 9th to 11th November 2019

PATRICIA LANCE LECTURE HOW DO WE KNOW WHAT WE KNOW, AND WHO KNOWS THAT WE KNOW IT? EVIDENCE-BASED ORTHOPTIC PRACTICE

Myra McGuinness

In the current environment of competing workforces, changing legislation and increasing litigation, evidence-based orthoptic practice is more important than ever. By striving for the highest level of clinical care, the orthoptic profession becomes empowered, benefits flow to employers and the healthcare system and, most importantly, patient outcomes improve. This lecture will highlight the importance of evidence-based orthoptic practice, examine barriers and explore systems for implementation in the workplace.

MANAGING REFERRALS AND THE DISCHARGE OF PATIENTS IN A BUSY PAEDIATRIC EYE CLINIC

Nicole Carter

With the demand for appointments at the Children's Hospital at Westmead continually increasing, implementing strict triage criteria for accepting new patients and for discharging current patients from the service, has become a top priority. This presentation outlined the criteria and processes the orthoptic department uses to make these decisions and to ensure clinic numbers and appointment wait times are appropriate.

ORTHOPTIST-LED NEUROFIBROMATOSIS TYPE 1 CLINIC AT THE ROYAL CHILDREN'S HOSPITAL, MELBOURNE: A STRATEGY FOR IMPACT

Navdeep Kaur, Catherine Lewis, Gabriel Dabscheck, Jonathan Ruddle

Neurofibromatosis Type 1 (NF1) is a common disease affecting 1 in 3000 individuals in Australia, with diverse complications affecting multiple organ systems. Up to 20% of NF1 patients develop an optic pathway glioma (OPG) resulting in vision loss. Patients with NF1 are often asymptomatic, as young children do not readily complain of impaired visual acuity, abnormal colour vision or visual field loss. Less than 50% of OPGs in NF1 patients become symptomatic. To minimise vision loss, ocular screening is imperative for prompt diagnosis and intervention.

Studies comparing screening strategies of NF1 centres in Europe and the USA identified a lack of uniformity in the frequency of reviews, duration of screening and ocular testing. To address the pressing need for a structured screening program at the Royal Children's Hospital (RCH) and to provide a streamlined clinical service, the RCH orthoptist-led NF1 screening clinic was implemented in 2016. This collaboration between the departments of ophthalmology and neurology at the RCH was developed for children diagnosed with NF1 and no known OPGs. Using evidence-based research from both departments, a strict protocol was designed.

Since implementation, the average ophthalmology consultation time reduced from 3 hours to 20 minutes and is completed without the use of dilating eye drops. Additionally, patients attend the NF outpatient clinic on the same day, requiring fewer trips to the hospital. This clinic has created uniformity in NF1 ocular testing, provided regular appointment reviews, and increased clinic capacity and efficiency.

THE CHALLENGES AND TRIUMPHS OF IMPLEMENTING EMERGING TECHNOLOGIES INTO PAEDIATRIC PRACTICE

Louise Brennan

Over time we have seen a changing health profile of children with more complex medical and behavioural needs presenting to the Eye Clinic at The Children's Hospital at Westmead. This, along with the utilisation of improved emerging technologies giving better visual outcomes, means that children remain within the eye clinic service for longer, require more visits and each visit takes more time. Increasingly the complex paediatric ophthalmic cases we now manage require a much more sophisticated assessment and evaluation. New technology sees multimodal imaging now a normal routine part of a clinic visit.

The push for younger patients to have non-invasive multimodal testing performed in the clinic is ever increasing to firstly gain quality images to help facilitate best care and secondly to avoid or reduce the number of examinations under anaesthetic.

Substantial change in clinical practice requirements are now needed by the paediatric eye team to deal with the use of emerging technologies including work practices, staffing levels, and enhanced skill sets. The paediatric orthoptist is well placed to be front and centre of this change in clinical care. The challenges along with the triumphs of this new role in clinical care was discussed.

10 YEARS ON … I AM OLDER BUT AM I WISER?

Lindley Leonard

Orthoptic-led clinics are continuing to be an important facet of best patient care at The Children's Hospital at Westmead. With the increased demand on services, thinking outside traditional models of care ensures appropriate use of public hospital resources. Ten years since the inception of our strabismus screening clinic, it is timely to review our service, the long-term validity, its success and its challenges.

MY YOUNG PATIENT HAS POOR VISUAL RESPONSES, WHERE TO FROM HERE?

Alison Byrne, Harzita Hashim

The cause of vision impairment can sometimes take time to diagnose in young children under the age of 3 years. However, these children often present with poor visual responses or atypical visual behaviour that suggests their vision may not continue to develop as expected. A significant amount of development occurs up to the age of 5 years and many of the skills children develop in this period of time lay the foundation for their future learning. Vision plays a significant role in early childhood development and a reduction in visual functioning can have an impact on all areas of development. This presentation highlighted the importance of eye clinics linking young children, who have reduced visual responses, with early intervention services, even before a confirmed diagnosis has been made. Case studies demonstrated how early intervention can improve the outcomes for children who are blind or have low vision.

LOOKING BACK FROM THE FUTURE - A REFLECTION ON ADVICE, PREDICTIONS AND THE OUTCOME

Cathie Wiltshire

A look back at a particular clinical case requiring corneal surgery, and the outcome – 20 years later. Was it what we had predicted? With our best intentions, guided by experience and knowledge, supported by ophthalmologists and other cases that have gone before, we make recommendations and predictions on clinical and functional visual outcomes. We advise families what their children may or may not be able to achieve – not to stifle them, but to put some sort of perspective and support networks there for the families. But what really happens? Do we get it 'right?' Is there a 'right'?

DELAYED DIAGNOSIS OF BRAIN TUMOURS IN CHILDREN

Agneta Rydberg

Introduction: Doctor´s delay in diagnosing paediatric central nervous system (CNS) tumours is a serious problem. Often various visual disturbances are the initial clinical signs and the tumours are life and sig ht threatening.

Material: Five children with early visual symptoms and with delayed diagnosis of CNS tumours were presented. The age of the children at diagnosis was 5½ to 9 years. Once the tumour was diagnosed neurosurgery and complementary treatment was initiated. However, the visual impairment was permanent.

Conclusion: Unexplained visual loss in paediatric populations must be investigated promptly. A complete neuro-ophthalmological investigation must be performed including visual field examination. Early diagnosis is essential in order to preserve existing visual functions.

'WON'T SOMEBODY PLEASE THINK OF THE CHILDREN?'

Premkumar Gunasekaran, Christopher Hodge, Gary Browne, Clare Fraser, Kathryn Rose

Aim: This retrospective study aims to determine how post-concussive vision problems in children impacts their symptom recovery.

Methods: Medical information from a paediatric sports concussion clinic in Sydney, was collected from November 2015 to May 2018. This included 142 patients with a medical diagnosis of concussion. Information analysed included age, sex, duration of symptomology, activity withdrawal, and the number of previous concussions. The Vestibular/Ocular Motor Screening (VOMS) test was used to determine concussion-related visual dysfunction.

Results: The mean age of subjects was 13.2 ± 2.6 years with 103 males and 35 females. Of these, 28% had a positive result on the VOMS test. Almost double the proportion females (42%) had a positive VOMS result compared to males (23%, $p=0.034$). Contact sports accounted for 58% of the concussions documented, with the highest prevalence (32%) in rugby. No association was found between VOMS result and age ($p=0.091$), occurrence of multiple concussions ($p=0.222$), or number of previous concussions ($p=0.187$). Ninety-three patients recovered from their concussion symptoms (median=33 days, IQR=21-71) while those with a negative VOMS had a 40% shorter mean recovery time (39.2 days) than those with a positive VOMS (63.7 days, $p<0.001$).

Conclusion: In children, visual dysfunction may be an important indicator of the time to recovery from concussion-related symptoms.

POST STROKE VISION CARE IN NSW: WHAT ARE THE CARE PATHWAYS AND ARE THEY WORKING?

Shanelle Sorbello, Amanda French, Kathryn Rose

Introduction: Visual impairment occurs in approximately 60% of stroke survivors. It often compounds the effect of age-related eye conditions and can greatly hinder successful rehabilitation overall. This study aims to evaluate the feasibility of surveys to investigate vision care pathways of stroke survivors in NSW and report preliminary findings.

Methods: Surveys were designed to investigate the major components of vision care, being the screening/assessment, management, referral, and education of stroke survivors in NSW. The experience and perspectives of health professionals and stroke survivors in NSW were gathered via the health professional survey (HPS) and stroke survivor survey (SSS), respectively. Survey feasibility was investigated using a mixed methods design. Preliminary data from both participant groups was analysed according to the three major components of care.

Results: Preliminary findings suggest that both surveys are of a reasonable length/time, widely understood by a variety of health professionals/stroke survivors, and address the major components of care. Care pathways of stroke survivors within NSW appear to be quite variable, with the success of each stage depending largely on timing and access to information and appropriately trained professionals.

Conclusion: The preliminary survey evaluation demonstrated that with minor refinements the survey tools are feasible and reliable. Results from both participant groups indicate a deficiency in most of the major post-stroke vision care components. The satisfaction of stroke survivors with their vision care seems to depend on the impact of the impairment on their daily life.

IMPROVING THE EXPERIENCE OF PEOPLE WHO ARE BLIND, HAVE LOW VISION OR DIPLOPIA WHILE THEY ARE IN HOSPITAL: AN EXPERIENCE BASED CO-DESIGN PROJECT

Kathryn Thompson, Sarah Jane Waller, Helen Badge, Susan Thompson, Conor Smith, Monique Tovo, Tara Dimopoulos-Bick, Christine Fuller, Nabill Jacob

Background: Anecdotal evidence exists that people who are blind, have low vision or diplopia, experience variation in the care they receive whilst in hospital. Feedback from staff highlighted uncertainty in how this patient cohort is best cared for in relation to their vision impairment, which maybe longstanding or recently acquired. Experience-based co-design (EBCD) is a rigorous evidence-based approach that brings together consumers, families and staff as active partners in healthcare improvement.

Aims:

1. Use EBCD to identify nature of experiences of people who are blind, have low vision or diplopia when they are in hospital and those who care for them.
2. Co-design, test and implement solutions to improve the experience of patients, carers and staff.

Methods: Use of proven EBCD approaches to start-up and engage, gather, understand, improve, measure the impact of various solutions.

Results: A co-design steering group was established including hospital staff, NSW Agency for Clinical Innovation (ACI), consumers or people with lived experience, Vision Australia and Guide Dogs. The EBCD processes were adapted to meet the access needs of people who are blind or with low vision.

Experience mapping described themes related to admission and consent, daily living, orientation to the ward and hospital environment, communication, maintaining independence and preparing for and being discharged from hospital. The themes included emotions and patient safety issues that may not have been identified through other research methods. The benefits of EBCD and results from capability training, co-design and solution testing were presented.

ARTIFICIAL VISION: LEARNING TO INTERPRET PHOSPHENES

Elizabeth Baglin

Vision prostheses, commonly referred to as 'bionic eyes' are implantable medical devices that are designed to provide artificial vision in people with profound vision loss. The devices work by using electrical or light energy to activate cells that are still intact along the visual pathway. They can be placed in a number of positions in the eye or visual cortex depending on the cells being targeted.

Retinitis pigmentosa (RP) is the leading cause of blindness in working-age adults due to degeneration of the photoreceptor layer of the retina. Those with advanced RP might benefit from a bionic eye device called a retinal prosthesis, implanted within the eye. A retinal prosthesis bypasses the degenerate photoreceptor cells to directly stimulate the inner retinal cells. Stimulation of the inner retinal cells can elicit the perception of flashes of light know as phosphenes, forming the basis of artificial vision.

Following a proof of concept study ending in 2014, researchers in Melbourne are currently conducting a trial of a second-generation bionic eye (NCT03406416). Between February and August 2018, four participants with end-stage RP were recruited and unilaterally implanted with a suprachoroidal retinal prosthesis. Following a period of device fitting, all four participants are able to reliably perceive phosphenes. This presentation outlined how the second-generation suprachoroidal device may enhance functional vision in participants with end-stage RP, whilst performing activities of daily living.

A RANDOMISED TRIAL TO INCREASE THE ASSESSMENT ACCURACY OF GLAUCOMA AND OPTIC DISC CHARACTERISTICS BY ORTHOPTISTS

Jane Scheetz, Konstandina Koklanis, Myra McGuinness, Maureen Long, Meg Morris

Introduction: To determine the accuracy of orthoptists when examining the optic disc for signs of glaucoma, and to explore the impact of targeted education on accuracy.

Methods: Participating orthoptists were presented with 42 monoscopic optic disc centred images and asked determine glaucoma likelihood, optic disc size, shape, tilting, vertical cup to disc ratio, cup shape, depth, presence of haemorrhage, peripapillary atrophy (PPA), and retinal nerve fibre layer (RNFL). The level of agreement with specialist ophthalmologists was assessed. Participants were then randomly assigned to an experimental group (targeted post-graduate education on optic disc assessment) or to no intervention. The educational program was designed to increase knowledge of the characteristic features associated with glaucomatous optic neuropathy. All participants re-examined the included optic disc images after a period of 6-8 weeks. The primary outcome measure was a change in agreement between attempts.

Results: The education group showed significant improvements between attempts for identifying haemorrhages ($p=0.013$), RNFL defects (0.035), disc size ($p=0.001$), PPA ($p=0.030$) and glaucoma likelihood ($p=0.023$). The control group did not show any statistically significant improvement. The intervention group showed significantly more improvement when identifying haemorrhages ($p=0.013$), disc size ($p=0.001$), disc shape ($p=0.033$) and cup shape ($p=0.020$) compared to the control group.

Conclusion: Orthoptists who receive additional postgraduate education based on principles of adult learning are more accurate at assessing the optic disc for glaucoma. These results highlight the value of continuing education to optimise clinical practice in allied health professionals.

THE STABLE MONITORING SERVICE FOR GLAUCOMA – WHAT ARE WE DOING WELL AND WHAT CAN WE DO BETTER?

Melanie Lai

In 2018, Sydney Eye Hospital Orthoptic Department commenced a Stable Monitoring Service (SMS) for patients with low risk glaucoma or suspect glaucoma in collaboration with the glaucoma specialist unit. The purpose of the SMS clinic improve is to improve service delivery by ensuring patients receive the right care at the right time, whilst ensuring we maintain delivery of high-quality patient care and improving the overall patient experience.

Glaucoma specialists can refer patients into the SMS clinic and orthoptists perform the comprehensive patient assessments, review results and make recommendations on the review plan. Currently, a glaucoma specialist then reviews the orthoptist's recommendation to determine appropriateness of the recommendation.

The role of the orthoptist in the SMS, inclusion criteria for acceptance into the service, and patient assessment, clinical results that guide the orthoptists' decision making, and agreement between orthoptist and ophthalmologist care recommendations was discussed.

EYE CARE ABOUT ICARE

Julie Lam

Glaucoma within Australia is currently the leading cause of irreversible blindness and is thought to affect up to 300,000 people in Australia of which only half have been diagnosed.

Due to the nature of the disease process, and the variability amongst every individual at which the level of the intraocular pressure incurs damage at the optic nerve, it is imperative for patients to attend regular ophthalmic appointments for intraocular pressure (IOP) monitoring to pre-determine treatment and management plans efficiently (medications/drops, laser, micro invasive glaucoma surgery (MIGS) or surgical glaucoma filtration/drainage intervention). This can essentially at times be logistically difficult and non-economically viable for some.

However, with the introduction of innovative technology such as the iCare Home, we now have the ability to deploy patients in using self-monitoring IOP devices to plot their IOPs anywhere and at any time without the need of attending clinic. We are also placing empowerment back with our patients by providing them with the opportunity to contribute to their treatment plans.

In further expansion, it can also prove to be a useful application in the modern realm of teleophthalmology for people living in rural communities. This case series explored the implementation of iCare Home data on three different patients.

CULTURALLY SAFE ORTHOPTICS - SOME THOUGHTS RELATING TO ABORIGINAL AND TORRES STRAIT ISLANDER EYE CARE

Rosamond Gilden

Cultural safety considers how a health professional does something, not what they do, in order to not engage in unsafe cultural practice that diminishes, demeans or disempowers the cultural identity and wellbeing of an individual. Health practitioners need to adopt an ongoing process of self-reflection and cultural self-awareness and an acknowledgement of how a health practitioners personal culture impacts on care to deliver cultural safe care.

In relation to Aboriginal and Torres Strait Islander health, cultural safety provides a decolonising model of practice based on dialogue, communication, power sharing and negotiation, and the acknowledgment of white privilege. These actions are a means to challenge racism at personal and institutional levels, and to establish trust in health care encounters (from CATSINaM 2017).

Cultural safety is being introduced across Australia in health professional education and practice through government and regulatory guidelines and by professional organisations adopting proactive approaches to reconciliation. This builds on a recommendation of the Roadmap to Close the Gap for Vision, which identifies the need for culturally safe mainstream practices. It is evident that to close the gap for vision for Aboriginal and Torres Strait Islander Australians, health practitioners involved in eye care require appropriate cultural capabilities.

In this presentation, we explored the training and development needed to support orthoptists to provide culturally safe eye care for Aboriginal and Torres Strait Islander Australians.

CATARACT PATIENTS: TELL ME WHAT YOU WANT, WHAT YOU REALLY, REALLY WANT

Vu Quang Do, Tracey Laba, Blake Angell, Anna Palagyi, Peter McCluskey, Andrew White, Nicole Carnt, Fiona Stapleton, Lisa Keay

Background: It has always been hard to know what patients really want and what they value most when deciding where to access their cataract surgery. Patients tend to overrate the importance of service features, and traditional surveys used in the past have considered features in isolation rather than in combination with one another. Both instances lead to an overestimation of value, and altogether makes it difficult for governments and policy makers to determine what aspects of services that are most important to patients.

Aim: To examine what service features have the greatest influence on patient choice regarding access to cataract surgery; and to estimate how much patients are willing to pay for these attributes.

Methods: A discrete choice experiment (DCE) was conducted at two secondary public hospital ophthalmology clinics in Sydney, Australia. A mixed multinomial logit model was used to estimate the relative influence of key features on cataract service preference (odds ratio) and the willingness to pay for improvements in these attributes ($AUD).

Results and Conclusion: Shorter wait times, lower out-of-pocket costs, senior surgeon experience and good institutional reputation were major influences on participant choice for cataract surgery services. Participants were willing to pay for these attributes despite the major influence of cost on service choice. Patient willingness to trade between attributes and to pay for service characteristics opens opportunities to improve upon current models of care and inform future funding policies.

LONG TIME - NO ASCAN

Catherine Mancuso, Suzanna Talevski

From the time of the purchase of our first optical biometer at the Royal Victorian Eye and Ear Hospital (E+E) approximately 17 years ago, we made an assumption - with this new technology being so accurate and repeatable there would be no need to routinely remeasure an axial length for the second cataract surgery, where no other surgical procedure or significant ocular trauma had taken place.

This assumption was built into our protocols for biometry, as with approximately 10,000 cataracts performed each year at E+E there are a significant number of biometry measurements to perform.

Seventeen years on, without any significant adverse events relating to our assumption and in the absence of any literature around to suggest a change in our process, the Orthoptic Department has been asked to change our protocol to repeat the biometry for the second eye surgery if a previous measurement was performed more than two years earlier.

An audit of the results and the variations in the measurements was presented and the implications discussed.

TRIFOCAL INTRAOCULAR LENS (PANOPTIX IOL) USE IN PATIENTS WITH PRIOR CORNEAL REFRACTIVE SURGERY

Kate Roberts

Purpose: Although laser refractive surgery has proven safe and effective, corneal ablations may impact visual quality. For post-laser refractive patients proceeding to cataract surgery, difficulties in obtaining accurate post-surgical refractive outcomes are well documented. Trifocal IOLs offer independence at all distances, however patient selection is key to maximising both outcomes and patient satisfaction. Previously post-refractive patients were considered sub-optimal for trifocal implantation however improvements in laser technology and our understanding of IOL power calculations now suggests this may be a reasonable option for selected, motivated patients. This study aims to investigate IOL calculations following prior laser refractive surgery.

Methods: This represents a retrospective review of consecutive patients with a history of prior laser refractive surgery who have undergone bilateral implantation of the Panoptix IOL. Refractive and visual outcomes are reported.

Results: 20 eyes were included in the analysis (14 previously myopic). Seven eyes required toric IOL implantation. The mean axial length was 23.86 ± 1.43mm and mean average keratometry 42.49 ± 2.99D. The mean arithmetic difference from target was -0.13 ± 0.39D and mean absolute difference from target was 0.24 ± 0.33D. 87.5% of eyes achieved UDVA of 6/6 or better, UIVA of N8 or better and UNVA of N5 or better. Five of 19 eyes underwent YAG capsulotomy following surgery.

Conclusion: Refractive and visual outcomes in this cohort are equivalent to results achieved in routine cases. Patient satisfaction was high, suggesting that trifocal IOL implantation can be a successful option for selected patients with a history of prior refractive surgery.

SUNLIGHT AND MYOPIA, HOW MUCH IS REALLY ENOUGH?

Long Phan, Amanda French, Ian Morgan, Kathryn Rose

Purpose: To compare objective light exposure measures in young Australian adults to the required levels in experimental environments for myopic protection.

Methods: 102 university students wore a light data logger over four days (2 week and 2 weekend days) in autumn, 2014. Participants simultaneously completed a 24-hour diary to capture indoor and outdoor exposures and activities undertaken.

Results: Subjects spent approximately 11.3% of daylight hours outdoors, equating to ≈81 minutes of exposure to lux >1,000 on a day with 12 light-hours. Of this, only ≈18 minutes was spent in environments >10,000 lx and a further ≈6 minutes >40,000 lx. The main activity differentiating behaviour on weekdays vs weekend days was tertiary education. However, this made no significant difference to the time spent in all light intensity ranges (0-100,000+ lx) nor in the mean daily light level experienced. Yet there was a graphic difference in the daily pattern of light exposure with weekday patterns more sporadic from sunrise to sunset.

Conclusion: Very little time was spent at light levels deemed protective in animal studies that used continual myopic stimuli, potentially leading to an overestimation of the requirements for protection in humans. Recent epidemiological evidence from Taiwan suggests that lower light exposures in humans may be protective for myopia. Spending time in education causes total light exposure to accumulate over multiple short intervals. Given that phasic dopamine release can occur from intermittent exposure to high intensity light, protective effects may continue if exposure times and intensities are kept above threshold.

INVESTIGATING THE EFFECT OF CHILDHOOD AND ADOLESCENT TIME SPENT OUTDOORS ON RISK OF MYOPIA IN YOUNG ADULTHOOD USING AN OBJECTIVE MARKER

Gareth Lingham, Kun Zhu, David Mackey, Robyn Lucas, Wendy Oddy, Patrick Holt, Lucinda Black, John Walsh, Seyhan Yazar

Purpose: To investigate whether serum 25-hydroxyvitamin D [25(OH)D] concentrations, a marker of vitamin D and recent time spent outdoors, at ages 6, 14, 17 and 20 years are associated with risk of myopia at age 20 years.

Methods: Participants of the Western Australian Pregnancy Cohort (Raine) Study had cycloplegic autorefraction at the 20-year follow-up and had serum 25(OH)D concentrations measured at the 6-, 14-, 17- and 20-year follow-ups. Myopia was defined as spherical equivalent ≤-0.50D. Serum 25(OH)D concentrations were de-seasonalised. Linear mixed models were used to calculate the average yearly change in 25(OH)D concentration for each subject. Logistic regression models were used to analyse the associations between myopia and 25(OH)D.

Results: Autorefraction data were available for 1,317 individuals and 282 (22%) were myopic. Average yearly change in 25(OH)D was -0.90 nmol/L (range -2.12 to 1.14). After adjusting for sex, Caucasian race, parental myopia, body mass index and studying status, low 25(OH)D at 20-years, but not at age 6, 14, or 17 years, was associated with higher odds of myopia at age 20 years (per 10nmol/L decrease, OR[20-years]=1.10, 95%CI 1.02, 1.18). A more negative yearly change (ie faster decline) in 25(OH)D with increasing age was associated with higher odds of myopia (per 1 nmol/L/year decrease OR=1.69, 95%CI 1.12, 2.56).

Conclusions: Myopia at age 20 years was associated with decreasing and recent, but not past, 25(OH)D levels. Using an objective marker, we were unable to demonstrate that more time outdoors during childhood or adolescence decreased long-term risk of myopia.

MODERN APPROACHES TO MYOPIA CONTROL: A CASE STUDY ON THE USE OF ATROPINE IN A CHILD WITH PROGRESSING MYOPIA

Georgia Alberti

An investigative case report concerning a young female who presented with bilateral high myopia and astigmatism with rapidly increasing refractive error. Atropine 0.01% drops were prescribed in attempt to slow or stop the rapid progression of short sightedness.

As mentioned by Lions Eye Institute paediatric ophthalmologist Antony Clark (2018), 'It is predicted that by 2050, Myopia will be the world's leading cause of blindness'. With this alarming prediction in mind, it becomes clear why further investigations are required to provide eye specialists, such as orthoptists, with the insight and knowledge into the modern approaches to both myopia identification and control when it is at a point of rapid rise. Highlighting the importance and purpose of this case report.

In conjunction with the use of corrective lenses, other management options which may be considered include atropine eye drops and increased sunlight exposure. Atropine in the Treatment of Myopia (ATOM I and II) studies conducted in Singapore show effectiveness of both options for Asian children. Currently, a similar trial is occurring in Australia to attempt similar results.

The purpose of this case presentation is to explore the modern approaches to control myopia in children and their efficiency across varying environments and cultures, through examining different literature. All relevant clinical investigations performed are detailed with particular focus on visual acuity results and refractive power values, as she was monitored throughout the two years while using atropine. All related ocular variables and findings were discussed in comparison to the relevant and current literature.

ANISEIKONIA, ANISOMETROPIA AND AMBLYOPIA

Jay South, Joanna Black, Andrew Collins, Tina Gao, Jason Turuwhenua

Aniseikonia is a perceived difference of image size or shape between the two eyes and can arise from physiological, neurological, retinal, and optical causes. Aniseikonia is associated with anisometropia, as both anisometropia itself and the optical correction for anisometropia can cause aniseikonia. Image size differences of three percent or more can impair binocularity in otherwise visually normal adults. Above this level of aniseikonia, binocular inhibition or suppression tends to occur to prevent diplopia and confusion.

Aniseikonia can be measured using a range of techniques or estimated from biometry, however subjective testing is the only way to accurately measure the overall perceived amount of aniseikonia. Despite clinically available tests, currently, aniseikonia is not routinely assessed in most clinical settings. As at least two-thirds of patients with amblyopia have anisometropia, we may expect aniseikonia to be common in patients with anisometropic amblyopia. However, aniseikonia may not be experienced under normal binocular viewing conditions if the image from the amblyopic eye is of poor quality or is too strongly suppressed for image size differences to be recognised.

Contact lenses or specially designed spectacle lenses can be used to correct or reduce aniseikonia. Current guidelines for the treatment of amblyopia advocate full correction of anisometropia to equalise image clarity but do not address aniseikonia. Signicant image size differences between eyes may lead to suppression and abnormal binocular adaptations. It is possible that correcting anisometropia and aniseikonia simultaneously would reduce the development of suppression and improve treatment outcomes for anisometropic amblyopia.

SWEPT SOURCE OCT ANGIOGRAPHY (SS-OCTA) - CLINICAL APPLICATIONS IN AMD; INTRODUCING THE SIRE SIGN

Emily Caruso, Callum Narita, Zhichao Wu, Robyn Guymer

Swept Source Optical Coherence Tomography – Angiography (SS OCT-A) allows imaging of the blood vessel network without the need for contrast such as fluorescence. In AMD this has enabled us to learn about the blood vessels within the retina in different stages of AMD other than just exudative macular neovascularisation (MNV). SSOCT-A has also allowed for detection of asymptomatic, non-exudative macular neovascularisation (NE-MNV), which is considered a risk factor for exudative MNV.

Participants with known NE-MNV identified by SS-OCTA were used to identify features on structural spectral domain OCT (SD-OCT) imaging, characteristic of NE-MNV. The common structural changes that were seen in these patients define the SIRE Sign - shallow, irregular retinal pigment epithelium (RPE) elevation. The features are; an RPE elevation with an irregular RPE contour, a greatest transverse linear dimension of at least 1000μm, a height above Bruch's membrane of predominantly less than 100μm, and a non-homogenous internal reflectivity. These features were then used to perform masked grading of SD-OCT structural images from 233 eyes of 132 AMD participants with large drusen to see if these structural signs predict NE-MNV.

SIRE can be used as a screening tool on routine structural OCT imaging, with OCTA imaging providing a definitive diagnosis of NE-MNV. If NE-MNV is diagnosed, more frequent follow-up and diligent home monitoring are recommended for early detection of exudation.

FUNDUS AUTOFLUORESCENCE PATTERNS IN BEST'S VITELLIFORM MACULAR DYSTROPHY

Thomas Groeneveld, Shanil Dhanji, Hira Sau, Maria Korsakova, Nonna Saakova, Haipha Ali, Clare Fraser, Robyn Jamieson, John Grigg, Nina Mustafic

Introduction: Limited studies have examined fundus autofluorescence (FAF) patterns in the different stages of Best's disease. We set out to further perform an analysis of our FAF images obtained on patients with a diagnosis of Best's disease and investigate the correlation between the FAF patterns and disease stages.

Methods: FAF images, best corrected visual acuity (BCVA), EOG Arden ratio, and Full Field ERG were examined in 28 eyes (14 patients) with confirmed Best's disease diagnosis between 2009 and 2017. FAF patterns were determined based on previous literature and compared to the disease stage.

Results: FAF patterns found amongst our cohort included: hyperfluorescent, hypofluorescent, patchy, ring, and normal. Normal FAF pattern was seen in only 33% of pre-vitelliform (n=2). Hypofluorescence was only found in atrophic macular lesions (n=2).

Discussion and Conclusion: FAF patterns were only useful for identifying the early or late stages of Best's disease, with the other disease stages having no stage-specific FAF pattern Previous literature findings suggested vitelliform and vitelliruptive stages can have a hyperfluorescent, ring or patchy FAF pattern. Hyperfluorescence was associated with better visual acuity levels. In conclusion FAF images can be useful in identifying previtelliform or atrophic stages of the disease and can be used in estimating anticipated acuity level through FAF pattern analysis.

TATTOO-ASSOCIATED UVEITIS

Debra Gleeson

As a cosmetic and decorative body art, tattooing has dramatically increased particularly among young adults. A survey of 1,013 Australians by market researcher McCrindle in 2018 showed that the number of people getting tattooed had hit a record high with one in five people having one or more tattoos. The majority (61%) had more than one tattoo and around 14% had six or more. Fifty-one percent had obtained their first tattoo between the ages of 18 and 25, and 36% at 26 or older. Australian women with tattoos (20%) outnumber men (19%).

We need to be aware of a possible increase in presentations of tattoo-associated uveitis.

'LET'S LOOK AT SQUINT AFRESH' - WHEN TACKLING IT ONLY ONCE IN A BLUE MOON

Angela Chung, Terence Tan

This presentation looks at squint assessments during ophthalmic based clinics such as corneal, glaucoma, retinal and refractive clinics. It presented a refresher for those who may not regularly be exposed to patients requiring a squint assessment as their presenting reason.

It aimed to discuss the importance of mindset, tips for a happy outcome of squint examination, essential measurements, time constraints, relying on ingrained knowledge and common examples that we may come across.

THE HUMPHREY VISUAL FIELD; WHERE WE WERE AND WHERE WE ARE NOW

Carly Hicking

Glaucoma, one of the leading causes of vision loss in Australia, is a disease when caught early, progression may be slowed. Visual field testing is a major component of detection and monitoring of glaucoma progression.

Glaucoma progression is regularly monitored using the Zeiss Humphrey Visual Field (HVF). Zeiss is working closely with clinics in order to improve the reliability and ease of use of their equipment.

Specific tests can be used to detect changes in a patient's visual field. The primary tests performed on HVF in a glaucoma clinic examine the peripheral visual field. When a central defect is identified, a central test is performed to assess the nature of this defect. When early changes to the central field occur, treatment can be personalised for each patient to limit the progression of the disease prior to it affecting their quality of life.

Orthoptists must monitor testing to ensure correct usage of equipment and that the test is performed to the highest of standards. If performed incorrectly, results may not be usable or may lead to a false diagnosis. The Asia Pacific Glaucoma Guidelines has an appendix which may be followed.

Orthoptists must realise the impact of the tests they perform, question why each test is being performed and whether it will aid identification of early changes in a visual field and thus affect the treatment of glaucoma.

LOW VISION: OLD SKILLS IN THE NEW ERA

Vincent Nguyen, Second year orthoptic students

Effectiveness of taking an ocular history remains a strength of a practising orthoptist. However, the contents of ocular history taking may be slightly different in a low vision setting. To gain knowledge about the impact of vision loss and to appreciate how it affects individuals, second year UTS orthoptic students were required to interview people with recognised low vision. The student's aim was to consider how loss of sight or absence of sight could affect each individual interviewed. Students formulated their own quality-of-life questionnaires prior to interviewing and were required to consider the following areas: daily living, employment, education, social network, and psychological effect. The interview occurred either at the interviewee's workplace or a public place such as a public library. Interviews were conducted in groups of three so students could assist one another with the reflective interview process. The data collected were reported and the effect of sight loss on individual was discussed with the focus on the functional loss.

DISCUSSING LOW VISION AND BLINDNESS WITH YOUR PATIENTS - POST CLINICAL SERVICES

Nabill Jacob

When is the right time to start referring patients to vision loss support services? Should this wait until the end of medical treatment? Life-changing support is available from diagnosis, but when is the right time to refer? And who is responsible for referring - the ophthalmologist, orthoptist, optometrist or GP, or should the patient self-refer? This interactive session looked at the continuum of care for vision loss; who should refer, triggers for referral, how to refer, and patient case studies.

The range of support and services available to patients of all ages experiencing vision loss were discussed. Many may surprise, including how advances in technology are dramatically improving the lives of people living with vision loss. It is important that ophthalmologists understand the support and services available so they can better inform and refer their patients. Vision Australia is the leading national provider of blindness and low vision services supporting people to live the life they choose.

A MULTIDISCIPLINARY APPROACH TO SERVICE DELIVERY: COLLABORATION BETWEEN SOCIAL WORK AND ORTHOPTIST IN LOW VISION PATIENT CARE

Afsah Zaheer

Low vision is known to reduce patients' quality of life, often more severely than other common chronic conditions (QALY -74.93 years). Approximately 8.2% of Australians live with low vision, with this percentage increasing over time. Centrelink indicates only 18,000 elderly Australians receive disability support/age pension and 40,000 who satisfy the criteria, do not. A possible way to decrease this number is to provide patients with a connection that enhances patient awareness and access to services in early stages of disability.

Our centre receives visits by low vision patients on a daily basis. A more holistic approach is achieved through the Patient Care Coordinator (PCC) role. The PCC (a social worker), is a link between the patient and their family/carers, the clinicians and various support agencies to assist low vision patients in navigating support services. For the PCC to effectively assess the impact of the patient's condition on their daily life and find appropriate support, the orthoptist provides context about their current ocular status and prognosis (eg implications of a constricted VF). In clinic, the PCC works closely with orthoptists and ophthalmologists, providing counselling and emotional support to the patients at the time of their review.

From our experience of adapting the biopsychosocial model, we conclude that the future approach to low vision patients in a busy ophthalmic clinic would benefit from such model of service as well as increasing functional vision assessments of patients. Greater collaboration between social workers and orthoptists could lead towards establishing more effective pathways.

WHAT IS THE ROLE OF THE ORTHOPTIST AND OPHTHALMOLOGIST IN THE NDIS APPLICATION PROCESS?

Alison Byrne

The rollout of the National Disability Insurance Scheme (NDIS) has significantly changed the way disability services providers operate. The NDIS is a social welfare scheme of the Australian Government and provides support to eligible people with a disability. The NDIS replaced a system of disability care where the government provided block funding to disability service providers. Through the NDIS, funding is now allocated to the individual who has choice and control over the provider who will supply goods and services. This has resulted in service providers now having to access NDIS funds through individual clients.

People with vision impairment are currently required to be enrolled in the NDIS to access vision services, as many vision service providers are required to charge for their services to be sustainable. In some cases, the NDIS can be difficult to negotiate and the application process can often delay their access to the early intervention, therapy, equipment and support that they require.

This presentation discussed the NDIS eligibility criteria for people with vision impairment, the importance of an early NDIS application especially for young children accessing early intervention services, how orthoptists and ophthalmologist can assist clients with their NDIS application process and what information is required in an ophthalmology report that is being used for an NDIS application.

NDIS has significantly transformed the way vision service providers operate. This presentation will discuss the important role orthoptists and ophthalmologists have in supporting the NDIS application process for their clients who have vision impairment.

A NEW OCULAR GENETIC CLINIC AT THE ROYAL VICTORIAN EYE AND EAR HOSPITAL

Lisa Kearns, Thomas Edwards, Alex Hewitt, Marc Sarossy, Mark McCombe, Mark Petty, Tracy Siggins, Catherine Mancuso, Aamira Huq, Joshua Schultz, Paul James, Ingrid Winship, Jonathan Ruddle

Inherited eye diseases are a significant cause of blindness. They impact on the reproductive decision making of affected individuals, parents of affected children and other family members. Historically, there have been no effective treatment options. With increased understanding of the genetic basis of these conditions, genetic testing becoming more affordable and promising gene and stem cell therapies entering clinical trial, resources are urgently required to manage patients with inherited eye disease.

The new Ocular Genetics Clinic (OGC) at the Royal Victorian Eye and Ear Hospital (RVEEH is a partnership between the RVEEH and Royal Melbourne Hospital (RMH) with patients being reviewed by a specialised multi-disciplinary team integrating ophthalmology, orthoptics, medical genetics and genetic counselling.

This specialised service assesses patients with inherited retinal diseases, inherited optic neuropathies, anterior segment dysgenesis and systemic genetic diseases with associated ocular involvement. Patients complete their vision and electrodiagnostic testing in the well-established Ocular Diagnostic Clinic (ODC) within the RVEEH, before review in the OGC for additional ophthalmic testing, genetic counselling and, where appropriate, genetic testing. Once confirmed, a genetic diagnosis can lead to a better understanding of the likely natural history, informed decision making in family planning and eligibility for enrolment in research and clinical trials. Since December2018, the clinic has seen 89 patients and undertaken 36 genetic tests.

The Ocular Genetics Clinic is a comprehensive clinical genetic service for patients and families. It is the foundation for genetic eye research and identification clinical trial-ready cohorts for upcoming therapies.

THE EPIC VISION STUDY: ECONOMIC AND PSYCHOSOCIAL IMPACTS OF CARING IN VISION IMPAIRMENT

Diana Jelovic, Deborah Schofield, Melanie Zeppel, Sarah West, Rupendra Shrestha, John Grigg, Robyn Jamieson

Genetic retinal diseases affect approximately 1:3000 people, causing progressive visual impairment. These conditions are genetically heterogeneous, previously a barrier to diagnosis. Genomic testing leads to genetic diagnosis in approximately 65% of patients. In combination with gene editing and replacement approaches, this heralds a new era of diagnostics and therapeutics for these conditions. This project, Economic and Psychosocial Impacts of Caring for Families affected by Visual Impairment (EPIC Vision), is being undertaken to facilitate implementation into the healthcare system and is the first project in Australia to systematically investigate costs of care at different ages and stages of the genetic retinal disease process.

Face-to-face interviews examine the economic impact of visual impairment and genetic diagnosis on individuals and families, and investigate psychosocial impact on affected adults and children, primary carers and partners. Patients are recruited from The Children's Hospital at Westmead, Westmead Hospital, Sydney Eye Hospital and Save Sight Institute, where individuals and multigenerational families with inherited retinal diseases are seen for ophthalmic and genetic assessments and review, at all stages of life and the diagnostic journey. The questionnaires capture quality of life, visual functioning and social and economic impacts. Data linkage approaches will assess these costs in concert with government costs.

Information pertaining to health costs at different life stages will build a longitudinal model of health and welfare costs, to develop a full understanding of the lifetime economic and psychosocial impact of genetic retinal diseases on the individual and society, and the value of genomic diagnostic and therapeutic approaches.

OPHTHALMIC MANIFESTATIONS AND SENSORY IMPAIRMENTS IN STICKLER SYNDROME

Georgia Shaw

Stickler syndrome is a group of hereditary connective tissue disorders. Stickler syndrome can be inherited in an autosomal dominant or autosomal recessive manner. It is characterised by a unique facial appearance and is associated with high myopia, glaucoma, cataracts and retinal detachment. Hearing loss of varying degree is also a well-known feature. Cases of Stickler Syndrome that are seen at The Children's Hospital at Westmead were discussed.

OSTEOPETROSIS AND THE VISUAL SYSTEM

Katie Geering

Osteopetrosis is a rare disease that refers to a group of inherited skeletal disorders, causing an increase in bone density. It can be inherited in various ways, autosomal dominant (most common), as well as autosomal recessive and X-linked recessive. Osteopetrosis varies in severity and age of onset, and as a result the characteristics vary between patients. Osteopetrosis is often known to involve the optic canal, causing irreversible optic neuropathy and blindness. This aspect of osteopetrosis will be discussed as well as the impact current treatment modalities have on halting the progression of this disease.

A COMPARISON OF THE HOTV LOGMAR VERSUS SHERIDAN GARDINER CHART FOR PRESCHOOL VISION SCREENING: THE STATEWIDE EYESIGHT PRESCHOOLER SCREENING (STEPS) PROGRAM

Mythili Ilango, Amanda French, Kathryn Rose

Introduction: The StEPS Program has transitioned from the Sheridan Gardiner (SG) to the HOTV LogMAR chart (HOTV). We aim to determine the comparability of these two visual acuity (VA) charts.

Method: Children aged 4 (n=67) were recruited through the StEPS program and had vision screened at their preschool, using SG and HOTV, and an orthoptic assessment. Children with poor vision were classified as routine (VA ≤6/9-2) or high priority (VA ≤6/18) referrals.

Results: Of the 64 children tested, VA using HOTV identified four who qualified for routine referrals and no high priority referrals. SG testing found 18 routine and one high priority referral, representing an additional 23.4% of children who would be referred using SG alone. The difference in mean VA between HOTV (logMAR: 0.11) and SG (logMAR: 0.17) was significant (3 letters, $p<.001$). Four children had an inter-ocular difference (IOD) of at least two VA lines using SG. For two children, the IOD disappeared upon testing with HOTV. One child was a routine referral on HOTV, however, the other child was classified a pass using both tests. Two children (3%) were referred on orthoptic assessment alone (end point nystagmus and anisocoria).

Conclusion: Referral differences related to the chart used is likely due to the greater testability of HOTV. VA cut-off 6/9-2 remains suitable for routine referrals using HOTV. As an IOD of two lines is considered clinically significant, it could be included in the referral criteria. Orthoptic assessment did not have a large enough effect to recommend for screening protocols.

DOES VISION SCREENING PLAY A ROLE IN IDENTIFICATION OF DUAL SENSORY IMPAIRMENT?

Rachel Elliott

A review of the literature shows a consistently higher prevalence of visual problems and ocular abnormalities in deaf children than in their peers with normal hearing. Infants who do not pass the statewide infant screening – hearing (SWISH) program are frequently referred for an ophthalmic review. In many cases the initial vision assessment in these newborns is normal. However, it is important as health professionals that we remind these families to have their child's vision reviewed periodically throughout childhood and adolescence as we know there are many visual problems that develop over time and which are not apparent in the newborn.

Usher syndrome is one such example. Usher's is a genetic condition that involves hearing loss and the development of retinitis pigmentosa. The hearing loss is evident at birth or very early childhood, however the diagnosis of retinitis pigmentosa is usually made later in childhood or in adolescence.

Two cases were described of students enrolled in RIDBC schools for deaf and hearing-impaired students. Both students failed a routine primary school vision screening with mildly reduced distance vision loss and questionable visual fields. Subsequent review and further investigation with an ophthalmologist resulted in a diagnosis of Usher syndrome for both students.

Vision screening for children who are deaf or have a severe to profound hearing impairment should occur regularly throughout their primary and secondary school years to avoid losing valuable time implementing new teaching strategies and equipment should a vision issue be identified.

THE USE OF FRESNEL PRISMS IN CLINICAL PRACTICE

Yi Ling Tan

Introduction: Fresnel prisms are typically used for diplopia relief and prism adaptation prior to strabismus surgery. Although Fresnel prisms relieve patients of diplopia, the prisms may affect the patient's vision and cause optical aberrations. The purpose of the clinical audit was to evaluate the reasons for which Fresnel prisms were prescribed, and the frequency of Fresnel prism changes.

Methods: A retrospective audit of patients prescribed with a new Fresnel prism from October to December 2017. One-year follow-up data was extracted to find out the diagnoses of the patients, the mean prism power given, and the changes in Fresnel prisms over time.

Results: 116 patients were prescribed Fresnel prisms, 80 males and 36 females, with a mean age of 59.8 years (± 17.35 SD). The most common diagnoses were decompensated esotropia (24, 19.2%), sixth nerve palsy (24, 19.2%) and fourth nerve palsy (22, 17.6%). Fresnel prisms of ≤ 10PD were most commonly prescribed (84, 68.3%). Of the 91 patients who returned for follow-up, 32 (35.2%) had no changes to Fresnel prism strength. Fifteen patients (16.5%) no longer needed Fresnel prisms as their diplopia resolved. Only seven patients (7.7%) stopped using Fresnel prisms due to reduced vision, torsional diplopia and/or optical aberration.

Discussion: Fresnel prisms were generally well tolerated and are useful in diplopia relief. In this audit, prism power was likely to remain unchanged, especially for decompensated and restrictive strabismus. Prisms for neurological strabismus would mostly reduce or even resolve over time.

PRISMS: AN EYE CLINICIAN'S PERSPECTIVE FOR ATAXIA AND GAIT/BALANCE DISORDERS

Cem Oztan

Ataxia is defined as the presence of abnormal, uncoordinated movements, which can make walking and maintaining balance difficult. There are four neurological divisions to maintaining balance: the vestibular system; the visual system; brain (frontal lobes, basal ganglia and cerebellum); and peripheral nerves, muscles and spinal cord. The clinician is faced with the unique challenge of examining, translating clinical results to the reported symptoms and providing therapy to patients presenting with ataxia, gait and balance disorders. The aim of this presentation was, through the use of two paediatric patient cases, to briefly review the anatomy of the vestibular system and cerebellum, highlight novel vision testing techniques, and provide an extended insight into the optics properties of prism lenses and their use as a therapy option for patients presenting with ataxia, gait and balance disorders.

CHANGE IN REFRACTION FROM THE USE OF UPPER EYELID WEIGHTS IN A PATIENT WITH BILATERAL VI AND VII CN PALSIES

Liane Wilcox

A long-term patient recently presented with reduced vision following facial reconstruction surgery which involved the placement of lid weights to aid in upper eyelid closure. The patient had previously developed bilateral VI and VII cranial nerve palsies following a traumatic brain injury in 2013. The patient's complex history was presented, outlining the various ophthalmic/orthoptic/surgical treatments undergone by this patient to highlight the outcomes possible from such a devastating injury. Emphasis was placed on the mechanism behind the effect of the most recent surgical procedure of the upper eyelid weights and the subsequent unexpected significant change in her refraction.

TORSION

Linden Chen, Elizabeth Sung Ju Baek, Ross Fitzsimons

Ocular torsion, as von Noorden put it, has always been put on the back-burner of strabismus. It is a phenomenon that we often accept exists, but almost never seems to be dealt with in too much detail. Our presentation firstly used a case to break down torsion into two separate entities: objective and subjective torsion. The purpose of our research was then to find any correlation between the two entities. Our hypothesis was that there was no correlation between the two. We used the Heidelberg OCT to measure objective torsion and the Torsionometer to measure subjective torsion.

WHY WON'T THE EYE GO UPWARDS? A CASE OF MONOCULAR ELEVATION DEFICIT

Coco Howard

Monocular elevation deficit, or double elevator palsy, is a condition defined by congenital deficiency of monocular elevation with associated hypotropia and ptosis/pseudoptosis. A retrospective review has been conducted on patients with monocular elevation deficit at The Sydney Children's Hospital Westmead and Randwick sites. The presenting reason, patient's age, visual outcome and treatment type was discussed.

A THIRD?

Nia Stonex

A second opinion was requested for a 56 year-old male who had a previous history of an intracranial posterior fossa astrocytoma treated with radiotherapy when 21 years of age. Over the past 3 years he started to experience difficulty crossing roads, walking into lampposts and noticed his right eye would turn in at the same time.

Ophthalmological examination showed bilateral optic atrophy and visual field constrictions. Orthoptic evaluation showed signs of a previous IIIrd nerve palsy with aberrant regeneration. Oddly, when trying to adduct the right eye he would develop an esotropia.

A review of publications showed this could be ocular neuromyotonia and treatment with a membrane stabilising agent (carbamazepine) could be effective in resolving/reducing symptoms. The patient was started on oral carbamazepine and his symptoms resolved.