

## Selected Abstracts from the Orthoptics Australia 69<sup>th</sup> Annual Scientific Conference held in Melbourne 25 to 28 November 2012

### PATRICIA LANCE LECTURE

#### A SNAPSHOT OF ORTHOPTICS FROM THE 1960s TO 2000

**Shayne Brown**

The paper was a snapshot of the trends in orthoptics from the mid 1960s till early in the 2000s. It covered changes in education, clinical practice, the profession and research. From the 1960s till the early 2000s, the orthoptic course progressed from a 90-week course run by the Orthoptic Board of Australia, under the auspices of the Ophthalmological Society of Australia (now RANZCO), to a degree course at universities in Sydney and Melbourne. In the 1960s and 1970s ocular motility was the major aspect of clinical work. This has gradually changed and now orthoptists also work as ophthalmic assistants, with patients with disabilities, in education and research. Clinical research kept pace with these changes and has underpinned the effectiveness of orthoptic procedures and treatment programs. The professional association, one of the oldest in the orthoptic world, continues to support its members and is held in high regard by its counterparts internationally.

#### ZEISS LISA 839MP TRIFOCAL IOL, A NEW STANDARD IN HYPERMETROPIC/PRESBYOPIC MANAGEMENT

**Dedei Armah, Ilan Sebban, Alana Parker**

**Aim:** To evaluate the visual outcomes, spectacle independence and patient satisfaction with the Zeiss AT LISA 839MP Trifocal compared with Zeiss LISA 809MP bifocal intraocular lens.

**Method:** The study enrolled 50 eyes (24 patients) with astigmatism of less than 0.70 DC. All patients received bilateral trifocal IOLs (AT LISA tri 839MP, Carl Zeiss Meditech). Surgical technique involved topical anaesthesia, 2.2 mm clear corneal incision and sutureless phacoemulsification. Visual acuity for near (33cm Niden Chart), intermediate (66 cm LogMAR chart), and distance (6m), and subjective refraction was assessed at 1 day, 1 week and 4-6 weeks post operation. Patient satisfaction was assessed at 4 to 6 weeks postoperatively including photophobia symptoms. These results were compared with the Zeiss LISA 809MP bifocal. Biometry was performed using the IOLMaster and Haigis formula was optimised.

**Results:** A high level of patient satisfaction was achieved with the Zeiss trifocal when compared with the bifocal IOL. Biometry and IOL power outcomes were extremely accurate. One week and 4 to 6 week postoperative results compared favourably to the Zeiss LISA 809MP bifocal for near N5 (Niden Chart) and distance 6/6 (LogMAR chart), but showed significantly better visual acuity at intermediate vision (N8 - N10).

**Conclusion:** The Zeiss AT LISA tri 839MP lens provides patients with excellent visual acuity at all distances, spectacle independence and a higher level of patient satisfaction when compared with bifocal IOLs.

#### PERIMETRIC ANALYSIS OF FLICKER-DEFINED FORM IN COMPARISON TO STANDARD AUTOMATED PERIMETRY

**Mitchell Bagley**

**Purpose:** To compare visual field outcomes between standard automated perimetry on the Humphrey Visual Field (HVF) and flicker-defined form using the Heidelberg Edge Perimeter (HEP).

**Method:** Seventy-four subjects performed both HVF and HEP on the same day. Visual field (VF) tests must have been performed reliably on both machines to be included in analysis. To evaluate the association between VF tests, mean deviation (MD), pattern standard deviation (PSD), test time and glaucoma hemifield test (GHT) data were collated from one eye per subject.

**Results:** There was an obvious learning effect with left eyes performing better than right eyes. The level of agreement for the GHT was 43%, with 66% of cases within normal limits on the HVF as opposed to 26% on the HEP. Both MD and PSD gave significant but not strong correlations ( $r = 0.451$ ,  $p < 0.001$ ;  $r = 0.553$ ,  $p < 0.001$ ). Paired samples t-test revealed that the mean test time on HVF was significantly shorter than on the HEP by 49.27 seconds ( $t = -4.791$ ,  $p < 0.001$ ).

**Conclusion:** The HEP demonstrates good consistency with the HVF in reference to MD and PSD and detects defects with greater sensitivity. The GHT analysis suggests the HEP may be hypersensitive with a high false positive rate on initial testing. Research is continuing, investigating the effects of repeated testing and learning curve on the HEP in addition to evaluating the accuracy with which the HEP can map known visual field defects.

#### 2RT LEADING THE WAY

**Kate Brassington**

The Macular Research Unit within the Centre for Eye Research Australia has been conducting a pilot study on the effects of a novel nanosecond laser and the development of late stage age-related macular degeneration. Fifty patients were lasered with the 2rt laser in one eye and monitored with imaging and psychophysics over a two-year period. To date no patient has experienced choroidal neovascularisation with results suggesting improvement in function of lasered eyes as well as the contralateral eye. The methodology and preliminary results of this pilot study will be discussed.

#### THE BIG MOVE

**Emily Caruso**

There are many areas in the field of ophthalmology in which orthoptists work. However these fields can present very different working environments and roles for orthoptists. The personal experience of changing from a private practice orthoptist, to a clinical trial coordinator in the Macular Research Unit at the Centre for Eye Research Australia will be discussed. Also the different roles each job entails, what it is like to work in a multidisciplinary team and the challenges that arise from changing fields will be explained.

#### NOT SO SIMPLE!

**Donna Corcoran**

A child presented and was treated with simple convergence, however the patient returns with an unexpected result. Everyone need be aware that, at times the unexpected can occur.

## THE VALUE OF EYE MOVEMENTS IN THE DIAGNOSIS OF BALANCE PROBLEMS

**Elaine Cornell, Ann Burgess, Hamish MacDougall, Ian Curthoys**

Vibration applied to the mastoid bone just behind the earlobe elicits eye movements that can assist in the diagnosis of balance problems, particularly those of the otolithic system (static posture as opposed to head rotation that activates the semicircular canals).

We have previously shown that bone-conducted vibration to each mastoid in humans results in small horizontal and vertical eye movements, suggesting that the ipsilateral superior oblique and the contralateral inferior rectus are also activated. The present study tested that hypothesis further by measuring the torsional component as well as horizontal and vertical responses during different directions of gaze. Additional information was obtained from one subject with a unilateral superior oblique palsy.

We concluded that conducted vibration to the mastoid bone in humans reproduces the dynamics of normal ocular compensation to a head tilt and could be a useful diagnostic tool for balance problems.

## THE ORTHOPTIST'S ROLE IN MANAGING OPTIC NERVE GLIOMAS

**Stephanie Crofts**

Optic pathway gliomas account for 5% of all intracranial tumours in children and are strongly associated with neurofibromatosis type 1. If left untreated, these tumours can result in significant visual impairment and restrictive ocular motility problems. The path of treatment is varied and highly dependent on the visual status of patients.

The orthoptist plays a vital role in monitoring vision in patients with optic pathway gliomas to ensure timely treatment is initiated.

## THE CORRELATION BETWEEN THE CLINICAL ASSESSMENT, HISTOLOGY REPORT AND THE POSITIVE DIAGNOSIS OF GIANT CELL ARTERITIS

**Natalie Duffy**

**Purpose:** The purpose of this study was to examine the correlation between the clinical assessment, histology report and the positive diagnosis of giant cell arteritis.

**Method:** In 2011, a retrospective study was conducted at a single-site ophthalmic practice in Sydney. Clinical staff reviewed records to identify temporal artery biopsy patients between 2005 and 2011. All patients were previously consulted by the same neuro-ophthalmologist prior to the biopsy. Relevant data was extracted and entered into a database for statistical analysis. A scoring system was developed for each sign and symptom to facilitate analysis. Descriptive and correlation statistics were applied to the collected data.

**Results:** A total of 40 patients were included in the study. The average age of participants was 78 years. At initial presentation common signs included headache, jaw claudication and a change in vision. Blood testing revealed that 55% of patients had an erythrocyte sedimentation rate (ESR), and 90% of patients had a c-reactive protein (CRP) level above normal at presentation. A positive final diagnosis of temporal arteritis was made in 72.5% of all patients, however only 52.5% of cases returned a positive temporal artery biopsy result.

**Conclusion:** This study has affirmed the importance of a temporal artery biopsy in the diagnosis of giant cell arteritis. However, with poor sensitivity it is critical for the clinician to take a detailed history of signs and symptoms to reveal possible indicators for the condition. Close clinical evaluation by a qualified orthoptist combined with the biopsy procedure will ensure that giant cell arteritis is promptly detected in patients.

## NEW TREATMENT IN UVEITIS: HUMIRA

**Carly D'Sylva, Robert McKay**

Patients with uveitis can represent some of the most difficult ophthalmology patients to treat. The large files of these patients represent huge amounts of human effort, hours spent in hospital, patience and compassion. Prednisolone in conjunction with an immunosuppressive drug is the current standard treatment for patients with chronic, severe uveitis. However, this treatment is not ideal given the numerous side-effects.

Humira is a fully humanised monoclonal antibody and represents hope for patients suffering with uveitis and potentially an alternative to high doses of oral prednisolone. Humira works by blocking the inflammatory process and is known as an anti-tumour necrosis factor (TNF) drug. TNF inhibition is targeted therapy, whereas steroids and immunosuppressants dampen the whole immune system. A number of patients are now receiving Humira through a compassionate assistance scheme from the Royal Victorian Eye & Ear Hospital and through participation in clinical trials, with pronounced improvements being observed in their disease and quality of life.

## THE RETINAL STRUCTURE OF AMBLYOPES RESISTANT TO OCCLUSION THERAPY: A LITERATURE REVIEW

**Adrienne Farrow, Connie Koklanis**

Debate persists in the literature as to whether there are retinal changes in amblyopic eyes. Despite varying opinions, there is consensus that further evaluation is required. Optical coherence tomography is a popular method of assessing retinal structures with numerous studies conducted on children with normal eyes and other ocular conditions, including amblyopia.

It appears that of the studies investigating amblyopia, strabismic, anisometropic and mixed types are most commonly considered. There does not however, appear to be any research investigating retinal changes using OCT with amblyopes resistant to occlusion therapy; children compliant with treatment but showing no improvement in visual acuity. This group would be worthy of exploration to ascertain if the retina differs from children with amblyopia who respond to occlusion. Early identification of any structural deficits of the retina in amblyopia could potentially allow for better prognosis and management for patients and their parents.

## A CASE OF TRIPLOPIA? A CASE OF CONVERSION DISORDER?

**Julie Fitzpatrick**

The low vision rehabilitation orthoptist is involved in assisting clients to maximise independence despite functional vision loss, which may come in the form of reduced vision, field loss, reduced contrast sensitivity or loss of binocular functions.

This is a case study of an elderly female who presented with monocular triplopia. The symptoms in relation to conversion disorder will be discussed. The role of the orthoptist in a multidisciplinary team will be summarised. Management of the patient's symptoms with the goal of maintaining binocularity is emphasised, as this is an important dimension that the rehabilitation orthoptist brings to the low vision therapy team.

## 'CULTURE IN THE CLINIC': THE PUBLIC HEALTH CHALLENGE OF ADDRESSING AGE-RELATED LOW VISION OR BLINDNESS IN AFRICAN AMERICANS

**Julie Fitzpatrick**

There is a body of evidence which supports the notion that African Americans are at a higher risk of developing blindness or low vision from aging-related eye conditions due to lack of attendance at eye screenings or non-compliance with treatment.

The eye conditions discussed in this public health context will include cataract, glaucoma and diabetic retinopathy, the latter resulting from type 2 diabetes. Studies also support the notion that African Americans would benefit from public health intervention to help prevent or minimise low vision due to these conditions.

The author suggests this health issue of African Americans suffering more significantly with low vision, is largely attributable to geographic and culturally-determined behavioural factors posing a barrier to seeking professional eye screening and treatment for any of these eye conditions. Also, these risk factors may be more likely to prevent the target group from modifying eating and lifestyle habits and taking control of any sight-threatening diabetes which may also exist.

The result from the above is poorer vision in this aging demographic, which research suggests will only worsen in the near future as more people in general in the United States are aging. If addressed, this health issue could save the nation millions of dollars in health care costs and provide participants with a better quality of life which is shown to be associated with having good vision. The relevance of considering cultural risk factors in planning any eye screening worldwide is emphasised.

## RISK FACTORS FOR THE DEVELOPMENT OF MYOPIA IN AUSTRALIAN SCHOOLCHILDREN

**Amanda French, Kathryn Rose**

**Aim:** To establish risk factors for incident myopia from the longitudinal Sydney Adolescent Vascular and Eye Study.

**Methods:** Sydney Myopia Study participants aged 6 and 12 years were re-examined 5 to 6 years later. Cycloplegic autorefraction (cyclopentolate 1%; Canon RK-F1) was measured at baseline and follow-up. Incident myopia was defined as no myopia at baseline but myopic ( $\leq -0.50$  dioptres) in either eye at follow-up. Risk factors were measured by questionnaire, including time spent outdoors and near work.

**Results:** Children who became myopic spent less time outdoors compared to those who did not (younger cohort, 16.3 and 21.0 hours  $p < 0.0001$ , older cohort, 17.2 and 19.6 hours,  $p = 0.001$ ) and in the younger cohort only, performed more near work (19.4 and 17.6 hours,  $p = 0.02$ ). Children with myopic parents were more likely to become myopic in the younger ( $P_{trend} < 0.0001$ ), but not the older cohort. Children of East Asian ethnicity had a higher incidence of myopia than European Caucasian children (both  $p < 0.0001$ ) and, spent less time outdoors (both  $p < 0.0001$ ). Predictive modelling showed that a less hypermetropic refraction at baseline was the most significant predictor of incident myopia. Addition of time outdoors, near work, parental myopia and ethnicity to the model improved the area under the ROC curve to 0.89 ( $p < 0.0001$ ) in the younger, but not the older cohort.

**Conclusions:** Time outdoors was related with incident myopia in both age cohorts but most strongly in the younger children. Near work and parental myopia were additional significant risk factors for myopia only in the younger cohort.

## ORTHOPTIST-LED ASSESSMENTS FOR DIABETIC RETINOPATHY AND CATARACTS

**Jana Gazarek, Rebecca Jessup, Robyn Wallace, Zeina Dayoub**

**Aims:** To pilot an advanced practice orthoptic role (within existing legislative scope). To improve access to ophthalmology services by better utilising the skills of orthoptists, without compromising the quality of patient care. To increase capacity and more timely access to care through

task reallocation.

**Methodology:** Competency packages were developed in partnership with La Trobe University and delivered to all orthoptists who would be undertaking cataract and diabetes assessments. A trial cataract assessment service was established and data collected over a 6-week period. Quantitative and qualitative data collected included waitlist and waiting times, patient and staff satisfaction, and management destination of patients attending the service.

**Results:** Results have shown that the service has enabled improved access and more time-efficient care, improved flow through the ophthalmology service, early identification of patients most in need of surgery, a reduction in waiting time from referral to assessment, a reduction in the 'waiting room' time for patients, redirection of almost one-third of cataracts to be managed conservatively by orthoptists or community optometrists, greater job satisfaction for orthoptists and better learning/development opportunities for orthoptic students attending placements at Northern Hospital.

**Conclusion:** This project achieved a number of positive outcomes: increasing capacity, improving access to eye services and increasing patient/staff satisfaction. Key learnings and practicalities of establishing and evaluating services such as this one, along with long term sustainability and application across Victorian health services, will be presented to Department of Health and the wider healthcare community.

## A NEW GOLD STANDARD FOR TREATING DIABETIC MACULAR OEDEMA? LOOKING TO THE FUTURE FOR DME

**Elizabeth Glatz**

Diabetic macular oedema (DME) is the principal cause of visual loss in people with diabetes. While until recently considered the gold standard for treatment of DME, laser is rapidly losing traction and may not necessarily be the first treatment option for many ophthalmologists today. As laser by its very nature is destructive, new novel therapies are emerging to take its place. This presentation will explore the direction that DME treatment is taking by presenting other options diabetics may have in the future and will present some recent research findings which support moving away from laser as the first line of defence against DME.

## THE GLAUCOMA MONITORING CLINIC - RVEEH

**Debra Gleeson**

Over the last 30 years the role of the orthoptist has certainly expanded. Orthoptists are now engaging in new models of care. The Glaucoma Monitoring Clinic is one such clinic at the Royal Victorian Eye & Ear Hospital. It is a multidisciplinary clinic set up to monitor chronic glaucoma patients. Currently there are two glaucoma consultants, four orthoptists, two optometrists and three nurses working in the clinic.

Through the weekly teaching session prior to the clinic and clinical support, team members have increased their knowledge and learnt new skills to enable them to assess these patients. New skills include gonioscopy and optic disc/fundus assessment with an indirect lens at the slit lamp.

Orthoptists are well placed to take the step forward to increase our knowledge and skill base to aid in the provision of services to the increasing number of those with chronic eye disease.

## CYCLODEVIATION ASSESSMENT: A NEW METHOD

**Kamil Gorski, Fiona Gorski**

This presentation introduces a new innovative objective method in the measurement of cyclodeviations, using a common tool found in general

ophthalmic and hospital departments. The method to be presented for measuring torsion provides a quick, accurate and efficient alternative to existing methods. It may provide invaluable data in the detection and measurement of torsion in complex strabismus. This method is particularly appropriate for use in the paediatric population and for those with developmental delay.

## THE CHALLENGE AND THE PROMISE OF THE BIONIC EYE: THE BIONIC VISION AUSTRALIA PROJECT

**Robyn Guymer**

**Purpose:** Bionic Vision Australia (BVA) is a multidisciplinary partnership of Australian researchers aiming to develop a retinal prosthesis to restore vision and improve the quality of life for people with degenerative vision conditions.

**Methods:** In 2009 the Australian Research Council awarded BVA \$42 million in a Special Research Initiative to develop this project. 157 researchers from various disciplines ranging from electrical engineers to clinicians from eight Australian organisations are currently involved in this project.

**Results:** Two device streams have been developed, a wide-view device which aims to deliver mobility and independence and a high-acuity device which is aimed at restoring acuity to allow for the possibility of reading. Currently the wide view device is placed in the supra-choroidal space and the high acuity device has an epiretinal approach. Both are currently undergoing preclinical studies. Current numbers of electrodes planned for the wide view device are around 100 and we aim to reach a level of 1,000 electrodes for the higher acuity device.

**Conclusion:** Our current devices are aimed at restoring vision to people with retinitis pigmentosa and similar retinal conditions. The multidisciplinary team at BVA brings world leading technologies to this challenge and is on track to meet all its major milestones of the ARC grant which concludes at the end of 2013.

## FIGHT RETINAL BLINDNESS! PROJECT

**Amparo Herrera-Bond**

**Purpose:** The Fight Retinal Blindness! project aims to identify optimal treatment patterns using the new treatments for macular disease, and to provide national benchmarks of treatment outcomes with which practitioners can compare their own results.

**Method:** An innovative web-based data entry tool has been developed to track treatments given, visual acuity and adverse events over time. Bearing in mind the dynamics of a busy clinic, patients can be entered into the system in less than 30 seconds, data from subsequent visits in less than 15 seconds. A graph of letters read versus time is generated 'on the fly' for each patient, providing a single page summary of the patients response over the entire course of treatment.

**Results:** Sixteen centres (5 academic) from Sydney, Perth, Melbourne, Adelaide, Canberra and Brisbane, New Zealand and Switzerland are currently contributing to the project. Data on over 2,000 patients receiving treatment for wet age-related macular degeneration have been entered with follow-up ranging from 4 months to 5 years. Release 5 of the data collection software, will be made available to all fellows treating AMD and will meet RANZCO CPD requirements. The graphical representation of treatment response facilitates patient flow and improves compliance.

**Conclusion:** The Fight Retinal Blindness! project is a unique Australian enterprise that provides a range of benefits to both patients and clinicians. It is anticipated that modules will be added to track treatment of diabetic retinopathy and other retinal and ophthalmic conditions.

## STROKE AND THE EYES: DECREASED VISUAL ACUITY AND ITS IMPACT

**Neryla Jolly, Ann Macfarlane, Rob Heard**

**Background:** The incidence of stroke and vision defects increase as age increases. Central vision or visual acuity can be a particular issue because when it is affected there is a decrease in ability to undertake high definition tasks (reading) and differentiation of low contrasted images such as facial recognition and step identification. Affected patients can respond poorly to the environment which impacts on their recovery and rehabilitation.

**Aim:** To investigate the incidence, cause and management of visual acuity defects in stroke patients.

**Methods:** Vision results from 150 randomly selected patients admitted to hospital with a diagnosis of stroke were collected. The results for visual acuity were analysed for the incidence of decreased acuity, the cause of the reduction and management strategies.

**Results:** Eighty-nine participants (37%) had good visual acuity; 6 (4%) were unable to perform any test; 55 (37%) were classified as having visual impairment (acuity less than 6/12 and N8). A major cause for the decreased acuity was glasses left at home, 22 participants (15%); with other reasons including ocular diseases, 14 participants (9%) and nystagmus. Management strategies included retrieval of glasses, referral for ophthalmic management and referral for agency support (Vision Australia or Guide Dogs). Twenty-three results were recorded prior to the research assessment and were mostly descriptive, with 8 correct and 15 incorrect results.

**Conclusion:** Visual acuity defects in stroke patients are present in high numbers. Accurate detection will assist stroke practitioners to be aware of vision impairment and manage affected patients appropriately.

## TOWARDS GAINING THE BEST INFORMATION ABOUT VISION TO ASSIST THE RECOVERY OF A PATIENT WITH STROKE

**Neryla Jolly, Ann Macfarlane, Rob Heard**

**Aim:** To report on the development and evaluation of a tool to be used by any health care practitioner, to screen for the presence of eye problems in patients who have been diagnosed to have had a stroke. Practitioners caring for stroke patients often detect stroke-related vision defects but miss pre-existing eye diseases, the need for glasses and reduced acuity. In stroke units where orthoptists are employed the detection is high (83%). The availability of orthoptists is limited, so affected patients are likely to have undetected vision-based problems, which may decrease the responsiveness to rehabilitation.

**Methodology:** This is a retrospective study using patient data collected from 100 patient case histories. The tool is a single page, tick box. It has three sections, each with actions to be implemented as required. The sections are: (a) questions about ocular history and symptoms, (b) observation of ocular conditions (red eye, ptosis), (c) responses affected by vision defects (ability to fix and follow). The tool was tested against 100 case histories of patients admitted to hospital following a stroke, noting information recorded by any health care practitioner and also information from the orthoptic assessment.

**Results:** Of the 499 ocular conditions found by the orthoptic assessment, the tool identified 307 (62%). Non-orthoptic health care practitioners identified 88 (18%) ocular conditions.

**Conclusion:** In the absence of orthoptic services the tool has the capacity to enable improved detection of vision conditions, enabling improved management as well as enhancing the response for rehabilitation.

## RETINAL VASCULAR CALIBRE AND DIABETIC RETINOPATHY: A REVIEW

**Stuart Keel, Laima Brazionis, Catherine Itsiopoulos, Connie Koklanis, Meri Vukicevic**

Diabetes is a major cause of morbidity/mortality worldwide. Type 1 (juvenile onset) diabetes accounts for about 13% of all diabetes in Australia but more than 90% of diabetes in children aged 0 - 14 years. Diabetes-related blindness is reaching alarming proportions in developing countries. Despite children/adolescents with type 1 diabetes having significant lifetime risk of blindness from retinopathy, clinically useful predictors remain limited. There is evidence that measurement of retinal vascular calibre may provide prognostic information about the risk of microvascular complications thereby offering some clinical predictors.

The effect of retinal arteriolar and venular calibre on incidence/progression of retinopathy in type 1 and type 2 diabetics has been researched. Variations in retinal arterioles may be present in early stages of retinopathy in type 1 diabetics suggesting that this may be a factor in recognising individuals who are at high risk of developing incident retinopathy. Conversely, retinal venular dilation appears to represent a later sign of severe retinopathy associated with microvascular complications in adults with type 2 diabetes. Findings imply that variations in retinal arteriolar/venular calibre may reflect different pathophysiological processes.

## INTERMITTENT EXOTROPIA: DOES CONTROL INFLUENCE QUALITY OF LIFE?

**Samantha King, Connie Koklanis, Zoran Georgievski**

**Aim:** To investigate the quality of life of children with intermittent exotropia as it relates to the control of the deviation.

**Methods:** Eighteen children diagnosed with intermittent exotropia were recruited from the Royal Children's Hospital (RCH) and Peninsula Eye Centre (PEC). Each underwent a general orthoptic examination. Control of the exotropia was determined with the measurement of BVA and the use of the Newcastle Control Score (NCS). The Intermittent Exotropia Questionnaire (IXTQ) and the Children's Visual Function Questionnaire (CVFQ) were completed by the participant and the parent respectively to quantify quality of life.

**Results:** Quality of life was significantly worse in children with poorer control of their deviation as measured by BVA on both the IXTQ ( $t(16)=2.22$ ;  $p=0.020$ ) and CVFQ ( $t(16)=3.00$ ;  $p=0.008$ ). However when utilising the NCS a significant difference was only noted with the CVFQ ( $t(16)=2.77$ ;  $p=0.014$ ) but not with the IXTQ ( $t(16)=2.00$ ;  $p=0.063$ ).

**Conclusion:** Children who have poorer control of their exotropia may have a reduced level of quality of life as compared to those with better control.

## PAEDIATRIC EYE INJURIES: A STUDY OF CHILDREN WHO PRESENTED TO THE CHILDREN'S HOSPITAL AT WESTMEAD

**Suzy King**

Eye injuries in children are one of the leading causes of non-congenital unilateral blindness. A number of children present each year to the Children's Hospital at Westmead, with a variety of eye injuries caused by various means.

A study was carried out focussing on children with eye injuries that presented as new patients to the Eye Clinic at the Children's Hospital at Westmead, between January 2011 and June 2012. The study aimed to investigate the age at presentation, gender, causation of injury and visual outcomes of these children.

Methods and results will be discussed in detail along with a few interesting case studies.

## CONGENITAL CATARACTS, AMBLYOPIA AND QUALITY OF LIFE

**Connie Koklanis, Monique Rose, Zoran Georgievski**

**Aim:** To investigate the quality of life in children undergoing treatment for stimulus deprivation amblyopia secondary to a unilateral congenital cataract as compared to strabismic and/or anisometropic amblyopia.

**Method:** Children aged 3 to 8 years underwent an orthoptic investigation including a visual acuity assessment, cover test, assessment of ocular movements and stereoacuity. Parents completed the Amblyopia Treatment Index (ATI) and Children's Visual Function Questionnaire (CVFQ).

**Results:** Preliminary data includes 27 children with amblyopia (19 strabismic/anisometropic and 8 stimulus deprivation). The overall score for the ATI was worse in the stimulus deprivation group ( $p=0.0396$ ). A significant difference was also noted for the 'treatment compliance' subscale ( $p=0.0002$ ). The scores for all other ATI subscales were poorer in the stimulus deprivation group but did not reach significance (adverse effects  $p=0.1811$ ; social stigma  $p=0.5952$ ). The overall score for the CVFQ was significantly worse in the stimulus deprivation group ( $p=0.0421$ ). All CVFQ subscale scores were poorer in the stimulus deprivation group, but only reached significance for the 'competence' subscale (competence  $p=0.0407$ ; personality  $p=0.5167$ ; family impact  $p=0.1057$ ; treatment difficulty  $p=0.1684$ ).

**Conclusion:** Children with stimulus deprivation amblyopia secondary to a unilateral congenital cataract may have significantly reduced quality of life as compared to children with strabismic and/or anisometropic amblyopia

## THE 'OCULAR MOTILITY SIMULATOR'

**Connie Koklanis**

Changes in health care delivery and clinical education in Australia have presented tertiary institutions with considerable challenges in providing students with suitable clinical experiences. Increases in student numbers alongside increases in demand for services and improved productivity, has led to a general reduction in students' access to patients. In this context, simulated learning can contribute to and expand students' opportunities for gaining clinical skills and experience. By providing opportunities for deliberate practice of new skills through simulation and by integrating this mode of teaching and learning into the curriculum, the transfer of skills into clinical practice can be better promoted. As part of ocular motility training at La Trobe University we are exploring the use of an 'Ocular Motility Simulator' to simulate various concomitant and incommittant deviations with the aim of assisting students to better acquire competencies in relation to the investigation, diagnosis and subsequent management of patients with ocular motility disorders. This paper will present the prototype being developed for discussion.

## TREATMENT OUTCOMES OF CHILDREN WITH VISION IMPAIRMENT DETECTED THROUGH THE StEPS PROGRAM

**Melanie Lai, Kim Marchant, Gillian May**

**Background:** The Statewide Eyesight Preschooler Screening Program (StEPS) is a free vision screening program offered to four-year old children in NSW, with the aim of early detection of childhood vision problems, prior to school entry so as to maximise treatment outcomes. Children who fail to pass the vision screening test at preschool, are referred on to tertiary paediatric outpatient ophthalmology clinics which are conducted at Sydney Hospital and Sydney Eye Hospital, Sydney Children's Hospital Randwick and St George Hospital. Children who attend these clinics and are confirmed as having vision impairment are managed with the treatment appropriate to their diagnosis.

**Method:** A retrospective study was conducted at each of the above hospital sites to review the outcomes of children who underwent treatment through the StEPS Paediatric Outpatient clinics. Children who received an initial screening and proceeded to treatment between May

2011 and July 2011 (inclusive) were included in the study.

**Results:** A total of 66 children were assessed at diagnostic clinics across the three study sites. A total of 43 children received treatment for visual impairment following their initial appointment. The two main causes of reduced vision were revealed to be uncorrected refractive error and strabismus. Spectacle correction and occlusion therapy were the two forms of treatment for vision impairment prescribed across sites. The outcomes of treatment of children in the StEPS program will be discussed.

## EXAMINING A CHILD WITH INTERMITTENT EXOTROPIA: TREATMENTS AND CONSIDERATIONS

**Wendy Liang**

Intermittent exotropia is found in 1% of the population and is the most common form of exodeviation. Once diagnosed, the indication, timing and type of treatment is subject to much discussion as patient response to the different treatments can be varied and unpredictable.

A review of the different types of treatment and their success rates including orthoptic exercises, prisms and overcorrecting minus lenses will be presented. Reasons why some treatments may work better for some patients than others will also be discussed.

Finally, some of these children may eventually require surgery and so the effects of these treatments on postoperative results will be looked at as well as any considerations prior to surgery for example: true divergence vs high AC/A ratio – how to diagnose and measure.

## EYE INVOLVEMENT IN DYSLEXIA AND THE ROLE OF VISION THERAPY

**Wendy Liang**

Teachers are rightly concerned when their students seem to have difficulties in reading at the level that is to be expected of their environmental factors and age, and often send them to have a thorough eye examination. We will be examining the part that the eyes play in dyslexia and review the different treatments often prescribed and their effectiveness.

## USE OF ELECTROPHYSIOLOGY TO CONFIRM INTACT VISUAL PATHWAYS IN A CASE OF CONVERSION DISORDER

**Jo Lynch, Heather Mack**

A 20-year old male presented with a history of sudden onset of blindness, during medically supervised withdrawal from opiate use over a nine-day period. The patient wished to avoid the possible long-term side-effects of opiate use such as liver damage. At the age of 8 years he had been diagnosed with Perthe's Disease, requiring numerous surgical procedures. His chronic pain was managed with various medications over the years. Extensive testing was undertaken in the clinic involving investigation of ocular structure and function, and a detailed history. The tests included electrophysiological investigations, confirming a diagnosis of Conversion Disorder.

## OREV: 4 YEARS ON, WHERE TO NEXT?

**Catherine Mancuso, Stephanie Tsonis**

The Orthoptic Review Clinic (OREV Clinic) was the brainchild of Zoran Georgievski, and was first set up in 2008. The idea was to review patients who were on a waiting list to see a doctor for their review appointment but were overdue for this and were unlikely to get an appointment due

to the demand on services in the public health system. These patients were reviewed by an orthoptist who would then determine the patient's need to be seen by an ophthalmologist or be discharged to the care of a community eye care professional. The OREV clinic has undergone a number of changes since its inception.

Four years of outcome data will be presented on this clinic and a discussion around its future direction will be conducted.

## EARLY EXPERIENCE WITH FEMTO-SECOND LASER CATARACT SURGERY IN VICTORIA

**Nhung Nguyen, Grant Snibson**

**Introduction:** Laser Assisted Cataract Surgery (LACS) with the LenSx first arrived in Victoria in 2011 at Manningham Day Procedure Centre (MDPC). This new technology may in time prove to revolutionise the way we perform cataract surgery with claims to have advantages in delivering precise and self-sealing corneal incision, make repeatable circular and accurate capsulorhexis, and require less technical difficulty in phacofragmentation and phacoemulsification. The presentation will outline the clinical and surgical adaptation process of integrating LACS into the theatre system with tips on selection criteria. It will report on the visual and refractive outcome and complications of the first 500 cases.

**Conclusion:** LACS appears safe in the first 500 cases. As the number of treatments are analysed the data may prove to have key benefits over conventional cataract surgery, however more data is required to support this claim fully.

## IMPROVED VISUAL ACUITY IN PATIENTS WITH CONGENITAL NYSTAGMUS FOLLOWING ANDERSON-KESTENBAUM PROCEDURE

**Stephanie Norman, Julie Green, James Elder**

**Purpose:** To assess the effectiveness of Anderson-Kestenbaum procedure on patients with congenital nystagmus, in improving both the size of the compensatory head posture and the level of visual acuity.

**Method:** This retrospective study conducted within a large paediatric clinical practice identified ten patients who were operated on during the period of 1996 - 2011, using the Anderson-Kestenbaum procedure. These patients, aged 4 to 17 years were operated on by the same surgeon. Visual acuity was measured using age-dependent linear or single optotypes and results were compared pre- and post-operatively. Observation of head posture by ophthalmologist, orthoptist and parent was recorded pre- and post-operatively.

**Results:** Visual acuities improved by at least three letters in 7 of the 10 patients postoperatively. Visual acuity in two patients remained the same whilst another decreased by five letters. It should be noted that all patients had a visual acuity of 3/9 or better and therefore no patients had poor visual acuity pre- or post-operatively. All patients had some amount of residual head posture, but all were observed to have significant improvement cosmetically. Head postures were not reversed in any instance.

**Conclusions:** Anderson-Kestenbaum procedure reduced the compensatory head posture and improved visual acuity in 70% of patients, with an average improvement in visual acuity of 3.5 letters. Patients showed minimal residual head posture. This study was limited by its retrospective nature and small subject numbers.

## GRADUATE ENTRY MASTERS: BRIDGING KNOWLEDGE

**Jean Pollock, Connie Koklanis**

The two-year Master of Orthoptics was introduced at La Trobe University in 2011. This incorporates a bridging program which aims to support the Graduate Entry Masters (GEM) students by providing them an introduction to fundamental concepts. The short course runs for one month prior to joining the existing undergraduate students and utilises a blended approach combining elements of online and face-to-face learning. The first evaluation of the bridging program was undertaken upon completion of the short course, the results of which were presented at this conference last year. A final evaluation of the student's perception of the worth of the bridging program was undertaken in 2012, when these same students were nearing the end of the degree and preparing for entry into the world of a new graduate. Student's perceptions were investigated using a questionnaire and focus group interview. This presentation will report the findings of this final evaluation.

### COLOURED LENSES REVISITED: USE OF FILTERS FOR ACHROMATOPSIA

**Marion Rivers**

The use of coloured filters in retinal disease has been controversial with various investigators unable to measure improvement in vision functioning on standard tests. People with retinal disease often report significant improvement in vision functioning with particular filters. Red filters for rod monochromatism is reviewed. The outcomes for children wearing 550 polaroid Eschenbach lenses will be presented.

### DO GOVERNMENT FUNDING PROGRAMS SUCH AS BETTER START, NATIONAL DISABILITY INSURANCE SCHEME, PERSON CENTRED FUNDING AND SUPPORTED LIVING FUND AFFECT THE PRACTICE OF ORTHOPTISTS?

**Marion Rivers**

What do these mean for orthoptists? 'Better Start' funding is here, supported living funds are here, National Disability Insurance Scheme (NDIS) is on the way to a location near you.

Government funding initiatives are changing the face of services for people with disability and the organisations that traditionally provide services. Orthoptists need to understand these changes to guide and help patients navigate the new world of access to funding. Support agencies face the challenge of continuing to deliver services in a competitive fee for service environment. The implications of these changes and services will be discussed.

### PATIENT COMPLAINTS: TRUE UNTIL PROVEN OTHERWISE

**Laura Rizza, Heather Mack**

A case report is presented showing the importance of an orthoptist's clinical testing in making a diagnosis.

A 39-year-old Asian male presented for a second opinion regarding visual loss. He underwent bilateral LASIK the year before for low degree myopia. The surgery was routine with no complications other than mild postoperative dryness which settled rapidly with topical lubricants. He complained of disturbance of vision in his left eye which became worse over time. His uncorrected visual acuity was 6/4 RE and 6/5 LE. Well-healed corneal flaps were noted; the remaining examination was normal including optical coherence tomography (OCT) macular scanning.

This case presentation outlined possible differential diagnoses and discussed the expectations of patients post refractive surgery. The patient's diagnosis indicates that even when a patient's vision is 'excellent', the role of the orthoptist is to exhaust all avenues to find the

problem when the patient is saying there is something wrong.

### RETINAL OXYGEN SATURATION AND FUNCTION IN EARLY AGE-RELATED MACULAR DEGENERATION

**Emilie Rohan, Meri Vukicevic, Lauren Ayton, Chi Luu**

**Purpose:** Ischemia and hypoxia have been implicated in the pathophysiology of age-related macular degeneration (AMD). Many studies have examined the choroidal perfusion in AMD eyes, however the retinal oxygen metabolism level has not been investigated. The purpose was to determine the retinal oxygen saturation level in patients with early AMD and to correlate the oxygen saturation level with retinal function, which is known to be altered in an early stage of the disease.

**Methods:** Participants were divided into two groups. Group 1 comprised 9 subjects with early AMD, aged between 60 and 76 years. Group 2 consisted of 30 healthy controls aged between 22 and 73 years. Only one eye of each subject was selected for the study. Retinal oxygen saturation level was measured using an oximeter. Retinal function was determined using multifocal electroretinography (mfERG) which records local electrophysiological responses from different areas of the retina. The stimulus for the mfERG recording consists of a hexagonal array made up of 61 hexagons. The oxygen saturation level of the control and AMD groups were compared. The relationship between oxygen saturation levels and the mfERG response amplitude and implicit time were also analysed.

**Results and Conclusion:** Data collection for this project is still in process. Final results and conclusion will be presented.

### THE EFFECT OF CENTRAL CORNEAL THICKNESS IN ASSESSING IOP WITH GOLDMANN APPLANATION AND DYNAMIC CONTOUR TONOMETRY: A COMPARATIVE CLINICAL STUDY

**Alina Sayer, Matthew Jacob, Angelique Antoniou, Peter Jefferies**

**Aim:** To validate the effectiveness of Goldmann applanation tonometry (GAT) in measuring intraocular pressure (IOP) at varying central corneal thicknesses (CCT) when compared to Pascal dynamic contour tonometry (PDCT).

**Method:** A total of 57 participants (65% female, mean age 67.91 ± 15.3 years) including 103 eyes were recruited over a 2 month study. Central corneal thickness was calculated with OCT (Zeiss Cirrus HD-OCT) and IOP determined by PDCT (Pascal Swiss Microtechnology AG) and GAT (Haag Streit Bern). Exclusion criteria included eyes with previous irido-corneal conditions or kerato-refractive procedures.

**Results:** Intraocular pressure measured with PDCT was significantly greater than IOP measured with GAT in the total sample ( $p < 0.001$ ), in  $\leq 500 \mu\text{m}$  ( $p < 0.001$ ) and  $\geq 600 \mu\text{m}$  corneas ( $p < 0.01$ ). The Bland-Altman plot demonstrated poor agreement between the two methods in the total sample (bias = 2.9 mmHg, 95% limits of agreement -1.4 to 7.2),  $\leq 500 \mu\text{m}$  (bias = 3.3 mmHg, 95% limits of agreement -1.6 to 8.2) and  $\geq 600 \mu\text{m}$  corneas (bias = 2.1 mmHg, 95% limits of agreement -3.2 to 7.4). There was poor correlation between CCT and PDCT ( $r = 0.104$ ), whereas CCT and GAT demonstrated a statistically significant correlation ( $r = 0.240$ ). There was strong correlation between GAT and PDCT ( $r = 0.87$ ), this correlation was weaker when nomogram-adjusted GAT IOP was compared to PDCT ( $r = 0.68$ ).

**Conclusion:** While GAT is a reproducible method in measuring IOP, it may be misleading in determining true IOP independent of CCT. Pascal DCT is a statistically less corneal-dependent method of determining IOP and should be considered the primary method of assessing IOP in the management and diagnosis of glaucoma and ophthalmic conditions.

## THE EYES HOLD THE KEY

**Katie Scanlon**

Quite often a systemic condition can be diagnosed during an eye examination. This talk explores the features of systemic disease that may be seen on an eye examination, and what may indicate that the patient requires further investigation.

## ACCURACY OF ORTHOPTISTS IN THE DIAGNOSIS AND MANAGEMENT OF TRIAGED PAEDIATRIC PATIENTS

**Jane Scheetz, Connie Koklanis**

Approximately four years ago the Royal Children's Hospital in Melbourne implemented an orthoptic triage clinic for non-urgent referrals related to ocular motility or vision disorders. This was implemented in response to increased demand for paediatric eye services. The intention was to safely expedite patient care and to discharge patients to the community where appropriate. Providing a high-quality eye service that is efficient and effective and which improves the patient journey has been central to developing this sustainable service.

The purpose of the current clinical audit has been to evaluate the agreement between the orthoptist and medical practitioners (ophthalmology consultant, fellow and/or registrar). Included in this audit are patients who were initially reviewed and managed by the orthoptist within the triage clinic and later reviewed by a member of the medical team. Patients who were discharged have not been included in this audit. This paper will present an outline of the model of service delivery and the outcomes of the latest audit.

## REFRACTIVE OUTCOMES OF TRANS-PRK ON HYPERMETROPES USING SCHWIND AMARIS

**Kathleen Suarez, Ilan Sebban**

**Purpose:** To evaluate the visual outcomes, spectacle independence and patient satisfaction with hypermetropic TransPRK and discuss how to manage patient expectations.

**Method:** The study involved 50 eyes of 25 patients. It was a prospective consecutive clinical study. All patients received TransPRK ablations using the ORK-CAM software module and aberration free protocol. All refractions and surgery were performed by a single surgeon.

**Results:** Average age of 51 years with 64% female and 46% male. The mean spherical equivalent was +2.58 D, mean sphere was +2.87 D and mean cylinder was -0.59 DC. The scattergram shows overcorrection, a trend towards overcorrection at 2 weeks, an almost perfect slope at 3 months, and a trend towards undercorrection at 6 months.

**Conclusion:** Laser vision correction for hypermetropic and presbyopic patients remains the poor second cousin to lens-based surgical procedures (PRELEX). It takes three months to achieve a stable desired result due to overcorrection outcome. Latent hypermetropia and presbyopic regression is unpredictable. Higher refractions tend to have greater regression.

## ORTHOPTIC-LED GLAUCOMA MONITORING CLINIC AT ALFRED HEALTH

**Danielle Thorburn, Connie Koklanis**

A significant number of specialist outpatient attendances are related to glaucoma follow-up. This most likely relates to the demography of an aging population and improved technology in detecting and monitoring optic neuropathy. With constant new referrals and fewer discharges due to the chronic nature of glaucoma, there is invariably an increased demand on outpatient services.

In response to this increased demand, Alfred Health has recently implemented a Glaucoma Monitoring Clinic. This model of care utilises specifically trained orthoptists to monitor and co-manage patients diagnosed with stable glaucoma or who are glaucoma suspects. Whilst the concept of shared care for glaucoma with allied health staff is not novel, no research to date has investigated the role of the orthoptist in integrated glaucoma patient eye care. Orthoptists are suitable to be involved in such models of service delivery as they have the underpinning knowledge and skills to carry out clinical investigations applicable to the diagnosis and monitoring of ocular pathology. Furthermore, given that orthoptists deliver outpatient eye care services within a collaborative hospital team, they are well positioned to offer further support to ophthalmology glaucoma services.

An outline of the new orthoptic-led Glaucoma Monitoring Clinic at Alfred Health will be presented and discussion invited.

## REFERRAL TRIAGE AND PRE-REFERRAL GUIDELINES

**Stephanie Tsonis, Catherine Mancuso**

The Royal Victorian Eye & Ear Hospital receives around 10,000 new referrals for ophthalmological services every year. The Orthoptic Department is responsible for the triage of these referrals to determine clinical urgency and priority.

A high demand on RVEEH services and limited access in a timely manner led to the development of pre-referral guidelines for general practitioners as part of the Outpatient Access Reform Project. The aim of the guidelines is to bridge community services and address the current and future growing demand on referrals.

## USING ON-LINE LEARNING IN THE TEACHING OF VERTOMETRY TO ORTHOPTIC STUDENTS: AN UPDATE

**Suzane Vassallo**

The purpose of this presentation is to provide an update about the ongoing development of an on-line simulation tool, 'Understanding Vertometry'. This resource was developed in response to student feedback which sought more efficient use of teacher time in vertometry workshops. This 'update' will highlight the changes this resource has undergone in the last 12 months, since it was first introduced at this conference in 2011. Using data collected over a 3-year period, this presentation will also detail the multiple benefits, both cognitive and affective to both student and teacher, which the implementation of this resource has afforded.