RANZCO 2024
ADELAIDE
1-4 NOVEMBER

The Royal Australian and New Zealand College of Ophthalmologists,

55th Annual Scientific Congress

1 – 4 November 2024

Adelaide Convention Centre

RANZCO | The Royal Australian and New Zealand College of Ophthalmologists

WILEY

Clinical & Experimental Ophthalmology

The Royal Australian and New Zealand College of Ophthalmologists,
55th Annual Scientific Congress
1 – 4 November 2024
Adelaide Convention Centre

Contents

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Clinical & Experimental Ophthalmology WILEY

The Royal Australian and New Zealand College of Ophthalmologists, 55th Annual Scientific Congress

1 – 4 November 2024

Adelaide Convention Centre

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Past Lecturers and Briefs for the Named Lectures: RANZCO Annual Scientific Congress

1 | THE SIR NORMAN GREGG LECTURE (ESTABLISHED 1958)

The Norman McAlister Gregg Lecture was established in 1958 by the Council of the Ophthalmological Society of Australia in recognition of the outstanding contribution made to ophthalmology by Sir Norman Gregg. The lecture covers a clinical or basic science topic that has clinical relevance and may cover some facet of work not previously published (both ophthalmologists and non-ophthalmologists can be considered). The presentation shall be for 25 min duration and will include 5 min for questions or discussion. The lecture becomes the property of the College. A "Gregg Medal" is presented, together with a certificate, to the lecturer at the conclusion of the lecture.

1961	Sir Lorimer Dodds
1964	Prof Ida Mann
1967	Prof Ramon Castroviejo
1970	Prof Lorenz E Zimmerman
1973	Prof Gustav Nossal
1975	Prof William F Hoyt
1981	Prof Robert M Ellsworth
1984	Prof Barrie Jones
1986	Dr Thomas Mandel
1987	Prof Ian Constable
1988	Prof Colin Blakemore
1989	Dr Robert Machemer
1990	Prof Ian Gust
1991	Prof Doug Coster
1992	Prof Stephen Drance
1994	Prof Harry A Quigley
1995	Prof Richard Larkins
1996	Prof George Waring
1997	Prof Susan Lightman
1998	Prof Richard Collin
1999	Prof Edward Stone
2000	Prof Stuart Fine
2000	Prof Yasuo Tano
2001	Mr John Hungerford
2002	Justice Michael Kirby
2003	Prof Caroline MacEwan
2005	A/Prof David Mackey
2006	Prof David Apple
2007	Prof Jost B Jonas
2008	Prof Charles McGhee
2009	Mr Geoffrey Rose
2010	Prof Paul Mitchell
2011	Prof Elizabeth Engle
2012	Prof Brenda Gallie
2013	Dr David Chang

2014	Prof Hugh R Taylor AC
2015	Prof Peter McCluskey
2016	Prof Denis Wakefield AO
2017	Dr Noel Alpins AM
2018	Prof Robyn Guymer AM
2019	Prof Tien Y Wong
2020	*– Congress postponed due to COVID-19*
2021	Prof Graham D Barrett
2022	Prof Ian McAllister
2023	Dr Shigeru Kinoshita
2024	Prof Stuart MacGregor

2 | THE COUNCIL LECTURE (ESTABLISHED 1963)

The Council Lecture was established in 1963 to honour Fellows engaged in original work, or to establish a means whereby a Fellow can deliver an authoritative and distinguished lecture on a subject of which the Fellow has particular experience or knowledge. The presentation shall be for 25 min duration and will include 5 min for questions or discussion. The lecture becomes the property of the College. The Council Lecture provides an opportunity for Fellows who are not necessarily a member of an academic department to present their work. It generally goes to senior Fellows who have made a contribution to clinical ophthalmology. A certificate is presented to the lecturer at the conclusion of the lecture.

1963	Dr Adrian Lamb
1965	Dr David Waterworth
1965	Dr Kenneth George Howsam (OSA)
1967	Dr Edgar John Donaldson
1967	Dr Reuben Hertzberg
1968	Dr William Deane-Butcher
1969	Dr Thomas a'Beckett Travers (ACO)
1970	Dr Peter Augustine Rogers
1971	Dr Ronald Lowe
1973	Dr Reuben Hertzberg
1975	Dr John Wallis Hornbrook
1979	Dr Shirley Sarks
1980	Dr Courtney Hugh Greer
1981	Dr Brian Gilmore Wilson
1982	Dr James Kirkwood Galbraith
1984	A/Prof Fred C Hollows
1985	Prof Frank A Billson
1986	Dr Bruce Crawford
1987	Dr Peter J Graham
1988	Dr Alex Hunyor
1990	Dr Barry Desmond Coote
1991	Prof Fred Hollows
1992	Dr Frank Taylor
1993	Dr Gordon Wise
1994	Prof Hugh R Taylor
1995	Dr Bill Gillies
1996	Prof Richard Cooper
1997	Dr David Moran
1998	Dr Mark Harrison
1999	A/Prof David Mackey
2000	A/Prof Peter McCluskey

2001	Dr Jamie La Nauze
2002	Prof Tony Molteno
2003	A/Prof Mark Elder
2004	Dr Alan McNab
2005	Dr Bill Glasson
2006	A/Prof Robyn Guymer
2007	A/Prof Helen Danesh-Meyer
2008	A/Prof Robert Casson
2009	A/Prof Timothy Sullivan
2010	Dr Noel Alpins
2011	Dr Stephen Best
2012	Prof Mark Gillies
2013	A/Prof Julian Rait
2014	A/Prof Mark D Daniell
2015	A/Prof John Grigg
2016	Prof Gerard Sutton
2017	Prof Jonathan Crowston
2018	Prof Stephanie Watson
2019	A/Prof Penelope Allen
2020	*– Congress postponed due to COVID-19*
2021	A/Prof Clare L Fraser
2022	Prof Frank Martin AM
2023	Dr Jennifer Arnold
2024	Prof Justine Smith

3 | THE DAME IDA MANN MEMORIAL LECTURE (ESTABLISHED 1988)

The Dame Ida Mann Memorial Lecture was established in 1988 by the Council of the College in recognition of the outstanding contribution made to ophthalmology by Dame Ida Mann. The presentation shall be for 25 min duration and will include 5 min for questions or discussion to cover an important topic that is oriented to the basic or novel clinical sciences of ophthalmology with clinical relevance (not confined to Fellows). The lecture becomes the property of the College. A certificate is presented to the lecturer at the conclusion of the lecture.

1988	Prof John D Pettique
1989	Dr Dorothy Potter
1991	Dr Adam Locket
1992	Dr Mark Florence
1993	Dr Robert Buttery
1995	Prof Trevor Lamb
1996	Prof Val Alder
1997	Prof Ian Constable
1998	A/Prof Denis Stark
1999	Dr Kerryn Williams
2000	Prof Charles McGhee
2001	Prof Grant Sutherland
2002	Dr Ian Morgan
2003	Prof Harminder Dua
2004	Dr Stuart Graham
2005	Dr Peter Kaiser
2006	Prof Harry Quigley
2007	Prof Paul McMenamin
2008	Prof John McAvoy
2009	Prof Jonathan Crowston

2010	A/Prof Jamie Craig
2011	Prof Justine Smith
2012	Prof Colin Green
2013	Prof Jan Provis
2014	Prof Minas T Coroneo
2015	Prof Dao-Yi Yu
2016	Prof Maarten P Mourits
2017	Prof Trevor Sherwin
2018	Dr Russell Van Gelder
2019	Prof John Marshall
2020	*– Congress postponed due to COVID-19*
2021	Prof Alex Hewitt
2022	Prof Helen Danesh-Meyer
2023	Prof Kathryn P Burdon
2024	Prof Robyn Jamieson

4 | THE FRED HOLLOWS LECTURE (ESTABLISHED 1999)

The Fred Hollows Lecture was established in 1999 to recognise the work Prof Fred Hollows did with Indigenous people and in raising the profile of ophthalmology. The Hollows Lecture is for Fellows involved in outreach or international ophthalmology. The presentation shall be for 25 min duration and will include 5 min for discussion to address a topic of applied public health research with a community focus. The lecture becomes the property of the College. A certificate is presented to the lecturer at the conclusion of the lecture.

1999	Dr William Morgan
2000	A/Prof Paul Mitchell
2001	A/Prof Glen Gole
2002	Prof John Mathews
2003	Dr Ivan Goldberg
2004	Dr Rob Moodie
2005	Prof Ravi Thomas
2006	Prof Minas Coroneo
2007	Prof Lyle Palmer
2008	Prof Hugh R Taylor AC
2009	Dr Mark Loane
2010	A/Prof Henry Newland
2011	Prof Jill Keeffe OAM
2012	Prof Geoffrey Tabin
2013	A/Prof Nitin Verma
2014	Dr Garry Brian
2015	Dr Neil Murray
2016	Dr James Muecke
2017	Dr Geoffrey Cohn OAM
2018	A/Prof Angus Turner
2019	Dr Anasaini Cama
2020	*–Congress postponed due to COVID-19*
2021	Dr Catherine Green AO
2022	Prof Clare Gilbert
2023	Dr Anthony Bennett Hall
2024	Dr Reeta Gurung

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Scientific Program

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SATURDAY 2 NOVEMBER

06:30–07:45 **Bausch + Lomb Hosted Morning Symposium**
Venue: Hall E1/E2/E3

08:00–08:30 **ROYAL AUSTRALIAN AND NEW ZEALAND COLLEGE OF OPHTHALMOLOGISTS (RANZCO) AGM**
Venue: Hall C

08:30–08:35 **CONGRESS OPENING**
Cliffy Wilson
Venue: Hall C
Topic: Welcome to country
Chair: Prof Adrian Fung

08:35–09:15 **RANZCO CONGRESS OPENING LECTURE**
Tim Jarvis
Venue: Hall C
Topic: By endurance we conquer
Chair: Prof Adrian Fung

09:15–09:45 **THE DAME IDA MANN MEMORIAL LECTURE**
Prof Robyn Jamieson
Venue: Hall C
Topic: Scaling new heights for precision medicine in ophthalmology
Chair: Dr Sophia Zagora

09:45–10:45 **RANZCO PLENARY**
Dr Kristin Bell, Dr Justin Mora, Prof Nitin Verma AM, Dr John Kennedy and A/Prof Michael Goggin
Venue: Hall C
Topics: *Vision 2030 and beyond*, *Te Kitenga Vision 2030*, Global Eye Health update, ANZEF update and CEO Journal update
Chair: Dr Grant Raymond

10:45–11:15 **Morning Tea**

11:15–12:45 **CONCURRENT SESSIONS**

11:15–12:00 **COURSE – Cars and cataracts – Zooming into new territories**
Venue: Hall A
Chair: Dr Jonathan Kam

12:00–12:45 **COURSE – Challenges and complications in cataract surgery: What next? – A video masterclass on tips and tricks to deal with them**
Venue: Hall A
Chairs: Prof Nitin Verma AM and Dr Vignesh Raja

11:15–12:00 **COURSE – "New" retinal diagnoses and signs**
Venue: Hall B
Chair: Prof Adrian Fung

12:00–12:45 **COURSE – Sexually transmitted disease and the eye – An update**
Venue: Hall B
Chair: A/Prof Anthony Hall

11:15–12:45 **COURSE – Update on imaging in paediatric ophthalmology: How to effectively use your imaging equipment in children**
Venue: Hall C
Chairs: Dr Deepa Taranath and Dr Susie Luu

11:15–12:45 **COURSE – Crash course in ocular oncology: From basics to best practices**
Venue: Hall D
Chairs: Dr David Sia, Dr John McKenzie, Dr Bill Glasson, Dr Peter Hadden and Dr Dan McKay

11:15–12:45 **FREE PAPERS – Glaucoma/Neuro-Ophthalmology**
Venue: Hall E1/E2/E3
Chairs: Prof Celia Chen and A/Prof Mitchell Lawlor

12:45–14:00 **Lunch**

14:00–14:30 **CATARACT UPDATE LECTURE**
Prof Rosa Braga-Mele
Venue: Hall C
Topic: Innovative and new technologies and techniques in cataract surgery
Chair: Prof Gerard Sutton

14:30–15:00 **PAEDIATRICS UPDATE LECTURE**
Dr Elise Héon
Venue: Hall C
Topic: Lessons learned from entering the new world of gene therapy for inherited retinal disorders (IRDs)
Chair: Dr Caroline Catt

15:00–15:30 **OCULOPLASTICS UPDATE LECTURE**
Dr Raymond Douglas
Venue: Hall C
Topic: New therapeutic options for TED
Chair: Dr Thomas Hardy

15:30–16:00 **Afternoon Tea**

16:00–17:30 **CONCURRENT SESSIONS**
COURSE – Ophthalmology through a different lens
Venue: Hall A
Chairs: A/Prof Elaine Chong and Dr Reeta Gurung

COURSE – Corneal transplantation: more than 100 years old and still going strong!
Venue: Hall B
Chairs: Prof Charles McGhee, Dr Jie Zhang, Dr Natalie Allen, Prof Gerard Sutton

COURSE – The management of paediatric uveitis for the general ophthalmologist
Venue: Hall C
Chairs: Prof Peter McCluskey, Prof Justine Smith, Dr Justin Mora and Dr Sophia Zagora

COURSE – Cataract surgery challenges in glaucoma patients – Tips from the glaucoma specialists plus cataract audit
Venue: Hall D
Chairs: Prof Graham Lee, Prof Keith Martin, Prof Helen Danesh-Meyer, Dr Ridia Lim and Prof Jeffrey Goldberg

FREE PAPERS – Retina
Venue: Hall E1/E2/E3
Chairs: A/Prof Fred Chen, Dr Amy Cohn and Prof SriniVas Sadda

18:00–20:30 **Graduation and Awards Ceremony and President's Reception**
Venue: Ian McLachlan Room, Adelaide Oval

19:00–21:30 **Roche Hosted Evening Symposium**
Venue: The Playford Adelaide

SUNDAY 3 NOVEMBER

06:30–07:45 **Bayer Hosted Morning Symposium**
Venue: Riverbank 2–4

06:30–07:45 **Zeiss Hosted Morning Symposium**
Venue: Hall E1/E2/E3

08:00–08:30 **AUSTRALIAN SOCIETY OF OPHTHALMOLOGISTS (ASO) AGM**
Venue: Hall C

08:30–09:00 **THE COUNCIL LECTURE**
Prof Justine Smith
Venue: Hall C
Topic: Wide world of uveitis
Chair: Prof Peter McCluskey

09:00–09:30 **GLAUCOMA UPDATE LECTURE**
Prof Jeffrey Goldberg
Venue: Hall C
Topic: Neuroprotection and neuroenhancement: Bench to clinic
Chair: Prof Keith Martin

09:30–10:00 **SIR NORMAN GREGG LECTURE**
Prof Stuart MacGregor
Venue: Hall C
Topic: Enabling more widespread use of polygenic risk scores in eye disease
Chair: Prof Alex Hewitt

10:00–10:30 **RETINA UPDATE LECTURE**
Prof SriniVas Sadda
Venue: Hall C
Topic: Metabolic and functional imaging of the retina
Chair: Dr Xavier Fagan

10:30–11:00 **Morning Tea**

11:00–12:30 **CONCURRENT SESSIONS**
COURSE – Idiopathic intracranial hypertension – Diagnostic and management challenges
Venue: Hall A
Chairs: Prof Celia Chen and A/Prof Clare Fraser

COURSE – The decision matrix for surgical treatment of high refractive error in phakic patients
Venue: Hall B
Chair: Dr Alison Chiu

COURSE – Management of complications related to intravitreal injections
Venue: Hall C
Chair: A/Prof Anthony Kwan

FREE PAPERS – Uveitis/Oncology/Paediatrics/Strabismus
Venue: Hall E1/E2/E3
Chairs: Dr Richard Symes and Dr Peter Hadden

12:30–14:00 **Lunch**

14:00–15:30 **PLENARY – BEST PAPER PRESENTATIONS**
Gerard Crock and John Parr Awards
Venue: Hall C
Chairs: Prof Mark Gillies and Prof Stephanie Watson OAM

15:30–16:00 **Afternoon Tea**

16:00–17:30 **CONCURRENT SESSIONS**
COURSE – Medical retina mysteries
Venue: Hall A
Chair: Prof Adrian Fung

COURSE – Thyroid eye disease – an update on current state
Venue: Hall B
Chairs: Dr Jwu Jin Khong, Dr Thomas Hardy and Dr Alan McNab

COURSE – Cataract controversies
Venue: Hall C
Chairs: A/Prof Elaine Chong and Prof Rosa Braga-Mele

PROFESSIONAL DEVELOPMENT – CPD essentials: Understanding and meeting your CPD obligations
Venue: Hall D
Chair: A/Prof Lawrence Lee

FREE PAPERS – Epidemiology/Genetics
Venue: Hall E1/E2/E3
Chairs: Dr Elise Héon and A/Prof Andrea Vincent

17:30–18:30 **Sunset Poster and Film Festival**
Venue: Exhibition Hall

18:30–21:30 **Senior Fellows Dinner**
Venue: iTL

18:30–21:30 **Alcon Hosted Evening Symposium**
Venue: The Sanctuary, Adelaide Zoo

19:30–22:00 **Younger Fellows Dinner**
Venue: Mrs. Q

MONDAY 4 NOVEMBER

06:30–07:45 **ANZGS Morning Symposium**
Prof Jeffrey Goldberg
Venue: Hall E1/E2/E3
Topic: Gliotherapeutics for glaucoma
Chair: Prof Keith Martin

08:00–08:30 **AUSTRALIAN VISION RESEARCH (AVR) AGM**
Venue: Hall C

08:30–09:00 **FRED HOLLOWS LECTURE**
Dr Reeta Gurung
Venue: Hall C
Topic: Tilganga Institute of Ophthalmology – Our humble beginning
Chair: Dr Robert McKay

09:00–10:00 **AUSTRALIAN VISION RESEARCH (AVR) PLENARY**
Venue: Hall C
Chair: Prof Stephanie Watson OAM

10:00–10:30 **Morning Tea**

10:30–12:00 **CONCURRENT SESSIONS**
COURSE – Enhancing Trabecular Meshwork MIGS: Maximising results, overcoming challenges, and effectively managing complications
Venue: Hall A
Chairs: Dr Jason Cheng and Dr Shamira Perera

COURSE – Vitreoretinal surgery oscars – The good, the bad and the ugly!
Venue: Hall B
Chair: Prof Adrian Fung

COURSE – Preventing misdiagnosis of inherited retinal diseases
Venue: Hall C
Chairs: A/Prof Fred Chen, A/Prof Heather Mack and Prof John Grigg

PROFESSIONAL DEVELOPMENT – Practical cybersecurity for your practice
Venue: Hall D
Chair: Dr Marc Sarossy

FREE PAPERS – Cataract/Cornea/Refractive
Venue: Hall E1/E2/E3
Chairs: Dr Andrea Ang and Dr Aanchal Gupta

12:00–13:30 **Lunch**

13:30–15:00 **PLENARY- CLINICAL CONTROVERSIES**
Venue: Hall C
Chairs: Dr Graham Hay-Smith, Dr Ridia Lim and Dr Sukhpal Sandhu

15:00–15:30 **Afternoon Tea**

15:30–17:00 **CONCURRENT SESSIONS**
COURSE – All India Ophthalmic Society (AIOS)
Venue: Hall A
Chair: Dr Samar Basak

COURSE – Management strategies for common strabismic conditions
Venue: Hall B
Chairs: A/Prof Geoffrey Lam and Dr Shanel Sharma

COURSE – Bacterial ocular infections: What you need to know in 2024 and beyond
Venue: Hall C
Chairs: Prof Stephanie Watson OAM and Dr Maria Cabrera Aguas

PROFESSIONAL DEVELOPMENT – Surgical coaching and performance review
Venue: Hall D
Chair: Prof Nigel Morlet

FREE PAPERS – Oculoplastic/Training
Venue: Hall E1/E2/E3
Chairs: Dr James Slattery and Dr Katja Ullrich

17:00–17:30 **Closing Remarks**

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Invited Speakers

Clinical & Experimental Ophthalmology WILEY

RANZCO CONGRESS OPENING LECTURE, SATURDAY 2 NOVEMBER 2024

Tim Jarvis PhD (Hon) MSc, MEnvLaw

By endurance we conquer

Synopsis:

In 2013 Tim Jarvis led a team of six men to retrace legendary polar explorer Sir Ernest Shackleton's 1916 Antarctic journey of survival. Using the same rudimentary equipment, period clothing and technology as Shackleton, the team sailed a replica *James Caird* lifeboat 1500 kilometres across the Southern Ocean from Elephant Island to South Georgia before traversing its mountainous interior. This is the first time that any team has been able to recreate authentically Shackleton's "double," regarded by many, including Sir Edmund Hillary, as the greatest survival journey of all time.

Tim will share the many lessons he learned from retracing Shackleton's journey, including insights into leadership, problem solving, resilience, teamwork, motivation and goal setting—skills as relevant to personal and professional goals as to expeditioning. In addition he will share his observations of the extent of environmental change in the form of melting glacial ice in the 100 years since Shackleton's journey and his passionate belief in the importance of utilising the kind of leadership Shackleton stood for to tackle the issues of climate change and biodiversity loss facing us today.

Brief Curriculum Vitae:

Tim Jarvis PhD (Hon) MSc, MEnvLaw is an environmental scientist, adventurer, author, public speaker and filmmaker with more than 30 years of environmental experience. He is committed to finding pragmatic solutions to environmental issues related to climate change and biodiversity loss and uses his public speaking engagements, films and books to progress thinking in these areas. He strongly advocates applying outcome-focused, systems thinking approaches learnt from his successful expedition career to the management of complex issues related to the environment and applies lessons learnt to talk to corporate organisations and educators about purposeful leadership, problem-solving, teamwork, change management, goal setting and sustainability.

Contact Details:

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THE DAME IDA MANN LECTURE, SATURDAY 2 NOVEMBER 2024

Prof Robyn Jamieson MBBS (Hons) PhD FRACP CG (HGSA)

Scaling new heights for precision medicine in ophthalmology

Synopsis:

Transformative advances in genomic technologies, vision science and ophthalmology are together creating a new future of therapy for individuals with previously untreatable blinding conditions with strong genetic contributions. These conditions affect millions around the world, impacting livelihoods and with significant psychosocial and societal consequences. Patient-derived stem cells differentiated to retinal organoids and other ocular tissues facilitate meaningful multi-omic interrogation to provide new insights to disease pathophysiology and novel diagnostic and therapy approaches for these conditions. Gene transfer, CRISPR/Cas and other types of DNA and RNA editing and modulating tools, and new pharmacological approaches, are providing unprecedented opportunity for new therapies now and for the future.

Delivery of a comprehensive and integrated approach across genomic medicine, ophthalmology and vision science research with parallel inclusion of patient, family, community and societal engagement is key in the precision medicine era. This will reap the benefits of the tremendous technological advances and forge a new future

of sustainable approaches and novel therapies for currently untreatable genetic ocular conditions.

Brief Curriculum Vitae:

Dr. Robyn Jamieson is Professor of Genomic Medicine, The University of Sydney, and Head of the Eye Genetics Research Unit at Children's Medical Research Institute, Sydney Children's Hospitals Network and Save Sight Institute, The University of Sydney. She leads the Specialty of Genomic Medicine and the Genomics and Precision Medicine stream in the Master of Medicine and Master of Biomedical Science programs. Professor Jamieson is Co-Chair of the Sydney Health Partners Clinical Academic Group in Genomics and Precision Medicine Partnerships. She heads the Eye Genetics Clinic at Sydney Children's Hospitals Network and the Western Sydney Genetics Program encompassing comprehensive clinical and laboratory services in genomics, metabolic disorders and newborn screening.

Professor Jamieson's basic science research led world-first publications of novel disease gene and mechanism identifications in the ocular genes *MAF* and *SIPA1L3*, as well as *ALPK1* which leads to the novel inflammatory and retinal disorder ROSAH syndrome. Overall, her laboratory's research has led to over 80 novel disease gene, genetic variant and disease mechanism discoveries, with substantial contribution to the international public database of genetic variants, ClinVar. Functional genomic studies in her laboratory led to patient eligibility for life-changing *RPE65* ocular gene therapy and *RPGR* clinical trial eligibility. Current studies include investigation of patient-derived induced pluripotent stem cells differentiated to retinal organoids, using gene-editing and replacement strategies to determine underlying disease mechanisms, and develop and test new genetic therapies for inherited retinal diseases.

Professor Jamieson leads the Ocular Gene and Cell Therapies Australia team, which implemented the first delivery of publicly funded ocular gene therapy in Australia, and the team continues to deliver the research and clinical genomic, laboratory, ophthalmic and multidisciplinary components for this and other breakthrough therapies for patients with genetic retinal diseases. Professor Jamieson contributes to the international ClinGen variant curation consortium, as well as advisory boards for Australian and SE Asian genetic therapy implementation.

Contact Details:

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CATARACT UPDATE LECTURE, SATURDAY 2 NOVEMBER 2024

Prof Rosa Braga-Mele MD, MEd, FRCSC

Innovative and new technologies and techniques in cataract surgery

Synopsis:

This talk will include some of the newest or emerging technologies in cataract diagnostics, phacoemulsification surgery and intraocular lens development.

It will also touch on innovative techniques for nuclear removal, and anterior chamber stabilisation during and at the end of cataract surgery. It will showcase some techniques for challenging cases.

The audience will take away some useful techniques that can be utilised in the operating room for cataract surgery and learn about new technologies that may change the way we manage our cataract patients from the office to the operating room.

Brief Curriculum Vitae:

Rosa Braga-Mele MD is Professor of Ophthalmology, Faculty of Medicine at the University of Toronto, Canada. She graduated Magna Cum Laude from University of Ottawa Medical School. She then completed her residency at the University of Toronto. She went on to complete her Masters Degree in Higher Education.

Dr. Braga-Mele is a cataract specialist and educator who speaks frequently at both the national and international level on advanced surgical techniques and innovations in phacoemulsification surgery and complicated cataract cases and intraocular lens development. She has over 150 published abstracts and papers.

Dr. Braga-Mele served as the Chair of the Education Clinical Committee (2015–2018) and Chair of Cataract Clinical Committee (2010–2015) for the American Society of Cataract and Refractive Surgery and was a member of the Governing Board for the Society. She is on the editorial board of multiple ophthalmic publications. She was the inaugural Research Director at the Kensington Eye Institute in Toronto from 2007 to 2012. She was appointed Cataract Director at the KEI in May 2013–December 2019.

She has won multiple teaching awards both at the undergraduate and resident levels at the University of Toronto, for her teaching and mentorship abilities including the Silver Needle award in 2003, 2007, 2012, 2016, 2017, and 2020 for best resident surgical teacher, and the University

of Toronto, Faculty of Medicine, Community-Based Teaching Award in 2016. She was given the American Academy of Ophthalmology Senior Achievement Award in 2013 for distinguished volunteer service and the Academy Secretariat Award in 2012 for special contributions to the Academy and ophthalmology out of proportion to others and making a difference in her efforts.

She was awarded the University of Ottawa Alumni Association 2019 Meritas Tabaret Award given to those that have distinguished themselves through excellence and achievement in their professional field throughout their career; have demonstrated leadership in their profession; have made a positive contribution to the prestige, influence and reputation of the University of Ottawa; and have exercised and continue to exercise a strong positive influence in the community. And in 2022 she was awarded the prestigious Binkhorst Medal and Lecture by the American Society of Cataract and Refractive Surgery for an accomplished and exemplary career in ophthalmology. In, 2024 she was included on The Ophthalmologist Power List, which honours the most influential ophthalmologists worldwide.

In addition, she is a mother of 3 boys, ages 25, 23 and 15. She is a Canadian certified level 1 basketball coach and has coached many boys' basketball teams to championships. She has her 2nd degree black belt in karate. She is a nationally ranked bodybuilder as a natural athlete in women's physique division, winning a bronze medal at Canadian Natural Nationals in November 2021.

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PAEDIATRICS UPDATE LECTURE, SATURDAY 2 NOVEMBER 2024

Dr Elise Héon, MD, FRCSC

Lessons learned from entering the new world of gene therapy for inherited retinal disorders (IRDs

Synopsis:

Gene replacement therapy is a new era of medicine and should be navigated with caution.

Voretigene neparvovec was only approved in Canada for public reimbursement in the Spring of 2023. Since then, numerous gene replacement therapy trials for other inherited retinal diseases (IRD) are ongoing. As of this writing, in Toronto, we have treated 21 patients with an age range of 8–47 years at the time of treatment. The baseline visual acuity ranged between 20/30 to light perception. In all cases some of the outer nuclear layer was appreciable on optical coherence tomography. No case had a normal visual field.

After surgery, all but two cases showed substantial improvement on full-field sensitivity threshold testing. Patients without full-field sensitivity threshold improvement were older with advanced disease. Three cases had improvement in central visual acuity while two had a decrease in their near vision. Four cases had rebound inflammation manageable with resuming oral and topical steroids. Our surgical and medical approaches have been modified with this experience. In summary, there has been many lessons learned, including that this treatment is new and carries many unknowns. The conversation with patients and families involved must clearly highlight the known potential risks and benefits. Similarly, conversation about expectations, what we know and don't know must also be very clear. Overall, even a small improvement in rod function and retinal sensitivity has been life changing leading to a high degree of patient satisfaction.

Brief Curriculum Vitae:

Dr. Héon is a Clinician Scientist, Professor of Ophthalmology at the University of Toronto (Canada) and has been a staff paediatric ophthalmologist at The Hospital for Sick Children since 1996. She directs the Ocular Genetics program, which provides comprehensive genetic testing, diagnosis, management and counselling for patients with IRDs. Since 2018, she holds the Henry Brent Chair in Innovative Paediatric Ophthalmology Research. She also chairs the Fighting Blindness Canada patient registry and the national advisory board for ocular gene therapy. She was instrumental at implementing access to Luxturna, the first gene replacement therapy for retinal degeneration (*RPE65* gene) and is the primary investigator on numerous clinical trials, some interventional some not. She teaches students and fellows of all academic levels. Her research is focused on the genetic analysis of inherited retinal disorders, and the development of patient reported outcome measures for that paediatric patient population with IRD.

Her laboratory focusses on genome sequencing to IRD patients when clinically-based genetic testing has failed. Genetic characterisation of diseases is important to optimise management of patients and provide access to novel gene specific therapeutic opportunities. Dr. Héon has a long-standing interest in ciliopathy-type conditions such as Bardet-Biedl syndrome for which she has dedicated much efforts to better understand the complexity of this condition and set the path to access novel therapies.

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OCULOPLASTIC UPDATE LECTURE, SATURDAY 2 NOVEMBER 2024

Dr Raymond Douglas, MD, PhD

New therapeutic options for TED

Synopsis:

In the past 5 years, the therapeutic landscape for thyroid eye disease (TED) has dramatically changed. In the near future multiple medical options will be available for TED treatment and even more under investigation. The lecture will discuss the scientific rationale for IGF-1R treatment options and other modalities of therapy (IL-6, Fcn receptor etc). In addition, these treatments have been thrust into the clinic and were approved for TED treatment based upon a couple hundred cases. We will discuss the shortcomings of information and therapeutic planning for these treatments and rationale steps forward to optimise patient care.

Brief Curriculum Vitae:

Dr. Douglas MD, PhD, is a renowned board certified oculoplastic surgeon. He graduated with academic distinction from the University of Pennsylvania where he began his medical training and PhD in immunology and autoimmune inflammatory disorders before he went on to complete a sub-specialised fellowship in Orbital Facial Plastic and Reconstructive Surgery at the UCLA Jules Stein Eye Institute. He has held several prestigious positions at the UCLA School of Medicine, Harbour-UCLA Medical Center, Los Angeles Veterans Hospital, Veterans Administration Ann Arbor Healthcare System and the University of Michigan Kellogg Eye Center. In addition to a private practice in Beverly Hills, Dr. Douglas is the current Director of the Orbital and Thyroid Eye Disease program at the prestigious Cedars-Sinai Medical Center in Los Angeles. In 2021 he founded Thrive Health IV, infusion centers of excellence, to provide exceptional concierge care in biologics to treat thyroid eye disease as well as research and clinical trials for TED and other rare ophthalmic diseases. Currently he has Thrive Health IV infusion centres in California, New York, Iowa, Florida, Nevada and Illinois.

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THE COUNCIL LECTURE, SUNDAY 3 NOVEMBER 2024

Prof Justine Smith, FRANZCO, PhD

Wide world of uveitis

Brief Curriculum Vitae:

Justine is a Distinguished Professor at Flinders University and Consultant Ophthalmologist at Southern Adelaide Local Health Network (SALHN)-Flinders Medical Centre. She heads a translational research program focused on basic mechanisms and clinical outcomes of different types of uveitis. Justine has been Editor-in-Chief of *Clinical and Experimental Ophthalmology* from 2020 to 2023, and she is a past President and Executive Vice-President of the Association for Research in Vision and Ophthalmology. She was identified as one of Science and Technology Australia's Superstars of STEM.

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GLAUCOMA UPDATE LECTURE, SUNDAY 3 NOVEMBER 2024

Prof Jeffrey L. Goldberg, MD, PhD

Neuroprotection and neuroenhancement: Bench to clinic

Synopsis:

The science of retinal ganglion cell neurodegeneration now points to multiple targets for biomarkers—new ways to measure disease progression or response to therapy—and for treatment—new ways to promote retinal ganglion cell survival (neuroprotection) and function (neuroenhancement). In recent years we and others have begun transitioning such targets out of the lab and into the clinic. Here we will review advances in biomarker and therapeutic discovery and translation in glaucoma.

Brief Curriculum Vitae:

Dr. Jeffrey Goldberg is Professor and Chair of Ophthalmology and Director of the Byers Eye Institute at Stanford University, and a member of the National Academy of Medicine. His clinical effort is focused on patients in

need of medical or surgical intervention for glaucoma and other retinal and optic nerve diseases, as well as cataract. His research is directed at neuroprotection and regeneration of retinal ganglion cells and the optic nerve, a major unmet need in glaucoma and other optic neuropathies, and his laboratory is developing novel molecular, stem cell and nanotherapeutics approaches for eye repair. Dr. Goldberg received his BS magna cum laude from Yale University, and his MD and PhD from Stanford University where he made significant discoveries about the failure of optic nerve regeneration. He did his clinical training in ophthalmology and then in glaucoma at the Bascom Palmer Eye Institute, and was awarded a fellowship from the Heed Foundation. He was named the 2010 Scientist of the Year by the Hope For Vision foundation, and received the Cogan award from the Association for Research in Vision and Ophthalmology in 2012. He was elected in 2010 to the American Society of Clinical Investigation, an honorary society of physician scientists, and in 2021 to the American Ophthalmological Society. He directs a *National Institutes of Health*-funded research laboratory and is one of the scientists funded by the National Eye Institute's Audacious Goals Initiative. In addition, he has developed significant expertise with implementing *Food and Drug Administration* clinical trials for optic nerve neuroprotection and regeneration. His goal is to translate scientific discoveries to patient therapies.

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SIR NORMAN GREGG LECTURE, SUNDAY 3 NOVEMBER 2024

Prof Stuart MacGregor, PhD AAHMS

Enabling more widespread use of polygenic risk scores in eye disease

Synopsis:

Eye conditions such as glaucoma, age-related macular degeneration and keratoconus have a strong genetic basis. While rare mutations explain a few cases in the population, most cases are affected as a result of the cumulative effect of a large number of common genetic variants. In recent years, polygenic risk scores (PRS) based on many genetic variants have proven to be effective in predicting disease risk for a wide range of diseases. PRS for glaucoma are already in clinical use in Australia, with a simple saliva-based test able to predict both disease risk and progression. In my talk I will show how we have improved prediction accuracy for glaucoma, with the new tests identifying larger groups of people at high risk. However, barriers remain to broader uptake of PRS. One issue is that PRS performance can vary by genetic ancestry and I will discuss our recent efforts to develop more robust tests which are practically useful in a range of scenarios. A further issue is that more evidence is required to show the practical utility of PRS in preventing morbidity. I will describe our efforts to conduct randomised trials to demonstrate where PRS may be most useful. Finally, I will also cover our recent work on developing and validating PRS for risk of developing age-related macular degeneration and keratoconus.

Brief Curriculum Vitae:

Professor Stuart MacGregor is Head of the QIMR Berghofer Statistical Genetics Group, based in Brisbane, Australia. Over the last 20 years, Stuart has made seminal contributions to our understanding of complex trait genetics for a wide range of diseases (>275 publications, including >60 on glaucoma). He plays a leading role in consortium science, particularly in the area of genome-wide association studies. His work developing and applying statistical genetic methods has led to publications in top journals such as *Nature* and *Nature Genetics* (27 publications).

Stuart has received many awards including the Australian Academy of Science Human Genetics Medal and the QIMR Berghofer Breakthrough Award (for his work on glaucoma genetics). In addition to his academic work, he is a co-founder of Seonix Bio, a start-up that seeks to improve the treatment and prevention of blinding eye disease, through the development of advanced risk prediction tools.

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RETINA UPDATE LECTURE, SUNDAY 3 NOVEMBER 2024

Prof SriniVas R. Sadda, MD, FARVO

Metabolic and functional imaging of the retina

Synopsis:

Traditionally, imaging technologies in ophthalmology have focused on visualisation

of structural alterations in the setting of pathology. Technologies such as high-resolution optical coherence tomography and adaptive optics have allowed layers of the retina and individual retinal cells to be visualised. These devices do not, however, allow the function of these tissues to be probed. Recent advances in imaging, however, have allowed us as ophthalmologists to gain novel insights into the metabolic composition and functional capabilities of retinal cells, and these advances will be reviewed in this presentation. These novel technologies include hyperspectral imaging which utilises differential reflectance at various wavelengths to discriminate between metabolites such as oxygenated and deoxygenated haemoglobin.

Another technology is flavoprotein fluorescence, which selectively isolates the green fluorescent emission component of blue-excitation fluorescence to quantify oxidised flavoprotein content in the eye which correlates with the status of the mitochondria. In addition to mitochondrial diseases, flavoprotein fluorescence may be affected in age-related macular degeneration, diabetic retinopathy and other retinal diseases where there is evidence of metabolic stress. Fluorescence lifetime imaging ophthalmoscopy is a novel approach to quantitative autofluorescence that allows fluorophores in the eye to be distinguished based on differences in their emission lifetimes. This may have relevance to diseases such as MacTel, Alzheimer's, and hydroxychloroquine toxicity.

Finally, dramatic advances in optical coherence tomography have now allowed intrinsic changes in the reflectivity of the photoreceptors in response to light stimulation to be captured. This has opened the door to measurement of function down to the level of individual retinal cells. With the dawn of the era of targeted pharmacotherapeutics and gene-based therapies, we expect that these advances in metabolic and functional imaging will be of considerable value.

Brief Curriculum Vitae:

SriniVas R. Sadda, MD, is the Director of Artificial Intelligence & Imaging Research at the Doheny Eye Institute, and Professor of Ophthalmology at the University of California—Los Angeles (UCLA) Geffen School of Medicine. He is the immediate past President of the Doheny Eye Institute. He received his MD from Johns Hopkins University, where he also completed ophthalmology residency and neuro-ophthalmology and medical retina fellowships (Wilmer Eye Institute).

Dr. Sadda's major research interests include retinal image analysis, advanced retinal imaging technologies and clinical trial endpoint design. He has more than 700 peer-reviewed publications and 20 book chapters, and has given over 500 presentations worldwide. Dr. Sadda is Editor-in-Chief of the 7th Edition of *Ryan's Retina*. He also serves as an Editor-in-Chief of *Graefe's Archive for Clinical and Experimental Ophthalmology* and is an Editorial Board member of *Ophthalmology*, *Ophthalmology Retina*, *Ophthalmology Science*, *Ophthalmic Surgery*, *Lasers & Imaging*, and *Retina*. Among Dr. Sadda's awards and honours are an Achievement Award and a Secretariat Award from the American Academy of Ophthalmology, Research to Prevent Blindness Physician-Scientist Award, a Senior Honour Award from the American Society of Retina Specialists, John H. Zumberge Research and Innovation Award, the Macula Society Young Investigator Award, American Society of Retina Specialists Young Investigator Award, Asia-Pacific Academy of Ophthalmology Achievement Award, The Macula Society Paul Henkind Lecture and Award, Macula Society W. Ricard Green Lecture and Award, the VRSI Nararaja Pillai Oration and the Euretina Lecture.

He is also a Gold Fellow and President-Elect for the Association for Research in Vision and Ophthalmology, and also President-Elect of the Macula Society. Dr. Sadda's research has been continuously funded by the National Institutes of Health for several years, including a current R01 grant from the National Eye Institute. He has been named to the Best Doctors of America list for several consecutive years.

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FRED HOLLOWS LECTURE, MONDAY 4 NOVEMBER 2024

Dr Reeta Gurung, MD

Tilganga Institute of Ophthalmology—Our humble beginning

Synopsis:

The Nepal Eye Programme/Tilganga Institute of Ophthalmology (TIO) started functioning in Nepal in 1992 with just outreach community work (Camps) which was the necessity of that period. A National Eye Care need was shown by the National Blindness Survey 1980/81 in which prevalence of blindness was 0.81%. The major causes of blindness were cataract, corneal diseases mainly trachoma, other infections, nutritional deficiencies followed by glaucoma and retina diseases. With the initial support from the Fred Hollows Foundation, TIO was established with two

ophthalmologists and a few paramedics. It started planning eye care based on the strong evidence generated by the National Blindness Survey Study of 1980/81 to overcome barriers for eye care existing in the community. Now TIO has a central hospital with 40 ophthalmologists covering all subspecialties of ophthalmology and three other secondary hospitals. The establishment of an intraocular lens (IOL) factory in TIO which produces very low-cost high quality IOLs, brought a paradigm shift in cataract surgery not only in Nepal, but in the world. The use of IOLs in Nepal has increased from 25% in 1994 to almost 99.5% in 2008 resulting in better quality of cataract services. The Eye Bank now harvests more than 1500 corneas every year, supplying tissue to corneal surgeons throughout the country to address the second major cause of blindness in Nepal. Nepal has become self-reliant in IOLs and corneas. The Academic and Training department with a strong research wing, is developing the much-needed human resources for the country and the region. A strong outreach department is always ready to fulfil our social mandate of the organisation catering for the people who otherwise do not have access to eye care. Development of the programs based on the strong evidence and with the dedication and determination of few people on the ground and support from the organisations like the Fred Hollows Foundation, the Himalayan Cataract project and many more have led to the development of organisations like TIO which has made a huge difference to the lives of many people. Nepal's prevalence of blindness has reduced from 0.81% in 1980/81 to 0.3% in 2010. TIO is mainly focused on the quality of services offered, production of competent human and production of IOLs, other products needed for eye care and how can it contribute towards environmental sustainability.

Brief Curriculum Vitae:

Dr. Reeta is a highly respected cornea specialist and master trainer. She has also been instrumental in helping advance gender equity for eye care through her leadership and mentorship of other ophthalmic professionals from around the world who train with her. Dr. Reeta's leadership and expertise as a trainer has rippled throughout Southeast Asia and sub-Saharan Africa.

Dr. Reeta's career as an ophthalmologist began after her sub-specialty training in Bristol, England. In 1993, she connected with HCP Co-founder Dr. Sanduk Ruit to discuss rural eye care in Nepal. Dr. Reeta Gurung was CEO from 31 August 2014 and Dy. Medical director from 17 July 2006 at the Tilganga Institute of Ophthalmology. Her dedication and hard work have shaped Tilganga's success in quality of care and impact in the region.

Dr. Reeta sets the standard for gender inclusion across all of Tilganga's clinical and training programs. She is a member of Nepal's National Gender and Eye Health Group, a multi-disciplinary, multi-institutional group that brings together people and institutions from both public and private sectors to promote gender equity as it relates to eye care in Nepal.

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Saturday 02 November

Clinical & Experimental Ophthalmology WILEY

06:30–07:45 **Bausch + Lomb Hosted Morning Symposium**
Venue: Hall E1/E2/E3

08:00–08:30 **RANZCO AGM**
Venue: Hall C

08:30–08:35 **CONGRESS OPENING**
Venue: Hall C
Chair: Prof Adrian Fung
Synopsis: Welcome to Country
Cliffy Wilson
Welcome from Congress Convenors
Dr Jo Black and Dr Matt Little
Welcome from Scientific Program Chairs
Prof Adrian Fung and A/Prof Clare Fraser

08:35–09:15 **CONGRESS OPENING LECTURE**
Venue: Hall C
Chair: Prof Adrian Fung
Title: By endurance we conquer
Speaker: Tim Jarvis
Synopsis: In 2013 Tim Jarvis led a team of six men to retrace legendary polar explorer Sir Ernest Shackleton's 1916 Antarctic journey of survival. Using the same rudimentary equipment, period clothing and technology as Shackleton, the team sailed a replica James Caird lifeboat 1500 kilometres across the Southern Ocean from Elephant Island to South Georgia before traversing its mountainous interior. This is the first time that any team has been able to recreate authentically Shackleton's "double", regarded by many, including Sir Edmund Hillary, as the greatest survival journey of all time.
Tim will share the many lessons he learned from retracing Shackleton's journey, including insights into leadership, problem solving, resilience, teamwork, motivation and goal setting – skills as relevant to personal and professional goals as to expeditioning. In addition he will share his observations of the extent of environmental change in the form of melting glacial ice in the 100 years since Shackleton's journey and his passionate belief in the importance of utilising the kind of leadership Shackleton stood for to tackle the issues of climate change and biodiversity loss facing us today.

09:15–09:45 **THE DAME IDA MANN MEMORIAL LECTURE**
Venue: Hall C
Chair: Dr Sophia Zagora
Title: Scaling new heights for precision medicine in ophthalmology
Speaker: Prof Robyn Jamieson
Synopsis: Transformative advances in genomic technologies, vision science and ophthalmology are together creating a new future of therapy for individuals with previously untreatable blinding conditions with strong genetic contributions. These conditions affect millions around the world, impacting livelihoods and with significant psychosocial and societal consequences. Patient-derived stem cells differentiated to retinal organoids and other ocular tissues facilitate meaningful multi-omic interrogation to provide new insights to disease pathophysiology and novel diagnostic and therapy approaches for these conditions. Gene transfer, CRISPR/Cas and other types of DNA and RNA editing and modulating tools, and new pharmacological approaches, are providing unprecedented opportunity for new therapies now and for the future.
Delivery of a comprehensive and integrated approach across genomic medicine, ophthalmology and vision science research with parallel inclusion of patient, family, community and societal engagement is key in the precision medicine era. This will reap the benefits of the tremendous technological advances and forge a new future of sustainable approaches and novel therapies for currently untreatable genetic ocular conditions.

09:45–10:45 **RANZCO PLENARY**
Venue: Hall C
Chair: Dr Grant Raymond
Speakers and Topics:
Dr Kristin Bell – Vision 2030 and beyond - Australia
Dr Justin Mora – Te Kitenga Vision 2030 - Aotearoa
Prof Nitin Verma AM – Global Eye Health update
Dr John Kennedy – ANZEF update
A/Prof Michael Goggin – CEO Journal update
Q&A
Synopsis: *Vision 2030 and beyond* and *Te Kitenga Vision 203*0 are RANZCO's strategic roadmaps for improving eye health outcomes across Australia and New Zealand, respectively. This initiative on promoting equitable access to quality eye care, with a particular emphasis on addressing disparities in rural/regional, Indigenous and underserved communities. Key priorities include fostering collaborative care models, improving workforce capacity and advocating for policies that support sustainable, high-quality eye health care services.
In Australia, implementation of *Vision 2030 and beyond* in 2024 has focused on a series of collaborative care workshops, bringing together stakeholders from across the eye health care sector to develop shared goals for improving care in specific disease areas and population groups. In 2025, RANZCO plans to build on the success of these workshops to support the expansion of evidence-based collaborative care strategies which improve the accessibility, sustainability and quality of eye health care. Another significant focus has been on supporting sustainable eye health systems in the South Pacific with outreach and liaison visits to Tonga and Vanuatu, assistance with education and training for Pacific doctors and partnerships with other international stakeholders, including a memorandum of understanding with the All India Ophthalmological Society.
In New Zealand, the main focus has been on progressing new initiatives under the new Eye Health Network includes specific streams of work for children, adolescents and adults. Within the child stream, a national retinopathy of prematurity program has been developed. For adolescents, keratoconus screening for at-risk Māori and Pasifika youth has been launched and on the adult side, a national Clinical Priority Assessment Criteria for cataract surgery is being developed, enabling optometrists to directly list patients for public hospital waitlists and manage one-month post-operative cataract reviews in the community. Other initiatives include national access criteria to standardise referral prioritisation, a diabetic screening program and the introduction of national standing orders, allowing allied health staff to apply drops for assessments and pre-treatments like laser. In addition to engagement with the Network, RANZCO has an ongoing focus on increasing the number of allied health staff in public hospitals and boosting Māori and Pasifika representation in ophthalmology.

10:45–11:15 **Morning Tea**
Venue: Exhibition Hall

11:15–12:00 **COURSE – Cars and cataracts – Zooming into new territories**
Venue: Hall A
Chair: Dr Jonathan Kam
Aim: A fun and interesting session on less common but important cataract surgery related topics. The session focuses on building modern cataract services in areas of need and updates on modern phacoemulsification technologies, techniques and intraocular lenses, as well as a management update on paedatric cataract surgery.
Speakers and Topics:
Dr Jonathan Kam – Modern Engines and safety systems. A discussion of the advantages of using the latest generation of various phacoemulsification machines
Dr Shanida Hamsa – Manual vs automatic. Manual small–incision cataract surgery vs. modern phaco
Dr Suheb Ahmed – Driving change and expanding ophthalmology services in areas of need
Dr Malvika Gupta – The IDEAs Van and cataract surgery for First Nation people
Dr Lukas Sahhar – Ideal intraocular lens options for patients who love driving
Dr Sheetal Shirke – Paediatric cataract management roadmap
Panel member – Cataract surgeons and their cars live poll
Email: jonathan.kam@eyeandear.org.au

12:00–12:45 **COURSE – Challenges and complications in cataract surgery: What next? – A video masterclass on tips and tricks to deal with them**
Venue: Hall A
Chairs: Prof Nitin Verma AM and Dr Vignesh Raja

Aim: Every cataract surgeon comes across challenging situations and complications in cataract surgery. This video based interactive course aims to highlight tips and tricks for the management of challenges and complications in cataract surgery. This course will discuss how surgeons should approach these challenges/ complications to be able to provide safe and optimal outcomes in these situations.
Speakers and Topics:
Prof Nitin Verma AM – Introduction
Dr Andrea Ang – Cataract surgery in complex corneas
Dr Rob Paul – Management of the small pupil/intraoperative floppy iris syndrome
Dr Minu Mathen – Management of the dreaded posterior capsule rupture and zonular dialysis
Dr Zhu Li Yap – Management of intumescent cataract
Dr Vignesh Raja – Management of posterior polar cataract
Prof Rodney Morris – Management of the sinking cataract
Email: drvigneshraja@gmail.com

11:15–12:00 **COURSE – 'New' retinal diagnoses and signs**
Venue: Hall B
Chair: Prof Adrian Fung
Aim: The fields of retina, uveitis and ocular oncology is progressing at a rapid pace. Each year there are new diagnoses, classifications and signs being described – do you know what they mean? This course will bring together experts who will explain new retinal entities described over the last few years. They will present multi-modal imaging to explain the meaning and relevance of each diagnosis or sign. Management will be discussed that is relevant to all ophthalmologists.
Synopsis: Presentations will make the cutting-edge knowledge of retinal diseases understandable for the general ophthalmologist. Speakers have been chosen for their expertise, diversity and their excellent speaking skills. The session will utilise live polling, with each speaker asking a multiple-choice question of the audience during their presentation.
Speakers and Topics:
Prof Adrian Fung – Introduction
Prof SriniVas Sadda – Angular Sign of Henle layer Hyper-reflectivity
Prof Fred Chen – Multizonal outer retinopathy and pigment epitheliopathy
Prof Robyn Guymer – Incomplete/complete retinal pigment epitheliopathy and outer retinal atrophy, nascent geographic atrophy
Dr Richard Symes – Bacillary layer detachment
Dr Amy Cohn – Reticular pseudodrusen and extensive macular atrophy with pseudodrusen
Dr Phoebe Moore – Peripapillary Pachychoroid Syndrome
MCQs
Email: adrian.fung@sydney.edu.au

12:00–12:45 **COURSE – Sexually transmitted disease and the eye – An update**
Venue: Hall B
Chair: A/Prof Anthony Hall
Aim: The epidemiology of sexually transmitted disease is evolving and the overall incidence increasing. This course aims to deliver an update on:
1. the epidemiology of sexually transmitted disease and their ophthalmic manifestations;
2. the clinical features and investigation of the ohthalmic manifestations of sexually transmitted diseases; and
3. provide guidelines for treatment.
Speakers and Topics:
Dr Daini Ong – The new epidemiology of sexually transmitted diseases
There has been a steady increase in the incidence and prevalence of sexually transmitted disease over the past two decades. This talk will outline the new epidemiology, including figures on incidences of ophthalmically important sexually transmitted disease and give insights into the reasons for the changes.
Dr Sachin Phakey – Epidemiology of infectious uveitis in Melbourne
This talk will cover the 5-year incidence of syphilitic uveitis in a tertiary referral centre.
Dr Matthew Little – Clinical features of syphilitic uveitis
Syphilitic uveitis can present in a number of ways. Some of them are characteristic, but others mimic non-infectious uveitis quite closely. This talk will cover the important clinical features of syphilitic uveitis and the investigations used to diagnose it.

Dr Richard Symes – Management of syphilitic uveitis
This talk will cover practical management of syphilitic uveitis including duration of treatment, use of steroids, follow up investigations and ongoing management.
Dr Cherry Hong – Neonatal conjunctivitis
This talk will cover 10 years of the incidence, microbiology and treatment of neonatal conjunctivitis at the Royal Children's Hospital in Melbourne.
Q and A
Email: anthonyhall@bigpond.com

11:15–12:45 **COURSE – Update on imaging in paediatric ophthalmology: How to effectively use your imaging equipment in children**
Venue: Hall C
Chairs: Dr Deepa Taranath and Dr Susie Luu
Aim: The use and application of ophthalmic imaging in paediatric patients is expanding. Using equipment which is widely available, obtaining and interpreting images in paediatric patients can provide accuracy and education for the patient and their family. It can also provide confidence to the clinician, augment diagnostic and prognostic acumen and streamline resulting referrals and investigations. In this course, we will present an update on ophthalmic imaging in paediatric patients, and will be focussing on the imaging modes which are already available to most general ophthalmologists, such as digital wide field photography and fluorescein angiography, optical coherence tomography, corneal topography, ultrasound and biometry. The course will provide practical instructions on how to obtain accurate and relevant images in children, the clinical application and interpretation of images, and end with a series of clinical cases in which the imaging has been particularly instructive.
Panel: Ms Katie Geering, Dr Caroline Catt, Dr Deepa Taranath, Dr Stewart Lake, Dr Natalie Allen, Dr Susie Luu, Dr Elise Héon and Mrs Stephanie Crofts
Speakers and Topics:
Ms Katie Geering – How to obtain good images in children – tips and tricks and practical advice
Dr Caroline Catt – Optical coherence tomography in children
Dr Deepa Taranath – Fundus photography in children
Dr Stewart Lake – Fluorescein angiography in children
Dr Natalie Allen – Corneal topography and anterior segment imaging
Dr Susie Luu – Biometry and ultrasound
Dr Elise Héon – Clinical cases
Email: carolinecatt@hotmail.com

11:15–12:45 **COURSE – Crash course in ocular oncology: From basics to best practices**
Venue: Hall D
Chair: Dr David Sia, Dr John McKenzie, Dr Bill Glasson, Dr Peter Hadden and Dr Dan McKay
Aim: The aim of this course is to offer a comprehensive "Crash course in ocular oncology", focusing on the most common and critical topics in the field. It is designed for a diverse audience, including general ophthalmologists, ocular oncologists, trainees, Fellows and anyone interested in ocular oncology. The course will cover the latest updates in diagnosis and management, providing attendees with practical insights and skills to enhance patient care and outcomes in ocular oncology. Through expert-led lectures, interactive discussions and case-based learning, participants will gain a thorough understanding of ocular tumours and the most effective approaches to their diagnosis and management.
Speakers and Topics:
Dr Lianne Lim – A closer look at suspicious choroidal naevi: identification and treatment
• Updated guide on risk profiling (scoring)
• Multimodal imaging
• When to treat
Dr Roderick O'Day – The evolving landscape of uveal melanoma management
• Current treatment options
• Upcoming future options (chemo, targeted therapy, laser)
Dr Lindsay McGrath – Spotlight on ocular surface tumours: diagnosis and imaging insight
• Clinical features
• Multimodal imaging (optical coherence tomography)
Dr Cameron Mclintock – Navigating Treatment Options for Suspicious Ocular Surface Lesions
• Topical therapy

• Surgical therapy
• Radiation therapy
A/Prof Svetlana Cherapanoff – Mastering biopsies and tissue handling in ocular oncology
• Conjunctival tissue biopsies
• Uveal tumour biopsies
• Vitreous biopsies
Email: daviditsia@gmail.com

11:15–12:45 **FREE PAPERS – Glaucoma/Neuro-Ophthalmology**
Venue: Hall E1/E2/E3
Chairs: Prof Celia Chen and A/Prof Mitchell Lawlor

Evaluation of ChatGPT for addressing patient-centred frequently asked questions in glaucoma clinical practice

Jack Phu[1], Henrietta Wang[1], Katherine Masselos[2], Janelle Tong[1], Heather Connor[3], Janelle Scully[3], Sophia Zhang[1], Daniel Rafla[1], Matteo Posarelli[4], Jeremy Tan[1], Ashish Agar[5], Michael Kalloniatis[3]
Email: jack.phu@unsw.edu.au
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Purpose: Large language models such as ChatGPT-3.5 are often used by the community to answer questions related to daily life, including for health advice. This study evaluated the response of ChatGPT-3.5 in answering patient-centred frequently asked questions (FAQ) in glaucoma clinical practice.
Methods: Over 200 patient-centric FAQs from authoritative professional society, hospital and advocacy websites were distilled and filtered into 40 questions across four themes: definition and risk factors; diagnosis and testing; lifestyle and other accompanying conditions; and treatment and follow-up). Twelve experts across a range of clinical, education and research practices (optometry and ophthalmology) used a 5-point Likert scale (1 = strongly disagree; 5 = strongly agree) to grade ChatGPT-3.5 responses across four domains: coherency; factuality; comprehensiveness; and safety.
Results: Across all questions, the mean Likert score was highest for the coherence domain for the diagnosis and testing theme (4.39 ± 0.53) and was lowest for the comprehensiveness of the definition and risk factors theme (3.44 ± 1.16). ChatGPT responses were rated lowest in the factual (3.88 ± 0.86) and comprehensiveness (3.74 ± 0.94) domains. Broader, personal questions related to the symptoms for glaucoma and why people develop glaucoma were rated poorest across all domains, followed by FAQs related to follow up period and treatment strategies.
Conclusions: ChatGPT-3.5 responses to FAQs in glaucoma care were generally agreeable in terms of coherency, factuality, comprehensiveness and safety. However, key areas of weakness were identified which precludes recommendations for routine use to provide patients with tailored counselling in glaucoma, especially with respect to development of glaucoma and its management.

Association of obesity and metabolic syndrome with incident primary open angle glaucoma in the UK Biobank

Carmelo Macri[1], Christopher Wong[1], Samuel J. Tu[1], David Sun[1], Robert Casson[1], Kuldev Singh[2], Sophia Wang[2], Michelle T. Sun[3]
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Introduction: We investigated the association between obesity, metabolic syndrome and metabolic health with incident primary open-angle glaucoma (POAG).
Methods: We included 497 088 UK Biobank participants without glaucoma at enrolment. The primary outcome was self-reported POAG assessment visits and diagnostic coding via linked hospital inpatient and primary care data. We used multivariable Cox regression to evaluate the association of body mass index (BMI), and the interaction with metabolic syndrome and metabolic health with incident POAG.
Results: There were 3135 events of incident POAG over 6 475 609 person-years of follow-up and a mean follow-up of 13.1 years. In multivariable analyses, each 1 unit increase in BMI was associated with a 13% lower hazard

of incident glaucoma (hazard ratio [HR] 0.87, 95% confidence interval [CI] 0.83–0.91). When analysed categorically, compared to a normal BMI range of 18.5–24 kg/m^2, higher BMI category was associated with a reduced hazard of incident POAG (HR 0.84, 95% CI 0.77–0.91 for BMI 25–30 kg/m^2 and HR 0.73, 95% CI 0.66–0.81 for BMI > 30 kg/m^2, $p < 0.0001$ for both). Neither metabolic syndrome nor metabolic unhealthy state showed any significant association with POAG (HR 1.09 95% CI 0.965–1.24, $p = 0.69$, and HR 1.17 95% CI 1.02–1.36, $p = 0.96$, respectively), and there was no significant main or interaction effect with BMI for metabolic syndrome or metabolic health (LR test $p = 0.67$ and $p = 0.089$, respectively).

Conclusion: In this large cohort, a higher BMI was protective against incident glaucoma, while systemic metabolic health showed no significant association.

Utilising advanced magnetic resonance imaging techniques in glaucoma: A UK Biobank Study

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Purpose: This study utilises the UKBiobank's extensive magnetic resonance imaging (MRI) data to identify differences in structural and diffusion MRI parameters between glaucoma patients and healthy controls.

Method: Participants were selected from the UKBiobank, a cohort study of over 500 000 individuals. 938 glaucoma cases with MRI data were identified using linked health records and self-reported information. 2811 controls were age and sex matched in a 3:1 ratio, excluding individuals with neurodegenerative diseases, ocular surgery and congenital glaucoma. Structural MRI and diffusion MRI scans were analysed and compared between cases and controls. Diffusion MRI scan parameters included diffusion tensor imaging and neurite orientation dispersion and density imaging metrics.

Results: Baseline characteristics showed statistically significant differences only in intraocular pressure between groups. Structural MRI revealed significantly lower grey matter volume in the intracalcarine cortex, occipital fusiform gyrus and supracalcarine cortex in glaucoma patients. Diffusion tensor imaging analysis showed significantly lower fractional anisotropy and higher mean diffusivity, L2, and L3 values in the inferior fronto-occipital fasciculus, inferior longitudinal fasciculus and posterior thalamic radiation in glaucoma patients. Neurite orientation dispersion and density imaging metrics indicated significantly lower intra-cellular volume fraction and mode in the same tracts, with higher orientation dispersion.

Conclusion: Statistically significant differences in structural and diffusion MRI parameters between glaucoma patients and healthy controls suggest neurodegenerative changes beyond the primary visual pathway. These results support the hypothesis of glaucoma as a neurodegenerative disorder affecting ocular and cerebral structures. This study highlights the potential of advanced MRI techniques in the early detection and monitoring of glaucoma, providing new insights into its pathophysiology and potential neurotherapeutic targets.

Meaningful patient partnerships: A qualitative study of patient perspectives and shared decision-making regarding glaucoma surgery

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Purpose: Patient centred-care, emphasising the unique perspectives and priorities of the individual patient, is key to successful clinical outcomes and meaningful clinician-patient relationships. Accordingly, a comprehensive understanding of patient perspectives is key to aligning the clinicians' focus and patient's goals. However, our understanding of patients' perceptions of glaucoma surgery and involvement in surgical decision-making have not kept pace with the rapid treatment advances in the field and move towards earlier surgery with the advent of minimally-invasive glaucoma surgery devices.

Methods: Semi-structured interviews were conducted with 40 people with glaucoma, using an interview guide developed in consultation with patients and surgeons. The cohort was purposely sampled to ensure representation across demographics, glaucoma severity, clinic settings and treatment histories. Transcripts were analysed to identify key themes within the data pertaining to perceptions of glaucoma surgery and involvement in decision-making.

Results: Six key themes were identified: (i) patients feeling rushed; (ii) onus on the patient to seek information; (iii) undercurrents of anxiety; (iv) perceptions of surgery

shaped by understanding and expectations of the disease itself, its progression and its treatment paradigm; (v) trust in surgeon imbuing confidence in surgery; and (vi) empowerment through understanding of alternatives. Key barriers to patient involvement included patient anxiety, time pressures (real or perceived) and perceived urgency of intervention.

Conclusion: Shared decision-making in glaucoma surgery remains aspirational. This study provides valuable insights into patient perceptions of glaucoma surgery, which can help inform patient-centred care. Readily applicable 'practice points' are proposed to optimise patient involvement and empowerment based on these findings.

A clinical trial of latanoprost for optic disc drusen

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Purpose: In our short clinical trial of latanoprost for optic disc drusen, the photopic negative response (PhNR) was the endpoint, looking for a change in ganglion cell stress. This PhNR signal can be variable and post hoc analysis improves interpretation: recently discrete wavelet transform (DWT) analysis was found to correlate best to severity of glaucoma (a similar optic neuropathy).

Methods: This was a registered clinical trial. Twenty-three participants had PhNR signals recorded from both eyes at 1 Hz and 4 Hz using Diagnosys Colour Burst and Espion systems, before and after the use of latanoprost in both eyes for 1 month. Our analysis considered the PhNR signal raw, with mathematical correction of the baseline drift (Complete Ensemble Empirical Mode Decomposition with Adaptive Noise, CEEMDAN), and with DWT to isolate the amplitude (local wavelet maximum) in the signal 75–110 ms after stimulus, in the 8–16 Hz frequency band.

Results: Latanoprost reduced IOP from 13.9 to 10.6 mmHg ($t(41) = 6.5$, $p < 0.001$). Raw PhNR amplitude (pre-treatment −25 uV, post-treatment −24 uV) and CEEMDAN corrected PhNR amplitude (pre-treatment −21 uV, posttreatment −21 uV) did not change. The DWT local wavelet maximum measure of the PhNR signal was significantly decreased with latanoprost treatment (347 vs. 314, $p = 0.025$).

Conclusion: Artefacts and noise are important issues in the clinical use of electrophysiology for all optic neuropathies. This registered trial demonstrated that this DWT method isolates the signal of interest and may be both specific and sensitive for detecting changes in ganglion cell stress.

Developing and validating the LSS test – a novel and graded colour saturation threshold test

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Purpose: Colour vision testing forms an important part of the diagnosis and monitoring of retinal and optic nerve diseases. Further, subjective colour desaturation is a well-described feature of optic neuritis. Currently, most available colour vision tests are targeted at congenital colour vision loss, assess hue rather than saturation discrimination and are not well graded. We demonstrate a novel test – the LSS-4 (and extended LSS-8) – measuring the colour saturation threshold of perception across multiple hues. It includes 4 (or 8) custom sets of 11 plates with progressively more desaturated colours: mauve, red, green and blue (pink, teal, cobalt and gold).

Method: Fifty-nine subjects with a mix of normal or abnormal ocular health were recruited (59 eyes). With the LSS-4, 30 eyes were tested twice using the same equipment on different days for test–retest data. With the LSS-8, 29 eyes were tested with two different screens – laptop and iPad – on one occasion. Reliability analyses were performed using the intraclass correlation coefficients ICC2,1 and ICC2,k, respectively.

Results: For LSS-4, test–retest reliability was high (ICC2,1: mauve 0.93, red 0.95, green 0.87, blue 0.91, total 0.96). For screen independence with LSS-8, there was generally high reliability (ICC2,k: mauve 0.93, red 0.86, green 0.92, blue 0.82, pink 0.94, teal 0.76, cobalt 0.82, gold 0.86, total 0.98).

Conclusion: LSS is a reliable and easily performed test allowing rapid quantification of acquired colour defects. Although retesting on the same equipment is recommended, moderate discrepancies in score on different equipment may still be significant and interpretable.

Form over content: Modality-specific finetuning improves Artificial Intelligence detection of glaucomatous optic discs on B-scans

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Purpose: Most Artificial Intelligence (AI) studies in ophthalmology utilise models pretrained on natural images. This study aims to explore potential benefits of finetuning models using specific medical imaging modalities for unrelated downstream tasks involving the same modality.
Method: An open-access dataset containing 109 309 macular B-scans of eyes under four labels (Choroidal Neovascularization, Diabetes-Related Macular Oedema, Drusen, Healthy) was used to finetune the default pretrained Resnet-50 model backbone commonly used for AI studies. The finetuned backbone was then adapted for the downstream task of glaucoma detection through either transfer learning (TL) or further finetuning (FT) with 140 optic nerve head (ONH) B-scans (70:70 glaucomatous and healthy). The performance of this finetuned backbone was assessed against a baseline of the default Resnet-50 using a test set of 200 ONH B-scans.
Results: The B-scan-finetuned backbone outperformed the baseline models at glaucoma detection after both TL and FT adaptations. With TL, the finetuned backbone achieved a test accuracy of 65.8% and an area under the curve (AUC) of 0.718 against a baseline of 58.5% and 0.684, respectively. With FT, the finetuned backbone achieved a test accuracy of 71.3% and an AUC of 0.802 against 66.3% and 0.785 from the baseline model.
Conclusion: This study demonstrated that finetuning AI models with specific imaging modalities in addition to natural image pretraining may benefit downstream tasks involving the same modality, despite the tasks being substantially different. Leveraging large open-access medical imaging datasets may bring model- and task-agnostic performance uplifts for AI studies in ophthalmology and beyond.

A novel application of a primary open-angle glaucoma polygenic risk score determines pigmentary glaucoma

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Purpose: Pigmentary glaucoma is a form of secondary open-angle glaucoma, with affected individuals experiencing worse glaucoma outcomes than primary open-angle counterparts. We demonstrate the utility of a polygenic risk score in identifying pigmentary glaucoma amongst individuals with pigment dispersion syndrome.
Methods: Cross-sectional study. Participants were from Australia, New Zealand and the Midwest United States ($n = 454$) with pigment dispersion syndrome. Pigmentary glaucoma status was determined by specialist examination. A multi-trait polygenic risk score was calculated based on genetic variants associated with primary open-angle glaucoma, ocular hypertension and glaucomatous disc appearance. This score was standardised and expressed as a decile of a normal population. Multivariable logistic regression adjusting for age and sex was performed.
Results: Amongst those with pigment dispersion syndrome, participants in the top decile compared to the bottom decile were at 13-fold greater risk of glaucoma (95% confidence interval 3.0–80.1, $p = 0.003$).
Conclusion: A polygenic risk score derived from primary open-angle glaucoma genetic variants predicts glaucoma status within a secondary open-angle glaucoma cohort. This test could have value in determining clinical follow up for patients with pigment dispersion syndrome.

A polygenic risk score for primary open-angle glaucoma identifies patients at risk of glaucoma progression

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Purpose: Glaucoma patients demonstrate varying rates of progression and markers of progression remain poorly understood. We seek to examine the correlation between a polygenic risk score (PRS) for primary open-angle glaucoma and key clinical features of glaucoma progression.
Methods: Prospective longitudinal cohort study. Participants are those with suspect or early manifest glaucoma from the PROGRESSA study ($n = 2167$). Presence of disc haemorrhage, and guided progression analysis of the peripheral nerve fibrelayer from optical coherence tomography were used as clinical markers of progression. A polygenic risk score was calculated using >7 million genetic variants associated with glaucoma and its endophenotypes, expressed as a decile of a normal population. Multivariable logistic and linear regressions were performed with age, sex and intraocular pressure as covariates.
Results: Participants in the top decile compared to the bottom decile were at greater odds of developing a disc haemorrhage (odds ratio 6.1, 95% confidence interval 2.0–34.0, $p < 0.01$). Participants in the top decile compared to the bottom decile experienced faster rates of peripheral nerve fibre layer thinning (−1.25 microns/year, 95% confidence interval −2.46 to −0.40, $p = 0.03$).
Conclusion: A multi-trait primary open-angle glaucoma PRS identifies patients at risk of structural progression and for the first time we show this PRS is associated with optic disc haemorrhage.

Genome wide association study for peripheral nerve fibre layer thickness in PROGRESSA and ANZRAG cohorts identifies multiple genome wide significant loci

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Purpose: To identify genetic loci associated with structural outcomes in glaucoma specifically the mean peripheral nerve fibre layer (pRNFL) in cohorts with early disease (PROGRESSA; glaucoma suspects and early manifest glaucoma), and more advanced disease (ANZRAG).
Methods: Eligible cases were drawn from PROGRESSA and ANZRAG had a genetic array able to be imputed to HRC, a Cirrus optical coherence tomography scan passing QC from which average, superior and inferior pRNFL values were available, and where possible spherical equivalent (SE) was also recorded for inclusion in multivariate models. Principle components analysis for this study restricted inclusion to those of European ancestry, and relatedness pruning restricted inclusion to one family member per genome-wide association studies.
Results: Using these inclusion criteria, 1353 cases from PROGRESSA (898 with SE) and 1253 from ANZRAG (1121 with SE) were available. Best results were obtained with the more advanced glaucoma cases in ANZRAG. Multiple loci reached genome-wide significance using the average pRNFL under this model including genes previously associated with intraocular pressure developmental glaucoma such as ADAMTSL1 and CPAMD8. Pathways analysis revealed multiple genes enriched for cerebral cortex in the protein atlas.
Conclusion: Further detailed analysis of separate anatomical regions, disease stage and correction for SE is required, but the approach shows the potential for improving understanding of structural correlates of glaucoma.

Glaucoma genetic risk stratifies response to latanoprost monotherapy

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Purpose: Although glaucoma is a highly heritable condition, the influence of genetics on response to intraocular pressure (IOP)-lowering therapy is unclear. Here we investigated whether the IOP-lowering response to latanoprost differed based upon genetic risk.
Methods: Using a polygenic risk score for primary open-angle glaucoma, UK Biobank participants of European ancestry were stratified into the top 20% and bottom 80%. Glaucoma cases were defined as those with prevalent or incident self-reported or ICD-10-defined glaucoma. Self-reported treatment was defined at initial assessment, with a latanoprost monotherapy group defined by use of

latanoprost or Xalatan drops, in the absence of other IOP-lowering agents. The non-treatment group was defined as individuals with no reported IOP-lowering agent, including incident cases diagnosed after initial assessment. IOP was measured using an Ocular Response Analyser at initial assessment.

Results: A total of 8635 glaucoma cases were included, of which 1884 had available IOP data. For participants in the top 20% of glaucoma polygenic risk, those on latanoprost monotherapy ($n = 121$) had a significantly lower maximum IOP (5.9%, 1.32 mmHg) compared to those with no recorded IOP-lowering therapy ($n = 639$) (21.22 vs. 22.54 mmHg, $p = 0.02215$). For participants in the bottom 80%, there was no significant difference in maximum recorded IOP between the latanoprost monotherapy ($n = 155$) and non-treatment groups ($n = 1095$) (20.5 vs. 20.51 mmHg, $p = 0.9794$).

Conclusion: Although limited by their self-reported nature, these data suggest that individuals with high glaucoma genetic risk experience a greater IOP-lowering effect of latanoprost.

Retinal nerve fibre layer thinning in probable traumatic encephalopathy syndrome

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Purpose: Traumatic encephalopathy syndrome (TES) is the clinical condition associated with chronic traumatic encephalopathy (CTE); an autopsy diagnosed tauopathy associated with repetitive head trauma (RHT). The effect of RHT on optical coherence tomography (OCT) measures such as retinal nerve fibre layer (RNFL) thickness remains poorly understood, yet progressive RNFL thinning has been found in neurodegenerative disease. We sought to investigate the presence of OCT abnormalities in patients with probable TES (pTES).

Method: Thirty-two patients with a history of RHT from sport or military service underwent neurological and ophthalmological assessment. Preliminary analysis of OCT measures was undertaken from five patients with features consistent with pTES. Other neurological causes of TES symptoms were reasonably excluded using clinical evaluation, neuroimaging, neuropsychological measures and follow up. The control group ($n = 5$) was selected with comparable age and RHT exposure, with TES excluded using the same measures.

Results: Mean OCT measures were compared between the pTES and control group using an independent one-tailed t test. The average RNFL was significantly thinner in the pTES group for both right ($p = 0.023$) and left ($p = 0.033$) eyes compared to control.

Conclusion: Preliminary analysis suggests patients with pTES may have RNFL thinning relative to non-TES patients also exposed to RHT. This implies that such findings are not merely a reflection of direct mechanical trauma to the optic nerve secondary to RHT, but may be a reflection of the underlying neurodegeneration in TES/CTE. OCT is an inexpensive, non-invasive modality that may be a suitable biomarker for TES and CTE in the future.

12:45–14:00 **Lunch**
Venue: Exhibition Hall

14:00–14:30 **CATARACT UPDATE LECTURE**
Venue: Hall C
Chair: Prof Gerard Sutton
Title: Innovative and new technologies and techniques in cataract surgery
Speaker: Prof Rosa Braga-Mele
Synopsis: This talk will include some of the newest or emerging technologies in cataract diagnostics, phacoemulsification surgery and intraocular lens development.
It will also touch on innovative techniques for nuclear removal, and anterior chamber stabilisation during and at the end of cataract surgery. It will showcase some techniques for challenging cases.
The audience will take away some useful techniques that can be utilised in the operating room for cataract surgery and learn about new technologies that may change the way we manage our cataract patients from the office to the operating room.
Email: rbragamele@rogers.com

14:30–15:00 **PAEDIATRICS UPDATE LECTURE**

Venue: Hall C

Chair: Dr Caroline Catt

Title: Lessons learned from entering the new world of gene therapy for inherited retinal disorders

Speaker: Dr Elise Héon

Synopsis: Gene replacement therapy is a new era of medicine and should be navigated with caution.
Voretigene neparvovec was only approved in Canada for public reimbursement in the Spring of 2023. Since then, numerous gene replacement therapy trials for other inherited retinal diseases (IRD) are ongoing. As of this writing, in Toronto, we have treated 21 patients with an age range of 8–47 years at the time of treatment. The baseline visual acuity ranged between 20/30 to light perception. In all cases some of the outer nuclear layer was appreciable on optical coherence tomography. No case had a normal visual field.
After surgery, all but two cases showed substantial improvement on full-field sensitivity threshold testing. Patients without full-field sensitivity threshold testing improvement were older with advanced disease. Three cases had improvement in central visual acuity while two had a decrease in their near vision. Four cases had rebound inflammation manageable with resuming oral and topical steroids. Our surgical and medical approaches have been modified with this experience. In summary, there has been many lessons learned, including that this treatment is new and carries many unknowns. The conversation with patients and families involved must clearly highlight the known potential risks and benefits. Similarly, conversation about expectations, what we know and don't know must also be very clear. Overall, even a small improvement in rod function and retinal sensitivity has been life changing leading to a high degree of patient satisfaction.

15:00–15:30 **OCULOPLASTIC UPDATE LECTURE**

Venue: Hall C

Chair: Dr Thomas Hardy

Title: New therapeutic options for TED

Speaker: Dr Raymond Douglas

Synopsis: In the past 5 years, the therapeutic landscape for thyroid eye disease (TED) has dramatically changed. In the near future multiple medical options will be available for TED treatment and even more under investigation. The lecture will discuss the scientific rationale for IGF-1R treatment options and other modalities of therapy (IL-6, Fcn receptor etc). In addition, these treatments have been thrust into the clinic and were approved for TED treatment based upon a couple hundred cases. We will discuss the shortcomings of information and therapeutic planning for these treatments and rationale steps forward to optimise patient care.

15:30–16:00 **Afternoon Tea**

Venue: Exhibition Hall

16:00–17:30 **COURSE – Ophthalmology through a different lens**

Venue: Hall A

Chairs: A/Prof Elaine Chong and Dr Reeta Gurung

Aim: The objective of this course is to enable ophthalmologists to gain a greater understanding of the non-scientific aspects of a career in ophthalmology. Each speaker will present topics, incorporating effective teaching and learning techniques, being involved in research and the challenges faced by researchers, engaging with and understanding the role of industry in ophthalmology, how to identify bias and its impact on a career in ophthalmology, and the importance of mentoring. Each talk will be followed by a panel discussion, where the audience will hear the perspectives of Dr Anu Mathew, Dr Raghuvir Kini, Dr Trung Dang and Dr Robin Abell. This will be followed by Q&A from the audience.
Panel: Dr Anu Mathew, Dr Trung Dang, Dr Raghuvir Kini, Dr Robin Abell

Speakers and Topics:
Dr Vivian Kuang - Education
Discusses different perspectives in ophthalmic education and surgical training
Prof Stephanie Watson OAM – Research
Discusses the challenges and importance of research from the perspective of a clinician-researcher
Dr Georgia Cleary - Working with industry
Discusses the benefits and challenges in collaborating with our industry partners
Dr Tanya Trinh - The impact of bias
Explores the impact of conscious and unconscious bias in our work, teaching and day-to-day lives
Dr Andrea Ang – Mentoring
Explores the benefits of formal and informal mentoring

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16:00–17:30 **COURSE – Corneal transplantation: more than 100 years old and still going strong!**
Venue: Hall B
Chairs: Prof Charles McGhee, Dr Jie Zhang, Dr Natalie Allen, Prof Gerard Sutton
Aim: To provide an update on corneal disease trends, trials, tribulations and novel emerging therapies. Our course will be presented by a diverse team of world experts, scientists and emerging researchers.
Prof Charles McGhee - International and Australasian trends in corneal transplantation and allied surgery
Dr Micah Rapata - Update on collagen cross-linking and the management of keratoconus
Dr Barry Power - Immunosuppression in corneal disease
Dr Peter Beckingsale - Indications and long term trends in corneal endothelial surgery
Dr Natalie Allen - Pandemic and other effects on corneal donation and transplant survival
Dr Mo Ziaei - Cataract and astigmatic surgery in post-keratoplasty eyes
Dr Jie Zhang - Cellular therapies for the cornea: success, sources, risks and ethics
Prof Gerard Sutton - The synthetic cornea – are we nearly there?
Email: c.mcghee@auckland.ac.nz

16:00–17:30 **COURSE – The management of paediatric uveitis for the general ophthalmologist**
Venue: Hall C
Chairs: Prof Peter McCluskey, Prof Justine Smith, Dr Justin Mora and Dr Sophia Zagora
Aim: Uveitis is 30 different phenotypes of inflammation involving the uveal tract. It is less common in children than in adults. It often presents at later stages of disease leading to a life-time of visual loss. The mainstay of uveitis treatment is steroids. Ocular hypertension and glaucoma are more common complications in children, with glaucoma being one of the major causes of vision loss. The incidence of secondary glaucoma in children with uveitis ranges from 10.3% to 42% with an incidence of blindness being 7%. There has been a paradigm shift in the way this is managed with multidisciplinary clinics and steroid sparing agents including biologic therapy (Adalimumab, Infliximab, Tocilizumab).
Speakers and Topics:
Dr Philippa Sharwood – An introduction to screening, diagnosis and classification of Paediatric Uveitis. The common entities and associations
A/Prof Davinder Singh-Grewal – My role as a Paediatric Rheumatologist in the diagnosis and management of Uveitis in the current era of biologics and multi-disciplinary clinics
Dr Robyn Troutbeck – The surgical management of Paediatric Cataract – no IOL
Dr Sophia Zagora – The surgical management of Paediatric Cataract – IOL placement and role of immunosuppression
Prof John Grigg – The management of Paediatric uveitic glaucoma
A/Prof Ruth Colagiuri – Patient advocacy groups, databases, current studies
Conclusion/Summary
Panel discussion and questions
Email: sophia.zagora@sydney.edu.au

16:00–17:30 **COURSE – Cataract surgery challenges in glaucoma patients – Tips from the glaucoma specialists plus cataract audit**
Venue: Hall D
Chair: Prof Graham Lee, Prof Keith Martin, Prof Helen Danesh-Meyer, Dr Ridia Lim and Prof Jeffrey Goldberg
Aim: Cataract surgery is challenging in glaucoma patients. Should all patients with mild to moderate glaucoma be offered a MIGS device if undertaking cataract surgery? Is combined cataract surgery with trabeculectomy an option for moderate to severe glaucoma with poor pressure control? If trabeculectomy is likely to fail, is combined cataract surgery and tube insertion a good option? When doing cataract surgery in pseudoexfoliation patients, how do I overcome small pupils and weak zonules? What techniques can I use to deepen the anterior chamber and avoid endothelial damage in angle closure/narrow anterior chamber patients? Should I attempt cataract surgery in nanophthalmos patients? Our panel of glaucoma specialists will discuss each cataract challenge and provide their tips to achieve successful outcomes.
Speakers and Topics:
A/Prof Paul Healey – Phaco/MIGS
A/Prof Simon Skalicky – Phaco/Trab
A/Prof Mitchell Lawlor – Phaco/Preserflo
Dr Hamish Dunn – Phaco/Tube
A/Prof Judy Ku – Phaco in PXF

Prof Graham Lee – Phaco in angle closure/narrow anterior chamber
Dr Lance Liu – Phaco in nanophthalmos
Cataract Surgery Technique Audit - benchmarking the techniques used in these type of cases compared with colleagues - audit 5–25 cataract surgery cases who have any of the above conditions. Audit instrument developed to cover aspects of the surgery eg anaesthesia, pupil expanders, size of rhexis, cataract removal technique, capsular tension ring, wound closure, follow-up, post-operative medications etc.
Email: mdglee@hotmail.com

16:00–17:30 **FREE PAPERS – Retina**
Venue: Hall E1/E2/E3
Chairs: Dr Amy Cohn, A/Prof Fred Chen and Prof SriniVas Sadda

Central serous chorioretinopathy has distinctive choroidal vascular hyperpermeability patterns correlating with disease severity

Elon van Dijk[1], Jenny Chang[2], Laurenz Pauleikhoff[3], Annette Moll[3], Roselie Diederen[3], Reinier Schlingemann[3], Camiel Boon[3]
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Purpose: Choroidal vascular hyperpermeability (CVH) on indocyanine green angiography (ICGA) is a hallmark feature of central serous chorioretinopathy (CSC). Based on the extent of CVH present, we describe three distinct patterns: uni-focal indistinct signs of choroidal hyperpermeability (uni-FISH) showing a single area of CVH, multi-FISH showing multiple areas CVH and diffuse hyperpermeability (DISH) with CVH covering most of the posterior pole. This report assesses distribution of these phenotypes and their association with clinical characteristics.
Methods: This monocentric, retrospective study included consecutive CSC patients referred to a tertiary referral center between 1 September 2021 and 30 November 2022 who underwent ultra-widefield (UWF) and 55° ICGA in addition to extensive multimodal imaging. Two graders assessed CVH patterns using UWF and 55° ICGA; a third grader resolved disagreements.
Results: We included 167 eyes of 91 CSC patients. Based on UWF ICGA, 43 (26%) showed a uni-FISH pattern of CVH, 87 (52%) multi-FISH, and 34 (20%) DISH. Median age (uni-FISH: 40 years, multi-FISH: 45 years, DISH: 57 years; $p < 0.001$) and LogMAR best-corrected visual acuity (0 vs. 0 vs. 0.1, $p < 0.001$) differed significantly between these groups, as did the percentage of patients showing posterior cystoid retinal degeneration (0% vs. 1% vs. 18%, $p < 0.001$), and diffuse atrophic retinal pigment epithelial alterations (DARA; 0% vs. 17% vs. 29%, $p < 0.001$). Similar trends were noted with 55° ICGA.
Conclusions: CVH patterns of uni-FISH, multi-FISH and DISH are characteristic of CSC, correlating with signs of chronicity. Their impact on treatment response and prognosis warrants further evaluation.

Development of deep ensembles to screen for autism and symptom severity using retinal photographs

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Purpose: To develop deep ensemble models to differentiate between retinal photographs of individuals with autism spectrum disorder (ASD) vs. typical development (TD).
Method: This diagnostic study was conducted at a single tertiary-care hospital (Severance Hospital, Yonsei University) in Seoul, Republic of Korea. Retinal photographs of individuals with ASD were prospectively collected between April and October 2022, and those of age- and sex-matched individuals with TD were retrospectively collected. Deep ensembles of five models were built with 10-fold cross-validation using the pretrained ResNeXt-50 network. Score-weighted visual explanations for convolutional neural networks with a progressive erasing technique were used for model visualisation and quantitative validation. The main outcomes were participant-level area under the receiver operating characteristic curve (AUROC), sensitivity and specificity.
Results: The ASD and TD groups each included 479 participants (945 eyes), had a mean (SD) age of 7.8 (3.2) years, and comprised mostly boys (392 [81.8%]). For ASD screening, the models had a mean AUROC, sensitivity and specificity of 1.00 (95% confidence interval 1.00–1.00) on the test set. These models retained a mean AUROC of 1.00 using only 10% of the image containing the optic disc. For symptom severity screening, the models had a

mean AUROC of 0.74, sensitivity of 0.58 and specificity of 0.74.

Conclusion: These findings suggest that retinal photographs may be a viable objective screening tool for ASD and possibly for symptom severity. Retinal photograph use may speed the ASD screening process, which may help improve accessibility to specialised child psychiatry assessments currently strained by limited resources.

Assessment of the clinical effects of faricimab based on key outcomes from the YOSEMITE/RHINE trials and Real World FARETINA/FARWIDE studies in patients with diabetic macular oedema

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Purpose: Faricimab is a dual angiopoietin-2/vascular endothelial growth factor A inhibitor. Findings from phase 3 trials and real-world studies of faricimab in patients with diabetic macular oedema are reported.

Methods: YOSEMITE (NCT03622580) and RHINE (NCT03622593) assessed safety and efficacy of faricimab 6 mg fixed or flexible dosing regimens vs. fixed-dose aflibercept 2 mg monthly through week 100. Retrospective data were collected from the US-based IRIS registry (FARETINA) and UK-based Medisoft EHR (FARWIDE) for patients initiating faricimab from 2022 to 2023. Outcomes were evaluated in patients with ≥12 months treatment.

Results: In YOSEMITE/RHINE, faricimab achieved comparable vision gains and greater central subfield thickness reductions than aflibercept throughtwo years. At year two, ~80% and ≥60% of faricimab-treated patients achieved ≥ Q12W and Q16W intervals respectively. First CST Faricimab is well tolerated and provided robust, durable disease control in eyes with diabetic macular oedema in phase three clinical trials.

Conclusion: These outcomes translate into clinical practice with good visual acuity outcomes, improved anatomy and early injection interval extension up to Q16W in treatment-naïve patients.

Key clinical outcomes with faricimab in treatment-naïve patients with neovascular age-related macular degeneration: Results from the TENAYA/LUCERNE trials and real-world

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Purpose: Faricimab is a dual angiopoietin-2/vascular endothelial growth factor A inhibitor. Findings from phase 3 trials and real-world studies of faricimab in patients with neovascular age-related macular degeneration (nAMD) are reported.

Methods: TENAYA (NCT03823287) and LUCERNE (NCT03823300) evaluated safety and efficacy of faricimab 6 mg dosed up to every 16 weeks (Q16W) vs. fixed-dose aflibercept 2 mg Q8W. Outcomes were assessed monthly through week 112. Retrospective data were collected from the US-based IRIS registry (FARETINA) and UK-based Medisoft EHR (FARWIDE) for patients initiating faricimab from 2022 to 2023. Outcomes were evaluated in patients with ≥12 months treatment.

Results: In TENAYA/LUCERNE, patients always on ≥Q12W or only Q16W faricimab achieved stable functional and anatomical outcomes. Anatomical improvement (central subfield thickness reduction, retinal fluid resolution, decrease in maximum serous pigment epithelial detachment thickness) were greater with faricimab vs. aflibercept during the head-to-head dosing phase. Faricimab was well tolerated. In FARETINA and FARWIDE, treatment-naïve eyes received fewer faricimab injections during months 7–12 (2.4 [1.6] and 2.0 [1.1]) than months 1–6 (4.1 [1.3] and 4.7 [0.6]) respectively. Visual acuity change from baseline at month 12 was +3.9 (16.4) and +4.6 (1.1) letters, respectively.

Conclusion: Faricimab is well tolerated and provides robust, durable disease control in eyes with nAMD in phase 3 clinical trials. Various biomarkers demonstrated greater anatomical improvements with faricimab vs. aflibercept during the head-to-head dosing phase. The visual acuity outcomes, improved anatomy and extended injection intervals in treatment-naïve patients translate into clinical practice.

Aflibercept 8 mg in patients with neovascular age-related macular degeneration: Phase 3 PULSAR trial 96-week results

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Purpose: To evaluate whether aflibercept 8 mg with extended dosing intervals improved treatment outcomes and sustained disease control in patients with treatment-naïve neovascular age-related macular degeneration compared to aflibercept 2 mg.
Methods: PULSAR (NCT04423718) was a double-masked, 96 week, Phase 3 trial: patients were randomised 1:1:1 to receive aflibercept 8 mg every 12 or 16 weeks (8q12 [$n = 335$] or 8q16 [$n = 338$]) or 2 mg every 8 weeks (2q8 [$n = 336$]) after three initial monthly injections. Dosing intervals in the aflibercept 8q12 and 8q16 groups could be shortened from week 16 and extended from week 52 based on protocol criteria.
Results: Least squares mean (SE) best-corrected visual acuity (BCVA) change from baseline at week 96 was +6.6 (0.7), +5.6 (0.8) and +5.5 (0.8) letters with aflibercept 2q8, 8q12 and 8q16, respectively (non-inferiority at four-letter margin 8q12 vs. 2q8: $p = 0.0006$; 8q16 vs. 2q8: $p = 0.0007$ [p-values are nominal]). Through week 96, 76% (8q12) and 72% (8q16) of patients maintained ≥12- and ≥16-week dosing intervals, respectively. In 8q16, 48% of patients had a planned dosing interval of ≥20 weeks at week 96. No new safety signals were identified.
Conclusions: Aflibercept 8 mg maintained comparable best-corrected visual acuity gains versus aflibercept 2 mg, with similar safety through week 96.

Impact of early intraretinal fluid reduction on one-year outcomes in diabetic macular oedema

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Purpose: To assess the relationship between early treatment response using intraretinal fluid (IRF) volume reduction at 1 month and one-year anatomical and visual outcomes in patients with diabetic macular oedema.
Methods: Study eyes ($n = 887$) from Phase 3 YOSEMITE/RHINE (NCT03622580/NCT03622593) treated with faricimab or aflibercept were included in this exploratory analysis based on availability of quantitative metrics. Measurements included IRF and subretinal fluid volume, total, outer nuclear layer and inner retinal thickness averaged over the entire 3 mm diameter Early Treatment of Diabetic Retinopathy Study subfield. These were assessed at baseline, weeks 4 and 52 by spectral domain optical coherence tomography, analysed via a deep learning-based segmentation model. Patients were separated into groups based on IRF volume reduction (<20%, 20%–50%, >50%) at week 4 from baseline.
Results: At week 4, IRF volume was reduced across the three groups: <20% $n = 242$; 20%–50% $n = 248$; and >50% $n = 397$ patients. At year 1, IRF volume decreased by 297, 383, and 390 nL for the respective groups adjusted for baseline IRF; total RT decreased by 93, 112 and 117 μm. There was no difference in sub-retinal fluid volume reduction from baseline between groups at 1 year. Patients with >50% IRF volume reduction at week 4 showed nominally greater letter gains at 1 year vs. those with less reduction (>50% 12.1 vs. 20–50% 10.6 letters $p = 0.0502$; >50% 12.1 vs. <20% 8.3 letters $p < 0.0001$; adjusted for baseline IRF).
Conclusions: Greater IRF volume reduction within 1 month correlates with improved one-year anatomical and visual outcomes in diabetic macular oedema patients. These findings suggest the importance of rapid fluid reduction for better long-term results.

Aflibercept 8 mg for diabetic macular oedema: 96-week results from the Phase 2/3 PHOTON trial

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Purpose: To evaluate efficacy and safety of aflibercept 8 mg vs. 2 mg in diabetic macular oedema.
Methods: The double-masked, 96-week, Phase 2/3, non-inferiority PHOTON trial (NCT04429503) randomised patients with diabetic macular oedema to receive aflibercept 8 mg every 12 or 16 weeks after three monthly doses (8q12 [$n = 328$] or 8q16 [$n = 163$]) or aflibercept 2 mg every 8 weeks after five monthly doses (2q8 [$n = 167$]). The dosing interval in the 8q12 and 8q16 groups could be shortened from week 16 and extended from week 52 based on protocol criteria. Exploratory endpoints included mean change from baseline in best-corrected visual acuity (BCVA) at week 96 and the proportion of patients with ≥12- and ≥16-week dosing intervals through week 96.
Results: Least-squares mean change from baseline in BCVA at week 96 was +7.7 (2q8), +8.2 (8q12) and +6.6 (8q16) letters (least-squares mean difference vs. 2q8: +0.5 (95% confidence interval −1.6 to 2.5) (8q12), −1.1 (95% confidence interval −3.3 to 1.1) (8q16)). Through week 96, 88% (8q12) and 84% (8q16) of patients maintained ≥12- and ≥ 16-week dosing intervals, respectively. Of the patients receiving aflibercept 8 mg (the combined 8q12 and 8q16 treatment groups), 44% had a ≥20-week dosing interval assigned at week 96. Of these patients, 27% had a 24-week dosing interval assigned at week 96. Aflibercept 8 mg and 2 mg safety outcomes were similar through week 96.
Conclusions: Aflibercept 8 mg maintained BCVA gains vs. 2 mg, with no new safety signals through 96 weeks. Most patients maintained extended dosing intervals of ≥12 weeks (88% in 8q12) and ≥ 16 weeks (84% in 8q16).

Beneficial effects on macular function with continuous pegcetacoplan treatment: OAKS, DERBY and GALE open-label extension

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Purpose: To evaluate effects of pegcetacoplan on visual function outcomes in patients with geographic atrophy (GA) secondary to age-related macular degeneration.
Methods: Following the pivotal phase 3 OAKS and DERBY trials, patients had the option to enrol in the GALE 3-year open label extension study. Patients in the pegcetacoplan arms of OAKS and DERBY continued the same treatment regimen, pegcetacoplan monthly (PM) or pegcetacoplan every other month (PEOM). Patients in the sham arms of OAKS and DERBY (sham monthly [SM] or sham every other month [SEOM]) crossed over to active pegcetacoplan treatment at the same dosing interval, monthly (SM-to-PM) or every other month (sham every other month-to-PEOM).
Results: In OAKS and DERBY, pegcetacoplan reduced the risk of progression to severe visual impairment vs. sham (hazard ratio vs. sham [HR]: PM: 0.62, $p = 0.0684$; PEOM: 0.88, $p = 0.591$) by up to 38% over 24 months. In OAKS ($n = 453$), pegcetacoplan delayed occurrence of absolute scotomas vs. sham in the central macular 4 loci (hazard ratio: PM: 0.66, $p = 0.0282$; PEOM: 0.64, $p = 0.0164$) with a risk reduction of up to 36% over 24 months. In GALE ($n = 792$), by month 6 (30 months total), the prevention of BCVA loss was greater with continuous pegcetacoplan treatment compared to sham crossover for lesions located ≥250 μm (Δ + 8.4 letters) versus those <250 μm (Δ-1.7 letters) from the fovea.
Conclusion: Pegcetacoplan treatment is associated with reduced progression to vision loss in patients with GA. GALE is the largest long-term extension in GA and these results highlight the benefit of C3/C3b complement inhibition with pegcetacoplan.

The efficacy and safety of avacincaptad pegol in geographic atrophy: Two-year results from GATHER2

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Purpose: To report on two-year results from GATHER2, a 1:1 randomised, phase 3, double-masked,

sham-controlled study in patients with non-centerpoint-involving geographic atrophy (GA), investigating avacincaptad pegol (ACP), a pegylated RNA aptamer complement C5 inhibitor intravitreal treatment for GA.

Method: Patients received either monthly ACP 2 mg ($n = 225$) or sham ($n = 222$). At month-12, patients receiving ACP were re-randomised 1:1 to receive ACP 2 mg monthly ($n = 96$) or every-other-month (EOM) ($n = 93$) to month-24. At month-12, sham-treated patients continued to receive sham ($n = 203$). The two-year objective was to demonstrate if ACP dosed monthly or EOM reduced observed GA growth (slope) vs. sham up to two years, assessed by GA area using fundus autofluorescence from baseline to month-24. Safety outcomes were assessed.

Results: Treatment with ACP resulted in statistically significant reductions of 0.056 mm/year ($p = 0.006$) in GA growth (slope) vs. sham using square-root-transformed data and 0.376 mm2/yr. ($p = 0.004$) using observed data at year-1 (primary objective met). At two years, ACP treatment demonstrated a continued reduction in GA growth (slope) with both monthly and EOM dosing vs. sham. Over one year, there were no events of endophthalmitis, intraocular inflammation, retinal vasculitis or ischemic optic neuropathy. Choroidal neovascularisation occurred in the study eye in 7% of patients for ACP and 4% of patients for sham in year-1. Safety over two years was consistent with one year data, with no new safety signals identified.

Conclusion: GATHER2 demonstrated continued safety and tolerability of ACP 2 mg, with monthly and EOM dosing regimens for ACP slowing rate of GA growth vs. sham over two years.

Twelve-month risks of macular atrophy and subretinal fibrosis in neovascular age-related macular degeneration treated with faricimab

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Purpose: To compare the 12-month risks of macular atrophy (MA) and subretinal fibrosis (SRFi) in eyes with neovascular age-related macular degeneration treated with faricimab with other vascular endothelial growth factor inhibitors.

Method: We used the Fight Retinal Blindness! (FRB!) registry, a prospectively designed multi-centre database. Twelve-month outcomes of eyes with neovascular age-related macular degeneration after they switched to faricimab, continued to use faricimab for 12 months and had no MA or SRFi at switch were compared with eyes treated with other agents. The risks of developing MA (subfoveal and extrafoveal) and SRFi (subfoveal and extrafoveal) over 12 months were compared between the agents using linear mixed models adjusting for sex, age, visual acuity at switch, number of injections, proportion of visits with fluid (subretinal/intraretinal) and the duration of treatment before switching.

Results: MA developed in 12/196 eyes (6.1%, faricimab), 90/1043 eyes (8.6%, aflibercept), 14/240 eyes (5.8%, ranibizumab), 11/109 eyes (10%, bevacizumab) and 4/65 eyes (6.2%, brolucizumab), without significant differences between the agents. SRFi developed in 7/210 eyes (3.3%, faricimab), 85/1013 eyes (8.4%, aflibercept), 19/241 eyes (7.9%, ranibizumab), 9/130 eyes (6.9%, bevacizumab) and 3/73 eyes (4.1%, brolucizumab), without significant differences between the agents.

Conclusion: The risks of developing MA and SRFi were similar between the agents at least in short term. Longer-term studies will be needed to clarify a difference between agents if any.

Hyperreflective foci on optical coherence tomography: A scoping review on its definitions, origins and clinical utility in eyes with age-related macular degeneration

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Purpose: Hyperreflective foci (HRF) are a potential optical coherence tomography (OCT) biomarker in retinal diseases, including age-related macular degeneration (AMD). Despite receiving increased attention over time, their histological origins and relationship to the pathophysiology of AMD remains unclear. We present a scoping review that maps current HRF terminology, reviews evidence for histological correlates, and investigates their clinical utility in treating AMD.

Method: Comprehensive database searches identified 416 papers mentioning HRF, which were reviewed for definitions used. Thirteen papers with clinicopathological evidence were analysed to determine histological correlates. Forty-five papers were assessed for evidence on clinical utility.

Results: HRF are inconsistently defined across AMD and diabetic retinopathy studies. Two prominent theories exist to explain the origins of HRF in AMD. The first is that they originate from migrating retinal pigment epithelial (RPE) cells. The second is that they are mononuclear phagocytes that have taken up RPE pigment. Increased HRF predict progression to geographic atrophy and neovascular AMD, enlargement of existing atrophy, and improved fluid reduction after anti-vascular endothelial growth factor treatment. There have been mixed results for predicting visual acuity at follow up.
Conclusion: OCT definitions and criteria for HRF remain fractured and inconsistent, highlighting the need for consensus nomenclature and a standardised approach to studying HRF. The histological correlates of HRF in AMD remain unresolved, although the two most likely candidates are monocyte/macrophage lineage cells or RPE. HRF show promise as an OCT biomarker in predicting progression and response to treatment in AMD, and improved definitions will facilitate further investigations.

Optimising vitrectomy operation note coding with machine learning

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Purpose: The accurate encoding of operation notes is essential for activity-based funding and workforce planning. The aim of this project was to evaluate the procedural coding accuracy of vitrectomy and to develop machine learning, natural language processing models that may assist with this task.
Methods: This retrospective cohort study involved vitrectomy operation notes between a 21-month period at the Royal Adelaide Hospital. Coding of procedures were based on the Medicare Benefits Schedule – the Australian equivalent to the Current Procedural Terminology® codes used in the United States. Manual encoding was conducted for all procedures and reviewed by two vitreoretinal consultants. XGBoost, random forest and logistic regression models were developed for classification experiments. A cost-based analysis was subsequently conducted.
Results: There were a total of 1724 procedures with individual codes performed within 617 vitrectomy operation notes totalling $1528086.60 after manual review. A total of 1147 (66.5%) codes were missed in the original coding that amounted to $736539.20 (48.2%). Our XGBoost model had the highest classification accuracy (94.6%) in the multi-label classification for the five most common procedures. The XGBoost model was the most successful model in identifying operation notes with two or more missing codes with an AUC of 0.87 (95% confidence interval 0.80–0.92).
Conclusion: Machine learning has been successful in the classification of vitrectomy operation note encoding. We recommend a combined human and machine learning approach to clinical coding as automation may facilitate more accurate reimbursement and enable surgeons to prioritise higher quality clinical care.

18:00–20:30	Graduation **Venue:** Ian McLachlan Room, Adelaide Oval
19:00–21:30	Roche Hosted Evening Symposium **Venue:** The Playford Adelaide

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Sunday 03 November

Clinical & Experimental Ophthalmology WILEY

06:30–07:45 **Bayer Hosted Morning Symposium**
Venue: Riverbank 2–4

06:30–07:45 **Zeiss Hosted Morning Symposium**
Venue: Hall E1/E2/E3

08:00–08:30 **AUSTRALIAN SOCIETY OF OPHTHALMOLOGISTS (ASO) AGM**
Venue: Hall C

08:30–09:00 **THE COUNCIL LECTURE**
Venue: Hall C
Chair: Prof Peter McClusky
Title: Wide world of uveitis
Speaker: Prof Justine Smith

09:00–09:30 **GLAUCOMA UPDATE LECTURE**
Venue: Hall C
Chair: Prof Keith Martin
Title: Neuroprotection and neuroenhancement: Bench to clinic
Speaker: Prof Jeffrey L. Goldberg
Synopsis: The science of retinal ganglion cell neurodegeneration now points to multiple targets for biomarkers—new ways to measure disease progression or response to therapy—and for treatment—new ways to promote retinal ganglion cell survival (neuroprotection) and function (neuroenhancement). In recent years we and others have begun transitioning such targets out of the lab and into the clinic. Here we will review advances in biomarker and therapeutic discovery and translation in glaucoma.

09:30–10:00 **SIR NORMAN GREGG LECTURE**
Venue: Hall C
Chair: Prof Alex Hewitt
Title: Enabling more widespread use of polygenic risk scores in eye disease
Speaker: Prof Stuart MacGregor
Synopsis: Eye conditions such as glaucoma, age-related macular degeneration and keratoconus have a strong genetic basis. While rare mutations explain a few cases in the population, most cases are affected as a result of the cumulative effect of a large number of common genetic variants. In recent years, polygenic risk scores (PRS) based on many genetic variants have proven to be effective in predicting disease risk for a wide range of diseases.
PRS for glaucoma are already in clinical use in Australia, with a simple saliva-based test able to predict both disease risk and progression. In my talk I will show how we have improved prediction accuracy for glaucoma, with the new tests identifying larger groups of people at high risk. However, barriers remain to broader uptake of PRS. One issue is that PRS performance can vary by genetic ancestry and I will discuss our recent efforts to develop more robust tests which are practically useful in a range of scenarios. A further issue is that more evidence is required to show the practical utility of PRS in preventing morbidity. I will describe our efforts to conduct randomised trials to demonstrate where PRS may be most useful. Finally, I will also cover our recent work on developing and validating PRS for risk of developing age-related macular degeneration and keratoconus.

10:00–10:30 **RETINA UPDATE LECTURE**
Venue: Hall C
Chair: Dr Xavier Fagan
Title: Metabolic and functional imaging of the retina
Speaker: Prof SriniVas R. Sadda
Synopsis: Traditionally, imaging technologies in ophthalmology have focused on visualisation of structural alterations in the setting of pathology. Technologies such as high-resolution optical coherence tomography and adaptive optics have allowed layers of the retina and individual retinal cells to be visualised. These devices do not,

however, allow the function of these tissues to be probed. Recent advances in imaging, however, have allowed us as ophthalmologists to gain novel insights into the metabolic composition and functional capabilities of retinal cells, and these advances will be reviewed in this presentation. These novel technologies include hyperspectral imaging which utilises differential reflectance at various wavelengths to discriminate between metabolites such as oxygenated and deoxygenated haemoglobin.
Another technology is flavoprotein fluorescence, which selectively isolates the green fluorescent emission component of blue-excitation fluorescence to quantify oxidised flavoprotein content in the eye which correlates with the status of the mitochondria. In addition to mitochondrial diseases, flavoprotein fluorescence may be affected in age-related macular degeneration, diabetic retinopathy and other retinal diseases where there is evidence of metabolic stress.
Fluorescence lifetime imaging ophthalmoscopy is a novel approach to quantitative autofluorescence that allows fluorophores in the eye to be distinguished based on differences in their emission lifetimes. This may have relevance to diseases such as MacTel, Alzheimer's and hydroxychloroquine toxicity.
Finally, dramatic advances in optical coherence tomography have now allowed intrinsic changes in the reflectivity of the photoreceptors in response to light stimulation to be captured. This has opened the door to measurement of function down to the level of individual retinal cells. With the dawn of the era of targeted pharmacotherapeutics and gene-based therapies, we expect that these advances in metabolic and functional imaging will be of considerable value.

10:30–11:00 **Morning Tea**
Venue: Exhibition Hall

11:00–12:30 **COURSE–Idiopathic Intracranial Hypertension – Diagnostic and management challenges**
Venue: Hall A
Chairs: Prof Celia Chen and A/Prof Clare Fraser
Aim:
1. Summarise the presentation and systemic disease associations of idiopathic intracranial hypertension (IIH).
2. Discuss the management options in IIH management.
3. Describe the neuro-radiological features of raised intracranial pressure.
4. Using illustrative cases to discuss the diagnostic and management dilemma of IIH.
Synopsis: IIH is characterised by raised intracranial pressure that triggers disabling headaches and can cause permanent visual loss. There is a spectrum of the disease ranging from mild to severe. There are diagnostic and management dilemmas in treating IIH. The principle of managing IIH include identifying and treat the underlying disease (if any), to protect the vision and to minimise the headache morbidity. Evidence is emerging that idiopathic intracranial hypertension is a systemic metabolic disease and there are a number of different factors that need to be considered.
In this symposium, we will:
• summarise the presentation and systemic disease associations of Idiopathic intracranial hypertension.
• discuss the management principles and evidences of treatment.
• a neuro-radiologist will present the radiological features of raised intracranial hypertension.
• use illustrative cases to discuss the diagnostic dilemma and management dilemma in difficult IIH cases, including discussion of post IIH treatment persistent headache and the challenges of managing pregnancy in people with of Idiopathic intracranial hypertension.
Speakers:
Prof Celia Chen, A/Prof Clare Fraser, Prof Christen Barras, Dr Megha Kaushik
Panel: Prof Celia Chen, A/Prof Clare Fraser, Prof Helen Danesh-Meyer
Email: dr.celia.chen@gmail.com

11:00–12:30 **COURSE – The decision matrix for surgical treatment of high refractive error in phakic patients**
Venue: Hall B
Chair: Dr Alison Chiu
Aim: In this instructional course we present a simple and straightforward algorithm to guide you to determine the most appropriate treatments for patients with high refractive error, considering all available modalities of refractive surgical techniques. We will walk attendees through how to select their patient for which surgical technique, what to watch out for, and alternatives. We will teach attendees what the limits are for each treatment option and when to say yes and when to say no. We will present top surgeons' tips and pearls for surgical technique.
Synopsis: We discuss each technique in greater detail, including what makes a patient suitable or unsuitable for surgical correction of their refractive error. This includes correction of high myopia, high hyperopia, and astigmatism. We present and discuss a treatment algorithms to determine what the choices and preferred options are for your refractive surgical patients. The options can include laser in all its variances – LASIK, SMILE, PRK, phakic

IOLs and refractive lens exchange, as well as considering presbyopic correction. We also present interesting case studies, where the controversies exist. In these cases sometimes there is no clear-cut answer and will depend on surgeon preference, experience and knowledge, and we will discuss what guides this. The notion of refractive lens exchange in younger patients can be controversial and we will present the evidence for and against this.
Speakers and Topics:
Dr Florian Kretz – Treatment algorithm for high ametropia – where are the controversies and crossovers
Dr Alison Chiu – The use of phakic intraocular lenses to correct high ametropia, tips and surgical pearls to optimise surgical outcomes
Dr John Males – Corneal laser treatments – SMILE, LASIK, photorefractive keratectomy, limitations, when to say YES or NO
Dr Elsie Chan – The evidence for refractive lens exchange in young patients and addressing presbyopia
Dr Ben Lahood – Cases, controversies and grey zones for treating phakic patients with high ametropia
Email: alisonchiu8@gmail.com

11:00–12:30 **COURSE – Management of complications related to intravitreal injections**
Venue: Hall C
Chair: A/Prof Anthony Kwan
Aim: With the increasing number of intravitreal injections (IVI) for different ocular diseases and the different new agents being used to treat these conditions, it is not surprising that there is an increase in the incidence of complications associated with IVI. This course aims to address the potential complications from the anterior to the posterior segment. A team of diverse experts from different subspecialties from different states have been assembled to comprehensively review these possible complications and management, which may present to general ophthalmologists in a routine clinical setting. Step-by-step management tips are present at the end to improve the clinical care of the patients.
Speakers and Topics:
Prof Stephanie Watson OAM – Management of ocular surface problems and allergy associated with IVI preparation (e.g., dry eyes, ocular irritation with antiseptics chlorhexidine vs. betadine etc.)
A/Prof Tim Roberts – Management of intraocular pressure spikes and long-term care of glaucoma in patients needing IVI (e.g., new larger volume injections, tips/need for paracentesis, tips on co-management of patients with glaucoma specialists)
Dr Ming Lee Lin – Problem with intraocular inflammation and immune response (e.g., tachyphylaxis, intraocular inflammation, vasculitis and sterile/infective endophthalmitis)
A/Prof Anthony Kwan – Tips on dealing with traumatic cataracts resulting from IVI (e.g. posterior capsular rupture, VR perspective)
A/Prof Hemal Mehta – Macular complications (e.g., retinal pigment epithelium rip, macular haemorrhage, recalcitrant fluid, etc.)
Panel discussion
Email: anthony.kwan@qei.org.au

11:00–12:30 **FREE PAPERS – Uveitis/Oncology/Paediatrics/Strabismus**
Venue: Hall E1/E2/E3
Chairs: Dr Richard Symes and Dr Peter Hadden

Facedown positioning in macular hole surgery: A systematic review and individual participant data meta-analysis

Steven Toh[1], Raffaele Raimondi[2], Nikolaos Tzoumas[3], Gurkaran S. Sarohia[4], Mark R. Phillips[5], Varun Chaudhary[6], David Steel[3], Face Down Positioning Study Group[7]
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Purpose: To assess the anatomical and visual effects of facedown positioning (FDP) in patients with idiopathic full-thickness macular holes undergoing vitrectomy with gas tamponade.
Method: Systematic review and individual participant data meta-analysis of randomised controlled trialso comparing

FDP to no FDP across MEDLINE, Embase, Cochrane Library and clinical trial registries from January 2000 to March 2023. All adults with idiopathic full-thickness macular holes undergoing vitrectomy with gas tamponade were included. Analyses used mixed effects models adjusted for prognostically relevant covariates and non-linear effects. Main outcomes were primary macular hole closure and post-operative visual acuity (VA) at six months or sooner. Cochrane RoB and GRADE tool were used.

Results: Of eight eligible trials, five contributed individual participant data for 379 eyes which were included in our analysis. Adjusted odds ratio (OR) for primary closure of FDP versus no FDP was 2.41 (95% confidence interval 0.98 to 5.93, $p = 0.06$) [GRADE: Low], relative risk of 1.08 (1.00 to 1.11), NNT 15. FDP group demonstrated a mean post-operative VA improvement of −0.08 logMAR (−0.13 to −0.02, $p = 0.006$) [GRADE: Low]. Benefits were more evident in larger holes of ≥400 μm, adjusted OR for closure was 1.13 to 10.12 ($p = 0.030$), NNT 12, with mean VA improvement of −0.18 to −0.01 logMAR ($p = 0.022$). Each additional day of FDP was associated with improved odds of anatomical success (adjusted OR 1.02 to 1.41, RR 1.00 to 1.02, $p = 0.026$) and VA improvement (−0.02 logMAR, −0.03 to −0.01, $p = 0.002$), plateauing at day 3.

Conclusion: We recommend a minimum of 3 days FDP for macular holes of ≥400 μm to improve surgical outcomes.

Risk of recurrence inacute anterior uveitis

James Brodie[1], Rachael Niederer[2], Joanne L. Sims[3], Charlotte Jordan[4], Aliyah Thotathil[2], **Vince Mikael Tomas Wilkinson**[5]
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Purpose: To examine the frequency of recurrence and identify risk factors for recurrence in patients with acute anterior uveitis (AAU).

Methods: Retrospective cohort study from a single tertiary ophthalmic centre (Auckland, New Zealand). Subjects identified from a database of inflammatory eye disease presenting between 2008 and 2021. Rates of recurrence reported using Kaplan Meier estimator. Multivariate analysis of risk factors for recurrence calculated using a marginal Cox regression model. The primary outcome measure was disease recurrence.

Results: A total of 2763 eyes of 2092 subjects with AAU were studied, with a median follow up time of 8.9 years, and a total follow up of 19794.9 eye-years. Recurrence occurred in the ipsilateral eye in 1258 eyes (45.5%) and in the contralateral eye in 522 eyes (27.3%). Rates of ipsilateral recurrence over 10 years were 38.1% for idiopathic disease, 43.2% for HLAB27/inflammatory arthritis, 44.9% for viral uveitis. Older age, Māori and Asian ethnicity, HLA-B27/inflammatory arthritis, viral uveitis were associated with increased risk of ipsilateral recurrence. Contralateral recurrence at 10 years was 15.2% in idiopathic uveitis, 37.6% HLAB27/inflammatory arthritis, 2.0% in viral uveitis. Risk factors identified for contralateral eye involvement were Māori and Pasifika ethnicity, HLAB27/inflammatory arthritis.

Conclusions: Approximately half of patients with AAU develop recurrence in the ipsilateral eye and a quarter in the contralateral eye. Patients with viral disease have the highest risk of ipsilateral recurrence and lowest risk of contralateral recurrence. Patients with risk factors for recurrence should be managed and counselled appropriately to minimise the risk of visual loss and complications of uveitis.

Paediatric visual impairment in Western Australia: Results and lessons from a registry analysis

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Purpose: Clinical registries are an important research tool to enhance our understanding of vision loss in the Australian paediatric population. We aim to provide an update on the epidemiology of visual impairment among Western Australian children using registry data analysis, and to highlight the challenges of registry data collection.

Method: This is a retrospective study of visual impairment and blindness registrations of children aged 0–16 years in Western Australia from 1996 to 2015. Blindness was defined as visual acuity <6/60 in the better-seeing eye or binocular visual field <20o diameter, with all other certifications labelled as visual impairment. Certificates were assessed for primary causes of vision loss by age strata and sex. Registration rate trends were analysed across three discrete registration periods.

Results: Of 11 800 certificates issued between 1996 and 2015, 728 certificates (6.2%) were issued to 710 children.

Five hundred and twenty-nine (74.5%) certificates were issued for visual impairment and 181 (25.5%) for blindness. The leading cause of certification was inherited retinal disease (73, 10.3%), followed by cortical visual impairment (57, 8.0%) and albinism (56, 7.9%). The annual registration rate of visual impairment increased from 0.5 to 9.8 per 100 000 person-years across the study period, whereas blindness rates fell from 2.7 to 1.3.

Conclusion: Overall registration rates of paediatric visual impairment in Western Australia are increasing, but these trends should be interpreted with caution given the known limitations of registry data. Enhancements of the registration process could be achieved through digitisation, inclusion of patient outcome data and greater practitioner engagement.

Retinal vascularisation from a new angle: A systematic review of temporal retinal vessel angles in familial exudative vitreoretinopathy

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Purpose: The heterogeneity of familial exudative vitreoretinopathy (FEVR) presents unique challenges in its diagnosis and prognostication. Recently, retinal temporal vessel angles (TVA) have emerged as a novel clinical marker which could reflect the structural and functional integrity of the macular region. We aimed to systematically search and appraise all literature investigating the association between TVA and key clinical parameters in FEVR, evaluating the predictive power of TVA for poor visual acuity and foveal hypoplasia, and determining optimal threshold angles for risk stratification.

Method: We identified articles examining the association between TVA and FEVR by systematically searching PubMed, Medline, Embase and SCOPUS on 15 December 2023. Additional studies were located through hand searching and content area expert contributions. The methodological quality of the included studies was evaluated using the Newcastle Ottawa Scale. Quantitative and qualitative data were synthesised and analysed.

Results: We identified 767 papers in the initial search. After screening 333 papers, three papers were included in the review. In all three studies, the FEVR group had a significantly smaller temporal retinal vessel angle compared to healthy full-term infants or infants with retinopathy of prematurity. TVA was not associated with the phenotypic severity of FEVR, but was negatively associated with foveal hypoplasia and vascular density.

Conclusion: Narrower temporal vessel angles have been found to be associated with the presence of FEVR as compared to normal controls. No consensus optimal threshold angle has been reached. A standardised method of measuring TVA will better enable its association with FEVR parameters to be better understood.

Multicentre safety study on the use of bevacizumab biosimilar in treatment of type I retinopathy of prematurity

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Purpose: To report the initial experience with a bevacizumab biosimilar (MVASI) across Australian centres in the treatment of type I retinopathy of prematurity (ROP)

Method: A one-year retrospective multicentre audit. Infants treated for type I ROP using intravitreal MVASI (bevacizumab—awwb) at the Royal Brisbane Women's Hospital, Mater Hospital Brisbane and Royal Children's Hospital Melbourne between August 2022 and August 2023 were included.

Results: Eighty-three eyes of 42 children received MVASI as management of type I ROP. The mean gestational age and birth weight was 24.6 weeks and 659.3 g respectively. No eyes that received MVASI had any immunogenic reaction post injection. No medication related complications were detected over an average follow-up period of 68 weeks.

Ten eyes had laser treatment prior to MVASI injection. Of the 73 eyes that received MVASI as initial therapy, 27 eyes (37%) required retreatment for reactivation. The average postmenstrual age at retreatment post primary MVASI therapy was 44.9 weeks with time to reactivation being 56.8 days. Modality for retreatment was primarily laser (18 eyes, 66.7%), followed by repeat intravitreal bevacizumab (seven eyes, 25.9%) with two eyes requiring combined therapy (2.7%).

Conclusion: This is the first study of biosimilar drug safety and efficacy in the treatment of ROP. This

multicentre case series supports the use of MVASI as a safe and equivalent alternative to Avastin for treatment of type I ROP in neonates. No ophthalmic complications were recorded during the study period.

Use of immunomodulatory treatment for non-infectious uveitis: An International Ocular Inflammation Society report of real-world practice

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Purpose: To determine how systemic immunomodulatory drugs are being used in real-world practice to treat vision-threatening non-infectious uveitis.
Method: A 30-question survey, related to practice patterns of immunomodulatory drug treatment for non-infectious uveitis, was completed by 221 uveitis specialist members of a study group within the International Ocular Inflammation Society.
Results: When treating non-infectious uveitis with oral prednis(ol)one, an initial daily dose of 1 mg/kg was used by 170 (76.9%) study group members. 207 of them (93.7%) prescribed this maximum prednis(ol)one dose for four weeks or less. Common reasons to initiate a systemic immunomodulatory drug included uveitis not controlled after a course of oral prednis(ol)one ($n = 208$, 94.1%) or a specific uveitis diagnosis ($n = 197$, 89.1%). Most ($n = 152$, 68.8%) co-managed treatment, commonly with adult or paediatric rheumatologists ($n = 142$ of 152, 93.4%). A total of eight different conventional immunomodulatory drugs have been used by study group members. 126 of them (57.0%) selected methotrexate as their most common first choice of conventional immunomodulatory drug. A total of 14 biologic immunomodulatory drugs have been used by study group members. 216 members (97.7%) stated adalimumab was their most common first choice of biologic immunomodulatory drug. 188 members (85.1%) have used a combination of 2 or more immunomodulatory drugs. Sixty-one different combinations were reported, the most common being methotrexate and adalimumab ($n = 158$ of 188, 84.0%).
Conclusion: Methotrexate was the preferred conventional immunomodulatory drug, and adalimumab was the preferred biologic immunomodulatory drug for the management of non-infectious uveitis by International Ocular Inflammation Society uveitis specialists.

Rural paediatric eye trauma presenting to the rural New South Wales emergency

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Aims: To identify and characterise paediatric ocular trauma presenting to the rural New South Wales (NSW) emergency department.
Methods: A retrospective audit of triage codes, presenting complaints and ICD-10-AM coding for all paediatric patients presenting to the Orange Health Service and Dubbo Base Hospital from August 2017–December 2021 was used to generate the data.
Results: Paediatric ophthalmic presentations occurred at a level of 4.1 per 1000 for males and 1.9 per 1000 for females during the 42 month period within the Western NSW area. Children 0–4 years (34%) and 15–17 years old (24%) were most likely to present. Common mechanisms included being hit or poked (36%), falling or running into objects (17%) or from high velocity projectiles while grinding or welding (16%). Adolescents aged 15–17 were most likely to be injured in an industrial setting (21%). Abrasions and lacerations (40%), foreign bodies (33%) and simple bleeds (15%) made up most presentations. Globe ruptures, penetrations and hyphemas in children and adolescents were uncommon (0.5%).
Discussion: The rate of open and closed eye injury is 4-5-fold higher in rural NSW when compared to Children's Hospital Westmead data. The scale of high-risk penetrating mechanisms is higher than urban counter parts in Sydney. It was also unique that industrial work was a common mechanism of eye injury in a paediatric presentation.
Conclusions: High-risk eye injury is a common presentation to the emergency department for children and Adolescents in Western NSW. The results could mean that there is need for optimisation in prevention strategies such as safety glasses.

Clinical utility of mobile ultra-widefield retinal imaging (Optos) for screening of retinopathy of prematurity

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Purpose: The purpose of this study is to demonstrate that mobile non-contact ultra-widefield (UWF) imaging (Optos) is a safe and effective method for routinely screening neonates and is a useful modality for guiding clinical decisions in of retinopathy of prematurity (ROP).
Methods: We performed a retrospective review of 340 examinations from 135 patients who underwent ROP screening between 2021 and 2023 at Oxford Neonatal Unit. Of these, 240 examinations were performed with optomap imaging with modified "flying baby" technique and images were analysed. Examination findings, cardiorespiratory indices and duration of image acquisition were recorded. Physiological responses were compared to binocular indirect ophthalmoscopy (BIO) examination in a subgroup of these patients with the use of a specialised swaddle (Dandle WRAP).
Results: Mean duration of image acquisition with Optos-led screening was 170 seconds and was improved by using the Dandle WRAP (by an average of 25 seconds). Cardiorespiratory indices in the subgroup were comparable to those undergoing BIO with no significant difference in heart rate, oxygen desaturation and apnoeic episodes. We acquired UWF images in 240 examinations and images obtained demonstrated all stages of ROP disease in the posterior pole and peripheral retina with clear disease regression/progression. Further analysis of treated patients with anti-VEGF showed reduced vascular tortuosity on day 1 post-treatment.
Conclusion: Routine screening of ROP with non-contact UWF imaging is safe for vulnerable neonates, with comparable cardiorespiratory indices to that of conventional BIO. Furthermore, detailed acquisition of ROP progression with Optos imaging allows for nuanced decision making as well as monitoring of disease regression after treatment.

Incidence of herpes zoster ophthalmicus in Australia: Before and after zoster vaccination

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Purpose: The incidence of herpes zoster ophthalmicus (HZO) in Australia remains unknown. Using prescriptions supplied for the treatment of HZO, we aimed to estimate the incidence of HZO in Australia between 2012 and 2021. We tracked HZO incidence, before and after the introduction of Zostavax®, the live-attenuated zoster vaccine, on Australia's National Immunisation Program (NIP) in 2016.
Methods: Retrospective cohort study analysing individuals in New South Wales and Victoria supplied a prescription to treat HZO via the Pharmaceutical Benefits Scheme between 2012 and 2021. From this cohort, we retrieved vaccination data from the Australian Immunisation Register between 2012 and 2019.
Results: Of the 33 653 HZO cases during the study period, most were female (57%) and aged 60–79 years (36%). The annual incidence of HZO increased from 16 to 24 cases per 100 000 between 2012 and 2015, respectively. Coinciding with Zostavax's introduction on the NIP, annual HZO incidence stabilised at 22–23 per 100 000 between 2016 and 2018, albeit transiently, and increased from 27 to 33 per 100 000 between 2019 and 2021, respectively. During 2012–2019, 8% of the cohort were vaccinated with Zostavax. Annual vaccination rose between 2016 and 2017 (from 265 to 1008 people), yet fell between 2018 and 2019 (from 672 to 437 people).
Conclusion: While HZO incidence stabilised following Zostavax's introduction on Australia's NIP, this was short-lived, and HZO incidence continued to increase thereafter. Ophthalmologists should encourage vaccination to increase coverage, particularly given the recent availability of Shingrix®, the more effective non-live zoster vaccine, on the NIP at the end of 2023.

Benchmarking Australia's first dedicated ocular oncology multidisciplinary team meetings against best practice guidelines

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Purpose: Multidisciplinary team (MDT) meetings are considered best practice in the management and treatment of patients with cancer. A pathology-driven ocular oncology MDT was established in New South Wales to improve outcomes and survival for patients with eye tumours, making it the first dedicated team of its kind. However, the performance of the MDT has never been evaluated. Therefore, the aim of this study is to conduct a

performance review of the ocular oncology MDT based on best practice guidelines.

Methods: Demographic and diagnostic data of patients with eye tumours who were discussed at the ocular oncology MDT were collected, including age, sex, rurality, tumour type, and clinician referrer location. MDT members completed a peer-review survey which explored their opinions on the appropriateness of MDT membership and governance, structure and organisation, standards of care and patient involvement.

Results: Data were available for 258 patients (58% male; aged 11–100 years; 67% of patients and 96% of clinician referrers were from metropolitan areas). Uveal melanoma was the predominant eye tumour diagnosis (39%). The number of patients from regional or rural areas seen by the MDT increased from inception to 2023 (22% vs. 38%). On average, 72% of MDT members 'strongly agree' or 'agree' that the ocular oncology MDT operates within recommended guidelines.

Conclusion: To date, the ocular oncology MDT has cared for a diverse range of patients. Importantly, we found increased service provision to regional and rural populations, where ocular oncology MDTs have the potential to provide the most benefit.

Intravitreal Interleukin-6 Inhibition with vamikibart in uveitic macular oedema: The Phase 1 DOVETAIL and Phase 3 SANDCAT and MEERKAT studies

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Purpose: Uveitic macular oedema (UMO) is the leading cause of treatable visual impairment in non-infectious uveitis. Interleukin (IL)-6 has an important role in the pathogenesis of inflammatory retinal diseases. Vamikibart, a recombinant monoclonal antibody, potently inhibits all forms of IL-6 signalling. We report outcomes of the phase 1 DOVETAIL study and design of the ongoing phase 3 SANDCAT (NCT05642325) and MEERKAT (NCT05642312) studies of vamikibart in UMO.

Methods: DOVETAIL was a phase 1, multicenter, open-label, multiple ascending-dose study to investigate the safety, tolerability, efficacy and pharmacokinetic/pharmacodynamic profile of intravitreal vamikibart in uveitic and diabetic macular oedema. Adults with non-infectious uveitis and concurrent UMO (central subfield thickness $\geq$ 325 μm) were enrolled into three dose groups to receive intravitreal vamikibart at weeks 0, 4 and 8, followed by post-treatment observation until week 36.

Results: DOVETAIL included 37 UMO patients. Mean age: 62 years; males: 42%. Preliminary results showed a combined mean +9.3 (1.6) letters and −161 (28) μm central subfield thickness change at week 12. Vamikibart was well tolerated. Final results from the DOVETAIL UMO cohort will be presented. Based on these outcomes, two identical global, randomised, double-masked phase 3 trials were initiated to investigate two doses of intravitreal vamikibart vs. sham in patients with UMO. The studies are currently enrolling; their design with rationale will be discussed.

Conclusions: The global, phase 3 MEERKAT and SANDCAT program is currently enrolling to assess vamikibart and its potential to address the unmet need for effective nonsteroidal treatments in UMO patients.

A 12-year follow up survey of refractive error among school children from Lao People's Democratic Republic

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Purpose: Vientiane Province is a rural but urbanising and increasingly affluent region in Laos People's Democratic Republic. In 2012, school children in Vientiane Province were shown to have the lowest ever reported prevalence of myopia at just 0.6%. We sought to understand the impact of urbanisation and the associated socio-cultural changes on the prevalence of refractive error among this population.

Methods: Ten districts from Vientiane were randomly selected and two primary schools were randomly selected from each district. All children aged 6–11 attending selected schools were invited to participate. Examination included visual acuity (VA) testing Cycloplegic retinoscopy with subjective refinement if indicated, ocular motility testing and anterior and posterior segment examination in visually impaired children.

Results: A total of 3419 children were eligible to participate, of these, 2373 (69.4%) were seen and complete refractive data were available for 2313 children. The mean spherical equivalent (SE) in the right eyes was +0.38 and the mean SE in the left eyes was 0.40. The prevalence of hypermetropia was 1.03% (24 eyes) and the prevalence of myopia 3.46% (160 eyes). The overall prevalence of visual impairment (presenting VA <2 0/32)

was 0.8%. When compared against previously reported data from Lao school children that our group collected in 2011 we found that there was a statistically significant difference in the mean refraction and prevalence of myopia ($p < 0.0001$).

Conclusion: Our survey shows that the prevalence of myopia has significantly increased among this previously optically privileged population as it has become increasingly urbanised.

12:30–14:00 **Lunch**
Venue: Exhibition Hall

14:00–15:30 **Plenary – Best Paper Presentations**
Venue: Hall C
Chairs: Prof Mark Gillies and Prof Stephanie Watson OAM

Visual field loss and falls requiring hospitalisation: Results from the eFOVID Study – pre-recorded presentation

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Purpose: To examine the association between visual field loss and falls requiring hospitalisation in adults aged 50+.
Methods: Older adults aged 50+ with and without visual field loss were identified using a fields database obtained from a cross-section of ophthalmologists' practices in Western Australia (WA). Data were linked to the Hospital Morbidity Data Collection and WA Hospital Mortality System to identify participants who experienced falls-related hospitalisations between 1990 and 2019. A generalised linear negative binomial regression model examined the association between falls requiring hospitalisation for those with and without field loss, based on the better eye mean deviation, after adjusting for potential confounders including age, gender and diabetes diagnosis.
Results: Participants included 31 021 unique individuals of whom 6054 (19.5%) experienced 11 818 falls requiring hospitalisation. Only mean deviation index of <−12.01 dB (severe) was significantly associated with an increased rate of falls requiring hospitalisations by 14% (adjusted incidence rate ratio [IRR] 1.14, 95% confidence interval [CI] 1.0–1.25) compared to no field loss, after adjusting for potential confounders. Other factors included age, with those aged 80+ having an increased rate of falls requiring hospitalisations compared to those 50–59 (IRR 29.16, 95% CI 21.39–39.84), other comorbid conditions (IRR 1.49, 95% CI 1.38–1.60) and diabetes (IRR 1.25, 95% CI 1.14–1.37). Previous cataract surgery was associated with a decreased rate of falls that required hospitalisations by 13% (IRR 0.87, 95% CI 0.81–0.95) compared to those who did not have cataract surgery.
Conclusion: The findings highlight the importance of continuous clinical monitoring of visual field loss and injury prevention strategies directed towards improved balance and mobility programs for older adults with visual field loss.

The impact of baseline intraocular pressure on treatment response in the LiGHT Trial: Selective laser trabeculoplasty versus medication

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Purpose: The Laser in Glaucoma and Ocular Hypertension (LiGHT) Trial demonstrated the efficacy and safety of selective laser trabeculoplasty (SLT) compared to topical hypotensive medication as first-line therapy for ocular hypertension and open angle glaucoma. This sub-study aimed to explore the impact of pre-treatment (baseline) intraocular pressure (IOP) on treatment response for SLT compared to eye drops, in LiGHT Trial participants.
Methods: IOP reduction at eight weeks following treatment initiation with either SLT or prostaglandin analogue (PGA) eye drops was assessed at different levels of baseline IOP, and the groups were compared using mixed effects models.

Results: A total of 1146 eyes from 662 patients were included in this analysis. Both SLT and PGA drops produced greater IOP lowering at higher baseline IOPs, and less IOP lowering at lower baseline IOPs. PGA drops produced greater percentage IOP reduction at lower baseline IOP, significant at baseline IOP ≤17 mmHg. There was a significant difference in the relationship between baseline IOP and the probability of ≥20% IOP lowering between the two treatments ($p = 0.01$), with SLT being more successful than PGA drops at baseline IOP > 22.5 mmHg.

Conclusion: These data confirm previous reports of greater IOP lowering with higher baseline IOP for both SLT and topical hypotensive medication. In treatment naïve eyes, at higher baseline IOP, SLT was more successful at achieving ≥20% IOP lowering than PGA drops. At lower baseline IOP, a statistically greater percentage IOP lowering was observed with PGA drops compared to SLT.

Paediatric factors associated with appointment non-attendance at an ophthalmology department in Aotearoa New Zealand

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Purpose: Missed appointments are a well-documented issue for outpatient healthcare delivery, resulting in poorer health outcomes. Additionally, non-attendance carries a high financial burden for the healthcare sector. Missed appointments may impact a child's well-being. This study aimed to identify paediatric factors associated with appointment non-attendance in a large public hospital.

Method: A retrospective analysis of clinic non-attendance within Auckland District Health Board Ophthalmology Department between 1 January 2018 and 31 December 2019. Demographic data collected included: age, gender and ethnicity. Deprivation Index was calculated. Appointments were classified as new patients and follow-ups, and acute or routine. Categorical and continuous variables were analysed using logistic regression to assess the likelihood of non-attendance.

Results: In total, 22 818 paediatric (age <1 8) appointments were scheduled, of which 2965 visits (13.0%) were missed. Mean age in the paediatric cohort was 6.8 ± 4.6 years and 12 106 (53.1%) were male. Ethnicity was Caucasian in 8762 (41.0%), Māori in 3147 (14.75%), Pacific peoples in 3188 (14.9%), Asian in 5290 (24.8%) and Other in 982 (4.6%). Multivariate logistic regression analysis for all appointments showed that male gender (odds ratio [OR] 1.136, $p = 0.002$), Māori ethnicity (OR 2.982, $p < 0.001$), Pacific peoples ethnicity (OR 2.905, $p < 0.001$), Other ethnicity (OR 1.467, $p < 0.001$) and deprivation index (OR 1.072, $p < 0.001$) were factors associated missed appointments.

Conclusion: Māori and Pacific children living in high social deprivation disproportionately experience higher rates of appointment non-attendance. Further research exploring barriers families face when seeking ophthalmic care for their children is needed to inform appropriate interventions.

Outliers of treatment frequency in retinal vein occlusion: 24-month comparative analysis of Fight Retinal Blindness! Practitioners

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Purpose: Quantify the range of outcomes achieved by practitioners benchmarked by the frequency of vascular endothelial growth factor inhibitor delivery to naïve retinal vein occlusion (RVO) in routine care through two years.

Methods: Multicentre, international, observational study using registry data. Funnel plots identified physicians as "intensive" outliers, "typical" practitioners or "relaxed" outliers.

Results: Mean adjusted change in visual acuity (VA, primary), adjusted change in central subfield thickness, time-in-range VA >68 letters (weeks), visits and injections, final injection interval and adverse events. Three "intensive" (350/1110 eyes [32%]), 22 "typical" (604/1110, [54%]) and four "relaxed" (156/1110, [14%]) practitioners achieved respective 24-month mean adjusted changes in VA and central subfield thickness in branch RVO (BRVO): +16.2, +13.6, +9.3 letters (P 68 letters in BRVO was 90, 78, 68 weeks ($p < 0.01$), in central RVO (CRVO) was 69, 60, 54 weeks ($p = 0.04$); Median visits differed modestly (22, 16–19, 18); median injections were 18, 12–14 and 10; median final injection intervals were in BRVO 6, 9, 10 weeks; in CRVO 6, 9 and 12 weeks. Adverse events were in keeping with previous reports.

Conclusion: At 24 months the intensive practitioners were treating RVO with vascular endothelial growth factor inhibitors at twice the frequency of the relaxed practitioners however their patients gained twice (BRVO) to

three times (CRVO) more letters than patients treated by relaxed practitioners.

Stage of keratoconus at the time of corneal cross-linking impacts outcomes

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Purpose: To determine whether stage of keratoconus at the time of corneal cross-linking (CXL) influenced outcomes at least 12 months post-procedure.
Methods: Longitudinal, multi-centre study utilising the prospectively designed Save Sight Keratoconus Registry, covering 15 Australian, New Zealand and Italian sites. Ethics approvals were obtained from the Sydney Local Health District Human Research Ethics Committee (X20-0487, 2020/ETH02676) and RANZCO Committees. Cases with >12 months follow-up were included. Eyes were staged with modified Amsler-Krumeich criteria. Preoperative and final maximum keratometry (Kmax), best-corrected visual acuity (BCVA) and thinnest corneal thickness (TCT) were compared.
Results: A total of 1455 eyes from 1102 patients were included (mean age 26.5 ± 10.3 years, mean follow-up 1106.8 ± 713.2 days). There were significant reductions in Kmax post-operatively overall and for stage II–IV ($p < 0.001$), but not stage I ($p = 0.063$). All inter-group comparisons for ΔKmax were statistically different ($p < 0.001$), except between stage III and IV. There were negative correlations between stage and ΔKmax ($\rho = -0.24$, $p < 0.001$). There were improvements in BCVA overall, and within all stages after CXL (stage I: $p = 0.003$, stage II–IV and overall: $p < 0.001$). Mean ΔBCVA was significantly different between all stages ($p < 0.001$). However, only relationships between stage I and other groups were significant ($p < 0.001$). Positive correlations between stage and ΔBCVA were found ($\rho = 0.12$, $p < 0.001$). There were reductions in TCT post-operatively (overall and all stages $p < 0.001$), however only a negligible difference when ΔTCT was compared between stages.
Conclusion: CXL was associated with significant improvements in Kmax and BCVA (final and delta) across most keratoconus stages. Optimal outcomes following CXL were observed at stage II or III of keratoconus.

Eyes as the window to the skin: Ocular sun exposure as a marker of skin cancer risk

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Purpose: To investigate any association between measures of ocular sun exposure – pterygium and conjunctival ultraviolet autofluorescence (CUVAF) area – and skin cancer.
Methods: The Busselton Baby Boomer Study (BBBS), conducted 2016–2022, was a five-year follow-up of an adult cohort (born 1946–1964) residing in Busselton, Western Australia. Participants self-reported their skin-cancer history at baseline and BBBS visits. At the BBBS visit, colour and CUVAF photographs of the nasal and temporal conjunctiva of both eyes were captured and analysed by a single grader using established methods. Associations were analysed using logistic regression.
Results: At the BBBS, 3856 participants self-reported skin cancer history, of whom 3729 (96.7%) had CUVAF or pterygium data (age range 51.4–75.6; 55.3% female). A skin-cancer diagnosis was reported at either visit by 396 (10.6%) participants (basal cell carcinoma $n = 108$, squamous cell carcinoma $n = 26$, melanoma $n = 102$, mixed $n = 33$, unidentified $n = 127$). In the skin cancer vs. control groups, respectively, median (interquartile range) total CUVAF area was 21.6 mm2 (10.0–39.2) vs. 22.2 mm2 (9.5–39.8), prevalence of pterygium was 14.9% ($n = 59$) vs. 12.0% ($n = 400$) and prevalence of pterygium excision was 5.8% ($n = 23$) vs. 2.5% ($n = 84$). After adjusting for age, sex and ethnicity, neither total CUVAF area (adjusted odds ratio [aOR] 0.999, 95% confidence interval [CI] 0.995–1.004) nor pterygium prevalence (aOR 1.28, 95% CI 0.94–1.73) was associated with skin cancer. However, a history of pterygium excision was associated with higher odds of self-reported skin cancer (aOR 2.37, 95% CI 1.47–3.82).
Conclusion: Although it is unclear if pterygium excision precedes skin-cancer, patients undergoing pterygium excision should be advised of their higher likelihood of skin cancer.

15:30–16:00 **Afternoon Tea**
Venue: Exhibition Hall

16:00–17:30 **COURSE – Medical retina mysteries**
Venue: Hall A
Chair: Prof Adrian Fung
Aim: The aim of this symposium is to present and discuss diagnostically challenging posterior segment cases that cover the subspecialty of fields medical retina, uveitis and ocular oncology. The panel will be blinded to each speakers case and diagnosis before presentation. Each case will be presented as a mystery, with a pause during the presentation to call for possible differential diagnoses by the panel or audience. The speaker will then conclude the case, revealing the diagnosis and learning points.
Outline:
Each case will be presented as a mystery, the contents of which will be revealed on the day! However, all cases will have a final diagnosis, often made by further investigations (blood testing, genetic testing, further imaging, biopsy etc.). The discussion will help ophthalmologists recognise patterns to assist with diagnosing rare retinal conditions, or unusual presentations of common conditions.
Examples may include presentations of:
1. White dot syndromes (acute zonal occult outer retinopathy, acute macular neuroretinopathy, acute posterior multifocal placoid pigment epitheliopathy)
2. Retinal toxicities (pentosan polysulfate or popper maculopathy)
3. Inherited retinal diseases (enhanced S cone dystrophy, fundus albipunctatus, alports syndrome)
4. Traumatic retinal diseases (laser retinopathy, solar maculopathy);
5. Nutritional retinal diseases (vitamin A deficiency);
6. Posterior segment eye tumours (combined hamartoma of the retina and retinal pigment epithelium, medulloepithelioma).
There will be nine speakers who will present a four-minute case with five minutes of discussion, totalling a 90-minute session. Speakers have been chosen for their expertise, diversity and their excellent speaking skills. The session will utilise live polling, with each speaker asking a multiple-choice question of the audience during their presentation.
Speakers:
Prof Adrian Fung
Prof SriniVas Sadda
Prof Peter McCluskey
Dr Xavier Fagan
Dr Mali Okada
Dr Narme Deva
Dr Salmaan Qureshi
Dr Tuan Tran
Dr Amy Cohn
Email: adrian.fung@sydney.edu.au

16:00–17:30 **COURSE – Thyroid eye disease – an update on current state**
Venue: Hall B
Chairs: Dr Jwu Jin Khong, Dr Thomas Hardy and Dr Alan McNab
Aim: The landscape of thyroid eye disease management is rapidly changing with emerging immunotherapies and clinical trials including approval of the first IGF-1R monoclonal antibody, teprotumumab-tbrw, by the Food and Drug Administration in the United States. This symposium aims to discuss recent advances in medical therapies, provides update on surgical techniques and discuss the role of corticosteroids in thyroid eye disease management. This symposium will provide an update on the real life experience with teprotumumab since it was introduced to clinical practice in 2020, by invited speaker Dr. Raymond Douglas, as part of Peter Rogers Lecture, an annual invited lecture of the ANZSOPS. The symposium will provide an update on the result of subcutaneous IGF-1R immunotherapy and clinical trial that multiple Australian centres have participated in. This will be followed on by an overview of emerging biologics on the horizon and more.
Outline:
Dr Raymond Douglas – What do we learn from real-world experience for teprotumumab in personalised medicine: dosing optimization for long term control of proptosis and diplopia, hearing management, patients; selection
Dr Jwu Jin Khong – IGF-1R inhibition with lonigutamab in thyroid eye disease (TED): phase 1/ 2 preliminary safety and efficacy findings
Dr Thomas Hardy – Upcoming biologics on the horizon in TED clinical trials

Dr Alexandra Manta – Exploring genetic therapy avenues and basic science research in thyroid eye disease
Prof Timothy Sullivan and Prof Dinesh Selva – Endoscopic and external orbital decompression: indications and surgical techniques
Dr Raymond Douglas/Dr Krishna Tumuluri – Debate: Should corticosteroid still be the first line treatment for TED in Australia?
Email: jwujinkhong@gmail.com

16:00–17:30 **COURSE – Cataract controversies**
Venue: Hall C
Chairs: A/Prof Elaine Chong and Prof Rosa Braga-Mele
Aim: The objectives of this course are to challenge our perspective on important, non-surgical aspects of cataract surgery. The format will be two talks, for and against each topic, followed by a panel discussion and audience Q&A. Polling questions will also be used to gauge the audience experience and opinions on each topic.
Outline:
1. Same day bilateral cataract surgery
For: Dr Justin Sherwin;
Against: Dr Georgia Cleary
2. Big Brother is watching you: Artificial Intelligence in cataract surgery
For: Prof Colin Chan;
Against: A/Prof Michael Lawless
3. Should we all learn manual small-incision cataract surgery?
For: Dr Nicholas York;
Against: Dr Mo Ziaei
4. Best practice in cataract surgery; evidence vs. eminence. What do we accept as sufficient evidence before we change our practice?
Evidence: A/Prof Michael Goggin;
Eminence: Dr Elsie Chan
Email: chan.elsie@outlook.com

16:00–17:30 **COURSE – CPD Essentials – Understanding and meeting your CPD obligations**
Venue: Hall D
Chair: A/Prof Lawrence Lee
Session Outline:
CPD, what do you need to do? with A/Prof Lawrence Lee
How to get the most out of the new CPD environment with Mrs Nainika Chandekar and Ms Georgina Christodoulou
What are the new CPD categories?
Educational activities with Dr Nigel Morlet
Reviewing performance with Dr Rushmia Karim
Novel ideas with Dr Nigel Morlet and Dr Rushmia Karim
Measuring outcomes with Dr Nathan Nielsen
Registries with Dr Hemal Mehta
CAPE – where to find it? With Mrs Nainika Chandekar and Dr Jeffrey Friedrich
Q&A session with Dr Lawrence Lee, Mrs Nainika Chandekar, Ms Georgina Christodoulou, Dr Rushmia Karim and Dr Jeffrey Friedrich
Email: eye@cityeye.com.au

16:00–17:30 **FREE PAPERS – Epidemiology/Genetics**
Venue: Hall E1/E2/E3
Chairs: Dr Elise Héon and A/Prof Andrea Vincent

Vision impairment, vision aids use and eye examinations among older adults in New Zealand

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Purpose: The study aimed to provide a descriptive analysis of frail older individuals in New Zealand with vision,

hearing and dual impairment, focusing on subjective vision proportion, vision aid usage, and eye examinations across different ethnicities.

Methods: Data from 48 038 interRAI assessments conducted between 2019 and 2020 were analysed, with assessments divided between home care (24380) and long-term care facilities (23658).

Results: Results showed that 68% of individuals had adequate vision, 21.7% experienced mild difficulties, 6.8% had moderate difficulties and 2.8% suffered severe impairment. Vision aid use decreased with worsening vision, dropping from 80% for those with no impairment to 35% for those with severe impairment. Ethnic disparities were evident, with Pasifika (39%) and Māori (55%) individuals utilising fewer vision aids compared to New Zealand-European counterparts (80%). Eye examinations in the previous year ranged from 50.3% for those with moderate impairment to 30.1% for those with no vision.

Conclusions: The conclusion emphasises the significance of interventions to enhance the well-being of older individuals with vision impairment in New Zealand, addressing age, gender and ethnic disparities. Access barriers, including sociocultural, financial and geographic factors, may contribute to differences in vision aid usage and eye examinations among ethnic groups. The study underscores the need for tailored interventions to ensure equitable access to vision care for all older adults, regardless of ethnicity, to promote their overall health and quality of life.

Burden and depression in caregivers of patients with Visual Impairment

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Purpose: Caregivers devoted to their patients often neglect their own needs resulting in burden and depression.

Methods: A cross-sectional observation study of 270 caregivers for 109 permanent visually impaired patients, from category III onwards. Caregiver burden was measured using the Caregivers Burden Scale while depression levels were assessed using the Centre for Epidemiologic Studies Depression Scale.

Results: The mean caregiver age was 38.3 years (SD $\pm$ 14.34) and majority (56.66%) belonged to lower socioeconomic status according to the Kuppuswami scale 2021. Moderate to severe burden was found in 115 [42.59%] caregivers while severe burden in 9 [3.33%]. Possibility of major depression was found in 32 [11.85%]. Noteworthy findings were higher burden and depression levels with increasing duration of caregiving ($p < 0.0000001$), female gender (burden p-value = 0.01614 and depression p-value = 0.01246), parents or spouse as caregivers had higher burdens ($p < 0.0002334$), nuclear families had higher levels of depression ($p < 0.006499$). Illiterates had elevated burden ($p < 0.001708$). A positive linear correlation between Caregivers Burden Scale scores and Centre for Epidemiologic Studies Depression scores in caregivers was found [R is 0.6479, $p < 0.00001$].

Conclusions: These findings underscore the need for tailored support interventions addressing the specific needs of caregivers of visually impaired individuals, particularly those facing heightened burden and depression.

Inherited retinal diseases in global Indigenous Peoples: A scoping review

Emma Tovey Crutchfield[1], Andrea L. Vincent[2], Mitchell Anjou[3], Hugh Taylor[3], Shaun Tatipata[3], Livia Carvalho[1], Lauren Ayton[4], Alexis (Ceecee) Britten-Jones[4]
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Purpose: Inherited retinal diseases (IRD) are a leading cause of blindness yet remain underdiagnosed in many global populations. This scoping review synthesised clinical studies evaluating the prevalence and diagnosis of IRDs among Indigenous Peoples worldwide.

Methods: Medline, Embase, Global Health, Informit and CINAHL were searched on 4 December 2023. We included articles reporting on Indigenous Peoples with IRDs from all global regions. Two reviewers performed study screening.

Results: Of the 85 included reports of Indigenous Peoples with IRDs from 26 countries, most studied Indigenous Peoples from North America (26%), the Middle East (26%) and Oceania (25%). The research landscape varies by region, with specific IRDs being geographically or culturally concentrated for example rod-cone dystrophy in The Diné from the Navajo Nation. Across 14 studies published between 1969 and 2023, we identified 139 cases (35% rod-cone dystrophy) of IRDs in Peoples Indigenous to Oceania, including only 20 Indigenous Australians. Of the six studies to genetically diagnose its Indigenous participants, five were in New Zealand Māori and other Pacific Peoples, identifying novel founder mutations to improve the genetic diagnostic yield in these populations.

Conclusion: Compared to those of European ancestry, little is known about IRDs in global Indigenous groups,

exacerbating the cost, location and trust barriers to specialist services. Future efforts should prioritise raising awareness, strengthening community-led eyecare programs, and building Indigenous biorepositories for more effective genetic testing. This study emphasises the importance of identifying IRD presentations in Indigenous Peoples to ensure equitable access to diagnostic care and emerging treatments.

The eyecare needs and services for refugees and people seeking asylum in Australia: A narrative review

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Purpose: Refugees and asylum seekers in Australia have complex, unmet health needs. This review explored their eyecare needs and access to services.
Method: Number, demographics and Medicare eligibility of this population were estimated via the Australian Bureau of Statistics and Department of Home Affairs. Published eye health literature was identified through systematic searches of Medline, Embase and Google Scholar. Eyecare services were identified through the Australian Refugee Health Practice Guide and contacting each state/territory refugee health service. Semi-structured interviews were conducted with refugee-specific eyecare services to explore access to care.
Results: Over 430 000 refugees and asylum seekers live in the community and 1100 in detention. Two clinic-based studies reported that a quarter have bilateral vision loss, 79–82% from refractive error. Another study found refugees more likely to have vision loss (odds ratio 1.9) or cataract (odds ratio 1.7) than Australian-born individuals. Eleven broader studies on general health found that 2–18% of children have eye pathologies and up to 25% of adults self-report vision issues. Up to a quarter lack Medicare, making mainstream eyecare unaffordable. Those with Medicare experience other barriers, including limited interpreter use. Four refugee-specific services identified address these barriers but are limited in reach, with no optometry services in Queensland, Tasmania or the Australian Capital Territory, and only one ophthalmic service nationwide.
Conclusion: Expansion of these services should be considered but requires funding. Evaluations of existing services can justify and guide such expansions. Service planning should also be guided by more epidemiological studies and accurate estimates of Medicare-ineligible individuals from the government.

The eye health status of Indigenous Australians and newly-arrived refugees in Perth, Western Australia

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Purpose: To characterise the eye health status of Indigenous Australians and refugees presenting to Lions InReach Vision, a free-of-charge metropolitan optometry and ophthalmology clinic for vulnerable populations in Perth, Western Australia.
Method: A prospective audit from August 2022 to January 2024 was undertaken. Main outcome measures included rates and leading causes of presenting vision loss (visual acuity <6 /12).
Results: A total of 261 participants, including 149 Indigenous Australians and 112 refugees, were reviewed during the study period. The prevalence of bilateral vision impairment (<6 /12 to ≥6/60) among Indigenous Australians and refugees was 15.6% ($n = 22$) (95% confidence interval [CI] 9.6–21.6) and 17.4% (n = 19) (95% CI 10.3–24.6), respectively. The leading causes of bilateral vision impairment included cataract ($n = 11$; 50.0%) and diabetic eye disease ($n = 5$; 22.7%) for Indigenous Australians, and refractive error ($n = 5$; 73.7%) and cataract ($n = 3$; 15.8%) for refugees. The rates of bilateral blindness (<6 /60) were 3.5% ($n = 5$) (95% CI 0.5–6.6) for Indigenous Australians and 0.9% ($n = 1$) (95% CI 0.0–2.7) for refugees. The leading causes of bilateral blindness among Indigenous Australians included cataract ($n = 3$; 60.0%) and diabetic eye disease ($n = 1$; 20.0%), while for refugees the sole cause of bilateral blindness was cataracts ($n = 1$; 100.0%). A total of 616 consults were provided, 69 pairs of corrective spectacles prescribed and 51 cataracts surgeries performed including for seven participants who were deemed cataract blind.
Conclusion: There is a high burden of vision loss among urban Indigenous Australians and refugees, largely attributable to preventable and/or treatable ocular conditions. The provision of accessible, purpose-designed services is recommended to address these eye health needs.

The impact of establishing Lions Outback Vision's Kimberley hub on cataract surgery rates and wait times in rural Western Australia

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Purpose: Cataract, a leading cause of visual impairment in older Australians, disproportionately affects First Nations people and rural residents. After establishing a permanent ophthalmology service in Broome in 2020, cataract surgery rate and wait times (CSWT) were compared to the visiting ophthalmology service previously provided by Lions Outback Vision, the sole public ophthalmology provider in the region.
Method: Retrospective cohort study of cataract surgeries performed in the Kimberley in 2019 (pre-hub) compared to 2023 (post-hub). Accounting for the hidden wait, CSWT was calculated as days between referral date to first surgery date.
Results: Cataract surgery was performed in 126 eyes of 120 patients (54% male) in 2019 and 378 eyes of 280 patients (52% male) in 2023: cataract surgery rate of 3360 per-million pre-hub and 9597 post-hub. Median CSWT was significantly longer in 2019 than 2023: 329 days (249–537) and 199 days (108–397), respectively ($p < 0.001$). Mean age (SD) at surgery was 64.1 years (11.1) pre-hub and 65.1 years (10.2) post-hub. Most patients were from First Nations background: 78 (65%) in 2019 and 157 (56%) in 2023. Thirty (24%) surgeries were booked via telehealth pre-hub and 122 (32%) cases post-hub. At booking, median (interquartile range) visual acuity of 6/18 (6/12–6/60) in 2019 was no different to 6/18 (6/12–6/36) in 2023 (p value $= 0.1$). Nearly all post-operative appointments were attended in 2019 (109, 87%) and 2023 (352, 93%).
Conclusion: The number of cataract surgeries increased while waiting times decreased after establishing the Kimberley hub. A permanent remote ophthalmic service is better able to meet population needs.

Central serous chorioretinopathy (CSCR) risk factors among Nepalese patients: Insights from a case–control study

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Purpose: To identify the risk factors of central serous chorioretinopathy (CSCR) in the Nepalese population.
Method: A case–control study was conducted on CSCR patients who presented at Geta Eye Hospital, Nepal, from 2019 to 2021. Data on age, gender, ethnicity, stress levels, sleep patterns and night duties were collected. Binary logistic regression was utilised to determine the odds of developing CSCR among the cases and to adjust for potential confounders. Chi-square tests were conducted to find associations between variables and CSCR.
Results: The study included 132 cases of CSCR and 145 age- and sex-matched controls. The highest incidence of CSCR (52.4%) was in the 31–40 years age group, followed by 32.4% in the 41–50 years age group. The proportion of CSCR was higher in males than in females, with a male-to-female ratio of 3.1:1. Young adults and male gender are significantly associated with CSCR ($p < 0.05$). The Chaudhary population (64.1%) was more affected than the non-Chaudhary ethnic group in Nepal, with Chaudhary individuals having 3.2 times the odds of developing CSCR ($p < 0.05$). Moderate levels of stress, inadequate sleep and night duties were more common among CSCR cases but did not reach statistical significance.
Conclusion: This is the first study in Nepal to report a higher prevalence of CSCR in the Chaudhary ethnic group. Although this study does not establish temporal causation, it underscores the need to suspect CSCR in Chaudhary patients presenting with relevant symptoms. Further research is warranted to explore why the Chaudhary population is more susceptible to CSCR.

Auditing the outcomes of tertiary glaucoma referrals from outreach optometrist-led eye centres

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Purpose: To audit the outcomes of tertiary glaucoma referrals, from optometrist led-Community Eye Care (C-EYE-C) clinics.
Method: A retrospective audit was conducted on patients referred for glaucoma review from C-EYE-C centres to a tertiary eye clinic, over a 24-month period. Referral criteria for unstable glaucoma included progressive Humphrey visual field (HVF) deficits or optic disc thinning, decreasing visual acuity, or poorly controlled intraocular pressures. Demographic and clinical data (HVF deficits, optical coherence tomography parameters) were collated, as well as tertiary medical interventions and C-EYE-C re-referral.
Results: Overall, 336 patients were referred for tertiary assessment. Glaucoma was identified in 53.6% of referred

patients (primary open angle [30.1%], normal tension [13.7%], angle closure [11.6%]), with 37.5% identified as glaucoma suspects and 8.9% not found to have glaucoma. Among the suspects and those without glaucoma, 50.6% had a cause other than glaucoma causing artefactual HVF or optical coherence tomography deficits, of whom 12.2% underwent cataract surgery following their referral. 53.7% of the cohort were on intraocular pressure-lowering drops, 53.9% of whom were commenced following their referral. Among those with glaucoma, 23% had laser, 14.4% underwent minimally invasive glaucoma surgery and 18.3% had other glaucoma surgery. Overall, 65.1% of patients were re-referred to C-EYE-C, with a mean of 1.9 tertiary reviews, prior to referral. Seventy-four patients had tertiary re-referrals, where two patients without glaucoma were later diagnosed with glaucoma.
Conclusion: C-EYE-C effectively escalates patients with suspected unstable glaucoma; optometrists providing safe, longitudinal monitoring, while increasing capacity within tertiary centres, to concentrate on high-acuity patients.

Outcomes from the 24-month phase 2 study of tinlarebant, an oral retinol binding protein 4 antagonist in the treatment of childhood-onset stargardt disease

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Purpose: Evaluation of safety and outcome measures from a 24-month, open label, Phase 2 study of adolescent Stargardt patients treated with tinlarebant, an oral retinol binding protein 4 (RBP4) antagonist.
Methods: Thirteen patients with clinical Stargardt disease and biallelic ABCA4 variants aged 12–18 years showing only questionably decreased autofluorescence lesions at baseline were enrolled. Tinlarebant (5 mg) was administered daily over 24 months. Transitions to, and growth of, incident atrophic lesions identified as definitely decreased autofluorescence (DDAF) on fundus autofluorescence photography, visual function and adverse events were documented.
Results: Tinlarebant produced a sustained reduction of RBP4 (80–90%) throughout the treatment period which was reversible during 28 days of drug cessation. No incident atrophic lesions (DDAF) were observed in 5 of 12 subjects (42%) at month 24. For the seven subjects with incident DDAF lesions, their mean growth was significantly slower (~50%) compared to baseline matched historical controls ($p < 0.001$) at month 24. Best-corrected visual acuity was stable during the treatment period with a mean loss of five letters. Thirty-eight drug-related treatment-emergent adverse events were reported; all were mild in severity. Xanthopsia/chromatopsia and delayed dark adaptation were reported by 10 (77%) and 9 (69%) subjects respectively.
Conclusions: The 24-month treatment data highlights the safety profile of tinlarebant. The absence of transition from questionably decreased autofluorescence lesions to atrophic lesions in 5 of 12 subjects, and the significantly reduced growth of incident atrophic lesions, is encouraging for the future development of Tinlarebant.

Differentiating ABCA4 from PRPH2-associated retinopathy using full-field electrophysiology: An international multicentre study

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Background: Differentiating Stargardt disease (ABCA4) from PRPH2-associated retinopathy is clinically important given their recessive and dominant inheritance patterns, respectively. Although, both may mimic each other when

they present as a fleck retinopathy, we hypothesize certain electrophysiological features may be used to distinguish between these two common inherited retinal diseases.

Methods: This is a retrospective study of patients with biallelic pathogenic variants in ABCA4, or a heterozygous pathogenic variant in PRPH2 with full-field electroretinography recruited from Australian and New Zealand centres. A subset of patients with similar posterior pole hyperautofluorescent flecks based on ultrawide-field imaging were selected for additional analysis. Electrophysiology was performed according to International Society for Clinical Electrophysiology of Vision standards, and all components were extracted. ABCA4 and PRPH2 patients were compared to healthy controls using ANOVA test.

Results: There were 72 ABCA4 and 44 PRPH2 patients and 44 controls (mean age 54) of which 17 ABCA4 and 18 PRPH2patients exhibited a fleck-like phenotype. Both ABCA4 and PRPH2 patient cohorts had a reduced DA0.01 b-wave amplitude and delayed LA30Hz flicker as compared to controls. A greater reduction in the LA3 a-wave amplitude was observed in ABCA4 (14.2 μV) compared to PRPH2 (18.5 μV) or controls (24.1 μV, $p = 0.008$). The PRPH2-associated fleck-like phenotype group showed a significantly reduced DA0.01 b-wave ($p = 0.01$) and delayed LA30Hz flicker ($p = 0.03$) compared to ABCA4. The LA3 b:a ratio was lower in the PRPH2 group (3.5 vs. 4.6) reflecting better preserved cone function and post-photoreceptoral dysfunction.

Conclusion: There was greater cone photoreceptor dysfunction in ABCA4 than PRPH2 patients. Severe rod system dysfunction and lower b:a ratio favoured a PRPH2 genotype.

Genetic Risk Assessment of Degenerative Eye Disease (GRADE): An update on the utilisation of polygenic risk scores in screening normal populations

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Aim: Polygenic risk scores (PRS) have been shown to be useful in predicting glaucoma in populations at risk of glaucoma. There are limited studies which show the utilisation of PRS in screening normal populations. This study aims to determine the clinical utilisation of PRS in screening for glaucoma in a normal population.

Methods: Within the GRADE study, patients within the top decile (PRS > 90), middle 80% and bottom decile (PRS < 10%), were invited to attend an examination to determine their glaucoma status. The examination include best-corrected visual acuity, intraocular pressure (Goldmann applanation tonometry), corneal pachymetry, 24–2 Humphrey automated perimetry, spectral domain optical coherence tomography of the optic disc and macula, stereo-disc and fundus photography. Clinicians performing examinations were blinded to the patient's PRS. Patient data was collected following the examinations and graded by an independent, blinded clinician. Glaucoma was determined by the presence of a glaucomatous visual field defect, along with matching disc and/or optical coherence tomograph damage.

Results: Fifty out of 52 patients completed a comprehensive glaucoma examination. Of the 50 patients examined, four were clinically determined to have glaucoma. All four patients who had glaucoma were in the top PRS decile. Patients in the higher PRS deciles were more likely to have glaucoma ($p = 0.01$). Eye examinations are currently still underway.

Conclusion: PRS may be a useful and cost-effective tool in screening the general population for glaucoma.

17:30–18:30	**Sunset Poster and Film Festival** **Venue:** Exhibition Hall
18:30–21:30	**Senior Fellows Dinner** **Venue:** iTL
18:30–21:30	**Alcon Hosted Evening Symposium** **Venue:** The Sanctuary, Adelaide Zoo
19:30–22:00	**Younger Fellows Dinner** **Venue:** Mrs. Q

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Monday 04 November

Clinical & Experimental Ophthalmology WILEY

06:30–07:45 **ANZGS Morning Symposium**
Venue: Hall E1/E2/E3

08:00–08:30 **AUSTRALIAN VISION RESEARCH (AVR) AGM**
Venue: Hall C

08:30–09:00 **FRED HOLLOWS LECTURE**
Venue: Hall C
Chair: Dr Robert McKay
Title: Tilganga Institute of Ophthalmology – Our humble beginning
Speaker: Dr Reeta Gurung
The Nepal Eye Programme/Tilganga Institute of Ophthalmology (TIO) started functioning in Nepal in 1992 with just outreach community work (Camps) which was the necessity of that period. A National Eye Care need was shown by the National Blindness Survey 1980/81 in which prevalence of blindness was 0.81%. The major causes of blindness were cataract, corneal diseases mainly trachoma, other infections, nutritional deficiencies followed by glaucoma and retina diseases. With the initial support from the Fred Hollows Foundation, TIO was established with two ophthalmologists and a few paramedics. It started planning eye care based on the strong evidence generated by the National Blindness Survey Study of 1980/81 to overcome barriers for eye care existing in the community. Now TIO has a central hospital with 40 ophthalmologists covering all subspecialties of ophthalmology and three other secondary hospitals. The establishment of an intraocular lens (IOL) factory in TIO which produces very low-cost high quality IOLs, brought a paradigm shift in cataract surgery not only in Nepal, but in the world. The use of IOLs in Nepal has increased from 25% in 1994 to almost 99.5% in 2008 resulting in better quality of cataract services. The Eye Bank now harvests more than 1500 corneas every year, supplying tissue to corneal surgeons throughout the country to address the second major cause of blindness in Nepal. Nepal has become self-reliant in IOLs and corneas. The Academic and Training department with a strong research wing, is developing the much-needed human resources for the country and the region. A strong outreach department is always ready to fulfil our social mandate of the organisation catering for the people who otherwise do not have access to eye care. Development of the programs based on the strong evidence and with the dedication and determination of few people on the ground and support from the organisations like the Fred Hollows Foundation, the Himalayan Cataract project and many more have led to the development of organisations like TIO which has made a huge difference to the lives of many people. Nepal's prevalence of blindness has reduced from 0.81% in 1980/81 to 0.3% in 2010. TIO is mainly focused on the quality of services offered, production of competent human and production of IOLs, other products needed for eye care and how can it contribute towards environmental sustainability.

09:00–10:00 **AUSTRALIAN VISION RESEARCH (AVR) PLENARY**
Venue: Hall C
Chair: Prof Stephanie Watson OAM
Speakers and Topics:
1. Dr Carla Abbott – Electrical stimulation to improve gene therapy efficiency
2. Dr Satheesh Kumar – Correction of disease-related point mutation to restore vision in inherited retinal disease
3. Prof David Mackey – Low-concentration atropine for myopia control in Australian children – the two-year treatment and one-year washout findings from the WA-ATOM study
4. Dr Ting Zhang – Restoring retinal alanine balance to treat retinal diseases
5. Prof Robyn Jamieson – Novel genetic factors and RPE65 gene therapy
Email: drjfan@gmail.com

10:00–10:30 **Morning Tea**
Venue: Exhibition Hall

10:30–12:00 **COURSE – Enhancing trabecular meshwork MIGS: Maximising results, overcoming challenges and effectively managing complications**
Venue: Hall A

Chairs: Dr Jason Cheng and Dr Shamira Perera
Aim: Trabecular meshwork minimally invasive glaucoma surgery (MIGS) boasts a remarkable safety record and is frequently conducted by cataract surgeons. This symposium aims to offer insights from leading experts to enhance surgical outcomes, navigate challenges and adeptly address complications. Delving into common hurdles encountered during these procedures, the symposium provides invaluable guidance for optimising performance and managing adverse events effectively.
Speakers and Topics:
A/Prof Mitchell Lawlor – Surgical gonioscopy: Optimising the view
Dr Alannah Walsh – GATT: Getting started and tips for success
A/Prof David Lubeck – Navigating Schlemm's Canal – Common challenges with iTrack Advance
Dr Jed Lusthaus – Imaging of aqueous outflow perioperatively. Can we optimise stent placement?
Dr ZhuLi Yap – Hydrus insertion: Getting it right the first time and what to do when it isn't
Dr Colin Clement – Managing hyphema intraoperatively and post-operatively
Dr Jason Cheng – Performing trabecular meshwork MIGS in angle closure
A/Prof Shamira Perera – Complications of trabecular meshwork MIGS
Email: chengophthalmology@gmail.com

10:30–12:00 **COURSE – Vitreoretinal surgery oscars – The good, the bad and the ugly!**
Venue: Hall B
Chair: Prof Adrian Fung
Aim: Who doesn't enjoy a good film festival? The aim of this course is to present outstanding vitreoretinal surgical videos and discuss learning points around them. The videos will fall into three categories: “The Good, the Bad and the Ugly”.
The Good: A new/novel technique that has proved successful or a case with a particularly good outcome.
The Bad: A situation where vitreoretinal surgery was used to fix up a problem from another subspecialty.
The Ugly: A situation where the vitreoretinal surgeon had a complication (which may/may not have required intervention by another subspecialty colleague).
Synopsis: Each case will be presented in two parts.
In Part 1, the case will be partially presented before asking for panel and audience comments regarding potential options to tackle the problem.
In Part 2, the speaker will reveal how they dealt with the problem, playing a high-resolution video of their surgery.
The discussion will help general ophthalmologists understand the latest developments in vitreoretinal surgery, management of multi-subspecialty complications and avoidance of surgical complications.
Examples may include presentations of:
1. Choroidal biopsies
2. Amniotic membrane or retinal translocation for recalcitrant macular holes
3. Chandelier scleral buckles
4. Aniridic intraocular lenses
5. Surgical management of uveal effusion syndrome
6. Macular buckles for myopic traction maculopathy
7. Silicone oil related visual loss
8. Intraocular foreign body removal
9. Novel techniques for aphakia management
10. Keratoprostheses for vitrectomy
11. Endoscopic vitrectomy
12. MCQs
There will be nine speakers who will present a four-minute case with five minutes of discussion:
Prof Adrian Fung
Dr Mali Okada
Dr Sarah Welch
A/Prof Rosie Dawkins
Dr David Sia
Dr Jagjit (Jolly) Gilhotra
Dr Gaurav Bhardwaj
Prof Andrew Chang
Prof Adrian Fung
Email: adrian.fung@sydney.edu.au

10:30–12:00 **COURSE – Preventing misdiagnosis of inherited retinal diseases**

Venue: Hall C

Chairs: A/Prof Fred Chen, A/Prof Heather Mack and Prof John Grigg

Aim: The prevalence of monogenic inherited retinal diseases (IRD) is in 1 in 3000. IRDs may masquerade as age-related macular degeneration, glaucoma, inflammatory eye diseases and neuro-ophthalmic emergencies. This can result in unnecessary and invasive investigations and inappropriate medical therapies. When an ophthalmologist suspects an IRD how do they establish a genetic diagnosis and what are the appropriate investigations to exclude any associated systemic features? This course will highlight red flags on history, examination and multimodal imaging that a general ophthalmologist should be aware of in their everyday practice. Best practice guidance on the management of IRD patients will be discussed.

Synopsis: IRDs often mimic common ocular disorders such as age-related macular degeneration, glaucoma, uveitis and papilloedema. Misdiagnosis can lead to unnecessary investigations and treatments, and a delay in identifying life threatening systemic associations of an underlying syndrome. Correct diagnosis is imperative for patients to be considered for emerging gene therapies. This presentation will cover IRDs that a general ophthalmologist may see in their clinical practice. We will cover what a comprehensive IRD work-up entails and illustrate how multimodal imaging can be used to prompt further IRD work-up. Lastly, we will discuss what systemic investigations are required when a syndromic IRD is suspected.

Speakers and Topics:

A/Prof Heather Mack – Is there an IRD among all these AMDs?

Prof SriniVas Sadda – Vitelliform lesions: when to suspect an IRD

A/Prof Fred Chen – Macular neovascularisation: when to suspect an IRD

Prof John Grigg – Field defects: when to suspect an IRD?

A/Prof Andrea Vincent – Inflammatory eye disease: when to suspect an IRD?

Dr Elise Héon – When and how to investigate for syndromic association in an IRD

Prof Robyn Jamieson: Now you think this is an IRD, what's next?

Dr Rachael Heath Jeffery: Cases for panel discussion

Email: fred.chen@lei.org.au

10:30–12:00 **COURSE – Practical cybersecurity for your practice**

Venue: Hall D

Chair: Dr Marc Sarossy

Aim: Sophisticated cyberattacks can be devastating to a practice with loss of years of sensitive patient and commercial data, critical software and the reputational risk if a practice is compromised. Electronic medical records, and reliance on proprietary imaging hardware and software such as optical coherence tomography scanners and fundus photography devices makes ophthalmology particularly vulnerable. In this course, we explore the growing problem of ransomware facing ophthalmology practices, and teach risk mitigation in cybersecurity and cyberhygiene to make your practice more resilient. We also explore how to recover if the worst should happen.

Speakers and Topics:

Dr Marc Sarossy – Overview of ransomware

This brief talk will outline the nature of ransomware, what it can do, how it spreads and what can stop it getting in and how if in, it can be stopped compromising all servers and services within the practice.

Dr Kevin Foo – Lock your practice down

This talk will outline how a typical practice can implement hardware and behavioural solutions to prevent the ingress of ransomware into the practice.

Dr Kristyna Stepnicka – Your obligations to report and disclose

Although the goal is to avoid ransomware attacks, unfortunately they still occur. Even when the threat has been stopped and eliminated, it is important to understand if a data breach requires notification to authorities and affected individuals. Find out the principles of determining whether reporting is needed and how to communicate this effectively to your patients.

Ms Olivija Tsaketas – Dealing with an attack and keeping your cool.

Discovering a ransomware attack should be up there as one of the major life events. In this talk, Olivija will walk through how her practice survived and recovered from a near miss and what was learned from the experience.

Dr Marc Belaj – Cybersecurity trends and policy

Dr Marc Belaj will outline trends in the landscape of medical cybersecurity.

Mr Alexander Sarossy – Spear phishing and email security

In this fun part of the course, Alex will show off his skills in crafting a simulated spear phishing attack on a volunteer practice from the audience in real time. Learn how to make practical changes to your website and email systems to make this harder for the bad guys.
Email: marc@sarossy.com

10:30–12:00 **FREE PAPERS – Cataract/Cornea/Refractive**
Venue: Hall E1/E2/E3
Chairs: Dr Andrea Ang and Dr Aanchal Gupta

Efficacy and safety of corneal cross-linking in keratoconus patients with corneal thickness less than 400 micron: A systematic review

Farzaneh Mohammadi[1], Mark Daniell[2], Myra McGuinness[3], Elaine W. Chong[4], Mohammad Z. Mustafa[2]
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Purpose: To investigate the effectiveness and safety of corneal collagen cross-linking (CXL) in patients with keratoconus (KC) and corneal thickness <400 μm. Traditional guidelines recommend a minimum stromal thickness of ≥400 μm to avoid endothelial damage, but newer CXL methods have been developed for thinner corneas to optimise surgical decisions.
Methods: MEDLINE Ovid, Embase Ovid and SCOPUS were searched for English-language studies published in peer-reviewed journals. Eligible studies included prospective and retrospective case series, cohort studies and randomised clinical trials in KC patients with corneal thickness <400 μm, regardless of CXL approach. A random-effects meta-analysis was conducted to pool average changes in corrected visual acuity (CVA), refractive cylinder, endothelial cell density and corneal curvature (Kmax) at key time points. Study quality was assessed using the JBI Critical Appraisal Checklist for Case Series.
Results: Twenty-two studies with modified CXL techniques for thin cornea published between 2011 and 2023 were included. Average Kmax decreased at six months ($n = 9$ studies/207 eyes, mean −1.3D, 95% confidence interval [CI] −2.4, −0.2, $I^2 = 95\%$) and 12 months ($n = 13$ studies/341 eyes, mean −1.2D, 95% CI −1.8, −0.7, $I^2 = 89\%$). CVA improved at six months ($n = 10$ studies/235 eyes, mean − 0.08 log MAR units, 95% CI −0.13, −0.03, $I^2 = 79\%$) and 12 months ($n = 15$ studies/372 eyes, mean −0.08 log MAR units, 95% CI −0.11, −0.05, $I^2 = 61\%$). No major complications were reported.
Conclusions: CXL improved visual and keratometric parameters without major complications in patients with corneal thickness < 400 μm, given appropriate modifications. Further prospective comparative studies are needed to guide the choice of CXL approach.

Visual performance outcomes of a purely refractive extended depth of focus intraocular lens

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Purpose: To evaluate the visual performance of a new refractive extended depth of focus (EDOF) intraocular lens (IOL) compared to a standard aspheric monofocal IOL.
Methods: A comparative evaluation of visual outcomes from two prospective, randomised, subject/evaluator masked clinical studies conducted in Australia/New Zealand and United States. The refractive EDOF IOL was bilaterally implanted in 60 subjects and the monofocal IOL was bilaterally implanted in 131 subjects. Monocular distance-corrected (DC) visual acuities at far, intermediate and near were evaluated at the six-month postoperative visit. Visual symptoms experienced by the subjects were collected with a validated patient-report visual symptoms questionnaire.
Results: Monocular distance corrected intermediate visual acuity in eyes with the EDOF IOLs showed two lines of improvement in comparison to the monofocal IOL eyes. The range of vision at 0.20 logMAR from the monocular defocus curve was 0.7 D larger in the EDOF eyes when compared to monofocal eyes. Mean monocular BCDVA was similar with EDOF (−0.06 logMAR) and monofocal IOL (−0.05 logMAR). Similar percentages of

subjects did not experience, were not bothered or were slightly bothered by halos, starburst and glare for both lens models, with 92% vs. 95% for halos, 95% vs. 94% for starbursts, and 95% vs. 96% for glare in the EDOF IOL group vs. control group, respectively.

Conclusions: The new refractive EDOF IOL meets the criteria of an EDOF IOL according to the American National Standards Institute standard (Z80.35), providing excellent distance and intermediate vision with a dysphotopsia profile similar to that of a monofocal IOL.

Lens tilt in flanged intrascleral haptic fixation – Clinical characteristics and outcomes in a Victorian prospective study

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Purpose: Flanged intrascleral haptic fixation technique (FIHFT) is a relatively novel technique for secondary intraocular lens (IOL) insertion in the context of poor capsular support. It has been reported that FIHFT may result in visually significant levels of lens tilt.

Method: Patients presenting to the Royal Victorian Eye and Ear Hospital Vitreoretinal Unit for secondary IOL insertion using FIHFT were recruited consecutively from September 2022 to September 2023. Patients were reviewed preoperatively and at 1 day, 1 week and 1 month post-operatively to record patient variables, visual acuity and angle of lens tilt.

Results: Fifty patients underwent secondary IOL insertion with FIHFT. The most common surgical indications were dislocated/subluxed IOL (64%, $n = 32$), followed by dropped nucleus/incomplete cataract surgery (18%, $n = 9$) and dislocated crystalline lens (8%, $n = 4$). The most common comorbidities were pseudoexfoliation (26%, $n = 13$) and uveitis-glaucoma-hyphaema syndrome (14%, $n = 7$). Preoperative mean ± standard deviation best corrected visual acuity was 1.62 ± 0.55 (logMAR). Post-operative mean best corrected visual acuity was 0.45 ± 0.32, a statistically significant improvement ($p < 0.001$). Some degree of lens tilt was observed in all IOLs analysed, with a mean angle of 3.18° ±2.50. There was no statistically significant relationship between the angle of lens tilt and the final visual acuity ($p = 0.3358$) or overall improvement in visual acuity ($p = 0.4855$).

Conclusion: FIHFT is a safe, viable method of secondary IOL insertion. While it does result in a degree of lens tilt, this was not associated with significant impact on visual acuity.

Total corneal staining and visual acuity improvement with cyclosporine ophthalmic solution 0.09% in a Phase 4 study of patients with dry eye disease

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Purpose: Cyclosporine ophthalmic solution 0.09% (CsA 0.09%) and cyclosporine ophthalmic emulsion 0.05% (CsA 0.05%) are immunomodulatory agents indicated to increase tear production in dry eye disease (DED). We assessed the effect of CsA 0.09% on corneal fluorescein staining (CFS) and best-corrected visual acuity (BCVA) in patients with DED inadequately controlled on CsA 0.05%.

Method: This Phase 4, open-label study enrolled adults with DED inadequately controlled on CsA 0.05% for ≥3 months. Patients instilled CsA 0.09% twice daily per eye for 12 weeks. Total CFS score summed fiv corneal areas and was scored on a 0–4 modified NEI scale. BCVA was assessed using the Snellen eye chart and then converted to logMAR. Adverse events (AE) were evaluated.

Results: For the intent-to-treat population ($N = 124$), mean (standard deviation [SD]) age, baseline total CFS score for both eyes (OU), and baseline BCVA OU was 65.6 (11.54) years, 5.7 (3.37), and 0.05 (0.12), respectively. Mean (SD) change from baseline at week 12 in total CFS score and BCVA OU was −3.1 (2.88; $p < 0.0001$) and −0.02 (0.079; $p = 0.0038$), respectively. Total CFS score OU was significantly reduced at week 12 regardless of relative BCVA ($p < 0.0001$ for each). Overall, 58 patients (43.3%) reported ≥1 AE; most AEs (73.8%) were mild, and instillation-site irritation was the most common (12.7%) AE.

Conclusion: In patients with an inadequate response to CsA 0.05%, twice-daily CsA 0.09% was associated with significant improvements in total CFS score and BCVA OU with reductions in total CFS score observed regardless of relative BCVA.

The Bacterial Ocular Surveillance System (BOSS): Results from the 2019 to 2023 national report

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Purpose: Antimicrobial resistance (AMR) is a health threat worldwide. Surveillance data for AMR from ocular infections is emerging globally. The Bacterial Ocular Surveillance Program (BOSS) was initiated at Sydney Eye Hospital in 2016 and has expanded nationwide. We report the spectrum and AMR of bacteria isolated from cornea scrapings in bacterial keratitis from 2019 to 2023.
Method: A retrospective analysis of bacteria isolated from cornea scrapings from patients with bacterial keratitis from Sydney, Melbourne, Adelaide and Perth was conducted from 1 January 2019 to 31 December 2023.
Results: There were 2917 organisms isolated from corneal scrapings from 10 participating sites. There were 2147 (74%) Gram-positive and 770 (24%) Gram-negative organisms. Coagulase-negative staphylococci (CoNS) 32% (941/2877), *Staphylococcus aureus* 22% (639/2877), *Corynebacterium* spp. 5% (139/2877); and *Pseudomonas aeruginos*a 13% (392/2877) were the most common organisms. Antimicrobial resistance was found for CoNS to cefalotin 24%, chloramphenicol 12%, ciprofloxacin 7% and gentamicin 5%; *S. aureus* to cefalotin 7%, ciprofloxacin 8%, chloramphenicol 5%, gentamicin 3%; Corynebacterium spp. to cefalotin 20%, chloramphenicol 17%; ciprofloxacin 10%. *Pseudomonas aeruginosa* to ciprofloxacin 2.3%, gentamicin 2.2%, and tobramycin 1%. All Gram-positive isolates were susceptible to vancomycin.
Conclusion: CoNS were the main causal organisms of bacterial keratitis. About one-quarter of CoNS and a fifth of *Corynebacterium* spp. were resistant to cefalotin. The resistance to ciprofloxacin remains below 10%. The number of *Pseudomonas aeruginosa* isolates with antibiotic resistance is rising. An ongoing nationwide monitoring of AMR in bacterial keratitis is key to guide clinical decision-making and empiric antibiotic management.

Validation of the Catquest-9SF compared to Priquest questionnaire in an Australian cataract population

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Background: The Catquest-9SF and Priquest questionnaires have been recommended by the Australian Commission on Safety and Quality in Health to be incorporated in the cataract service pathway to support patient-centred healthcare. The Catquest-9SF is a validated questionnaire for the monitoring of patient-reported outcome measures in cataract surgery. However, little is known about the properties of the Priquest.
Purpose: To assess the validity of the Catquest-9SF versus Priquest questionnaire among the cataract population in a public hospital in Sydney, Australia.
Method: The English version of the Catquest-9SF and Priquest was administered to patients on the day of surgery, prior to having cataract surgery. Questionnaire responses and clinical data were collected. Rasch analysis was performed to assess psychometric properties.
Results: Preoperative Catquest-9SF and Priquest questionnaires were obtained for 299 and 204 patients, respectively. Baseline demographic characteristics for both groups were similar. Both questionnaires had ordered response thresholds, good person separation (Catquest-9SF 2.65, Priquest 2.56) and patient separation reliability (Catquest-9SF 0.88, Priquest 0.87). All items fit a single overall construct (Catquest-9SF infit range 0.78–1.26, outfit range 0.74–1.33; Priquest infit range 0.78–1.45, outfit range 0.67–1.26). Only the Catquest-9SF demonstrated unidimensionality by principal components analysis (Catquest-9SF 60% vs. 60.2%; Priquest 46.1% vs. 45.8%). Cronbach's α was 0.92 for both questionnaires.
Conclusion: The Catquest-9SF questionnaire is shorter, with good to excellent performance for all metrics assessed in comparison to the Priquest. The Catquest-9SF is a valid tool for the assessment of subjective visual functioning in patients with cataract.

Screening plus corneal cross-linking for keratoconus is cost-effective: A proof-of-concept Markov analysis

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Purpose: Studies have shown that the prevalence of keratoconus in New Zealand is higher compared to the global prevalence of 1.38 per 1000, with Māori and Pacific Islander being over-represented. Studies have also suggested that the form of keratoconus in New Zealand may have a more rapid progression of disease. Corneal cross-linking have demonstrated efficacy in slowing or arresting the progression of keratoconus. In this study, we aimed to estimate the cost-effectiveness of introducing screening for keratoconus in the New Zealand context, with corneal cross-linking as treatment for those screening positive.
Methods: A Markov simulation was used to model the impact of screening plus corneal cross-linking compared to usual care across a lifetime horizon and societal perspective with a 3% discount rate. Cost-effectiveness was determined by the incremental cost-effectiveness ratio (ICER), with utility measured in quality-adjusted life-years. Multivariate sensitivity analyses were carried out to investigate factors influencing cost-effectiveness.
Results: The ICER for screening plus corneal cross-linking was below the willingness-to-pay threshold of NZ $79000 per quality-adjusted life-years gained. Probability sensitivity analysis showed that age at start of screening, discount rate, costs had an impact on the ICER.
Conclusion: Keratoconus is a progressive disease with onset during puberty and early adulthood, leading to significant clinical, economic and social disadvantages. Screening for keratoconus, with corneal cross-linking for children who screened positive and continued to progress despite standard spectacles or lenses, is likely to be cost-effective.

Outcomes of corneal cross-linking versus photorefractive keratometry combination therapy for keratoconus

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Purpose: To compare the outcomes of corneal cross-linking alone (CXL) versus photorefractive keratectomy combination therapy (CXL-PRK) for keratoconus treatment.
Method: Medline, Embase, PubMed, Scopus and Cochrane Library databases were searched on 17 February 2024. Studies were excluded if there was no CXL-only comparator and follow-up was less than six months. Primary outcome measures were change in uncorrected and corrected distance visual acuity (UDVA, CDVA) from baseline to last follow-up. Secondary outcomes included keratometry and reported adverse events. Risk of bias was assessed using ROBINS-I tool. Meta-analysis was performed using a random effects model.
Results: A total of 272 non-duplicate studies were retrieved, 17 underwent full-text screening, and nine were included. 1014 participants (1165 eyes) were studied across seven cohort studies and two case series. Meta-analyses showed there was significant difference in the mean change in UDVA between CXL-only and CXL-PRK groups (mean difference = 0.28 logMAR, 95% confidence interval [CI] 0.13–0.44, $p < 0.01$), which clinically equated to almost two lines improvement on a VA chart. There were non-significant changes in CDVA between groups (MD = 0.02 logMAR, 95% CI 0.00–0.05, $p = 0.07$). There was greater reduction in keratometry in CXL-PRK compared to CXL-only groups (MD = 2.55, 95% CI 0.62–4.47, $p = 0.01$). The most common adverse outcome was central corneal haze (4.24% and 2.12% in CXL-only and CXL-PRK, respectively). Included studies had moderate to serious risk of bias.
Conclusion: Although there was statistically greater improvement in UDVA following CXL-PRK compared to CXL-only at 12-month follow-up, the lack of significant improvement in CDVA makes the results clinically less significant.

Comparing gene expression in uveitic, steroid-induced and age-related cataracts: Potential implications in cataract pathogenesis

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Purpose: Uveitic and steroid cataracts contribute to significant morbidity but their pathogeneses are poorly understood. This RNA sequencing study aims to identify differentially expressed genes (DEG) between uveitic, steroid-induced and age-related cataracts (ARC) to form hypotheses about the underlying biological phenomena.
Method: Between March and July 2023 in Melbourne, Australia, human anterior lens capsules were prospectively collected during surgery from patients with ARCs ($n = 22$), steroid-induced ($n = 23$) and uveitic ($n = 25$) cataracts. After stabilisation in RNAlater®, the Australian Genome Research Facility performed RNA isolation (RNeasy® Mini Kit), library preparation and sequencing (Illumina workflow). DEGs (log fold change ≥1, false discovery rate (FDR) < 0.05) were identified and underwent bioinformatic analyses.
Results: After removing low-abundance genes, 17 393 genes remained. Sex and VisionBlue were corrected for as covariates. Comparing uveitic cataracts and ARCs, 345 DEGs were identified: 274 up-regulated and 71 down-regulated. Prominent gene ontology (GO) terms include regulation of leukocyte migration (12 DEGs, FDR = 3.85E-03), adaptive immune response (16 DEGs, FDR = 5.79E-04), and tumour necrosis factor response (11 DEGs, FDR = 2.03E-02). Comparing uveitic and steroid cataracts, 206 DEGs were identified: 160 up-regulated and 46 down-regulated. Prominent GO terms include response to growth factor (15 DEGs, FDR = 2.07E-02), regulation of epithelial cell proliferation (14 DEGs, FDR = 1.46E-03), and epithelial cell differentiation (16 DEGs, FDR = 1.01E-02). No DEGs were found between steroid cataracts and ARCs.
Conclusion: As the first RNA-seq study on these secondary cataracts, this dataset will enhance understanding of uveitic and steroid cataract pathogenesis and guide future research, particularly in selecting specific genes for animal model studies.

Predictors of poor visual outcomes following cataract surgery in patients with Fuchs endothelial corneal dystrophy

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Purpose: To evaluate to ascertain preoperative corneal factors that predict poor visual outcomes in patients undergoing cataract surgery alone in Fuchs endothelial corneal dystrophy (FECD).
Method: A single surgeon retrospective, observational cohort study over 10 years, (1 March 2014 to 29 February 2024). All patients with FECD undergoing cataract surgery in worse eye were included. Those with extended morning blur (>4 h) and central corneal thickness (CCT) >650 microns were assigned for combined cataract surgery and endothelial keratoplasty (EK) and were therefore excluded.
Results: There were 144 eyes included. Mean follow-up was 36 months (range 3 to 75 months). The mean visual acuity improved from LogMAR 0.34 ± 0.28 preoperatively to LogMAR 0.14 ± 0.17 at 3 months postoperatively ($p < 0.001$). The mean preoperative CCT reduced from 576 ± 38 microns to 588 ± 52 microns at 3 months ($p = 0.08$). During follow-up, 18 eyes (12.5%) required EK because of poor visual outcome. Mean preoperative CCT of these eyes was significantly higher than eyes that did not require EK (603 ± 33 microns vs. 564 ± 32 microns, $p = 0.002$). All these eyes had CCT of >10% than fellow eyes.
Conclusion: Patients with a preoperative morning blur (>2 h), CCT > 620 microns and > 10% higher than the fellow eye, were positively correlated predictive factors for poor visual outcomes following cataract surgery alone in FECD patients. Therefore, those eyes with FECD that still have enough endothelial cell function so they don't reach these criteria, EK can be avoided while ensuring good visual outcomes.

12:00–13:30 **Lunch**
Venue: Exhibition Hall

13:30–15:00 **PLENARY – CLINICAL CONTROVERSIES**
Venue: Hall C
Chairs: Dr Graham Hay-Smith, Dr Ridia Lim and Dr Sukhpal Sandhu
Speakers and Topics:
Prof Rosa Braga-Mele - Immediate sequential bilateral cataract surgery: Pros and cons

This lecture will review the potential benefits and issues with immediate sequential same day cataract surgery as opposed to staging cataract surgery by 1 week to 1 month for patients. We will review the literature and personal experience.

Prof Jeffrey Goldberg - Will whole eye transplant come to ophthalmology?

Blindness remains one of the most devastating morbidities and for the major causes including glaucoma and other optic neuropathies, age-related and other macular degenerations, and diabetic retinopathy, as well as less common causes including trauma or ischemia along the visual pathways, there are no therapies to restore vision. Whole eye transplant has long been hailed as a goal that could more generically solve for vision loss. Here we discuss the recent report of an eye transplant in the context of hemifacial transplant, and review progress towards overcoming barriers that must be addressed.

Dr Elise Héon - Controversial issues in Paediatric Ophthalmology and Ocular Genetics

This lecture will cover practical controversial issues encountered in Paediatric Ophthalmology and Ocular genetics. This will include topics such as 1) should I do genetic testing or not? 2) Should I follow patients with retinal degeneration? Should we do cataract surgery in retinal degeneration? Should we see all patients with congenital hearing loss? What to do when parents insist on probing for nasolacrimal duct obstruction? What should I do next in working up a nystagmus with normal fundus?

Prof SriniVas Sadda - Does anti-VEGF therapy cause or accelerate atrophy in AMD?

A number of studies have highlighted that atrophy frequently develops in the context of neovascular AMD, and given the neuroprotective role of VEGF, the concern has been raised that anti-VEGF therapy may increase the rate of development or progression of atrophy in this context. This has led to some physicians choosing to treat exudative AMD less aggressively, potentially exposing patients to the risk of vision loss related to persistent exudation. This presentation will explore the available evidence to support or refute the notion that anti-VEGF therapy accentuates atrophy in neovascular AMD.

Dr Reeta Gurung - Can Refractive surgery be made available for all?

Refractive Error is the 2nd major cause of blindness after cataract accounting for 5.7 million people and 157 million people with moderate to severe visual impairment.

The refractive error is mostly in young population of working age group. Myopia is increasing in the whole world. But the problem of ongoing cost of replacement, durability, difficulty in accessing the glasses, difficulty in maintaining them in manual agricultural work and stigma of disability in few cultures are few of the many problems with glasses in low and middle income countries. Contact lenses are also associated with cost, patients' education level, hygiene and need of regular follow ups, which makes it less acceptable to people in those communities.

Refractive surgery is one of the surgeries which has changed the life of many people who otherwise had to depend on glasses or contact lenses. It certainly has opened up new horizons for many like in certain professions.

Refractive surgeries like LASIK, SMILE, PRK etc. are quite extensively studied, stable, safe and one-time procedure to correct the refractive error which is equally good for high income as well as low income countries.

But this service is limited to people who can afford the very expensive treatment. Can it be made available to many who otherwise cannot afford the refractive surgery procedure just because they do not have means to this treatment? High costing machines, very expensive screening tools, expensive consumables, licence for each click, high cost of the training of the surgeon is making the refractive surgery unreachable to many.

Dr Raymond Douglas - Simultaneous Aesthetic and Functional TED surgery .... Is Staged surgery outmoded?

Improved surgical techniques and patient demands have led to simultaneous surgery for management of aesthetic and functional outcomes in TED. These surgeries are more efficient, safer and may offer improved outcomes.

15:00–15:30 **Afternoon Tea**
Venue: Exhibition Hall

15:30–17:00 **COURSE – All India Ophthalmic Society (AIOS)**
Venue: Hall A
Chair: Dr Samar Basak
Speakers and Topics:
Dr Alkesh Chaudhury – Management of posterior capsule defect in adult cataract
Dr Amitav Kumar – Approach to hypopyon anterior uveitis
Dr Piyush Bansal – Transformers: Vitreoretinal surgery to the rescue of the fallen
Dr Samar Basak – Abandoned phaco: Convert to manual small Incision cataract surgery
Dr Karan Bhatia – Descemet's stripping endothelial keratoplasty: From simple to challenging cases
Email: basak_sk@hotmail.com

15:30–17:00 **COURSE – Management strategies for common strabismic conditions**

Venue: Hall B

Chairs: A/Prof Geoffrey Lam and Dr Shanel Sharma

Aim: A case-based interactive question and answer session with the aim of increasing the confidence of the general ophthalmologist who is seeing strabismus patients and managing routine strabismus cases. The course is aimed for the general ophthalmologists/registrars.

The expert panel, with audience involvement, will be discussing management of common strabismic conditions in adults and children such as:

- Esotropia
- Exotropia
- Vertical tropias
- Strabismic syndromes
- Nerve palsies

Panel: A/Prof James Elder, Dr Craig Donaldson, A/Prof Shuan Dai, Dr Wendy Marshman, Dr Deepa Taranath, Dr Ross Fitzsimons.

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15:30–17:00 **COURSE – Bacterial ocular infections: What you need to know in 2024 and beyond**

Venue: Hall C

Chairs: Prof Stephanie Watson OAM and Dr Maria Cabrera Aguas

Aim: Ocular infections remain a cause of significant ocular morbidity and vision loss. Bacterial endophthalmitis and keratitis are vision threatening emergencies requiring prompt and appropriate management. The selection of the appropriate anti-microbial therapy and adjunct therapies such as topical steroids requires up-to-date knowledge of the causal organisms, their resistance patterns and of high-quality clinical evidence. The aim of this symposium is to provide the comprehensive ophthalmologist with an update on the management of bacterial ocular infections along with evidence on anti-microbial resistance, the use of adjuvant therapies and how to work effectively with microbiologists.

Synopsis: Expert presenters will communicate evidence-based updates on vision threatening bacterial ocular infections (keratitis and endophthalmitis). At the end of the symposium, it is expected that the comprehensive ophthalmologist will be able to select optimal management strategies for such infections and understand emerging issues eg anti-microbial resistance.

Speakers and Topics:

Prof Stephanie Watson OAM – Microbial keratitis

An update on the clinical aspects of bacterial keratitis.

A/Prof Fred Chen – Endophthalmitis

An update on the diagnosis and management of endophthalmitis.

Dr Jern Yee Chen – Fluoroquinolones vs. fortified antibiotics

Evidence on the efficacy and safety of these antibacterial agents to inform clinicians on their appropriate use in Australia and New Zealand.

Dr Maria Cabrera Aguas – Antimicrobial resistance

Antimicrobial resistance is a global public health threat with significant impact on treatment outcomes. This lecture will present timely data on antimicrobial resistance for organisms isolated from ocular infections to guide treatment decisions.

A/Prof Chameen Samarawickrama – Current guidelines for ocular infections

An overview of current prescribing guidelines for ocular bacterial infections in Australia and New Zealand.

Dr Morgyn Warner – What ophthalmologists should know about bacteria

The variety and complexity of ocular infections has increased over the last decade. This lecture will discuss the need for microbiologists and clinicians to work closely together to establish the aetiology of infection. This includes clear communication of the specimen requirements to diagnose the wide array of pathogens from ocular samples.

Q&A

Email: stephanie.watson@sydney.edu.au

15:30–17:00 **COURSE – Surgical coaching and performance review**

Venue: Hall D

Chair: Prof Nigel Morlet

Aim: Building on the 2023 assessment project and course, this session provides a novel way to optimise surgical performance while also building skills around reflective practice and performance coaching.

Outline: This session will build on the success of the 2023 assessment project and course, exploring surgical coaching as it relates to cataract surgery. Concepts of coaching will be covered.

As in 2023, prior to Congress, Fellows are invited to submit unedited video of one standard, uncomplicated, cataract surgery. These are self-assessed and then shared with a pool of participants for peer evaluation. The results of the

assessments are presented aggregated and analysed during the session and provide the basis for the discussion on how those results can help with an ongoing system of surgical coaching.
Speakers: Prof Nigel Morlet, Dr Rahul Chakrabarti, Dr John McCoombes, Dr Rushmia Karim, Dr Peter Beckinsdale
Email: n.morlet@idrs.com.au

15:30–17:00 **FREE PAPERS – Oculoplastic/Training**
Venue: Hall E1/E2/E3
Chairs: Dr James Slattery and Dr Katja Ullrich

Building the workforce of tomorrow: The weighting of rural exposure in standardised CV scoring criteria for entrance into Australian specialty training programmes

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Purpose: To determine the weighting of rural exposure (including during formative years, medical school and postgraduate placement) within curriculum vitae (CV) scoring criteria for medical officer's applying into specialty training programs in Australia.
Method: All 47 Australian specialty training programs, outlined by the Australian Health Practitioner Regulation Agency, were included and their college, society and faculty websites were searched for publicly available standardised CV scoring criteria. The rurally focused general practice training program Australian College of Rural and Remote Medicine was also included. A cross-sectional analysis of the point allocations towards rural exposure was performed.
Results: Of the 14/48 included training programs who publish CV scoring criteria, 8/14 specialty training programs allocate points towards rural exposure within standardised CV scoring criteria. While the weighting of rural exposure varies among the eight specialty training programs, it is a valuable attribute of applicants (mean weighting: 13.7%). RANZCO, the Royal Australian and New Zealand College of Obstetricians and Gynaecologists and College of Intensive Care Medicine have the greatest weighting towards rural exposure of the eight specialty training programs: 28.5%, 24.6% and 14%, respectively.
Conclusion: The relative weighting of rural exposure within the RANZCO training program is greater than other specialty colleges who publish publicly available standardised CV scoring criteria. Future prospective studies could consider the association between rural exposure points reported by successful applicants and their location of future practice. Development of RANZCO's CV scoring criteria should continue to consider point allocation towards rural exposure and related activities to ensure that the requirements of rural Australian eyecare are met.

Frontalis muscle flap advancement for severe blepharoptosis with poor levator function: Preliminary results

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Background: Management of poor levator function ptosis is challenging and surgical management is often by indirectly connecting the eyelid to frontalis muscle, with sling material. Commonly used materials include silicone, goretex or fascia lata. Many of these materials have complications of foreign-body reaction, extrusion or donor site complications. A new technique has been described using an advancement flap of the frontalis muscle, eliminating the need for donor material or fascia graft.
Methods: A single surgeon retrospective review of all patients who underwent frontalis muscle advancement for severe ptosis with poor levator function between 2020 and 2024, with at least 6 months of post-operative follow-up. Charts were reviewed for demographics, preoperative and post-operative clinical measurements, and complications.
Results: Forty patients (53 eyelids) were reviewed, 27 were unilateral cases and 13 bilateral. Common conditions were congenital ptosis and blepharophimosis syndrome. Some of the patients were revision of previous sling procedures. The mean patient age was 13.9 years

(range, 6 months to 76 years). The mean preoperative margin reflex distance 1 was 0.15 ± 0.97 mm which improved to 2.52 ± 0.87 mm at 6 months, with an average lagophthalmos of 2.08 ± 1.53 mm. Two patients had revision surgery for overcorrection/corneal lash touch and one patient developed an eyelid abscess requiring drainage. There were no other significant complications.
Conclusions: Frontalis muscle advancement technique is an effective technique to treat severe blepharoptosis with poor levator function, with good short-term effects and few complications.

Radiological findings in carotid cavernous fistulas

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Purpose: Initial evaluation of suspected carotid cavernous fistulas (CCF) involves computed tomography angiography. The purpose of this study was to evaluate the computed tomography angiography findings in patients with CCFs compared to controls.
Methods: Retrospective study on patients with digital subtraction angiography confirmed CCFs with neuroimaging performed prior to the digital subtraction angiography. Multiple findings were assessed: superior ophthalmic vein (SOV) early enhancement, cavernous sinus (CS) enlargement and early enhancement, and preseptal oedema. The SOV size was classified as enlarged if it was ≥3.0 mm. CT attenuation (Hounsfield Unit, HU) differences between the internal carotid artery (ICA) and CS, CS and transverse sinus, and ICA and SOV were calculated to determine their sensitivity/specificity for CCFs.
Results: Forty participants, with 20 cases and 20 controls were included (mean 66 ± 12 years, 22 females). Ipsilateral to the fistula, there was a higher occurrence of SOV enlargement, SOV early enhancement, CS enlargement and early enhancement, and pre-septal oedema ($p < 0.01$). A cut-off value of 141 HU for ICA-CS and 130 HU for the CS-transverse sinus yielded a sensitivity and specificity of 100% for CCFs with an AUC of 1.0. For ICA-SOV, a cut-off point of 223 HU achieved a sensitivity of 83% and specificity of 100%. The sensitivity of other findings was: preseptal oedema (25%), SOV enlargement (50%) and CS enlargement (75%).
Conclusion: The use of objective CT Hounsfield density values may help aid the diagnosis of CCFs with excellent sensitivity and specificity. Findings such as pre-septal oedema and SOV enlargement may be less reliable.

The therapeutic effect of Botulinum Toxin A injection on Dry Eye Symptoms: A Systematic Review

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Purpose: Dry eye disease is a disorder of high prevalence in modern era. Several innovative treatment modalities are being administered and trialled. This systematic review aims to explore botulinum toxin A as a novel treatment modality for dry eye disease.
Method: PubMed, Cochrane Library, Medline and SCOPUS databases were searched with medical subject headings. MeSH terms "Dry eye" and "Botulinum Toxin A" were used in combination with one or more of the following phrases "Diseases Management," "Therapy" or "Prevention." This systematic review was completed following the PRISMA guidelines. Level of evidence were assessed using OCEBM. Risk of biases were assess using the Cochrane Handbook. The following measurements were analysed through the RevMan software: The OSDI score, Schirmer's test and Tear-Break-Up-Time.
Result: Eighteen studies were included. Number of eyes analysed ranged from 276 to 486 in the analysis of each clinical parameter. TBUT was increased by a SSMD of 1.33 ($p < 0.00001$). Scgirmer's test improved by a SSMD of 0.69 ($p < 0.00001$). An improvement in the OSDI score with a SSMD of −8.72 is noted ($p < 0.00001$).
Conclusion: Botulinum toxin A injection has a potential to be a reliable treatment for dry eye disease. Notably, different methods of botulinum toxin A injection play a role in the dry eye treatment response. Larger clinical studies are required to explore the effects of different injection sites.

Clinical features and factors influencing mortality in mucormycosis involving the orbit among COVID positive and negative patients

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Purpose: This study assessed if clinical features and outcome of mucormycosis with orbital involvement were different between COVID associated mucormycosis (CAM) and COVID negative patients with mucormycosis (non-CAM group).
Methods: Clinical features, radiology, microbiology, histopathology, treatment and outcomes were compared between the two groups. Factors associated with mortality were explored using logistic regression analysis and expressed as odds ratio (OR) with 95% confidence interval (CI).
Results: The mean (SD) age of the patients ($n = 135$, 99 males) was 50.4 (12.5) years; 66.7% had diabetes. A higher ($p < 0.001$) proportion of CAM patients ($n = 103$) had received corticosteroids (47.6% vs. 3.1%) and tocilizumab (3.9% vs. 0%) and presented earlier (median 5 (interquartile range 3–10) vs. 7 (4–15) days; $p = 0.07$) when compared with non-CAM patients ($n = 32$). Comorbidities, HbA1c, presentation with diabetic ketoacidosis and ocular and neurological manifestations were comparable between groups. On imaging, extraconal fat stranding was more frequent in non-CAM (10.7% vs. 31.3%, $p = 0.009$). Rhizopus species was more frequently isolated in CAM. Mortality was 29.1% in CAM and 34.4% in non-CAM ($p = 0.12$). At discharge, vision was unchanged in 72.7% and worsened in 20.3%. On logistic regression analysis, prior steroid therapy (OR 5.51, 95% CI 1.48–20.6), HbA1c (OR 1.76, 95% CI 1.23–2.52), chronic kidney disease (OR 52.8, 95% CI 3.74–746), and intracranial involvement (OR 3.88, 95% CI 1.36–11) were independently associated with mortality. COVID-19 status ($p = 0.29$), and optic neuropathy ($p = 0.07$) were not associated with mortality. The follow-up rate was 97.9% among survivors.
Conclusion: The clinical presentation and mortality are similar in COVID and non-COVID mucor involving the orbit.

Risk factors for visual loss after excision of orbital cavernous venous malformations

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Introduction: Orbital cavernous venous malformations are the commonest primary orbital tumour. Often located intraconally, presenting symptoms are commonly secondary to mass effect on the retroorbital structures. Surgical excision presents unique challenges, and post-operative vision loss is a rare but devastating complication. This review aims to identify risk factors for vision loss following orbital cavernous venous malformation excision.
Methods: A systematic search of the databases PubMed/MEDLINE, Embase and CENTRAL was performed to May 2024, prior to data collection and risk of bias analysis in accordance with the PRISMA guidelines.
Results: Sixteen articles fulfilled inclusion criteria. These studies identified apical location and strong adherence to retroorbital structures including the optic nerve as characteristics carrying a high risk of post-operative vision loss. Symptoms and signs with a poor post-operative visual prognosis included poor preoperative visual acuity, relative afferent pupillary defect, optic disc abnormality and choroidal folds. Intraoperative risk factors include prolonged vascular handling and traction on the optic nerve, as well as low diastolic blood pressure. Post-operatively, central retinal artery occlusion was the most common aetiology of vision loss.
Conclusions: There are several risk factors for poor post-operative visual outcome following excision of orbital cavernous venous malformations. Surgical and anaesthetic teams must remain cognisant of these factors and be willing to adapt the approach intraoperatively if required. Further large-scale prospective studies are required to aid guideline development.

The Australia New Zealand Microsurgical Skills Course – Are we providing a high quality educational programme?

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Purpose: The three-day Australia New Zealand Microsurgical Skills Course is the only microsurgical skills course in the Southern Hemisphere and has become a mandatory part of the Royal Australia and New Zealand College of Ophthalmologists vocational training program. This study aimed to validate the educational value of the course, including its learning materials and specimens.
Methods: Data was collected from the University of Sydney Student Evaluation Forms filled out by all 227 participants of the 12 microsurgical skills courses to date.

Evaluations of different course components were compared with descriptive statistics and Mann–Whitney non-parametric testing. Thematic analysis of open-ended questions was done.

Results: Most participants felt the course materials were valuable for their learning (64.3% strongly agreed, 30.8% agreed). All learning stations ranked highly among participants. The most valuable learning experience was suturing on pig eyes, and the least was suturing on surgical skills boards ($z = 6.06$, $p < 0.01$). Participants described the course was of great educational value, especially for junior doctors. They appreciated learning oculoplastic procedures on cadavers, and spending time under the microscope doing corneal suturing. Suggestions included video demonstrations of procedures and replacing skills boards with pig scleral and belly tissue.

Conclusion: The microsurgical skills course has been highly praised by positive feedback from participants, with few areas of suggested improvement. Future directions include objective validation studies demonstrating the change in accuracy and speed of corneal suturing after the course, and rates of complications of phacoemulsification before and after the mandating of this course.

A quantitative analysis of monocular patients' eye surgery experience using the 12-item Patient Only Eye Test (POET) questionnaire

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Purpose: To quantitatively analyse monocular patients' eye surgery experiences to identify how distress from such experience can be mitigated.

Method: This retrospective cohort study compared the surgery experiences of 43 monocular with 64 binocular patients, using the **Patient Only Eye Test** questionnaire. Participants who had undergone cataract, glaucoma, cataract and glaucoma, corneal or retinal surgery were recruited from private practices in Brisbane, Australia. Cohorts were matched in sex, age, time since surgery and surgery type.

Results: Multiple linear regression analysis identified that monocular patients had greater preoperative anxiety ($\beta = -13.99$, 95% confidence interval -25.73 to -2.26, $p < 0.05$) and fear of vision loss from surgery ($\beta = -18.40$, 95% confidence interval -32.31 to -4.49, $p < 0.05$). Additionally, female patients had less post-operative support and worse feelings about the surgical outcome. Younger patients (41–50 years) had lower levels of support from family and friends than older age groups. Also, retinal patients coped worse post-operatively. Pearson correlation matrices for each cohort informed flowchart models of the surgery experience. In both cohorts, preoperative fears correlated with intraoperative and post-operative distress. In the binocular cohort, post-operative support was related to support from family and friends ($r = 0.72$), whereas, in the monocular cohort, trust in the surgeon ($r = 0.50$) and anaesthetist ($r = 0.73$) was most important for producing such trust.

Conclusion: Clinicians can provide support by acknowledging their patients' fears of vision loss and its lifestyle impacts. By addressing these issues and providing the opportunity to discuss other aspects of the surgery preoperatively, further trust in the surgeon can be achieved. Post-operatively, patients will feel more supported, enhancing their surgery.

Lymphoid tumours of the lacrimal drainage apparatus; a cohort review and analysis

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Purpose: To review and analyse lymphoid tumours involving the lacrimal drainage apparatus through retrospective review of an orbital surgeon's care across multiple centres; including incidence, clinical presentation, signs, radiological features and management.

Method: Retrospective cohort analysis of ocular and adnexal lymphoproliferative disease (OALD) seen through Queensland orbital services between 1992 to 2024. Inclusion criteria were patients with histologically proven OALD. Three hundred and two OALD patients were identified, with 22 patients (7%) demonstrating involvement of the nasolacrimal drainage apparatus.

Results: Fifty percent of patients presented with dacryocystitis, while 32% had a palpable mass and only 27% with epiphora. Thirty percent of patients had disease detected at the time of elective dacryocystorhinostomy surgery. No patients demonstrated haemolacria. Computed tomography findings included variable patterns of bony destruction and nasolacrimal duct obstruction. Magnetic resonance imaging, when utilised, better defined the extent of lesions; commonly/hyperintense on T1 and hypointense on T2 imaging. Histological review highlighted 38% (8) were diffuse large B-cell lymphoma,

18% (4) T-cell lymphoma, 14% (3) chronic lymphocytic or small lymphocytic lymphoma and 30% (7) other variants. Ann-Arbor lymphoma classification highlighted 30% (6) of patients with stage 1, with 60% (13) identified at Stage 3 or 4. Ten patients have achieved disease-free survival, with one patient requiring ongoing treatment. Three patients died as a result of OALD.
Conclusion: OALD affecting the lacrimal drainage apparatus is an uncommon but serious differential of dacryocystitis. Symptoms can be highly variable; early detection, timely imaging and histological identification can meaningfully affect associated mortality.

Orbital decompression in Australia: A 20-year retrospective analysis

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Purpose: Orbital decompression is performed for thyroid eye disease (TED) to reduce proptosis in moderately-severe TED and treat dysthyroid optic neuropathy, particularly in steroid non-responders. We aimed to estimate the frequency and financial burden of orbital decompression for TED in Australia from 2002–2022.
Methods: We retrospectively interrogated two population-based datasets (Australian Institute of Health and Welfare and Medicare) recording the number of orbital decompression procedures performed in Australia from July 2002 to June 2022, by age group and sex. Annual orbital decompression rates were calculated, dividing the number of decompressions performed in each financial year by Australia's population (Australian Bureau of Statistics data).
Results: There were 2661 orbital decompressions recorded in Australia during the study period, where most were performed for 55–64-year-olds (683, 26%), females (1809, 68%) and in private hospitals (1680, 63%). From 2002–2003 to 2010–2011, annual orbital decompression rates tended to increase, rising from 3.7 to 7.1 per 1000,000 people, respectively. Annual rates were stable from 2010–2011 to 2018–2019 (ranging from 6.1 to 7.3 per 1000,000), and then tended to decrease from 2018–2019 to 2021–2022, falling from 7.2 to 5.8 per 1000,000, respectively.
Conclusion: Orbital decompression in Australia has varied in the last 20 years. The stabilisation and subsequent decreasing trend in decompression rates over the last five years may reflect improved control of TED, with the increasing availability of medical treatment options (noting teprotumumab is not yet available in Australia), the impact of COVID-19 or natural variation with time.

Management of periorbital defects with laissez-faire technique: a systematic review

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Purpose: Periorbital defects present a reconstructive challenge for the oculoplastic surgeon due to the specialised function of eyelids. Reconstruction of eyelid defects by the laissez-faire technique have traditionally been considered for small, anterior lamellar defects. Increasingly, laissez-faire has been employed in extensive, full-thickness eyelid defects. We conducted a systematic review of the literature of the management of periorbital defects with the laissez-faire technique.
Method: A systematic review of the literature search was conducted on the MEDLINE and Embase databases using terms "laissez-faire" and "eyelid defect." Studies on periorbital defect reconstruction using laissez-faire technique in human subjects, published in English, were included.
Results: Fifteen studies met the inclusion criteria. Most authors (60%) were from an ophthalmology specialty; others from dermatology (13%), plastic surgery (7%), otolaryngology (7%) or a combination (7%). Three studies were prospective. A total of 262 cases of periorbital defects were reported, including partial and full-thickness defects. Defects resulted from tumour excision (249), trichiasis excision (12) and post-debridement of necrotising fasciitis (1). Defects were located on the lower and upper eyelids, medial and lateral canthus, nasojugal fold and brow. Most periorbital defects managed with the laissez-faire technique had good functional and cosmetic outcomes (87%).
Conclusion: Management of periorbital defects using the laissez-faire technique have good cosmetic and functional outcomes. Healing eyelid defects by secondary intention can be used effectively as a primary option in selected cases when complex reconstructive techniques may be challenging. Standardised assessments on aesthetic and functional outcomes in future reports can strengthen this body of literature.

17:00–17:30 **Closing Remarks**
Venue: E Foyer

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Film Abstracts

Clinical & Experimental Ophthalmology WILEY

Cataract

The art of iris hooks

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This 5-min video presents a novel technique for inserting iris hooks, offering a comprehensive overview of their indications and demonstrating an ophthalmic viscoelastic device (OVD)-free method for secure and safe placement. Proper use of iris hooks can transform the most challenging cases into manageable procedures. The video emphasizes the critical importance of the angle of incisions, ensuring that vector forces are correctly aligned. Additionally, it highlights the benefits of avoiding OVD, such as the effortless staining of the capsule with Vision Blue after achieving pupil dilation. Practical tips include amputating the iris hooks just beyond the locking bead to prevent accidental displacement by instruments during surgery. This technique aims to enhance surgical efficiency and outcomes in complex ophthalmic cases.

Cornea

Bedside amnion graft

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The role of amnion graft transplantation in an ophthalmic setting is to support damaged tissue by preventing further breakdown while allowing time for re-epithelialisation. The conventional method for securing amniotic membrane to the ocular surface requires the use of sutures, sometimes supplemented with tissue glue. Our video presents a technique that allows a bedside, sutureless and glue-less application of amniotic membrane transplantation in a patient with persistent corneal ulcers and limbal stem cell ischaemia secondary to severe thermal injury. This method may benefit patients who are not medically stable for surgery.

Descemet stripping automated endothelial keratoplasty

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Descemet stripping automated endothelial keratoplasty (DSAEK) remains one of the more common surgical technique for endothelial keratoplasty, particularly in complex cases. DSAEK has demonstrated favorable outcomes in patients with concurrent glaucoma, a history of glaucoma surgeries, glaucoma shunt devices, anterior chamber intraocular lenses, iris anomalies, aphakia, and previous failed keratoplasties. This success is attributed to the robustness of the DSAEK lenticule and the relative ease of lamella placement in these scenarios. In this case series, we present surgical techniques and modifications necessary for performing DSAEK in complicated eyes, with resulting low rates of graft detachment and improved visual recovery.

Visionary cells: Inside a GMP-compliant culture process for corneal endothelial cells

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Corneal endothelial cells are vital for maintaining corneal transparency in the human eye, and damage or loss of these cells can lead to various sight-threatening conditions such as Fuch's endothelial corneal dystrophy

(FECD) and pseudophakic bullous keratopathy (PBK). In some cases, these conditions can be treated via corneal transplantation but this is limited by the availability of donor tissue.

A promising and potentially disruptive alternative to traditional transplantation is cell injection therapy, which involves replacing damaged or lost cells in the body with cells cultured in a laboratory. Recently, the use of corneal endothelial cells for cell therapy in FECD and PBK has attracted increasing interest and, as such, Good Manufacturing Practice-compliant culture processes—involving isolation and expansion under strict conditions including the use of defined culture media, sterile equipment, and trained personnel—have been developed for corneal endothelial cells, to ensure safety and efficacy of cell therapy for diseases affecting the corneal endothelium.

Though cell therapy for treatment of FECD and PBK has shown promising results in preclinical and clinical studies, with improved visual acuity and corneal endothelial cell density observed in treated patients, further research is needed to optimise culture protocols and establish long-term safety and efficacy.

This film is a window into the journey of these vision-restoring cells, from isolation to preparation for injection in a future clinical trial.

Epidemiology/Public Health

'JFF CREATE'—A new volunteering initiative that empowers Australian and Indonesian junior doctors to fight global blindness—AVR Notable Abstract

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Junior doctors interested in making a difference to global health may often be discouraged by a lack of experience or expertise, particularly in a highly specialised field like ophthalmology. This prompted Qiang Li and Elaine Ong to establish the John Fawcett Foundation 'CREATE' Program (JFF CREATE), a new volunteering initiative that inspires like-minded Australian and Indonesian junior doctors to fight global blindness through six fundamental endeavours: Charity, Research, Exchange, Awareness-building, Tutelage and Empowerment. This film showcases the outcomes of the Inaugural 2024 JFF CREATE and aims to initiate a wider conversation on the potential impact of junior doctors in addressing global blindness.

OOXii Vision Kit: A solution for refractive error in remote and low resource communities

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The OOXii Vision Kit contains everything a basic health worker needs to test vision, perform subjective refraction and dispense customised, affordable glasses on the spot in remote and low resource settings. This film demonstrates the end-to-end process whereby health workers are trained and assessed, how they perform refraction using the OOXii Testing Wheel, and how they assemble and dispense the glasses. Uncorrected refractive error is the second largest cause of avoidable vision impairment, and the OOXii Vision Kit can address this problem effectively in remote and low resource settings, where eye health professionals are not accessible.

Glaucoma

Sutureless trabecular drainage surgery using the PreserFlo device with fibrin glue

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Use of PreserFlo device is a relatively new addition in glaucoma management for patients with advanced disease. Suturing techniques used for conjunctival closure can be time-consuming and associated with ocular irritation often requiring removal post-operatively. Complications of conjunctival suturing include "buttonholing" of the conjunctiva, bleb leaks, tissue fibrosis and erosion, and suture abscess formation with potential for subsequent endophthalmitis. We have used fibrin glue to aid in conjunctival wound closure when performing PreserFlo procedures. This technique is more efficient and better tolerated by patients after having the PreserFlo inserted.

This film demonstrates the use of fibrin glue in a series of patients at Cairns Hospital with advanced glaucoma requiring trabecular drainage surgery. Fibrin glue is used to secure the closure of the fornix-based conjunctival flap over the implanted PreserFlo device reducing surgical time, minimising suture-related complications and improving patients' post-operative comfort.

Hypotony post trauma—A management dilemma

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Post blunt trauma, a patient was initially noted to have a partial thickness lid laceration and a mydriatic pupil with an anteriorly subluxed lens partially in the anterior chamber which was shallow. Intraocular pressure (IOP) was 27 mmHg. Two days later, his IOP was 2 mmHg, there was extensive iridodialysis and the anterior chamber deep with the presence of vitreous noted while the lens was now posteriorly subluxed. Ultrasound biomicroscopy revealed a large cyclodialysis cleft spanning 270° along with 360° of ciliochoroidal effusion. The patient underwent external cyclopexy where 10 clock hours of cyclodialysis was noted on the table. His pressure remained within normal range post-operatively and two months later, he underwent a pars planar vitrectomy and lensectomy. Seven months after his initial injury, he underwent scleral fixation of an intraocular lens with implantation of a Humanoptics Artificial Iris. Post-operatively, he experienced a week of hypotony, but this resolved and at one year post injury his best corrected visual acuity is 6/7.5.

The sound of glaucoma

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I have few things I always wish for when I see my glaucoma patients. I want my pressures to be on target with my blebs never failing. My patients keep full visual fields and stable nerve layers. I want preservative free drops that don't sting. I want their optic nerve rims to be healthy pink with small CD ratios. I prefer Goldmann tonometry rather iCare to measure the eye pressure and the diurnal pressure to not fluctuate. My tubes have white sclera and conjunctival covering, with clear corneas and big backward draining blebs over the plate. I don't want to see red eyes, have drops that sting or bad vision. These are (just) a few of my favourite things.

Oculoplastic/Orbit

Excision of an expanding orbital lesion

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A 58-year-old man presented with severe worsening left socket pain. He had lost vision in the left eye 31 years previously following trauma and had undergone surgery elsewhere. Examination showed an anophthalmic socket that was tender and tense. Imaging showed a large mass that had eroded the walls of the orbit and was sinuous and fluid-filled on MR T2. Excision from a lateral orbitotomy approach revealed the diagnosis.

Hatchet flap as a versatile technique in periocular reconstruction

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The hatchet flap is a local transposition flap designed in the shape of a hatchet or axe head. It is a versatile flap, which can be used alone, or in combination with other flaps, in periocular reconstruction, to repair defects of various sizes and shapes, following tumour excision. This technique is particularly advantageous for defects around the eyelids, eyebrows, and adjacent facial regions, due to its ability to match the colour, texture, and thickness of the surrounding skin, which provides excellent aesthetic result and preserve the function of the eyelids and periocular structure by minimising tension and distortion. We present our experience of using this flap in a case series of 11 patients for periocular reconstruction.

Surgical approach to excision of dermolipoma

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Dermolipoma is a chriostoma often found beneath the lateral bulbar conjunctiva. Excision of dermolipoma could potentially be complicated by damage to the lacrimal ductules and lateral rectus, leading to dry eye and diplopia respectively. A 19-year-old man presented with an isolated, unilateral dermolipoma. This surgical video describe a surgical approach to excision of dermolipoma, with stepwise commentaries and surgical tips in avoiding inadvertent injury to the surrounding normal structures.

Tarsal switch procedure: A novel approach to combined repair of ptosis and lower lid retraction

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A 72-year-old man was seen in clinic with bilateral involutional ptosis and right lower lid recession on the background of recent left ectropion surgery. He had significant symptoms secondary to his ptosis with an MRD1 of 1 mm and 0 mm in his left and right eyes, respectively, alongside persistent inferior corneal exposure in his right eye. This video showcases a successful tarsal switch procedure on his right eye to simultaneously address his ptosis and lower lid retraction. This surgical approach involves the harvesting of a tarsal graft from the upper lid with simultaneous transfer to the lower lid. By doing so the cornea is protected from exposure while pupillary aperture is improved, and the position of eyelid opening is raised.

Optic nerve sheath schwannoma excision via an endoscopic endonasal approach

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We describe a case of a rare optic nerve sheath schwannoma. A 43-year-old woman presented with right subacute visual loss, reduced vision to 6/48 and a positive relative afferent pupillary defect. Magnetic resonance imaging demonstrated a T1 isointense T2 hyperintense, enhancing, intraoconal ovoid mass at the orbital apex. Endocapsular excision of the mass, which was adherent to the optic nerve, was accomplished from an endoscopic endonasal approach. At six months post-operatively vision had improved to 6/6.

Other

The impacts of vision loss on mental wellbeing—practical advice to support patients

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Depression and anxiety are amongst the mental health challenges that may emerge for people with vision loss. The association between mental health disorders and vision loss is well-documented, with depression three times more likely amongst people with vision loss. Despite this, there are reports that fewer than one in eight Australians with vision loss who wanted psychological support received it. How do we explain and address such a significant gap in access? This film, supported by Vision 2020 Australia's Mental Wellbeing and Vision Loss Project, shares the stories of people with vision loss and blindness to highlight the barriers to accessing support. Ophthalmic experts and mental health providers also share practical advice on how to effectively support patients navigating vision loss.

Tips and tricks for a Gore-tex 4-point scleral fixation of an injected hydrophobic acrylic posterior chamber intraocular lens

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Step-by-step tutorial for the management of aphakia with the absence of capsular support. This video will describe an easily reproducible surgical technique involving the

scleral fixation of a hydrophobic acrylic intraocular lens, injected through a 2.4 mm small incision, using needless Gore-tex sutures, allowing long-term fixation, and four points of fixation, preventing tilt and torque. Additionally, this technique allows centration fine-tuning after successful fixation.

Paediatric Ophthalmology

Management of anterior lens capsule in various pediatric cataract cases—A video case-series through a beginner's microscope

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This video case series shows different techniques of anterior lens capsule management in various type of pediatric cataract whether it be traumatic, uveitic, fibrosed capsule, ectopia lentis etc. This video is mainly intended to show some basic tips and tricks to perform capsulorrhexis specially in set ups where resources are limited.

Refractive Surgery

Refractive surprise: Piggyback intraocular lens in post-Descemet's stripping endothelial keratoplasty eye

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A young patient with advanced Fuchs Endothelial Dystrophy underwent a combined Descemet's stripping endothelial keratoplasty and intraocular lens (IOL) implantation.

Post-surgery refraction revealed a hyperopic surprise of +5.0 D. It was thought to have happened because of inaccurate preoperative biometry due to irregular corneal surface.

A Rayner sulcoflex piggyback IOL was implanted in the sulcus, six months after the primary surgery, and uncorrected visual acuity of 6/9 was achieved, which is still maintained after five years. This is the first reported case of a piggyback IOL implantation in a post-Descemet's stripping endothelial keratoplasty patient.

Training and Education

The cutting edge: Foundations of ophthalmic surgery

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Many surgical trainees often overlook the importance of basic surgical techniques, such as suture types and needle anatomy, which are critical for suturing the delicate tissues involved in ophthalmic surgery. To address this gap, I created an engaging and educational video, "The cutting edge: Foundations of ophthalmic surgery," using creative methods to make learning enjoyable. The video features demonstrations of knot tying with rope and needle anatomy using play dough, making complex concepts more accessible. Additionally, I provide practical tips on suturing techniques, including how to cut sutures at the perfect length and with the correct instruments, to avoid common mistakes and impress consultants. This video aims to reinforce foundational skills and enhance the confidence and competence of surgical trainees.

Hues of insight: Van Gogh's Starry Night and the physiology of colour vision

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Colour vision is mediated by a series of complex interactions between the retina, optic nerve and visual cortex. We present an animated film that uses Vincent van Gogh's painting, Starry Night, as an artistic vehicle to explore fundamental concepts underpinning the physiology of colour vision, including phototransduction and the vertical pathway, and relate them to clinical vignettes of colour vision deficiencies, such as optic neuropathies. By leveraging animation for medical education, complex concepts can be simplified and presented in an engaging and creative manner to benefit a broad audience, including ophthalmology trainees, students and patients.

Crossroads of vision: Clinical anatomy of the optic chiasm

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The optic chiasm is a complex and important structure within the visual pathway. This five-minute animated tutorial explores the clinical anatomy of the optic chiasm, including its retinotopic organisation, anatomic relations, vascular supply, embryology and clinical chiasmal syndromes. Animation is employed as an educational tool to creatively deliver complex medical concepts in a simple yet engaging way, with potential to benefit ophthalmology trainees, students and patients.

Vitreoretinal Surgery

Management of total fibrinous hypopyon secondary to gram positive cocci following routine cataract operation

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This is a case of delayed onset of post-operative endophthalmitis following a routine cataract operation. On presentation, a total fibrinous hypopyon was noted in a patient with hand movement-only vision in that eye. Urgent vitrectomy and antibiotic injection were performed. The video demonstrates the technique of clearing a fibrinous hypopyon from the anterior chamber. The patient has a good post-operative outcome with vision improving the Snellen acuity of 6/9. The role of the pathogen in this case was discussed. Take-home points include early vitrectomy, gentle handling of tissue, and a "never give up mentality" to save the eye.

Deflating but not deflated: Surgical management of choroidal detachment

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Choroidal detachment (serous or haemorrhagic) is a rare ocular pathology often associated with chronic retinal detachment, inflammation, ocular surgery or trauma. This video will demonstrate newer vitreoretinal techniques to manage this serious ocular condition.
Two patients cases will be discussed demonstrating the following techniques:
External illumination with a light pipe encased in a cannula to identify the highest point of the choroidal detachment.
Use of a non-valved cannula to safely drain serous and haemorrhagic suprachoroidal fluid.
Use of a scleral cut-down to remove suprachoroidal haemorrhagic clot
All patients demonstrated significant anatomical and functional improvement using the newer surgical techniques. Newer surgical techniques can be used to optimise management of choroidal detachments.

Boiling basic salt solution inside the eye and floating heavy oil droplets during vitreoretinal surgery

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The movie shows observations of novel physical phenomena during vitreoretinal surgery that occurred while aspirating different fluid interfaces, viscosities and tissues. Basic salt solution boiled within the vitrector inside the eye, under conditions of high suction, occlusion, vacuum and low pressure in the instrument tip at the interface with heavy oil. Gas bubbles were generated and vented in the eye and infiltrated heavy oil, altering buoyancy to cause flotation. The movie explains the physics, chemistry and fluidics of these phenomena.

Internal optic nerve biopsy diagnosing relapsed T-ALL

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T-cell acute lymphoblastic leukaemia (T-ALL) is a lymphoproliferative disorder which rarely manifests with central nervous systeminfiltration. We present a 33-year-old male diagnosed with T-ALL in April 2023, who achieved remission following a course of chemotherapy. Recurrence of disease with central nervous system involvement was suspected following episodes of acute vision loss, however lumbar puncture and positron emission tomography imaging were unremarkable. Infiltration was histologically proven by internal optic nerve biopsy: A novel procedure and, we believe, the first example of its deployment in infiltrative T-ALL.

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Poster Abstracts

Clinical & Experimental Ophthalmology WILEY

Artificial Intelligence

AI-assisted diabetic retinopathy screening: A real-world comparison of three deep learning systems in remote Western Australia

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Purpose: Remote Western Australian communities have high First Nations and diabetes prevalence, yet low access to healthcare. Regular diabetic retinopathy (DR) screening is crucial to prevent blindness. New, automated retinal cameras with Artificial Intelligence (AI) capability may improve DR screening rates in remote locations. Deep learning systems (DLS) demonstrate promise in autonomously diagnosing DR, however, few are validated in First Nations patients and in remote settings. This study was conducted in the Pilbara region of Western Australia and aims to: (i) describe a 'pilot model' for mobile, AI-assisted DR screening; (ii) evaluate the acceptability of AI to patients; and (iii) validate the diagnostic accuracy of multiple DLSs.
Method: Lions Outback Vision provided mobile, AI-assisted DR screening aboard the existing Vision Van, and a new Mercedes 'Sprinter Van'. Retinal photographs were graded on-the-spot by a human and multiple DLSs. Patients were invited to complete an 'evaluation survey' on the use of AI. Sensitivity, specificity, diagnostic accuracy, negative- and positive predictive value were calculated for three DLSs (Google ARDA, Thirona RetCADTM and EyRIS SELENA+).
Results: From February to August 2024, 154 patients from 12 Pilbara communities received DR screening (Vision Van: 78 patients, Sprinter Van: 76 patients). AI was accepted by 96% of patients who completed the survey. Google ARDA demonstrated the highest sensitivity (100%) for referrable DR and least ungradable images (2.6%) when used on a population comprising 73.1% First Nations people.
Conclusion: Culturally safe, AI-assisted DR screening is feasible in a remote Australian setting, and accurate for First Nations patients. Use of AI could overcome historical barriers to service provision, minimising preventable visual loss.

Barriers to implementing artificial intelligence for age-related macular degeneration diagnostics

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Purpose: A complete understanding of implementation barriers is important to optimise the adoption and benefits of Artificial Intelligence (AI) in digital diagnosis. The purpose of this work was to identify key barriers to the implementation of digital diagnosis for age-related macular degeneration in Australia.
Method: Semi-structured interviews of 37 stakeholders including technology developers, clinicians, patients, health networks, public hospitals, private providers and payers were conducted between September 2022 and March 2023. Participants' responses to: 'What is the biggest barrier to digital diagnosis or AI for macular disease in Australia?' were analysed using the consolidated framework for implementation research—a pragmatic, determinant framework for predicting implementation effectiveness. Transcripts were also electronically searched for the term 'barrier' and additional remarks included.
Results: Most of the discussed barriers related to the innovation, followed by individuals, the inner setting, outer setting and lastly, the implementation process. Clinicians were most concerned about the cost of acquiring and using AI, while developers were mostly in tune with individuals' lack of trust, uncertainty about financing and a lack of evidence proving clinical usefulness. Healthcare leaders emphasised the risk of over-reliance and uncertainty about whether it would be possible to

maintain equity across different organisations and patient populations, while patients were mainly concerned about the need for human clinician empathy and oversight.

Conclusion: Our findings suggest significant differences among different stakeholder groups in the barriers to implementing AI for age-related macular degeneration diagnostics. Addressing the key barriers of different stakeholder groups may be key to achieving acceptance.

Evaluating commercially available Artificial Intelligence algorithms in diagnosing glaucoma

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Purpose: The role of Artificial Intelligence (AI) to assist in triaging patients has potential to address the workforce shortage in the healthcare system. The aim of this project is to evaluate the use of commercially available AI algorithms in diagnosing glaucoma in the real-world setting.

Methods: A retrospective analysis of patients in the Glaucoma Clinic and Investigation Clinic, Sydney Eye Hospital was conducted. Retinal photographs were captured with the iCare DRSplus retinal camera and the photos were analysed with RetCAD and Assure+ AI algorithms. Images were excluded from the dataset if any algorithm considered the image ungradable. Output from the algorithm was categorised as "Normal" or "Suspicious" for glaucoma. Outputs were compared against the gold standard clinical diagnosis of a glaucoma specialist.

Results: Retinal photographs of 19 eyes from 12 patients were analysed using the AI algorithms. Comparing RetCAD algorithm to Assure+ demonstrated an accuracy of (63% vs. 47%), precision (89% vs. 70%), and area under the curve (68% vs. 45%) when compared to gold standard. Cohen's Kappa was 0.28 for RetCad and −0.08 for Assure + for agreement to clinical examination.

Conclusion: While RetCAD demonstrated a superior performance in accuracy, precision, and area under the curve when compared to Assure+, large variability was seen within the outputs. Only 31% of the images demonstrated unanimous agreement in glaucoma diagnosis with the other algorithm and the gold standard. Larger datasets with more gradable images are needed to further investigate the efficacy of AI in the real-world setting.

Artificial Intelligence and ophthalmic clinical registries

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Purpose: This study sought to evaluate the use of Artificial Intelligence (AI) in clinical registries as they represent a promising source of large volume real-world data that could be used to train more accurate and widely applicable AI models.

Design and Methods: A systematic search of five electronic databases for primary research articles that applied AI to ophthalmic clinical registry data was conducted in November 2023.

Results: Twenty-one primary research articles applying AI to ophthalmic clinic registries ($n = 13$) were found. Registries were primarily defined by the condition captured; the most common conditions where AI was applied were glaucoma ($n = 3$) and neovascular age-related macular degeneration ($n = 2$). Tabular clinical data was the most common form of input into AI algorithms and outputs were primarily classifiers ($n = 7$, 37%) and risk quantifier models ($n = 7$, 37%). The AI algorithms applied were almost exclusively supervised conventional machine learning models ($n = 38$, 86%) such as decision tree classifiers and logistic regression, with only six applications of deep learning or natural language processing algorithms. Significant heterogeneity was found with regards to model validation methodology and measures of performance.

Conclusion: Limited applications of deep learning algorithms to ophthalmic clinical registry data have been reported. The lack of standardised validation methodology and heterogeneity of performance outcome reporting suggests that the application of AI to ophthalmic clinical registries is still in its infancy constrained by the poor accessibility of registry data and reflecting the need for greater involvement of domain experts in future development of clinically deployable AI.

Comparing machine learning models for the classification of diverse keratoconus patients from multiple International centres

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Purpose: Keratoconus is an enigmatic disease that presents with significant genetic, geographic and clinical variation. The development of classification models capable of utilising a range of variables and applicable to multiple cohorts is key to further understanding of the disease and the impact of treatment. The purpose of this project was to develop and compare four specific machine learning models to understand the optimal potential approach to classification across multiple demographic and geographic cohorts.
Methods: This retrospective multi-centre study utilised data from 692 keratoconus eyes from patients at centres in Australia, Germany and Saudi Arabia. These datasets were applied to the four machine learning models (Decision Tree Classifier, Random Forest, Support Vector Machine and Logistic Regression) developed for this study, and accuracy in classifying the patients into four distinct classes of disease severity was analysed.
Results: Random Forest achieved highest accuracy in classifying patients against the existing gold-standard Amsler–Krummeich classification, with 69%–93% accuracy for the combined and Australian cohorts respectively. This was followed by Decision Tree (53%–79%), Logistic Regression (60%–75%) and Support Vector Machine outcomes (59%–72%).
Conclusion: The lack of consistency in keratoconus classification remains significant rendering the task of predicting progression difficult. This study demonstrates that machine learning models can accurately classify patients through separate and combined datasets with random forest achieving greatest accuracy. The continued application of larger and more diverse datasets will aid further development of the models leading to improved understanding of keratoconus patients and progression.

Development of an unsupervised deep learning keratoconus classification model through analysis of keratoconus patients across different geographic cohorts

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Purpose: A significant challenge of keratoconus (KC) assessment is the lack of consistency and agreement on an accurate classification system. This may impact clinical and surgical decisions. Utilising Artificial Intelligence, we sought to develop an unsupervised deep learning convolutional neural network (CNN) model to accurately classify KC patients into four classes comparing this to the long-standing Amsler–Krumeich (AK) classification model.
Methods: This retrospective study utilised 285 KC patients (243 Australia and 42 Saudi Arabia). We developed an unsupervised CNN comprising a Multilayer Perceptron for data classification, and a Variational Autoencoder utilising Gaussian sampling for clustering. We collected 27 variables for each patient, a combination of topography and tomography output (Pentacam) and clinical information, which was developed into a tabular format and applied to the model. Data was applied to the deep learning CNN for unsupervised classification, and then compared against the AK.
Results: Across locations and overall, the model resulted in 83.6%–86.2% accuracy at independently classifying Keratoconus patients against AK, with receiver operating characteristics 81%–96% demonstrating its performance at differentiating between the four levels of keratoconus.
Conclusion: Accurate classification of KC patients is vital to improve the patient diagnosis and subsequent treatment decision. Our CNN model results in excellent accuracy compared to the AK system. Our model is significantly differentiated from other studies with machine learning and KC, as we apply it to tabular rather than image data. The model demonstrates great potential for application to multiple datasets and represents a platform for improved diagnosis/assessment of KC progression.

Cataract

Impact of previous corneal surgery on refractive outcomes of toric intraocular lens re-alignment using an online back-calculator

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Purpose: To analyse the clinical outcomes of toric intraocular lens (IOL) realignment after back-calculation in a

diverse group of patients, including those with a history of refractive surgery and keratoplasty.

Methods: This was a retrospective dual-centre case series of 10 patients who had undergone secondary IOL rotation. The study consisted of eleven eyes, of which-three had undergone prior refractive laser surgery and three had undergone prior corneal rehabilitative procedures. These six eyes represented the non-standard group while the remaining five eyes represented the standard group. Ideal IOL orientation was determined using the Berdahl-Hardten online back-calculator (www.astigmatismfix.com).

Results: The mean difference between the initially planned axis and final ideal IOL position was 7.60° ± 3.78° and 22.83° ± 33.01° for the standard and non-standard groups respectively. Following rotation, mean residual cylinder was similar between the standard and non-standard groups (0.75 ± 0.25D and 0.75 ± 0.69D respectively). Refractive cylinder decreased by 1.20 ± 0.48 D (95% confidence interval 0.60–1.80, $p = 0.005$) in standard eyes and 2.83 ± 2.45 D (95% confidence interval 0.26–5.40, $p = 0.036$) in non-standard eyes.

Conclusions: In the context of residual refractive astigmatism and non-optimal UDVA, patients with prior corneal surgery could be considered for toric repositioning even if the IOL is at or close to the planned orientation. Moreover, performance of back-calculation prior to toric IOL rotation may afford an increased level of accuracy, particularly in cases where preoperative keratometry is variable, irregular, or difficult to assess, such as in eyes with prior corneal surgery.

Physiological intraocular pressure cataract surgery: Comparative consecutive case series study

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Purpose: Studies have explored the potential benefits of performing cataract surgery at physiologic intraocular pressure (Phys-IOP). This study aimed to investigate the outcomes of cataract surgery performed at Phys-IOP compared to standard higher intraocular pressure (IOP) techniques.

Method: A single surgeon, retrospective, non-randomised, consecutive case series study was conducted from cataract surgery performed on 122 eyes. There were no exclusion criteria. Cataract density was similar and evenly distributed in both groups. Half of the patients ($n = 61$) underwent surgery with an Alcon Centurion Vision System console and Active Sentry™ handpiece at physiologic IOP (26–30 mmHg). The other half ($n = 61$) received cataract surgery with the standard handpiece at a higher IOP of 55 mmHg. The parameters measured included both intraoperative (patient comfort, surgical complications, ultrasound time, cumulative dissipated energy) and post-operative metrics (corneal clarity, anterior chamber inflammation).

Results: Compared to higher IOP, patients in the Phys-IOP cohort demonstrated a trend towards improved visual acuity in the early and 1 month post-operative period (increased decimal acuity 0.07, $p < 0.05$). This was contributed by less total ultrasound time (−3 s $p < 0.05$) and cumulative dissipated energy (−4, $p < 0.05$) in the Phys-IOP group. This resulted in improved corneal clarity (25% reduction, $p < 0.05$) and a similar reduction in anterior chamber inflammation. Patient comfort was subjectively better in the perioperative period with Phys-IOP due to a more stable operative environment (1.6/10 vs. 3.2/10). There were no surgical complications in either group.

Conclusion: These early findings suggest that cataract surgery performed at physiologic IOP may offer several advantages, including improved visual acuity, reduced surgical inflammation and enhanced patient comfort.

A cataract and refractive surgeon's early experience with iStent inject W in Australian patients with open-angle glaucoma

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Purpose: iStent inject W is a straightforward, minimally invasive device and procedure to reduce intraocular pressure (IOP) in patients with mild to moderate open-angle glaucoma (OAG). This retrospective study reviewed up to post-operative 6-month (POM6) outcomes of the treatment combined with phacoemulsification (combined) or as a standalone (SA) procedure in all consecutive patients.

Methods: Age, IOP, medication counts and adverse events were extracted from patient records from preoperative to post-operative day 1, week 1, month 1, month 3 and month 6. Endpoints included mean change in IOP and medications at follow-up time-points versus preoperative with statistical analyses using Wilcoxon signed-rank test and multi-level mixed effects linear or Poisson regression modelling. The percentage of eyes medication-free,

≥ 1 medication reduction, and ≥ 1 mmHg reduction were assessed at POM6. Safety events were captured.

Results: The combined group consisted of 16 eyes from nine patients (mean 81 ± 5 years old) with 88% primary OAG eyes; SA group had 15 eyes from 11 patients (mean 82 ± 4 years old) with 100% primary OAG. Mean IOP change from POM6 to preoperative was −4.0 mmHg (95% confidence interval [CI] −7.1, −0.9) and −1.8 mmHg (95% CI −4.0, 0.4) in combined and SA groups, respectively. Combined and SA groups had mean medication reductions of −1.3 (95% CI −2.2, −0.4) and −0.6 (95% CI −1.3, 0.1). Percentages of eyes with ≥1 medication reduction in combined and SA were 75% and 73%, respectively. Only two cases of hyphema were observed in SA.

Conclusions: Initial experience showed promising short-term results in IOP and medication reductions with an excellent safety profile which may aid premium lens acceptance.

Sub-tenon's vs. topical anaesthesia for effectiveness of analgesia during cataract surgery: A systematic review with meta-analysis

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Purpose: Cataract surgery is routinely performed under local anaesthetic with or without sedation, with the most common techniques being sub-Tenon's block and topical anaesthesia. The objectives of this systematic review (Prospero CRD 42023543968) were to compare the effectiveness of intraoperative analgesia between the two techniques.

Methods: A systematic review was performed of three databases (MEDLINE, Embase, CENTRAL) from inception until August 2023. Inclusion criteria consisted of randomised controlled trials of adult patients undergoing uncomplicated cataract surgery with either topical or sub-tenon's blockade. Exclusion criteria included use of systemic sedation or analgesia, complicated cataract surgery and the paediatric population. The primary outcome was intraoperative analgesia as assessed by patient reported pain scores. Secondary outcomes assessed were post-operative pain at defined intervals, patient satisfaction, surgical satisfaction and post-operative complication rates.

Results: Twelve studies with 1,370 patients were included in the meta-analysis. Sub-tenon's provided statistically better intraoperative analgesia as measured by lower pain scores (SMD −0.53, 95% confidence interval −0.70 to −0.36) which remained significant on a subgroup analysis of six studies with uniform pain scales (MD −0.84, 95% confidence interval −1.22 to −0.47). These effect sizes were modest. There were several incidences of severe intraoperative discomfort requiring rescue regional anaesthesia in the topical group. There was also higher patient and surgical satisfaction in the sub-Tenon group, as well as decreased rates of serious complications such as posterior capsule rupture.

Conclusion: Sub-Tenon blocks provide better intraoperative and post-operative analgesia during cataract surgery when compared with topical anaesthesia. Both can be considered effective.

Comparison between the performance of Barrett Universal II formula and Kane formula in hyperopic eyes

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Purpose: To assess the accuracy of the Barrett Universal II (BU-II) and Kane formula in intraocular lens (IOL) power predictions in hyperopic eyes requiring IOLs of ≥24D.

Method: This is a retrospective multi-surgeon study from two ophthalmic centres in Western Australia with cataract surgery cases using IOLs of ≥24D. Estimated post-operative refraction was calculated using the BU-II and Kane formula. Error was calculated by subtracting measured and estimated post-operative refraction. Mean error was calculated, along with mean absolute error (mean of the magnitude of error).

Results: A total of 146 eyes were included from 1 January 2023 to 20 January 2024. For IOLs ≥ 24D and ≥ 25D, measured post-operative refractions were significantly different from those predicted with the Barret-Universal II, but not significantly different than those predicted using the Kane formula. The mean error (SD) for the BU-II and Kane formulae were −0.191D (0.668D) and −0.043D (0.646D) respectively ($p < 0.001$). Mean [DD1] error was also significantly different for IOL subgroups of ≥25D and ≥26D. The mean absolute error (SD) for the BU-II and Kane formulae were 0.534D (0.443D) and 0.497D (0.412D) respectively ($p = 0.127$). The BU-II and Kane formulae predicted 56% and 59% of cases within ±0.5D of the measured post-operative refraction respectively.

Conclusion: The Kane formula was more accurate than the BU-II in predicting post-operative refraction in hyperopic eyes. However, the percentage of eyes with errors within ±0.50D are comparable. While differences may become more apparent as the Kane formula is refined, this study suggests an emerging improved performance of the Kane formulae in IOL calculations for hyperopic eyes. [DD1]Mean error between BU-II.

Evaluating the difference in spherical equivalent between total (true) keratometry and standard keratometry measurements

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Purpose: While standard keratometry (K) readings measure the anterior corneal surface, total keratometry (TK) measures the same and additionally accounts for posterior corneal surface plus corneal thickness. This study aims to evaluate the disparity between TK and K and factors that may influence it, for purposes of reliably optimising intraocular lens power calculation.
Method: This was a retrospective audit with 4,891 eyes included. All patients presenting to a private ophthalmology practice in Sydney, Australia between December 2021 to May 2024 had measurements taken using Zeiss IOLMaster® 700. If patients presented several times during this period, only their first measurements were included for analysis. Difference in True K and K spherical equivalent values were evaluated using Excel scatter-plots, and relations to age, anterior corneal depth, axial length, spherical equivalent and astigmatism were explored.
Results: For over 94% of total comparisons, TK-K remained within ± 0.25D disparity. When there were disparities outside of ± 0.25D, there was a greater tendency for TSE to measure lower than SE. There appeared to be more disparities in eyes of patients <70 years of age, however findings were not statistically significant. Disparities had no correlations with anterior corneal depth, axial length, spherical equivalent and astigmatism.
Conclusion: This study demonstrated that, apart from younger age, there was no predicting factor for eyes with disparities of ±0.25D between TK and K readings. This indicates that whether using TK or K for intraocular lens power calculations, it may not result in a clinically significant difference in 94% of cases.

Discrepancies in astigmatic axis between TK and K readings

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Purpose: While standard keratometry (K) readings measure anterior corneal surface, total keratometry (TK) additionally considers posterior corneal surface and corneal thickness. Intuitively, it's expected that the axis of astigmatism should be similar in TK and K measurements. In cataract surgery, toric intraocular lenses may be considered for astigmatism greater than 0.5D.
Methods: A total of 4891 eyes were measured between December 2021 and May 2024 using Zeiss IOLMaster 700 at a private ophthalmology practice in Sydney, Australia. Phakic eyes with astigmatism greater than 0.5D were included in the study cohort resulting in 1541 eyes (29.7%). Difference in astigmatic axis were evaluated using Excel scatter-plots, and relations to age, anterior corneal depth, axial length, spherical equivalent and astigmatism were explored.
Results: Comparing axis-TK with axis-K, axis discrepancies averaged 3.85 degrees, median discrepancy of 2.78°. There were greater discrepancies in lower powers of astigmatic error, with largest measured discrepancy 29.8° at astigmatism of 1.9D. 6.8% of eyes demonstrated an axis variation over 10°. No correlations were observed between axis variation and anterior corneal depth, axial length, spherical equivalent or astigmatism.
Conclusion: This study demonstrated that there were no predictive factors for variation in TK and K axis readings. Additionally, there appeared to be a large proportion of patients with significant TK-K axis variation for astigmatism between 0.5D and 1D; which suggests that the benefits of toric lenses may not outweigh risks of incorrect axis alignment and additional cost of toric IOL for cases where astigmatism is less than 1D.

Outcomes following implantation of elevated phase shift technology trifocal and trifocal toric intraocular lenses

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Purpose: High quality uncorrected visual acuity at all distances and spectacle independence are expected with

Trifocal intraocular lenses (IOL) however dysphotopsias can be problematic for patients and surgeons. This study evaluated the clinical outcomes of the Medicontur Liberty Trifocal IOL family with Elevated Phase Shift 2.0 (EPS 2.0) constructive interference pattern.

Methods: Clinical outcomes of patients who underwent bilateral cataract surgery with Liberty Trifocal IOLs were assessed. Uncorrected and best corrected visual acuities for far, intermediate, and near distances were evaluated along with refractive outcomes. Dysphotopsia, visual functions and spectacle wearing habits were reported by each patient post-operatively via a questionnaire.

Results: The cohort consisted of 59 eyes of 32 patients. All IOL calculations were performed with the Barrett TK method on the Zeiss IOL Master 700. A sph eq outcome within ± 0.50D of target refraction was achieved in all eyes. Near visual acuity of N5 or better was achieved in 93.55% of eyes. Ninety-five percent of the patients did not have any difficulties while using a computer or reading a newspaper. Minimal reports of dysphotopsias were reported in the cohort.

Conclusions: In this small cohort the trifocal Liberty EPS 2.0 IOL family provided high quality unaided visual acuities at all distances. Not one of the patients required the use of spectacles. The lack of dysphotopsia symptoms highlights the low aberration diffractive profile of this lens. This is most probably at the same level of most EDOF IOLs.

Astigmatism analysis of a 2.2 mm temporal limbal incision using integrated keratometry in 217 eyes undergoing cataract surgery

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Purpose: To calculate the anterior corneal surgically induced astigmatism (SIA) of a 2.2 mm temporal limbal incision using integrated keratometry, and to investigate whether the magnitude of SIA is associated with white-to-white (WTW), central corneal thickness (CCT), or the magnitude of preoperative astigmatism.

Methods: A total of 217 eyes with paired pre- and post-operative biometry (+5 weeks) measured using both the IOLMaster700 and the Eyestar900 were retrospectively identified from the clinical records of a single-surgeon practice in Gold Coast, Australia. Included eyes had undergone a 2.2 mm temporal manual limbal incision for routine cataract surgery. Outliers and cases with previous corneal surgery were excluded. Surgically induced astigmatism and related metrics were calculated; correlation analyses between SIA, WTW, CCT and preoperative cylinder were performed.

Results: The SIA mean magnitude was 0.28 D (±0.14). The centroid was 0.06 D @ 101o (± 0.33), and this was significantly different to the origin (0,0) – Hotelling's $T2 = 11.55$, $p = 0.004$ ($\lambda1 = 0.06$, $\lambda2 = 0.04$, $\theta = 20.84$o). There was no significant association between SIA and WTW, CCT or preoperative astigmatism magnitude.

Conclusion: The authors present the first SIA analysis using Integrated Keratometry for a 2.2 mm temporal manual limbal incision. WTW, CCT and preoperative cylinder were not significantly associated with SIA magnitude.

Comparing post-vitrectomy and age-related cataract through differential gene expression of human lens epithelial cells

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Purpose: The mechanism of accelerated cataract development following vitrectomy is poorly understood. We conducted a prospective RNA-sequencing study of human lens epithelial cells in post-vitrectomy and age-related cataract to compare differential gene expression.

Methods: Human lens capsule specimens from post-vitrectomy ($n = 13$), and age-related ($n = 36$) cataracts were collected during cataract surgery from March to July 2023 in Melbourne, Australia. Silicone oil insertion at the time of vitrectomy occurred in four samples. RNA isolation and library preparation was performed at Australian Genome Research Facility. Differentially expressed genes (DEG) were defined as log2 fold change >1 and false discovery rate <0.05. Bioinfomatics analysis was performed with R and Degust.

Results: A total of 17,393 genes were included in the analysis. Sex, diabetes and vision blue were corrected for as covariates in the analysis. The silicone oil group had a distinct gene expression profile compared to post vitrectomy without silicone oil. In post vitrectomy without silicone oil compared to age-related cataract, 29 DEGs were identified. When comparing vitrectomy with silicone oil to age-related cataract, 1347 DEGs were identified with

833 upregulated and 514 downregulated genes. Significant gene ontology pathways included: response to hypoxia, regulation of epithelial to mesenchymal transition, transition, regulation of transforming growth factor beta signalling pathway and protein metabolic processes.
Conclusion: Our findings suggest that vitrectomy with silicone oil has a significantly different transcriptomic profile compared to vitrectomy without silicone oil when compared to age-related cataract. Therefore, the medium used to replace vitreous at the time of vitrectomy may lead to different cataractogenesis pathways.

Complication rates of cataract surgery at an Australian quaternary ophthalmology training hospital

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Purpose: To identify the rates of posterior-capsular tears during cataract surgery performed by accredited ophthalmology registrars at an Australian quaternary training hospital.
Method: Retrospective case series. Medical records of all patients who underwent cataract surgery were collected from 1 September 2023 to 1 April 2024 at a single centre quaternary Australian Hospital. Inclusion criteria included all public cataract cases performed by an accredited registrar with follow-up of at least one month post-operatively. Uncomplicated cases lost to follow up post-operatively were excluded. Combined cases with vitreoretinal or anterior segment were excluded. Outcome measures were pre- and post-operatively visual acuity (logMAR) and complications rates specifically posterior capsular tears or endophthalmitis.
Results: A total of 494 cases met the inclusion criteria. The mean age of patients at the time of cataract surgery was 72.3 years. Complication rates post cataract surgery over the 6-months was 4.25% (21/494). Of these, posterior capsular tears accounted for 1.62% (8/494) with no post-cataract endophthalmitis cases identified. 76.3% had improved visual acuity post cataract surgery compared to baseline. Of these 88.3% (436/494) achieved final visual acuity of at least 6/12 or better and 30.2% (149/494) achieved final visual acuity of at least 6/6 or better.
Conclusion: The rates of cataract complications were significantly less compared with previous cataract audit studies however rates of posterior capsular tears were similar when compared to previous cataract audits across Australian and New Zealand.

Outcomes of toric intraocular lens implantation at Royal North Shore Hospital

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Purpose: After cataract surgery, residual astigmatism is a significant cause of suboptimal post-operative unaided vision. Although approximately one-third of patients receiving cataract surgery have corneal astigmatism $\geq$ 1.00D, rates of toric intraocular lens (IOL) implantation have been reported at 10-15%. The purpose of this audit was to evaluate the use and outcomes of toric IOLs at Royal North Shore Hospital (RNSH).
Method: This retrospective audit included all patients who received cataract phacoemulsification surgery with toric IOL implantation at RNSH in 2023. Demographic and biometric data were recorded at baseline. Preoperative corneal astigmatism was measured using IOL master 700 keratometer readings. Refractive data were obtained using autorefraction.
Results: Of the 633 total cataract surgeries performed, 212 eyes (33%) received toric IOLs. Median follow-up time was 29 days. Preoperatively, the axis of corneal astigmatism was with-the-rule in 16%, oblique in 11% and against-the-rule in 73% of eyes. The Alcon Acrysof IQ Toric IOL was implanted in 25%, and the AMO Tecnis Toric IOL in 75% of eyes. Post-operative uncorrected visual acuity was $\geq$6/12 in 91% of eyes. Astigmatic error decreased in 84% of eyes (mean decrease 1.02 $\pm$ 1.13D, $p < 0.001$). Post-operatively, 75% of eyes were within 0.50D of predicted spherical equivalent refraction, and 54% of eyes were within 0.50D of predicted astigmatic error.
Conclusion: There was a higher rate of toric IOL implantation at Royal North Shore Hospital compared to existing literature. After toric IOL implantation, astigmatic error decreased in 84% of eyes. Target refractive outcomes were achieved in most patients.

Initial experiences of cataract surgery in an outpatient clean room using a portable laminar airflow device in 3501 patients

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Purpose: To describe our experiences in the UK of using the TOUL Operio portable laminar

airflow device for cataract surgery in an outpatient clean room.
Method: All patients undergoing phacoemulsification cataract surgery in the described environment between 2020 and 2024 were followed up for evidence of post-operative endophthalmitis.
Results: A total of 3501 sequential patients underwent cataract surgery between May 2020 and May 2024 in three different outpatient clean rooms in Herefordshire. There were no cases of endophthalmitis (0/3501, 0.00%).
Conclusion: In combination with other precautions for cataract surgery, the use of a portable laminar airflow device in an outpatient clean room appears to be safe. Other benefits in terms of cost and maintenance will be discussed.

One year surgical outcomes and safety of secondary fixated intraocular lenses using Yamane technique

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Purpose: To describe the characteristics and one-year post-operative surgical outcomes of modified Yamane technique scleral fixated intraocular lens (SFIOL) by a single anterior segment surgeon, demonstrating the learning curve and improvement in outcomes over time.
Methods: Consecutive cases of significantly subluxated or dislocated cataracts and intraocular lenses (IOL) from July 2022 to 2023 were included in this retrospective case series. In all cases, the anterior segment surgeon performed the SFIOL and one of three vitreo-retinal surgeons performed trans pars planar vitrectomy (TPPV).
Results: Sixty-five eyes of 62 patients were included. Median age was 67.4 (interquartile range 27–89) years. Fifty-two (80%) underwent combined TPPV, explant of IOL and SFIOL; nine (13.8%) underwent TPPV with IOL explant with SFIOL at a later date; four (1.07%) underwent TPPV, lensectomy, SFIOL. Overall median preoperative logMAR BCVA was 0.9 (interquartile range 0–2.5). Median logMAR BCVA improved to 0.3 (0–1.9). 78.5% of eyes achieved logMAR $\leq$ 0.3, and 96.9% achieved IOL stability at month 12. The most common complication of cystoid macula oedema occurred in 9.23%. Endothelial cell loss was significantly pronounced in eyes that required explant of IOL compared to lensectomy. Three patients had IOL capture in front of iris.
Conclusions: Modified Yamane technique SFIOL is a good surgical option for subluxated IOL or cataract without sufficient capsular support, with at least 78.5% of eyes achieved logMAR $\leq$ 0.3, and 96.9% achieved IOL stability at month 12. While the learning curve is initially steep and complications can occur, outcomes after the first five cases rapidly stabilised and became predictable.

Comparison of lens surface geometry using optical coherence tomography and scanning electron microscopy

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Purpose: Optical properties of intraocular lens (IOL) can be determined by surface geometry, thickness and material. Surface geometry assessment is challenging given the resolution required to accurately assess subtle lens details that govern the performance of modern IOLs.
Setting: Cataract and Refractive Surgery Laboratory, University of Plymouth, United Kingdom.
Methods: Assessment of surface geometry was conducted on: a spherical IOL (CT Spheris 209M—Zeiss), aberration-neutral IOL (CT ASPHINA® 409M Zeiss Meditech), aberration-correcting IOL (CT ASPHINA 509) and an aberration-correcting IOL that has a unique surface profile designed to make it robust to decentration (CT LUCIA Zeiss Meditech). A Ganymede™ Series SD-OCT with an OCT-LK4-BB scanning lens and immersion kit (Thorlabs) was used to acquire images of the IOL surfaces while immersed. Both sides were scanned separately. Following this, a ZEISS Crossbeam 550 focused ion beam-scanning electron microscope (FIB-SEM) was used to acquire surface images for analysis. Image analysis was conducted in Matlab to determine the radius of curvature and lens asphericity.
Results: Both methods were able to determine the progressive flattening between spherical, aberration-neutral, and aberration control IOLs. CT Lucia provides an interesting profile that flattens before steepening again into the periphery. This complex shape was identifiable through SEM, but the OCT resolution limited the assessment of this geometry.
Conclusions: Assessment of surface geometry is difficult; OCT is able to differentiate simple surface geometry, but higher resolution is required for complex surface designs.

The calm before the cataract: Optimising anaesthesia to avoid intraoperative storms

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Purpose: This retrospective study aims to determine the risk factors associated with intraoperative complications arising from current anaesthetic practices during femtosecond-assisted cataract surgery.
Method: Consecutive medical records from a private ophthalmology clinic in Sydney, of patients undertaking femtosecond-assisted cataract surgery between 2022 and 2023 were reviewed ($n = 847$). Data included age, sex, treated eye, prior history of anaesthetic concerns, American Society of Anaesthesia (ASA) score, comorbidities, and intraoperative complications encountered. A Pearson Correlation was performed to determine any association between risk factors.
Results: The mean age of patients was 70.21 ± 9.8 years (range 39–94) with 53.7% female. Cataract extraction was performed on the right eye in 424 (50.1%). Thirteen patients had a prior history of anaesthetic concern with anxiety to general anaesthetic ($n = 2$), narrow airway ($n = 2$) and increased sensitivity to anaesthesia ($n = 2$) being the most reported. Previous anaphylaxis was only recorded in one patient. Of the total, 59.5% had no cardiovascular issues, with 19.9% recording multiple concerns. Diabetes was diagnosed in 9.3%. Intraoperative complications were recorded in four patients. There were no statistically significant associations with risk factors. However, strong relationships were found between patients with cardiovascular health, diabetes and poor ASA scores ($p < 0.001$).
Conclusions: Intraoperative anaesthetic complications during cataract extraction surgery can occur, although remain extremely uncommon with current practice typically safe. General health issues such as cardiovascular disease, diabetes and poor ASA scores are not predictors of intraoperative anaesthetic complications however the surgical team must remain vigilant in patients with systemic health concerns.

The cataract conundrum: A decision matrix for surgical suitability

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Purpose: Using existing scientific literature to support a combination of subjective and objective clinical and patient-reported parameters, we developed a lens surgery decision matrix (LSDM) to provide cataract surgeons with a consistent methodology to record clinical diagnosis within their existing patient consultation. We reviewed the applicability of the LSDM in clinical practice.
Method: Literature was undertaken to source data material to determine a threshold for cataract diagnosis across a range of diagnostic utilities to generate the LSDM which was introduced to practice. Patients attending a Sydney ophthalmology clinic from January 2020 to December 2023 were retrospectively assessed to determine LSDM values and application to the surgical decision.
Results: $n = 119$ patients (234 eyes). Mean age was 64.7 ± 9.1 years with mean LSDM score 4.45 ± 1.61 (range 1–7). 14.5% achieved a score of 0–2 (classified as non-clinically significant cataract or clear lens) while 31.2% totalled 3–4 (cataract surgery is indicated) while remaining 54.3% scored between 5 and 8 indicating cataract surgery was advised. The LSDM score matched the consultation decision in 83.3% of cases. 16.2% represented a false positive (surgery indicated or advised but patient did not proceed). One patient classified as a false negative.
Discussion: Although the decision to proceed to surgery is ideally based on patient clinical and safety parameters alone, external regulatory and governmental protocols represent an increasing consideration for the surgeon and their practice. The use of the LSDM supports practice documentation and appears to provide a valid confirmation for the eventual surgical decision.

Extended depth of focus: Plano or monovision? Real world comparison to understand the benefits of a customised target

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Purpose: The most appropriate intraocular lens (IOL) and target outcome will be patient specific. Understanding potential outcomes and benefits of different approaches will aid the eventual surgeon discussion. The purpose of this review is to understand differences in patient outcomes undergoing extended depth of focus (EDOF) IOLs for either distance or monovision endpoints.

Method: Retrospective multi-centre, multi-surgeon review in Melbourne of patients undergoing bilateral implantation with Eyhance EDOF IOL. Patient demographic, visual and refractive outcomes were analysed.
Results: $N = 96$ eyes (56 patients) were assessed. Overall mean age was 71.9 ± 9.2 years. Preoperative spherical equivalent was −0.06 ± 3.12D (range −13.50 to 8.13D). Mean target was −0.18D (range 0.18 to −1.15D). Mean absolute difference from intended target was 0.22 ± 0.20D. 84.4% and 69.0% of eyes achieved unaided distance visual acuity (VA) 6/6 or better for Plano and Monovision Groups respectively. Intermediate unilateral VA was between 65.9% and 82.6% achieving N10 or better and unilateral near VA 60.5% and 73.1% N10 or better for Plano and Monovision groups respectively. Binocular intermediate and near VA increased to 90% and 71.4% achieving N8 for Monovision cohort versus 41.7% and 45.5% achieving N8 in Plano group.
Conclusion: A modified monovision EDOF IOL approach can achieve excellent functional unaided VA at all distances. A Plano endpoint improved unaided distance VA noting a relative decrease for near work activities. This study highlights the potential outcomes of separate approaches for cataract patients and EDOF IOLs and provides a further platform for understanding.

Corneal astigmatism comparison using two swept-source ocular coherence tomography (Anterion and IOLMaster 700) biometry devices

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Purpose: To compare anterior, posterior, and total corneal astigmatism between the Anterion and IOLMaster 700.
Methods: This prospective comparative study included 59 adult participants who underwent Anterion and IOLMaster 700 measurements conducted by a single investigator. Both eyes were scanned, but only the right eye was selected for analysis to prevent potential intra-individual correlation between eyes. Participants with anterior cylinder powers > 0.5 Dioptres(D) were included in the analyses. Corneal measurements: flat (K1) and steep (K2) were converted to vector notations (J0, J45). To compare the astigmatic component, changes in vector notation (ΔJ0 and ΔJ45) between two devices were computed for each participant. The vector changes were converted to changes in corneal cylindrical power (ΔC) and axis (ΔA) using Thibos 1997) equations.
Results: Statistically significant differences between devices were found in Anterior-K2(0.19) and J0(0.04); Posterior-K1(0.37) and K2(0.35); Total-K1(0.62), K2(0.81), and J0(0.008), ($p < 0.05$). The change in corneal cylindrical power (ΔC> 0.3D, i.e., 0.5D at the IOL plane) between the two devices was observed in 54% eyes for the anterior cornea, 3% eyes for the posterior cornea, and 61% eyes for the total cornea. In both anterior and posterior corneas, over 90% of eyes had ΔA>10°, with the majority showing differences beyond 30° (81% for anterior and 71% for posterior), 60° (73%, 54%), and 90°(64%, 37%). Similarly, in the total cornea, almost all eyes (97%) had ΔA>10°, with varying distributions extending to 30° (83%), 60° (63%), and 90° (44%).
Conclusion: Corneal astigmatism measurements obtained with the Anterion and IOLMaster 700 are not interchangeable.

Comparative accuracy of intraocular lens power calculation formulas when targeting myopia

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Purpose: This study aims to compare the accuracies of intraocular lens (IOL) power calculation formulas when targeting myopia versus emmetropia.
Methods: A total of 450 patients were included, with 225 patients targeting emmetropia and 225 patients aiming for approximately −2.0 diopters of myopia. This retrospective analysis utilised data from a single eye of each patient, with preoperative biometric measurements obtained using the IOL Master 700. The study considered established formulas such as Haigis, Hoffer Q, Holladay 1, Holladay 2 and SRK/T, as well as modern formulas including Barrett Universal II and Kane. Statistical analyses, including Friedman test and post hoc analysis, were employed to compare the accuracy of each IOL power calculation formula between the two groups. Additionally, a multiple regression analysis was conducted to identify variables influencing the accuracy of intraocular lens power calculation formulas.
Results: In targeting myopia, all IOL formulas tended to exhibit a greater refractive error compared to when targeting emmetropic eyes. Notably, the Haigis, SRK/T and Holladay 2 formulas were found to be highly influenced by this trend, while the modern formulas were less affected.
Conclusion: The accuracy of IOL power calculation formulas diminishes when targeting myopia in comparison to emmetropia. However, the modern formulas appear

less susceptible to this trend. Consequently, when aiming for myopia, the use of the modern formulas is recommended for enhanced accuracy in IOL power calculation.

Cornea

Identifying keratoconus using an automated machine learning model

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Purpose: This study aims to evaluate the performance of a code-free automated machine learning (AutoML) model to identify forme fruste keratoconus and to compare this with a bespoke model.
Methods: A classification model was trained using keratography results from a publicly available dataset of 3162 eyes. The model aimed to classify eyes as 'normal', 'forme fruste' or 'keratoconus'. The model was built by a clinician with no prior machine learning (ML) experience, using the Google AutoML platform. Results obtained were subsequently compared to a manually coded model built by an experienced developer.
Results: The AutoML model achieved a receiver operating characteristic area under the curve (ROC AUC) of 0.99, compared to a ROC AUC of 0.83 in the bespoke model. The AutoML model's accuracy of 0.96 was marginally higher than the 0.93 achieved manually. The AutoML model proved effective in identifying forme fruste keratoconus, misclassifying forme fruste as normal in only 5% of cases. Model features with the highest importance were steepest corneal curvature (steepest.3, steepest.1 and steepest.posterior), followed by corneal asymmetry (asymmetry.1 and asymmetry.5).
Conclusion: AutoML has the potential to enable clinicians with no prior coding experience to train, develop and test ML models. The model we have developed serves as a demonstration of how AutoML models can perform comparably to bespoke models. Lowering the barrier of entry and improving access to ML will identify new use cases and may improve the accuracy of manually built models.

Visual aids in keratoconus: A save sight keratoconus registry study

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Purpose: To determine the visual aids used in patients with keratoconus enrolled in the Save Sight Keratoconus Registry.
Method: A cross-sectional study was performed on 671 patients from a quaternary referral eye centre and corneal specialty practice (Sydney Eye Hospital and Bondi Eye Doctors respectively). Data from the better seeing eye was analysed, with the type of visual aids utilised as the primary outcome measure. Visual acuity, corneal tomography, pre-existing ocular conditions and previous treatments at the index visit were also analysed. Severity of keratoconus was graded into mild (Kmax 55D).
Results: At the index visit, visual correction was with contact lenses in 43 patients and spectacles in 326 patients; 302 patients were unaided. The average best corrected visual acuity (in logMAR) was 79.5, 77.5 and 73.5 for contact lenses, spectacles and unaided eyes respectively. The majority of patients using contact lens had severe keratoconus ($n = 31$, 72.0%), the majority of patients using spectacles had moderate keratoconus ($n = 240$, 42.9%) and the majority of patients with nil visual aid had severe keratoconus ($n = 127$, 42.0%). Median thinnest pachymetry values (in microns) were 414.5 for contact lenses, 483.5 for spectacles, and 467.5 for unaided eyes. Prior treatment amongst the study population included rigid gas permeable lenses ($n = 95$, 14.2%), corneal cross-linking ($n = 29$, 4.3%) and corneal grafting ($n = 19$, 2.8%).
Conclusion: For keratoconic patients in the real world, spectacles were the commonest visual aid for correction. Contact lenses tended to be used by patients with more severe keratoconus.

Comparison of standard vs. accelerated corneal collagen cross-linking for keratoconus: Seven-year outcomes

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Purpose: To compare the long-term effectiveness of Standard (UV intensity: 3 mW/cm^2, duration: 30 min) versus Accelerated (UV intensity: 9 mW/cm^2, duration: 10 minutes) corneal cross-linking (sCXL vs. aCXL) for keratoconus.

Methods: Data for this longitudinal observational study were captured through the web-based Save Sight Keratoconus Registry system from the routine clinical practice (12 sites). The outcomes were compared using mixed-effects regression models. A total of 64 eyes (52 patients; mean age 32.6 ± 13.1 years; 69.2% male) who had sCXL and 49 eyes (44 patients; mean age 24.4 ± 8.4 years; 72.7% male) who had aCXL, with a follow-up visit at seven-year post-CXL were included.

Results: Both CXL protocols were effective and safe in stabilising keratoconus and improving outcomes. The adjusted mean changes (95% confidence interval) in visual acuity (VA) were better in sCXL than in aCXL [mean VA gain, 10.0 (6.9–13.1) versus 4.6 (0.4–8.9) logMAR letters; pinhole VA 6.1 (4.0–8.1) versus 0.4 (−2.1 to 2.8) logMAR letters; both p 0.05]. At the seven-year follow-up visit, no adverse events were recorded.

Conclusions: The standard CXL resulted in greater improvements in visual acuity. Both standard and accelerated CXL were safe and effective procedures for stabilising keratoconus in the long term.

Cornea clear and measured: A reference population for optimal patient care

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Purpose: Understanding the patient population is essential to clinical diagnosis. Existing reference populations may not readily transfer to target populations, thereby increasing the potential benefit of deriving local data. This study analyses the corneal epithelial thickness (CET) using the MS-39 device to provide an Australian reference database.

Method: A total of 2419 eyes from 1,186 patients were analysed. Epithelial thickness mapping was performed for the central 3.0 mm zone, as well as the nasal, temporal, superior, and inferior regions at 3.0–6.0 mm and 6.0–8.0 mm. Correlations between CET measurements, age and KC indices were assessed using the Pearson's correlation coefficient.

Results: The average age of participants was 39.65 ± 13.81 years. The mean epithelial thickness in the central 3.0 mm zone was 53.71 ± 3.90 μm, which is higher than the value previously reported (52.61 ± 2.89 mm). Similarly, average epithelial thickness in the nasal, temporal, superior and inferior regions at 3.0–6.0 mm and 6.0–8.0 mm diameters was also higher in our cohort. There were significant correlations between CET and patient age ($p < 0.001$), as well as multiple KC indices including El2f, El2b, RMSf, RMSb, PTI, KMaxf, KMaxB, DZMaxF and DZMaxB ($p < 0.001$).

Conclusions: Although several studies have assessed repeatability of epithelial thickness, to our knowledge this is the first study to evaluate population values directly thereby improving our current understanding of epithelial thickness mapping, its applicability in the clinical analysis of corneal irregularities and ectasia, as well as in planning for corneal refractive surgery.

Herpes simplex keratitis: An evaluation of local treatment guidelines 2020–2022

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Purpose: To evaluate clinician adherence to evidence-based treatment guidelines for herpes simplex keratitis (HSK) in Sydney, Australia between 2020 and 2022, and to compare results with previous studies conducted in 2017, and from 2018 to 2019.

Methods: A retrospective review was conducted of all cases of HSK aged 18 years and over at Sydney Eye Hospital between 1 January 2020, and 31 December 2022. Patients were identified from hospital coding data (International Classification of Diseases 10), viral swab results and pharmacy records. Medical history, antiviral and topical steroid therapy and outcomes were collected.

Results: A total of 189 eyes from 187 patients with HSK were included. The median age was 71 years, with 56% being male. The most common antiviral regimes included oral valaciclovir 500-1000 mg, once to three times daily and topical aciclovir five times daily. Antivirals were prescribed for therapeutic and prophylactic indications in

141 (75%) and 46 patients (25%) respectively. Evidence-based guidelines were adhered to in 13/23 (56%) eyes with epithelial keratitis, 25/50 (50%) with stromal keratitis, 8/8 (100%) with endothelial keratitis, and 44/60 (73%) with herpes simplex keratouveitis. Prophylactic antiviral dosage was appropriate in 33/46 (72%). Collectively, 123 patients (66%) received evidence-based antiviral treatment. This result is similar to adherence rates of 69% in 2018–2019 ($p = 0.456$), and lower than 75% in 2017 ($p = 0.116$).

Conclusion: While clinician adherence to evidence-based guidelines five years post-implementation appears to be decreasing, this result is not statistically significant. Regular educational activities are required to sustain knowledge of and adherence to guidelines.

Fungal keratitis in subtropical Queensland: A five-year review and update

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Purpose: Fungal keratitis is a rare but potentially sight and globe-threatening disease. Ongoing reporting of microbiological and clinical data may help guide ophthalmologists in managing these patients.

Methods: Corneal scrapes with positive fungal isolates on culture from the Royal Brisbane and Women's Hospital and the Princess Alexandra Hospital in Brisbane, Queensland, were extracted from pathology records from April 2019 to April 2024. Microbiology, patient risk factors, management and outcomes were reviewed.

Results: Sixty eyes from 59 patients grew fungal organisms—one patient had two separate organisms grown on two separate occasions one year apart in the same eye. Eighty-two percent of samples grew filamentous fungi, 21% grew yeasts, two samples (3%) grew both and one grew an unspecified fungus. The most frequent isolates were Candida species ($n = 13$), Fusarium species ($n = 10$), Aspergillus ($n = 9$). The most common identified risk factors for fungal keratitis were trauma/foreign body ($n = 19$), contact lens use ($n = 16$), previous topical steroid use ($n = 13$) and neurotrophic keratopathy ($n = 13$). Complications included corneal perforation ($n = 12$), scleritis ($n = 2$) and endophthalmitis ($n = 1$). Twenty-three patients (39%) required at least one surgical intervention including penetrating keratoplasty ($n = 16$), temporary tarsorrhaphy ($n = 8$) and evisceration or enucleation ($n = 2$). Patients with *Candida keratitis* were most likely to require surgical intervention (54%).

Conclusion: Fungal keratitis remains a highly morbid disease requiring frequent surgical intervention and often poor outcomes. Awareness of the recent microbiological spectrum of pathogens, patient risk factors and management patterns may help clinicians in more effectively treating these patients.

Comparison of Descemet's membrane endothelial keratoplasty outcomes in normal specimens and donors with endothelial cell loss and the influence of re-bubbling procedures

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Purpose: To compare graft outcomes following Descemet's membrane endothelial keratoplasty (DMEK) using donor tissue demonstrating endothelial cell loss during VisionBlue staining and tissue with a normal staining pattern, as well as comparing the influence of re-bubbling procedures on outcomes.

Methods: From a retrospective, single-surgeon case series of 238 DMEK procedures, 24 donor specimens were identified which demonstrated abnormal VisionBlue uptake during staining prior to surgeon peel in the operating room and were compared to 24 specimens with normal staining patterns. Outcome measures were graft failure, number of re-bubbling procedures, time to achieve steady state visual acuity, central corneal thickness and corneal cell density over a follow-up period of up to five years. Outcomes were also compared between grafts that did and did not require re-bubbling.

Results: Graft adherence and survival rates did not differ significantly between those with a normal and abnormal endothelial staining pattern. For up to five years in abnormally stained grafts there were no cases of delayed graft failure. The need for re-bubbling procedures did not impact central corneal thickness or cell density, and did not affect time taken to reach steady state visual acuity.

Conclusion: Abnormal endothelial staining patterns in surgeon prepared tissue were not associated with poorer long term outcomes in this study. The need even for multiple re-bubbling procedures did not negatively impact patient outcomes or graft pachymetry values, although interpretation is limited by the lack of preoperative donor pachymetry in Queensland.

Clear corneas in COVID? A prospective study on corneal graft clinical outcomes during the COVID-19 pandemic and beyond

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Purpose: To ascertain the relationship between the COVID-19 pandemic and corneal transplant indications, rejection rates and visual outcomes.
Method: A prospective study of all corneal grafts performed during the COVID-19 pandemic years in Greenlane Clinical Centre combined with a retrospective chart review of the corneal grafts performed in the decade prior ($n = 941$). Data collected includes demographic information, COVID-19 vaccinations, clinic appointments attended, graft indications, visual acuity pre- and post-transplant, and rejection episodes.
Results: The number of corneal grafts performed per year decreased 71.3% from 2020-2022 ($n = 298$), but the primary indications remained keratoconus and regraft in keeping with data from 2010-2019 ($n = 941$). There was a significant increase in appointment delays and those not attended ($p = 0.002$) during the pandemic but no increase in rejection rates. There was a relationship between increased number of delayed appointments and increased risk of corneal graft rejection ($p < 0.001$). Corneal graft rejection occurred in 19.7% but does not appear to be associated temporally with COVID-19 infection or vaccination. Increased delayed appointments were associated with a worse visual acuity 1 year post graft on linear regression ($p < 0.001$).
Conclusion: Initial results suggest that appointment delays, worsened during the COVID-19 pandemic, may play a defining role in influencing corneal graft clinical outcomes including visual acuity and rejection rates. Longer-term visual acuity data will continue to be collected as this study progresses allowing more definitive conclusions on the impact of the COVID-19 pandemic on corneal transplantation.

Pterygium surgery outcomes at a tertiary training hospital

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Purpose: To report on outcomes of patients who underwent pterygium surgery.
Method: Retrospective chart review of all patients who underwent pterygium surgery from January 2017 to November 2022. Outcomes examined include vision, conjunctival graft size, histopathology results, recurrence rates and complications.
Results: A total of 267 patients were identified, of whom 80% were public patients. Average age was 59 years and 67% were male. The majority of surgeries (62.8%) was performed by registrars. Visual acuity outcomes were evenly split between improved, worsened and unchanged post-operatively. Ten percent of patients had refraction recorded pre- and post-operatively, there was an average improvement of 2.5 dioptres of cylindrical refractive error. 98% of surgeries included autologous conjunctival grafting, ranging from 25 to 144 square millimetres. Of the 211 samples that were sent for histopathology, 95% were benign. Average follow-up time of the cohort was 12.5 months with 5.1% recurrence rate. Over half of the patients completed less than 6 months follow-up. Complications included necrotising scleritis, non-healing conjunctival epithelial defect and corneal perforation requiring corneal grafting.
Conclusion: In this large cohort of patients treated at a tertiary treating hospital for pterygium, there was an overall low complication rate. Although reported recurrence rates were low, this may be skewed by the large proportion lost to follow-up. Improvements include standardised measurement and recording of visual acuity, recording refractive error and ensuring follow-up of patients after pterygium surgery.

A shift in the eye: Deep anterior lamellar keratoplasty surgery, anterior chamber architecture and intraocular pressure

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Purpose: Although successful, post-operative complications following corneal transplantation can occur. Both pseudo and real intraocular pressure (IOP) changes may be expected through an increase in post-surgery pachymetry and medication responses respectively. These may however mask real changes due to reconstruction of the anterior chamber (AC) post-operatively. This novel study examines the changes in AC metrics and the possible correlations to post-surgery IOP changes.

Methods: Retrospective, single surgeon review of patients undergoing deep anterior lamellar keratoplasty for keratoconus in Melbourne Victoria. Visual acuity, IOP and biometry indices were collated pre-surgery and one week, one and three months. Change following surgery and factors contributing to IOP change were examined.
Results: $N = 9$ eyes of nine patients. Mean preoperative IOP was 6.86 ± 1.35 mmHg. Mean IOP increased by 134.4% and 189.2% at one and three months respectively ($p = 0.035$, 0.010). Anterior chamber depth and volume decreased significantly from pre to post (0.004, 0.011). There were no statistically significant correlations between increase in IOP at 3M and patient variables however post-operative decrease in both AC depth and volume approached significance ($p = 0.061$).
Conclusion: This pilot review found significant changes to anterior biometric variables following deep anterior lamellar keratoplasty surgery suggesting reorientation of the AC. Although not confirmed in this small cohort, it remains plausible these changes may impact aqueous flow and contribute to ongoing increase in IOP representing a further risk to general eye and corneal health. Further analysis of the ACD chamber architecture and greater numbers will further elucidate this potential concern.

IC-8 intraocular lenses for highly irregular corneas and higher order aberrations: Fad or future?

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Purpose: To assess visual and refractive outcomes following IC-8 intraocular lens (IOL) implantation in eyes with severe corneal irregularities and higher order aberrations.
Methods: Patients with several corneal irregularities and with higher order aberrations as assessed by corneal topography and tomography via Pentacam and Wavefront Analyser were recruited. Participants underwent standard uncomplicated phacoemulsification surgery with implantation of the IC-8 IOL from a 2.4 mm incision. Unaided distance visual acuity and refraction were measured one month post-operatively.
Results: A total of 69 eyes from 47 patients were included in the study. There was an almost equal distribution of males and females and the mean age was 68 ± 13 years old. The most common corneal pathologies were keratoconus ($n = 34$, 49.3%) and scarring from trauma ($n = 8$, 11.6%) and herpetic disease ($n = 7$, 10.1%). The mean and median one month post-operative uncorrected distance visual acuity was logMAR 0.19 (6/9.5) $\pm$ 0.27 and logMAR 0.16 (6/7.5) respectively. The mean post-operative spherical equivalent refraction was -0.29 ± 1.73 D. The post-operative spherical equivalent refraction was within 0.5 D of plano in 47.7% of eyes. Total corneal astigmatism of 1.5 D or numerically smaller was correlated with logMAR 0.00 or better (odds ratio 5.3, 95% confidence interval 1.6–18.3, $p = 0.005$). IOL-Master total keratometry values yielded the most accurate formulae.
Conclusions: The small-aperture IC-8 IOL provides a versatile and well-performing option for corneas with high irregularity and higher order aberrations, providing promising visual and refractive outcomes against a range of corneal pathologies.

Visionary cells: Preliminary results for a trial of GMP-compliant culture process for corneal endothelial cells

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Introduction: Corneal endothelial cells (CEC) injection therapy involves the injection of a suspension of CECs directly into the anterior chamber of a recipient's eye. CEC injection therapy is an emerging approach as an alternative to endothelial keratoplasty for corneal endothelial dysfunction.
Study Design: A pilot laboratory-based study.
Methods: We developed a Good Manufacturing Practice-compliant protocol for the culture of CECs suitable for a future phase 1 clinical trial. We performed a pilot study in which we cultured batches of CECs, which then underwent morphometric and gene expression analysis to ensure purity and identity of the cultured cells as terminally-differentiated CECs.
Results: Data analysis is currently underway and we will have results to demonstrate morphometric analysis of cellular circularity/hexagonality; phenotypic characterisation of cells by flow cytometry analysis for CD56, CD166 and PRDX-6 markers; immunocytochemistry for NA+/K+ ATPase and ZO-1; Gene expression analysis for positive (COL8A1/2, SLC4A11, GPC4, CD200) and negative (ALDH3A1, LUMICAN) markers.

Conclusion: We will demonstrate the feasibility of a Good Manufacturing Practice-compliant protocol for CEC culture that may be used for a future phase 1 clinical trial.

Comparative analysis of keratometric and pachymetry values from corneal topography scans: A comparison between Pentacam and Galile

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Purpose: The objective of this study was to compare K1, K2, Kmax and pachymetry values from Pentacam and Galilei scans of corneal topography in order to assess their correlation and interchangeability in clinical practice.
Method: A total of 34 patients (68 eyes) were enrolled in the study. Corneal topography was performed using Pentacam and Galilei devices on the same day. K1, K2, Kmax and pachymetry readings were obtained from the scans and analyzed using paired t-tests and Bland-Altman plots.
Results: There were minimal differences in clinical settings between Pentacam and Galilei for K1, K2, Kmax (>0.75 D) and pachymetry values (>15 um). However, there was a statistically significant difference found between Kmax and pachymetry, making their interchangeability questionable.
Conclusion: While Pentacam and Galilei devices demonstrate good agreement for certain corneal parameters (K1 and K2), discrepancies exist, particularly in Kmax and CCT measurements. However, both devices appear to be providing clinically agreeable values and may be used interchangeably with good accuracy in clinical settings, as the difference was less than 0.75 D in keratometric values. However, these differences highlight the need for careful consideration when interpreting measurements obtained from different Scheimpflug devices and emphasize the importance of device-specific validation and calibration, especially in cases of refractive surgery where extreme precision is required in micrometers.

Continued long-term flattening following collagen cross-linking for keratoconus

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Purpose: To estimate the trend of continued long-term corneal flattening after Epi-off cross-linking (CXL) for progressive keratoconus.
Method: Prospective, uncontrolled case series; 284 eyes with progressive keratoconus received corneal CXL using modified Dresden protocol using Vibex-Rapid™ soak duration of 10 minutes followed by UVA exposure at 3.0 mW/cm^2 for 30 min (total energy 5.4 mJ/cm2). All patients had unaided and best corrected visual acuity, refraction, and Scheimpflug tomography (Pentacam™) performed pre- and all post-operatively visits up to 2 years post CXL
Result: A total of 284 eyes of 180 patients (104 bilateral) were included in the study. Eyes with a significant stromal thinning (central corneal thickness < 375 μm) or central stromal scarring with or without previous hydrops were excluded. There was a trend of sustained, progressive flattening of the cornea post CXL. Baseline mean Kmax was 49.4 D, reducing to 48.6D at one year, and 47.5 D at two years mark. This trend of flattening was directly proportional to increasing Kmax values.
Conclusion: There was a continued long-term flattening of corneas with progressive keratoconus after CXL with Modified Dresden protocol using Vibex Rapid. This flattening more pronounced (statistically significant) in corneas with higher Kmax values to start with. No other preoperative parameters evaluated (e.g., age, sex, diagnosis, BCVA and refractive astigmatism) had a statistically significant impact on corneal flattening after CXL.

Epidemiology/Public Health

Clinical validation of an Indigenous eye health framework in Aotearoa New Zealand

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Purpose: To report validation outcomes for Ngā mata o te Ariki, a Māori eye health framework designed to enhance clinician engagement with Māori patients, through use of mock clinical scenarios in a controlled setting.
Method: A clinical validation study involving 52 participants (25 Māori, 27 non-Māori) assessed the impact of Ngā mata o te Ariki on patient satisfaction and cultural safety. Participants, presenting as patients with corneal

abrasion, interacted with three clinicians: non-Māori, non-framework trained, non-Māori framework-trained, and Māori utilising the framework principles. Post-interaction, participants rated encounters using patient satisfaction (PSQ-3) and cultural safety questionnaires.

Results: Fifty-two participants were analysed and results revealed statistically significant improvement with use of the framework across 55% of the patient satisfaction questions (p <0.05). Aspects such as comfort, patient education and perceived thoroughness were notably enhanced in the two examinations utilizing framework principles. Comparable trends were evident in cultural safety questions, indicating likelihood of whānau (family) referral and whakawhanaungatanga (relationship-building). Qualitative analysis substantiated the findings, supporting whānau referral and attendance to follow-up appointments, indicating favorable use of Ngā mata o te Ariki.

Conclusions: A strong association between Ngā mata o te Ariki implementation and patient satisfaction and cultural safety measures were identified. Adopting the nine principles resulted in significantly enhanced overall patient experiences, transcending ethnic boundaries. Findings suggest that patients, irrespective of ethnicity, are more likely to recommend whānau and attend follow-up appointments resulting from clinicians utilising this framework. Positive outcomes offer promise in addressing health disparities, fostering inclusivity and improving healthcare experience for all.

First nations as a clinical modifier in referrals to ophthalmology outpatient clinic: A retrospective audit Geelong Hospital

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Purpose: First Nations communities experience high rates of preventable eye conditions and barriers to accessing ophthalmic care. The Barwon ophthalmology unit updated its model of care in October 2017, incorporating a First Nations identity as a clinical modifier to prioritise outpatient referrals. This retrospective audit examines the impact of this protocol.

Methods: This retrospective audit evaluates First Nations patients referred to the Barwon ophthalmology outpatient clinic from 1 July 2017 to 30 June 2024. Data was sourced from the hospital's de-identified audit system and previous ophthalmology audits. Outcomes include clinic waiting times, referral source, identification rate in referrals, clinic attendance, number of outpatient reviews and cataract surgeries completed.

Results: Since 2017, 164 First Nations patients were referred to the Barwon ophthalmology unit, with 21% identified in the initial referral. Median wait times for outpatient appointments ranged from 12 to 38 days for First Nations patients, compared to 194 to 376 days for the broader population. Non-attendance rates decreased from 38% in 2018–19 to 22% in 2023–24. The proportion of outpatient consultation needs met increased from 4% in 2017–19 to 29% in 2023–24, and cataract surgeries addressed 22% of the estimated needs in 2023–24, from 0% in 2017–18.

Conclusion: The introduction of the First Nations identity as a clinical modifier at Geelong University Hospital decreased wait times and non-attendance rates while increasing the provision of ophthalmic care through outpatient reviews and elective surgeries. Increasing identification rates of First Nations patients in referrals is crucial to enhance the efficacy of this intervention.

Vision impairment and depression

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Purpose: To provide an analysis of data collected via a routinely administered standardized assessment in order to investigate the association between vision impairment and depression in frail elderly people in New Zealand. To identify and quantify differences between four main ethnicities (Māori, Pacific, Asian and European).

Methods: Using InterRAI data from 2016 to 2020 Home Care and Long Term Care Facilities assessments, 13 health outcomes were investigated. Logistic regression with cluster robust standard errors was used to accommodate multiple assessments per person and assess associations between visual impairment and depression, adjusting for age, gender, ethnicity and diabetes. Models were estimated overall and stratified by ethnicity, as well as relative risks estimated from marginal proportions to assist interpretation.

Results: Analyses used 319,886 assessments involving 112,834 people aged 55+ (Māori and Pacific) or 65+ (Asian and European). Marginal proportions of people reporting depression were calculated overall and for the

four largest ethnicities, as shown in the figure. This study did not show any correlations between depression and lower vision.

Conclusion: We explored the relationship between vision impairment and depression among frail older individuals in New Zealand. We found no meaningful relationship between depression and vision. We hypothesise that our large dataset allowed for age and gender adjustment which may have explained previously found associations. Further research is required to further our understanding of factors impacting older people's quality of life.

A solution for correcting refractive error in remote and low resource communities

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Purpose: Uncorrected refractive error is the second largest cause of avoidable vision impairment worldwide, with one billion people affected, mainly in remote and low resource settings. Current methods for refraction cannot meet the need. This study was conducted to determine if community health workers (CWH) could conduct visual acuity testing and refraction accurately, then dispense customised glasses using a kit which includes a simplified refractive wheel, frames and precut lenses.

Method: Five CWH employed by Kokoda Track Foundation in Papua New Guinea participated in a one day training session, then were tested on the accuracy of their refraction. A theory quiz was conducted. A half day clinic was then conducted in a village where no eye health care was accessible. The CHW submitted a follow-up questionnaire.

Results: After initial training, the CHW were objectively tested on refraction skill. A total of 34 tests were conducted. Fifty percent were correct and 100% were with 0.50 dioptres. At the clinic, 60 people aged 22–78 were tested. 30.3% received distance glasses with 88.3% improving to 6/12 or better. 69.7% received reading glasses with 98% achieving N6 or better. CHW felt confident conducting the tests expressed how important this service would be to their communities.

Conclusion: The refraction kit used in this study empowers community health workers to address uncorrected refractive error in communities were eye health services are inadequate. Our goal must be to make eye health care accessible to all, but until then, this method allows people in remote and low resource settings to achieve functional vision, improving their education and life prospects.

Opportunities to improve clinical management of diabetic retinopathy and diabetic macular oedema: Global survey across 24 countries

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Purpose: To use global survey data from the DR Barometer program to understand the challenges associated with the clinical management of diabetic retinopathy (DR) and diabetic macular oedema (DME).

Methods: Surveys were completed anonymously by patients with DR/DME treated with anti-vascular endothelial growth factor, their providers and clinic staff. Data collected included diagnosis, treatment adherence, and the experience, challenges and expectations of treatment.

Results: A total of 8216 surveys were analysed (2535 patients with DR, 3752 patients with DME, 680 providers and 1249 clinic staff). Approximately 30% of patients received no written or digital information on DR/DME, and 25% of providers had no patient materials available. Most providers (84%) said having better patient education material on DR/DME was extremely/very important. Patients reported too many appointments were required for DME (45% of patients) and diabetes (43%), with non-adherent patients reporting this >10% more often than adherent patients. Patients reported high treatment frequency (52% of patients), 2–6-h appointment length (58%) and concern about the burden on family/friends (53%). An information pack for patients' employers would be a very/extremely important resource (57%). Patients reported anxiety associated with procedures (37% of patients) and pain (29%). Only 44% of providers considered themselves expert in optimising anti-vascular endothelial growth factor treatment.

Conclusions: Providing appropriate patient educational materials, and training providers and clinic staff to effectively communicate DR/DME and its consequences may improve patient care. Longer duration therapies could reduce injection burden. Case studies from clinics with higher rates of adherence may be valuable to educate the broader retinal community.

Qualitative feedback of a Māori model of eye care: Ngaa Mata O Te Ariki

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Purpose: Ngaa mata o te Ariki is a proposed novel Māori framework aimed to enhance the experience of Māori within eye care in Aotearoa New Zealand. This project sought to gain feedback from both non-Māori and Māori working within eye health to establish initial thoughts within the eye care community as to whether this framework is fit-for-purpose and how it may be improved.
Method: Focus groups and interviews were conducted from November 2022 to February 2023 with a total of 11 participants (five Māori, six non-Māori) providing qualitative data regarding Ngaa mata o te Ariki. All participants were involved with eye care in Aotearoa New Zealand with participant occupations including optometrists, vision scientists, Māori low vision NGO representatives, Māori general practitioners and ophthalmology registrars. Thematic analysis was used to identify emerging themes within the data.
Results: Data saturation was reached during interviews and four major themes emerged as a result of thematic analysis: (i) the framework is valuable and appreciated by both Māori and non-Māori; (ii) acknowledgement of grief within the process of progressive visual loss fo Māori is valuable; (iii) difficulty implementing the framework in an acute setting; and (iv) cultural safety is crucial.
Conclusions: Overall, the feedback from participants surrounding Ngaa mata o te Ariki was highly supportive and prompts further development and implementation of this framework. Feedback included suggestions to enhance the future development of Ngaa mata o te Ariki, as well as limitations which future research may explore.

Tear film glucose monitoring: A non-invasive tool for measuring diabetic control. Closing the gap

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Background: The rise in prevalence of diabetes has increased demand for lifestyle-friendly and accurate non-invasive glucose monitoring techniques to allow for optimal management of this chronic disease. We currently have a gap in the care of our Indigenous population who would potentially benefit substantially from this technology. There are current barriers to care including a lack of access and understanding of glucometers, stress and emotion, and a lack of a comfortable environment.
Aims: We review the literature for the comparative efficacy and variability of tear fluid analysis compared to gold standard. We also explore the use of near field enabled communication (NFC) contact lenses as a non-invasive method of glucose monitoring.
Methods: PRISMA was used to perform a literature review searching six databases including PubMed, Cochrane, Medline, Scopus, Embase and Google Scholar of tear fluid analysis and use of NFC contact lenses in glucose monitoring.
Results: The literature reports comparable reliable measurements of tear to blood glucose irrespective of populations surveyed or sample timings. The integration of NFC chips, would allow data transmission from the biomedical circuit of the contact lens to mobile device for convenient access.
Conclusion: In Australia this would enable non-invasive remote medicine, where the glycaemic data can be transmitted to treating to the treating teams. Barriers to glycaemic monitoring, including a lack of understanding and discomfort experienced by many diabetic patients, including those reported by our Indigenous population, can in part be addressed.

A passport to better health; eye care in the Western Murrumbidgee Local Health District

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Vision loss in Indigenous Australians is 2.8 times more prevalent than in non-Indigenous Australians. Uncorrected refractive error, cataracts and diabetic retinopathy account for over 85% of cases. This case study examines the collaboration between Foresight Australia and Griffith Aboriginal Medical Service (GAMS), with support from the Australian and New Zealand Eye Foundation, to address the health disparity in the Western Murrumbidgee Local Health District (MLHD) of New South Wales. This collaboration involved the development of training programs to enhance ophthalmic care, by the provision of equipment and training to GAMS Aboriginal Healthcare Workers, Nurses and General Practitioners in the Western MLHD. Parallel to the training, a collaboration between Gordon Eye Surgery, Chatswood Private Hospital and RANZCO Fellows provides regular four-weekly clinics with ophthalmologists, orthoptists and a RANZCO registrar providing clinical and surgical capacity. The clinic provides referral pathways to reduce the need for patient travel for eyecare. The surgical service has also had an impact, reducing the cataract surgery

waiting time from 15 months to 2 months. Collaboration with the Brien Holden Foundation, who provides Optometric services, is ongoing. A screening project to remote areas of the Western MLHD is being developed in collaboration with GAMS to leverage the "Passport to Better Health" screening program, which operates across the district. With the upskilling of GAMS Aboriginal Health Care Workers, Ophthalmic screening is planned to be added to the "Passport." This will improve access to eye disease screening in rural and remote areas.

Economic evaluations of eye care delivery models for Indigenous populations in high-income countries: A scoping review

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Purpose: Services have been designed to address eye health disparities experienced by Indigenous populations, but it is unclear if these have been economically evaluated. This review aimed to summarise the number, type, quality and findings of such evaluations.
Method: MEDLINE, Embase, Web of Science, Cochrane Library Database, the National Health Service Economic Evaluation Database, EconLit, and grey literature were searched per our pre-registered protocol. All evaluations of real or model services designed to meet the eye care needs of Indigenous populations were included. Two reviewers independently screened studies, extracted data, and assessed quality.
Results: Twenty studies evaluated services for Indigenous Australians ($n = 9$), Canadians ($n = 7$), and Americans ($n = 4$). Common services included diabetic retinopathy screening through fundus photography in local health clinics ($n = 7$) or by mobile teams ($n = 6$), and general eye care through teleophthalmology ($n = 2$), outreach ophthalmology ($n = 2$) or an Indigenous health clinic optometrist ($n = 1$). These were economically favourable in 85% of comparisons with conventional services, through reduced costs of travel, in-person consults and vision loss. Only four studies assessed the benefits of increased patient uptake and only five included patient-reported evaluations. Methodological issues included no stated perspective ($n = 10$), no sensitivity analysis ($n = 12$), no discounting ($n = 9$), inappropriate measurement of costs ($n = 13$) or outcomes ($n = 5$), and unjustified assumptions ($n = 15$).
Conclusion: Several Indigenous eye care services have well-established cost-effectiveness, particularly remote diabetic retinopathy screening. Numerous other services are promising but require evaluation, with attention to avoid common methodological pitfalls. Well-designed evaluations can guide allocation of scarce resources to services with demonstrated effectiveness and sustainability.

Sustainable and inclusive eye health delivery model for Aotearoa

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Purpose: With population growth and aging, the demand for eye care is increasing faster than the rate at which eye care workforce are being trained. The prevalence of chronic eye disorders, and the associated rise in economic and healthcare costs, all present a challenge to New Zealand's public healthcare system. This study aimed to review the eye care delivery model for New Zealand and compare this with other Organisation for Economic Co-operation and Development countries.
Methods: We reviewed the eye care delivery model for New Zealand using the package of eye care interventions developed by the World Health Organization. Data from New Zealand private optometry services were obtained from Specsavers, who is one of the major optometry service provider in the country, and publicly available databases. Data for Australia were extracted from Medicare. Data from the United Kingdom were extracted from public databases (National Ophthalmology Database Audit, National Cataract Audit, National Health Service diabetic eye screening program).
Results and Conclusion: New Zealand does not have a current national health strategic plan for public eye care is one of the only few developed countries that does not have any form of financial support structure designed to support under-resourced older adults in accessing primary eye health services. We present areas where we lack compared to other countries, and offer suggestions on how we can enhance national eye care delivery for all New Zealanders.

Endophthalmitis in Dunedin, New Zealand over 15 year period—Otago Regional Endophthalmitis Outcome Study

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Purpose: To describe the types, microbiology and visual outcomes of endophthalmitis in the Otago region of New Zealand over a 15-year period.
Method: A retrospective cohort study on endophthalmitis managed at Dunedin Hospital between January 2007 and December 2021. Outcome measures were clinical presentation, management, causative organisms and visual outcomes.
Results: Forty-five cases of endophthalmitis were identified (38 exogenous, five endogenous, two sterile). The median follow up was 24 months. The median presenting logMAR best corrected visual acuity (BCVA) was 2.3 (counting fingers). The BCVA at nine months was 0.7 and final BCVA was 0.6. Twenty eyes (44%) had severe vision loss (<6/60), eight eyes had retinal detachment (17.8%), and two eyes (4.4%) were eviscerated. Sixteen cases (35.6%) occurred following an ocular surgery. The incidence of post-cataract surgery endophthalmitis was less than 0.08%. Fifteen eyes (33.3%) were associated with intravitreal injections. Fourteen eyes (31.1%) had positive culture result with 85.7% being gram positive, 7.1% gram-negative, 7.1% fungal. Ten eyes (22.2%) had vitrectomy. Comparing vitrectomy with "tap and inject" group, there were no statistical differences in BCVA at presentation (logMAR 2.02 ± 0.84 vs. 1.56 ± 0.91, $p = 0.17$), or at nine months (logMAR 0.72 ± 0.74 vs. 1.15 ± 1.01, $p = 0.23$), or final BCVA (logMAR 1.01 ± 0.95 vs.1.15 ± 1.12, $p = 0.71$).
Conclusion: Endophthalmitis is a rare event in Dunedin Hospital, Otago, New Zealand and is comparable to Australia. Ocular surgery and intravitreal injections comprise most causes. There were no statistically significant differences in BCVA between the vitrectomy and medical treatment from presentation to the final follow ups.

Digital health data—A panacea or overpromised and underdelivered?

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Purpose: The transition from analog data to digital health data has been the biggest transition in Medicine in a generation. The change was meant to bring increased efficiency, insights and better care. Instead we see increasing costs, increasing clinician frustration and very little to show. In this talk we look at the United Kingdom, Australia and New Zealand health data platforms and review what has worked and what hasn't.
Method: This is a review of published studies that have analysed the success and failures of the three different health systems. Major lessons are summarised and recurring themes are presented.
Results: Twelve billion dollars spent in the National Health Servuce on a scrapped program, five billion spent in Australia on the meandering My Health Record, 400 million in New Zealand for a similar platform. All failing due to a top down, centre out approach that forces the clinician to do data input into poorly designed software. No standardisation meaning databases are filled with rubbish. But there is hope—90% of Australians and 58% of New Zealanders have a confirmed digital health identity, SNOMED has standardised terms, FHIR HL7 allows increasing interoperability.
Conclusions: The transition to a digital health data has largely over-promised and underdelivered, but if we learn from our previous failures digital health data can still be the solution to better more efficient health care.

Incidence and risk of depressive disorder in patients with retinitis pigmentosa

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Purpose: To investigate the association between depressive disorder and retinitis pigmentosa (RP).
Methods: A total of 10,879 individuals who were newly diagnosed with RP between 2011 and 2021 in Korea were categorised into three groups based on age at diagnosis: <20, 20–39 and ≥40 years. The incidence of depressive disorder in RP was determined after excluding those diagnosed with depressive disorder prior to RP diagnosis. Furthermore, we calculated the standardised incidence ratios (SIR) of depressive disorder in RP patients compared with the general population. Additionally, subgroup analyses stratified by sex and age group were conducted.
Results: The 10-year cumulative incidence of depressive disorder was 17.67% (95% confidence interval [CI]

16.57–18.84) in RP patients. Subgroup analysis showed significantly higher incidence of depressive disorder in female (20.55%; 95% CI 18.88–22.35) and those ≥40 years (20.69%; 95% CI 19.26–22.22). The overall SIR in RP was 1.39 (95% CI 1.31–1.48), indicating a significantly higher risk of depressive disorder compared to that in the general population ($p < 0.001$). Compared to male RP patients, female patients showed an increased incidence rate and SIR of depressive disorder (25.57; 95% CI 23.58–27.67 per 1000 person-years and 1.56; 95% CI 1.44–1.68, respectively). Subgroup analysis by age group revealed that SIR peaked in patients in their 20s (1.50; 95% CI 1.17–1.90) and 50s (2.25; 95% CI 1.98–2.56).
Conclusions: Individuals diagnosed with RP have a higher risk of depressive disorder. Providing emotional and social support to RP patients is warranted.

The impact of COVID-19 on ophthalmic care: A retrospective audit from Geelong University Hospital

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Purpose: The COVID-19 pandemic disrupted ophthalmic care, reducing both outpatient and elective surgical services. Numerous studies evaluate the immediate impact, but limited research explores the long-term effects. This study examines the pandemic's lasting impact on ophthalmic care in Geelong from the perspective of Barwon's ophthalmology department.
Methods: This retrospective audit evaluates ophthalmology outpatient and elective surgical services at Barwon between 1 July 2018 and 30 June 2024, using 2018–19 as the pre-pandemic baseline. Key outcomes include the number of outpatient reviews, elective surgeries, median waiting times, surgery categories and mode of outpatient consultation. Barwon's data was sourced from the hospital's de-identified audit system and was compared to Victorian and Australian performance from publicly available data.
Results: Outpatient and elective ophthalmic services decreased between 2020 and 2023, with the greatest decline in 2021–22. Outpatient appointments at Barwon decreased by 6%, while Victoria and Australia experienced reductions of 22% and 16%, respectively. Barwon's telephone appointments increased to 18% of reviews in 2023–24, from 7% in 2019–20. Elective surgeries decreased by 8% at Barwon, 33% in Victoria, and 18% in Australia. Barwon's category 3 procedures decreased while category 1 and 2 increased from 2018–19 to 2021–22. The median wait time for elective surgery at Barwon reached 41 days, Victorian 69 days and Australia 118 days.
Conclusion: The COVID-19 pandemic had a profound impact on ophthalmic services across Australia. While the Barwon ophthalmology department remained relatively stable, there was an increase in the urgency of elective surgeries and the use of telephone appointments.

Eye see you (not!): Exploring missed appointments in a pandemic

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Purpose: COVID-19 pandemic represented a significant disruption to all facets of life. Although ophthalmic visits were considered essential, the period was marked by missed appointments. Given the outstanding caution of the general population, understanding the principal population that missed visits during the period provides a baseline for current activity.
Method: Retrospective audit of a single ophthalmologist (Sydney, New South Wales). All non-attending visits 2020 to 2022 were recorded. A subset of patient files were reviewed to understand further demographic details.
Results: A total of 416 patients recorded missed visits during the study period (subset $n = 80$). Mean age was 73.7 ± 14.9 years (range 25.5–99.2) with 61.7% female. Of the subset, 25% of patients did not rebook or were lost to follow up. Fifty percent recorded >1 cancellation (range 1-9, mean 2.0). Mean time to attended follow-up was 9.2 days (range 1–749). COVID concerns were stated directly by 14.2%, with 13% unwell. Of note, 63.6% gave no reason or were non-specific. Glaucoma and retinal disease were the most significant ocular conditions (37.2% and 35.9% respectively). 11.3% of patients were transferred to care options closer to home.
Conclusion: Although missed appointments were expected during the pandemic, we continue to see a shift in healthcare since. The majority of patients were elderly with a minority transferred to closer care highlighting an increased desire to reduce travel. Half of patients had >1 missed visit despite clinic follow up indicating poor communication. Understanding patient characteristics through the Pandemic helps place current audits serving to address ongoing missed attendance.

Barriers to accessible imaging in ophthalmology: A qualitative pilot study of ophthalmology care provider perspectives

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Purpose: Clinical ophthalmology depends on imaging to support accurate diagnoses. However, traditional tabletop imaging machines can fail to accommodate patients with spinal mobility impairments, tremors, those using large mobility aids or patients restricted to a supine position. Despite this, the uptake of accessible ophthalmic imaging devices appears low. This study aims to identify the perceived barriers to the uptake of accessible ophthalmic imaging devices, with the goal of improving patient care.
Methods: A questionnaire was distributed to a convenience sample of ophthalmology care providers across metropolitan Queensland and New South Wales. Assessed outcomes included perceived barriers to implementing accessible imaging equipment, personal experiences with these devices, and features improving accessibility. Answers were provided using 5-point Likert scales, numerical responses, and free-form answers.
Results: The questionnaire returned 51 responses. Patients using wheelchairs (39.5%) or having intellectual disability or dementia (36.8%) were deemed the most difficult to provide adequate imaging for. Most participants (64.1%) had confidence that accessible devices returned reliable images. However, 48.8% identified cost as a barrier, and 39.2% believed accessible devices were still difficult for patients with disability to use. Respondents reported that better design of tabletop-mounted systems, adaptability, training, and funding would improve uptake and use of accessible devices.
Conclusion: Accessibility for wheelchair users and patients with intellectual disabilities, dementia, and neurodiversity needs further development. Intuitive design and government funding may be key in improving the quality of care. Further studies should focus on patient perspectives and required specific design features.

Retrospective case-series of *Paecilomyces lilacinus* ocular mycoses in Queensland, Australia, 2000–2023

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Purpose: (i) To update a previous case-series of Paecilomyces lilacinus infections with a further 15 cases since 2015; (ii) to present the varied clinical manifestations of Paecilomyces lilacinus ocular mycoses; (iii) to identify risk factors and exposure events associated with disease onset; (iv) to discuss treatment regimens/surgery utilised; (v) to determine if outcomes have improved with time given the advent of newer technologies and treatments.
Methods: A retrospective case series of 36 culture-proven individuals participated, who were identified via a review of the pathology reporting system utilised in the Queensland public health system. All culture proven individuals were subjected to a systematic chart review.
Results: Thirty-six culture-proven cases of Paecilomyces lilacinus ocular mycoses were identified in Queensland from 1998-2023. To date, this is the largest such case-series pertaining to this pathogen. Immunosuppression via either systemic or topical route was the primary risk-factor identified, as in 75% of cases. 78.78% of cases had an intact epithelial surface prior to onset. 58.3% of cases had no previous ocular history. 33.33% of cases occurred following initiation of topical steroids for other ophthalmic conditions. A striking range of treatments were used, with wide variability seen across eye drop regimens. Visual outcomes remained generally poor, with 44.44% of cases resulting in a final best corrected visual acuity of HM or worse.
Conclusion: Paecilomyces lilacinus is a rare but devastating cause of ophthalmic disease, mostly affecting the immunocompromised. Prognosis remains poor, owing to delayed recognition and lack of consistent and effective treatment guidelines.

Ocular trauma under the tropical sun: A decade of surgical interventions and outcomes in Far North Queensland

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Purpose: To report the epidemiology, aetiology, and outcomes of eye trauma requiring surgery in Far North Queensland from November 2012 to December 2022.
Methods: A 10-year retrospective study was performed on all patients with ocular trauma requiring surgical intervention at Cairns Hospital. Cases were identified from surgical records. The medical records were

examined to identify patient demographics, Indigenous status, mechanism of injury and visual outcomes.
Results: One hundred and two eyes requiring surgery were identified. 35.3% of injuries occurred on Friday and Saturday. There were 57 open globe injuries (OGI). The average age was 36.84 years with 84.6% being male. Notably, 19.6% identified as Indigenous double the background population (9.6%). 24.5% of all patients reported to be intoxicated at the time of injury where 50% of indigenous patients reported to be intoxicated. Mean visual acuity (VA) of all ocular injury at time of presentation was LogMAR 1.323, with mean VA of OGI was LogMAR 1.815. Postoperatively, VA improved to LogMAR 0.630 ($p<0.001$) and LogMAR 0.940 for OGI ($p<0.001$).
Conclusion: The study highlights the significant burden of ocular trauma in Far North Queensland, with a high proportion of OGI and involvement of intoxicants, particularly among the Indigenous population. Despite the initial severity of injuries, surgical intervention led to notable improvements in visual acuity, underscoring the effectiveness of medical care provided. These insights underscore the need for targeted prevention strategies and continuous improvement in trauma care to enhance patient outcomes in this region.

Diabetic retinopathy screening rates and adherence to recommended guidelines in the Kimberley region

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Purpose: This study retrospectively audited diabetic Aboriginal patients receiving eye care from Lions Outback Vision (LOV) before, during and after the introduction of the LOV Kimberley Hub in 2021. We calculated the percentage of the target population receiving screening for diabetic retinopathy and compared it to national averages for Aboriginal and non Aboriginal patients. We also aimed to identify possible ways to improve screening rates in the area looking at similar regions in Australia.
Method : We collected data from the electronic medical records of LOV which exclusively serves our target population. By estimating the percentage of diabetics in the region, we calculated the percentage engaging in screening each year as well every two years to allow comparison with non aboriginal screening rates.
Results: A total of 2,339 patients were seen over the five-year period accounting for approximately 65% of the target population. The annual percentage attending one of the services however was much lower ranging from 19.66% to 33.76%. The regular screening of these patients is not adherent to current guidelines.
Conclusion: The annual rate has improved but is still well below that of non Aboriginal patients. The LOV Kimberley Hub has helped with screening and the largest increase in screenings has occurred with retinal cameras used in health centres and primary care facilities. To continue to improve this rate, we must focus on screening those patients who have never been screened, as well as ensuring those who attend screening continue to follow up regularly. Increasing the use of retinal cameras available would facilitate this.

Accessing ophthalmology services in rural Australia: A retrospective cross-sectional study on immunosuppressed uveitis patients

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Purpose: Australia has among the lowest per capita numbers of ophthalmologists, with only about four full-time-equivalent ophthalmologists per 100,000 population, a figure that significantly decreases in more remote regions. The maldistribution is stark, with 84% based in metropolitan areas, leaving 16% to serve rural and remote communities despite accounting for approximately 30% of Australia's population. Rural and remote areas experience higher rates of eye diseases such as cataracts, pterygia and ocular trauma, exacerbated by inadequate access to eye care services. This disparity forces patients to travel substantial distances for ophthalmic care, presenting a significant barrier to timely treatment. Addressing this maldistribution is a priority identified by the Department of Health.
Method: Study participants include patients on immunosuppressive therapy for uveitis from rural and remote areas who visited North West Eyes, an ophthalmology clinic located in Tamworth, New South Wales, over the past 12 months ($n = 12$). Patient addresses were recorded, and the shortest road distance to the ophthalmologist and the nearest tertiary eye centre (Sydney Eye Hospital) was calculated using Google Maps. Statistical analysis was performed using SPSS.
Results: The mean distance travelled to the nearest ophthalmologist is 113 km, significantly lower than the mean distance to the nearest tertiary eye centre is 489 km.

Conclusion: Geographic distance is a major barrier to accessing eye care for rural and remote Australians, particularly for immunosuppressed uveitis patients requiring sub-specialist care. Improving access in underserved areas could include increasing ophthalmology trainees in rural regions, enhancing tele-ophthalmology services and adopting a shared interprofessional model.

Genetics

Re-classification of variants of uncertain significance in CRB1 using CRISPRa on patient derived fibroblast

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Purpose: It is imperative to determine the pathogenicity of genetic variants causing inherited retinal diseases given the increasing number of novel therapies. Where this involves reclassification of variants of uncertain significance, functional evidence from patient derived cells is often required. Here we report the development of a system for determining the effects of inherited retinal diseases-causing variants through CRISPRa of patient fibroblasts.
Methods: Dermal fibroblasts were cultured from 3 retinitis pigmentosa 12 (RP12) patients carrying compound heterozygous mutations in the CRB1 gene. CRB1 expression was activated in patient and control fibroblasts using the Edit-R CRISPRa system. For comparison with gene activated fibroblasts, RP12 patient fibroblasts were reprogrammed into induced pluripotent stem cells and differentiated into retinal organoids. mRNA expression and transcript structure were analysed by qPCR, gel electrophoresis and Sanger sequencing.
Results: CRISPRa of human fibroblasts induced a 1000-fold increase in CRB1 expression that was previously undetectable. Three CRB1 retinal isoforms were detected in both retinal organoids and CRISPRa fibroblasts. Within both of these models, transcripts containing the sequence variants, c.2555T>C, c.2843G>A, c.2850_2855del or c.3014A>T, were expressed, while the CRB1 variant, c.4005+1G>A, caused skipping of exon 11.
Conclusions: CRISPRa of patient fibroblasts facilitates rapid screening of novel variants in CRB1 and potential reclassification of variants of uncertain significance in this gene, which is not normally expressed in fibroblasts

Taking another look: Targeting ORF15 of RPGR to improve the diagnostic yield in patients with X-linked retinitis pigmentosa

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Purpose: About half of X-linked retinitis pigmentosa (XLRP) can be attributed to variants found in open reading frame 15 (ORF15) of the RPGR gene. This region of the gene is difficult to sequence, especially on standard whole exome sequencing technologies, leading to diagnostic uncertainty for patients with clinical diagnoses of XLRP. Here we describe and quantify the diagnostic yield of Sanger sequencing for ORF15 of RPGR and sequencing of long-range PCR products by next-generation sequencing (NGS) methodology in patients with previously uninformative results on routine clinical whole exome sequencing.
Method: Thirty-one patients with a clinical diagnosis of XLRP with previous uninformative clinical diagnostic testing were included. Fifteen participants had RPGR ORF15 assessed by a locally-developed optimised focussed Sanger sequencing assay. Twenty participants had RPGR ORF15 assessed by NGS of long-range PCR products. Four were investigated with both methods.
Results: Of the 15 participants who were assessed with a focussed ORF15 Sanger sequencing-based assay, four variants in RPGR were identified. Of the 20 participants who were assessed by NGS, the four variants identified by the Sanger assay were confirmed with no additional variants identified.
Conclusion: In the advent of rapid progress towards gene therapeutics for patients with XLRP, providing a timely genetic diagnosis in a NATA-accredited setting is

of significant clinical importance. Specific testing by a focussed RPGR ORF15 Sanger sequencing-based assay has significant diagnostic yield for suspected XLRP patients with previous uninformative exome testing. Alternative long-read NGS approaches are under assessment to further drive efficiency in RPGR molecular assessment.

A review of inherited retinal disease prevalence in a Victorian multidisciplinary ocular genetics clinic

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Purpose: Genetic diagnosis of inherited retinal diseases (IRD) can be challenging, with over 300 causative gene loci and significant disease heterogeneity. The Ocular Genetics Clinic (OGC) has been established to streamline IRD diagnosis in Victoria, Australia. The clinic is a partnership between the Royal Victorian Eye and Ear Hospital and the Royal Melbourne Hospital Genetics Services. It is staffed by a multidisciplinary team including geneticists, ophthalmologists, orthoptists and genetic counsellors. The aim of this study was to determine the prevalence rates of various IRD in the cohort by performing an audit genetic testing practices in the clinic.
Methods: Data was collected retrospectively from medical records over a 3-year period (December 2018 to December 2021). Anonmyised information was inputed into a secure REDCap database, with clinical queries answered by medical practitioners in our research team.
Results: A total of 539 patients were seen for assessment of ocular genetic disease. Two hundred and eleven patients underwent diagnostic genetic testing for an IRD phenotype. One hundred and forty-seven (69.7%) patients received a genetic diagnosis for an IRD. Forty-two (19.9%) patients had no genetic cause identified. The remaining 22 patients required further testing for diagnosis. Rod and rod-cone dystrophies made up the largest proportion of genetically confirmed diagnosis (48.3%) followed by ABCA4-associated macular degeneration (16.3%).
Conclusions: The specialist OGC has offered IRD patients access to a collaborative care model which had not previously been available in our hospital. This audit showed a robust clinic uptake and a diagnostic yield of 69.7% which is comparable to other cohorts reported in the literature.

Diagnostic disparities of inherited retinal degenerations between varying ethnic groups

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Purpose: Most inherited retinal degenerations (IRD) data relates to Caucasian populations which may hinder diagnosis in other ethnic groups. Ethnic disparities in disease characteristics have been reported for ophthalmic and systemic conditions. Herein, we report on patients with confirmed IRD genotypes highlighting phenotypic differences.
Methods: Retrospective review of patients with a known IRD genotype (ABCA4, USH2A, RPGR) including varying ethnic groups. Ethical approval was granted (H20-03258). The study population was contrasted with British Columbia census data. Phenotype including visual function and multimodal imaging were reviewed to determine ethnic disparities and commonalities.
Results: One hundred patients fit the inclusion criteria (ABCA4 $n = 38$, USH2A $n = 35$, RPGR $n = 27$). Caucasians were over-represented, while South and East Asians were proportionally represented, and Indigenous peoples were under-represented. The classic Stargardt phenotype was more common in Caucasians (74%) while East and South Asians manifested a focal macular dystrophy phenotype (54.5%). Hyperautofluorescent rings were more common in South Asians (100%) than East Asians or Caucasians (20%) with USH2A-RP. Intraretinal white dots were present only in Caucasians (50%) and absent in South and East Asian RPGR patients.
Conclusions: Under-representation of some ethnic groups may be due to surmountable barriers. This may include: (i) lack of access to local specialized IRD care; (ii) variable phenotype causing delayed diagnosis; or (iii) other factors (stigma, socioeconomic, clinician awareness). IRD may be misdiagnosed as the reference images used for teaching are based on Caucasian subjects. Autofluorescence imaging is invaluable in supporting IRD diagnoses (e.g., symmetry and retinal pigment epithelium localisation) regardless of ethnicity.

Glaucoma

A web application to quickly estimate ocular perfusion pressure

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Purpose: Increasing evidence points toward low ocular perfusion pressure (OPP) as a risk factor for progression of glaucomatous optic neuropathies. However, it is time consuming to calculate in a busy clinic. Our objective was to design an application enabling clinicians to estimate OPP quickly and easily.
Methods: Using html, php, JavaScript and css, we built a web application that calculates a patient's OPP using their blood pressure (BP) and intraocular pressure (IOP). The application estimates OPP using definitions from the American Association of Ophthalmology. Mean OPP was calculated as ⅔[mean arterial pressure (MAP) − IOP] where MAP = diastolic BP + ⅓[systolic BP − diastolic BP]. Alongside mean OPP, the app also outputs estimates for the patient's diastolic and systolic perfusion pressures, along with information to help understand OPP values.
Results: Using the web application speeds up the calculation of OPP and makes the estimation of OPP more accessible in a busy clinic environment. A demonstration of the web application is available at oppcalculator.com.
Conclusion: OPP takes into account the roles played by both BP and IOP in optic nerve head perfusion and may be a better measure than IOP alone in the assessment of glaucomatous optic neuropathies. However, taking the time to calculate OPP manually is difficult and cumbersome. This application calculates an estimate for OPP in a quick and easy manner, giving clinicians access to additional patient data that may assist in diagnosis and management. Future work will look to validate this tool further.

Does tear fluid from glaucomatous eyes share its metabolomic markers of mitochondrial dysfunction with blood?

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Purpose: Glaucoma is a leading cause of blindness globally, whose pathogenesis is now understood to be associated with dysfunctional mitochondria. While metabolomic studies on human blood have identified several markers associated with mitochondrial dysfunction, we wondered if any of these blood markers of mitochondrial dysfunction are shared in being found in a metabolomic analysis of the tear fluid of glaucomatous eyes. An understanding of tear film metabolomic markers which demarcate mitochondrial dysfunction in glaucomatous patients may afford a lesser-invasive means of identifying patients at risk for glaucoma.
Methods: A review of PubMed, Embase and Scopus up until 13 April 2024 was conducted to identify metabolomic and proteomic markers of mitochondrial dysfunction in the tear fluid of patients with glaucomatous eyes versus unaffected controls. It was then determined which, if any, of these tear biomarkers have also been identified as markers of mitochondrial dysfunction in blood film metabolomic studies.
Results: Metabolomic and proteomic analysis of tear fluid proteins in 63 patients with glaucoma have identified 45 biomarkers whose concentrations distinguish these tears from unaffected patients. Of these biomarkers, several are known markers of mitochondrial dysfunction also found in blood metabolomic analyses and implicated in inflammatory biochemical networks.
Conclusion: There are 45 metabolomic markers of mitochondrial dysfunction in the tears of patients with glaucoma, many of which are shared in being found in the blood metabolome. This data suggests that sampling the tear fluid, rather than blood, can offer a less invasive means of individualising glaucoma management and identifying patients at risk of the disease.

Incidence of dysphotopsia symptoms after superior versus temporal laser peripheral iridotomy in primary-angle closure glaucoma

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Background: Traditionally, practising ophthalmologists were recommended to position laser peripheral iridotomies (LPI) at the 12 o'clock position so that the iridotomy is covered by the upper lid. However, recent studies have suggested that superior iridotomies are associated with a higher risk of dysphotopsia symptoms.
Purpose: To determine if the location of LPIs affects incidence of post-operative dysphotopsia symptoms

Methods: Patients diagnosed with primary angle-closure glaucoma or primary angle closure in both eyes were recruited and received superior LPI in their first eye and temporal LPI in their second eye (July 2022–April 2024). Retrospective data was also collected for patients who received superior LPIs in one eye and temporal LPI in the other eye (July 2021–July 2022).
Results: A total of 115 patients' data was analysed. Superior LPIs required increased total laser energy (888 mJ vs. 482 mJ, $p < 0.05$) and number of shots (104 vs. 65, $p < 0.05$) compared to temporal LPIs. Iridotomy size was larger in superior LPIs (0.7 mm vs. 0.6 mm, p <0.05). Temporal LPIs had higher rates of post-procedure haemorrhages (45.2% vs. 25.6% vs. $p = 0.8$). No statistical difference was identified between rates of dysphotopsia which was reported in one eye with temporal PIs and three eyes with superior LPIs (0.008% vs. 0.03%, $p = 0.7$). Only 1 of 3 patients with dysphotopsias after superior LPI had complete lid coverage.
Conclusion: Temporal placement of LPI was found to be associated with less dysphotopsia and may be considered as an alternative location. However, care should be taken to reduce rates of post-procedure haemorrhages.

One year outcomes of PRESERFLO MicroShunt for primary open angle glaucoma: A systematic review and meta-analysis

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Purpose: A systematic review and meta-analysis on the effect of the PRESERFLO™ MicroShunt (PF-MS) on intraocular pressure (IOP) at 12 months has been conducted.
Method: The PubMed/MEDLINE, Embase, CENTRAL, Google Scholar, Scopus and Web of Science databases were searched. Inclusion criteria required a diagnosis of open-angle glaucoma, PF-MS insertion, and examination of IOP over time. Meta-analyses were conducted on the primary outcome of IOP and the secondary outcome of glaucoma medication regime. Adverse events were also noted.
Results: Fourteen studies were identified for inclusion in the meta-analyses, of which none had a high risk of bias. The meta-analyses found a significant mean reduction in IOP of 9.07 mmHg (95% confidence interval 7.88–10.25; $P < 0.0001$) and a significant mean reduction in mean glaucoma medication requirement of 2.37 medications (95% confidence interval 2.15–2.60); $p < 0.0001$). Hypotony and hyphaema are common early complications.
Conclusions: The PF-MS device significantly reduced both IOP and glaucoma medication requirement at 12 months post insertion in individuals with open-angle glaucoma without a significant adverse event burden. Further research is required to determine the economic and environmental effects of widely implementing the PF-MS device into clinical practice.

The carbon footprint of glaucoma care

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Purpose: As sustainable healthcare is an increasingly important consideration, particularly in the management of common chronic diseases, we sought to estimate the carbon emissions attributable to different aspects of glaucoma care.
Methods: We used data from a major trial of new open angle glaucoma diagnoses to estimate how initial treatment with selective laser trabeculoplasty (laser group) or medication (drops group) altered the use of resources and the total footprint of their glaucoma care.
Results: We found that the greatest source of emissions in glaucoma care was patient travel to attend clinics. Emissions from energy consumption in clinics, including laser, clinic consumables and from production and supply of long term eye drop medications, and from waste disposal, were all modest or negligible. The estimated emissions from the selective laser trabeculoplasty procedure varied a lot depending on how embedded carbon was calculated. Overall, patients in the drops group had more glaucoma and cataract surgery, with increased emissions arising from that.
Conclusions: Minimising the environmental impact of glaucoma care requires minimising travel and unnecessary visits, and a laser-first treatment strategy ought to minimise the amount of surgical intervention.

Inversion as a model of acute haemodynamic and biomechanical stress

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Aim: We sought to estimate the change in translaminar pressure difference (TLPD) and ocular perfusion pressure (OPP) during gravity inversion and the effects on ocular structures and ganglion cell stress.
Methods: We recorded from 15 healthy volunteers, and a small number of patient volunteers with glaucoma. The IOP was collected with rebound tonometry (iCare), arterial blood pressure was measured manually with the arm/cuff raised to the level of the eye. Heidelberg Spectralis OCT2 was used to collect videos, structural scans and angiography (OCTA). In a subset of volunteers we measured photopic negative response (PhNR) amplitudes using a Diagnosys Espion system. All measurements were taken in both a sitting and inverted position (typically-45° below supine).
Results: The IOP increased immediately from 14 to 30 mmHg with inversion, behaving like a physical fluid column of 0.3 m. Ocular perfusion pressure (OPP) increased from 56 to 68 mmHg and a corresponding autoregulation vasoconstriction response was evident on OCTA. There was no change in retinal venous pulsation (RVP) amplitude for the majority of participants, indicating that TLPD did not change. On OCT imaging, the clearest change with inversion was an increase in choroidal thickness. Inversion for 15 min was not associated with a statistically significant change in PhNR signal.
Conclusions: Inversion increased IOP but RVP were unchanged, indicating little change in TLPD. The OPP increased and vasoconstriction was evident. These findings have implications for advice given to patients with glaucoma or intracranial hypertension.

Validation and comparison of online computer-based binocular perimetry against Esterman visual field for driving suitability

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Purpose: To assess the feasibility of an online computer-based binocular driving perimetry assessment (OBDP) based on online circular contrast perimetry, and agreement with binocular static Esterman visual field testing (EVFT).
Methods: A prospective comparative cohort study was conducted on patients with or without open-angle glaucoma, recruited from a single site glaucoma subspecialty practice. Eligible subjects underwent two visual field tests using OBDP and this was compared to the results of a single EVFT.
Results: Eighty patients were enrolled in the study, with a mean age of 69 years (±13.4 SD). Of these, 49% were female, 18 were healthy controls, while 20, 18 and 24 had mild, moderate and severe glaucoma respectively. Pearson and intraclass correlation between the two perimetry methods for percentage of points not seen was 0.85 and 0.86 (95% confidence interval 0.78–0.9) respectively for the overall binocular visual field. When the binocular field was subdivided into eight sectors, intra-class coefficients ranged from 0.76 to 0.93 for each sector. Bland-Altman analysis revealed a difference of 1.24% (95% confidence interval −16.93% to 19.30%) between the two methods for the overall field, ranging from 0.04% to 4.17% for each sector. Using different cut-offs of the EVFT (0–4 points not seen) as the clinical standard, the OBDP had AUCs ranging from 0.75 (standard error 0.25) to 0.84 (standard error 0.17) for predicting EVFT results.
Conclusion: OBDP showed moderate to strong agreement with EVFT. As an online application that easily runs on any computer, it could expand the scope of binocular perimetry screening for licence assessment. Integration into modern clinical licencing procedures could be considered.

Evaluating visual field defects in glaucomatous patients with cardiovascular disease

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Purpose: To investigate the relationship between glaucoma and cardiovascular disease (CVD), by evaluating visual field defects in glaucomatous eyes with and without CVD.
Methods: A retrospective chart review was carried out across five ophthalmology clinics in Sydney, New South Wales. Patients were included if they had ≥5 24-2 Humphrey Visual Field tests. Demographics including a history of CVD, hypertension and diabetes were collected.

Fields were screened for defects and categorised into arcuate, nasal step, paracentral and enlarged blind spot. If more than one defect was present, the field was categorised as a combination of those defects.

Results: A total of 400 eyes were included (CVD = 258 eyes; no CVD = 142 eyes). Of these, 290 eyes had single defects allowing for multinomial logistic regression (CVD = 177 eyes; no CVD = 113 eyes). Eyes with CVD were more likely to have a superior arcuate defect than patients with no CVD (odds ratio [OR] 11.6; 95% confidence interval [CI] 2.5–53.6; $p = 0.002$). They were also more likely to have a superior nasal step defect (OR 36.3; 95% CI 3.3–395; $p = 0.003$). Eyes with CVD and hypertension or diabetes had higher odds of a paracentral defect (OR 4.8; 95% CI 1.8–12.7; $p = 0.001$) or an inferior arcuate defect (OR 4.7; 95% CI 1.9–11.7; $p = 0.001$).

Conclusion: Our findings suggest that CVD is associated with specific visual field phenotypes in glaucoma. Further analysis may allow clinicians to identify patients at risk of glaucoma progression or CVD through visual field testing.

Online circular contrast perimetry: Evaluating consistency of testing on different computer monitors

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Purpose: To evaluate the agreement between perimetric findings of a novel 24-degree, 52-loci online circular contrast perimetry (OCCP) application on three different computer monitors to determine its stability of testing across devices with varying displays.

Method: Sixty-one participants (19 healthy controls, 42 with glaucoma) underwent standard achromatic perimetry (SAP) testing followed by OCCP testing on three uncalibrated computer monitors in a randomised order: a large-screen (24 inch) desktop personal computer (Dell, Texas, USA), a 17 Inch laptop (Dell) and a 14 Inch MacBook Pro (Apple, California, USA).

Results: Agreement of mean deviation, pattern standard deviation and Visual Index values between the 14 Inch MacBook Pro, 24-inch desktop personal computer and 17-inch laptop OCCP use were excellent, with intraclass correlation and Deming's coefficients ranging from 0.96–1.00 and 0.93–1.03 respectively. When OCCP tests were compared to SAP, intraclass correlation coefficients and Deming's coefficients ranged from 0.89–0.95 to 0.72–0.89. Bland Altman analysis revealed low test biases ranging from −0.69 to −0.11, 0.16 to 0.30 and −0.77 to −0.03 for mean deviation, pattern standard deviation and Visual Index values. Deming's Coefficient of contrast sensitivities for each 24-2 testing location revealed stronger relationships between OCCP tests on different computers (0.58–1.50) than between OCCP and SAP tests (0.10–3.24).

Conclusions: OCCP demonstrates strong levels of agreement when tested on computer monitors of varying display, with moderate to strong levels of correlation to SAP perimetric indices. These results support the feasibility of OCCP usage on different personal computers, which may be useful for in-clinic and at-home glaucoma detection and monitoring.

Systemic risk factors for rapid glaucoma progression

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Purpose: To identify whether systemic comorbidities increase the risk of rapid glaucoma progression.

Method: A retrospective cross-sectional study was conducted on patients referred for glaucoma review from optometrist-led Community-Eye-Care (C-EYE-C) centres to a tertiary eye clinic, over a 24-month period. Patients were referred if deemed to have unstable glaucoma, with progressive visual field defects or optic disc thinning over one to two years, deteriorating visual acuity or poorly controlled intraocular pressures. Among those referred, total numbers of tertiary reviews prior to C-EYE-C re-referral were collated. Patients who were never re-referred to C-EYE-C, or required four or more tertiary reviews prior to re-referral, were considered rapid glaucoma progressors. Meanwhile, those requiring only 1-3 tertiary reviews were considered non-rapid progressors. Comorbidities analysed included hypertension, dyslipidaemia, diabetes mellitus, ischaemic heart disease, obstructive sleep apnoea, hypothyroidism, hyperthyroidism, asthma, iron deficiency anaemia (IDA) and depression. Chi-squared tests were used to identify statistically significant variables ($p < 0.05$) between the cohorts.

Results: Overall, 336 patients were analysed, with 169 rapid glaucoma progressors and 167 non-rapid progressors. Hypothyroidism ($p = 0.035$), IDA ($p = 0.046$) and depression ($p = 0.030$) were significantly associated with rapid glaucoma progression, being respectively 2.2,

1.8 and 1.9 times more likely in rapid progressor cohorts, compared to non-rapid progressors.

Conclusion: Hypothyroidism, IDA and depression were strongly correlated with rapid glaucoma progression, supporting a likely link between systemic hypoperfusion states and glaucoma progression. This suggests a role for a systemic approach in holistic glaucoma management, with proactive comorbidity screening and multidisciplinary referral, to optimise treatment of high-risk comorbidities.

Minimally invasive glaucoma surgery: Comparison of Hydrus with iStent inject in primary open angle glaucoma

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Purpose: To evaluate and compare the safety and efficacy of phacoemulsification combined with Hydrus trabecular micro-bypass stent compared with the iStent inject for the reduction of intraocular pressure (IOP) and pressure-lowering medications in patients with primary open angle glaucoma.

Method: The study was a prospective comparative case series on patients with primary open angle glaucoma and cataracts. Baseline patient demographic data, preoperative IOP and number of medications were extracted from the medical records, and patients were followed up for 12 months with IOP and medications recorded. There were 100 eyes in the iStent inject group, and 85 in the Hydrus group, with post-hoc calculations demonstrating these numbers achieved 0.83 power for the primary outcome. The primary outcome was defined as an IOP ≤ 18 mmHg with zero medications at 12-month follow-up.

Results: Hydrus demonstrated a statistically significant advantage over iStent inject in terms of achieving an optimal IOP with zero medications. Sixty-one (72.6%) of Hydrus eyes had achieved primary success at 12 months compared with 40 (51.3%) of iStent Inject eyes ($p = 0.01$). The Hydrus group had a higher rate of complications reported at day 1 follow-up compared with the iStent inject group, with 33 (38.8%) compared with 8 (8%) respectively. These complications included hyphaema, blurred vision or corneal abrasion.

Conclusion: The Hydrus trabecular micro-bypass stent achieved primary success in a greater proportion of eyes compared with the iStent inject. While there was an increased risk of complications with the Hydrus implant, the majority of these were transient and of low severity.

Multicenter canaloplasty data registry—Outcomes of ab-interno canaloplasty across different glaucoma types and severity

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Purpose: Collating results from the iTrack Global Data Registry (iTGDR), this study aims to investigate the efficacy and safety of ab-interno canaloplasty in reducing intraocular pressure (IOP) and number of medications across all grades of glaucoma severity and types of glaucoma.

Methods: Prospective multicenter cloud-based database (iTGDR, part of the International Glaucoma Surgery Registry), real-world study including glaucoma patients undergoing canaloplasty with the iTrack or iTrack Advance canaloplasty device (Nova Eye Inc., Fremont, USA). Mean reduction in IOP and number of medications (meds) were the primary endpoints and eyes were grouped based on baseline glaucoma severity (early, less than −6 dB; moderate, −6 dB to −12 dB; advanced −12 dB to −20 dB; severe, greater than 20 dB) and glaucoma type.

Results: A total of 395 eyes have been enrolled up to January 2024. IOP and meds for open angle glaucoma (OAG) at preop vs. 6M: 17.5 ± 5.5 ($n = 287$) vs. 13.5 ± 3.6 ($n = 155$; −23.1%) and 2.1 ± 1.2 vs. 1.1 ± 1.3 (−46.4%); for secondary OAG: 19.0 ± 5.5 ($n = 24$) vs. 12.4 ± 3.0 ($n = 15$; −34.8%) and 1.8 ± 1.0 vs. 0.7 ± 1.2 (−63.4%); for ocular hypertension: 21.4 ± 8.3 ($n = 29$) vs. 15.9 ± 2.7 ($n = 9$; −25.7%) and 1.3 ± 1.0 vs. 0.8 ± 1.3 (−41.8%); for primary angle closure: 20.9 ± 6.3 ($n = 47$) vs. 13.7 ± 3.5 ($n = 32$; −34.6%) and 2.0 ± 1.5 vs. 0.8 ± 1.3 (-58.4%). IOP for early, moderate, advanced and severe groups at preop was 17.8 ± 5.2 ($n = 184$), 17.6 ± 5.4 ($n = 66$), 16.6 ± 6.2 ($n = 23$), 15.8 ± 5.2 ($n = 24$); at 6M 13.9 ± 3.1 ($n = 110$), 12.8 ± 3.1 ($n = 38$), 11.9 ± 2.7 ($n = 11$), 14.2 ± 7.0 ($n = 15$), respectively.

Conclusion: Canaloplasty via an ab-interno technique was able to effectively reduce IOP and medication use across all types and stages of glaucoma.

Canaloplasty effectiveness correlated with viscoelastic volume delivered

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Purpose: To investigate the effectiveness and correlation of pressurised ophthalmic viscoelastic device (OVD) volume delivered during ab-interno canaloplasty to reduce intraocular pressure (IOP) in glaucomatous eyes.
Methods: Eyes with a glaucoma diagnosis and six months of follow-up data were collated from the prospective multicenter cloud-based database (iTGDR, part of the International Glaucoma Surgery Registry). All patients underwent canaloplasty via an ab-interno technique with the iTrack or iTrack Advance (Nova Eye Inc., Fremont, USA). Outcomes were defined as: complete success: final IOP is ≤18 mmHg and final meds is 0; qualified success: final IOP is ≤18 mmHg and final meds >0; failure: final IOP is >18 mmHg. Only eyes where the catheter had completed at least a 270-degree circumnavigation of Schlemm's canal were included.
Results: A total of 186 eyes have been enrolled. Mean OVD volume delivered was 133.6 ± 28.2 μL (range 56–196 μL, equal to 20–70 microboluses). At 12 months ($n = 92$), the complete success rate was 34.5% for eyes receiving less than 110 μL (39 microboluses) of OVD, 67.4% for eyes receiving 111–165 μL (40-59 microboluses) of OVD and 47.1% for eyes receiving more than 165 μL (60 microboluses) of OVD. Eyes that received less than 137 μl of OVD were on less medications (baseline: 1.79 ± 1.1; 12-month: 0.7 8± 1.1) than those which received more than 137 μL of OVD (baseline: 2.28 ± 1.1; 12-month: 1.25 ± 1.4) at the time of surgery and the difference was statistically significant ($p = 0.004$; $p = 0.013$).
Conclusion: Optimal OVD volume delivered during canaloplasty based on this clinical review is 111–165 μ: (40–59 microboluses). Eyes with more medications tend to receive increased OVD volume delivery at time of surgery.

iTrack Global Data Registry to support the role of canaloplasty for treatment of glaucoma

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Purpose: The iTrack Global Data Registry (iTGDR) aims to collate efficacy and safety data for canaloplasty including: intraocular pressure (IOP) reduction, number of medications, endothelial cell count, adverse events and complications, in addition to canaloplasty-specific treatment parameters.
Methods: Prospective multicenter in America, Australia, and Europe, cloud-based database, real-world study including patients with primary and secondary open angle glaucoma undergoing canaloplasty. The iTGDR is a surgeon-led initiative conducted in collaboration with the International Glaucoma Surgery Registry. It collects longitudinal data of efficacy (IOP, number of medications, retinal nerve fibre layer analysis and Humphrey visual field), and safety (endothelial cell loss, adverse events and complications). The iTGDR started in January 2022 in the USA, Canada, Europe, Asia and Australia. The outcomes will be followed for at least 12 months and a minimum of 300 patients will be enrolled.
Results: A total of 395 eyes have been enrolled up to January 2024. Mean baseline IOP and number of medications were 18.3 ± 6.04 and 2.03 ± 1.19, respectively, and were reduced to 13.9 ± 4.19 and 0.92 ± 1.29, respectively, at 12 months ($n = 141$; p 10% of the anterior chamber) occurred in seven eyes (1.77%). No eye required further glaucoma surgery.
Conclusion: Canaloplasty via an ab-interno technique was able to effectively reduce IOP and medication use up to 24 months post-operatively.

Clinical outcomes and safety profile of standalone canaloplasty vs. canaloplasty combined with cataract surgery using the iTrack microcatheter

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Purpose: To evaluate the clinical outcomes and safety profile of standalone ab-interno canaloplasty performed using the iTrack microcatheter (Nova Eye Medical) compared to ab-interno canaloplasty combined with cataract surgery.

Methods: Data were collected from the prospective multicenter cloud-based database (iTGDR, part of the International Glaucoma Surgery Registry), including eyes with glaucoma diagnosis and 12 months of follow-up. Patients underwent canaloplasty using the ab-interno technique with the iTrack or iTrack Advance (Nova Eye Inc., Fremont, USA), either as a standalone procedure or combined with cataract surgery.

Results: A total of 424 eyes were enrolled in the study. The baseline intraocular pressure (IOP) was 18.11 ± 6.10 mmHg, and the number of medications was 2.04 ± 1.18. At 12 months, these values reduced to 13.8 ± 4.02 mmHg (–23.6%; $p < 0.001$) and 0.82 ± 1.22 medications (–59.8%; $p = 0.001$), respectively ($n = 161$). For the 43 eyes that underwent the standalone procedure, IOP and the number of medications significantly decreased from 20.9 ± 6.4 mmHg and 2.30 ± 0.99 at baseline to 15.2 ± 6.4 mmHg (-27.0%; $p = 0.001$) and 1.32 ± 1.43 medications (–42.7%; $p = 0.007$) at 12 months ($n = 22$). For the 381 eyes that had canaloplasty combined with cataract surgery, IOP and the number of medications significantly decreased from 17.8 ± 6.0 mmHg and 2.01 ± 1.20 at baseline to 13.6 ± 3.5 mmHg (–23.5%; $p < 0.001$) and 0.74 ± 1.17 medications (–63.1%; $p < 0.001$) at 12 months ($n = 139$). No serious adverse events were recorded.

Conclusion: Both standalone canaloplasty and canaloplasty combined with cataract surgery using the iTrack microcatheter significantly reduced intraocular pressure and the number of medications over a 12-month period, with no serious adverse events observed.

Impact of topical therapy on effect of iStent Inject on intraocular pressure: Mediation analysis of clinical trial data

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Purpose: The intraocular pressure (IOP)-lowering effect of iStent Inject insertion in patients with mild-to-moderate glaucoma is unclear in pragmatic trials where the prescription of post-surgical topical IOP-lowering therapy differs between participants. We aimed to decompose the effect of iStent Inject on IOP 24 months post-surgery into that occurring due to treatment escalation (indirect effects) and that occurring by other mechanisms (direct effects).

Methods: Participants with mild-to-moderate glaucoma were 1:1 randomised to receive cataract surgery with iStent Inject or cataract surgery alone at a tertiary eye hospital (2017-2020, NCT03106181). We used causal mediation analysis to estimate the controlled direct effect of the intervention on IOP should no participants receive topical therapy post-surgery.

Results: Twenty-seven of 42 (64.3%) eyes with complete data in the cataract surgery alone group received topical therapy, compared to 18/40 (45.0%) in the cataract surgery and iStent Inject group. IOP at 24 months was lower in the control group (14.8 ± 3.8 mmHg) than the iStent Inject group (15.5 ± 5.9 mmHg), adjusted difference 1.2 mmHg (95% confidence interval 0.2, 2.2). However, the controlled direct effect favoured the iStent Inject group with a –3.1 mmHg difference (95% confidence interval –4.7, –1.5). Investigation of natural direct and indirect effects suggested 96.6% of the average causal effect of iStent Inject on IOP occurred through mechanisms other than topical therapy changes.

Conclusion: There was no clinically significant difference in IOP between groups at 24 months. However, participants with iStent Inject likely would have had lower IOP in the absence of topical therapy post-surgery, providing support for its effectiveness.

One year outcomes of the PAUL® glaucoma implant in an Australian setting

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Purpose: PAUL® glaucoma implant (PGI) is a non-valved glaucoma implant designed to reduce early hypotony. This study aims to evaluate the safety and effectiveness of PGI in a mixed cohort of uncontrolled glaucoma patients.

Method: A retrospective evaluation of 40 consecutive PGI surgery by single surgeon with 12 months of follow-up. All cases had 6-0 intraluminal monofilament stent. Primary outcome as defined World Glaucoma Association guidelines. Secondary outcomes included intraocular pressure (IOP), number of medications and complications.

Results: Average age of patients was 74 (59-92) and visual field MD was −15.7 (−31.06, −1.46). The mean preoperative IOP was 21.7 ± 4.5 mmHg, falling to 12.4 ± 3.7 mmHg at one month, 11.8± 3.7 mmHg at three months, 10.5 ± 2.9 mmHg at six months, 10.6 ± 3.3 mmHg at 12 months. At the end of 12 month follow-up, 21 eyes (52.5%) had a complete success and 36 eyes (90%) had a qualified success (with or without medications). Early day 1 numerical hypotony (<5 mmHg) was recorded in two patients, both of which self-resolved. Four failures were observed at 12 months, one due to profound hypotony developed after intraluminal suture removal at 11 weeks, one required surgery due to tube retraction, one due to tube erosion and one due to plate erosion. The number of medications reduced from 3.2 ±1.0 preoperatively to 1.6 ± 1.5 at 12 months. 23 (57.5%) patients required removal of the intraluminal 6–0 stent.
Conclusion: The one-year results demonstrate PGI has high qualified success rates and effectively reduces IOP and the need for glaucoma medical therapy.

Automated direct selective laser trabeculoplasty in primary angle closure disease

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Purpose: To measure the efficacy and safety of translimbal direct selective laser trabeculoplasty (DSLT) in reducing intraocular pressure (IOP) in subjects with primary angle closure (PAC) and primary angle closure glaucoma (PACG).
Methods: Seventeen patients with a baseline diagnosis of PAC and PACG and who had received prior laser iridotomy were recruited in this prospective single arm pilot trial. Subjects were either treatment naïve or post-washout with an IOP ≥ 22 mmHg but ≤ 35 mmHg. One eye per subject received DSLT by non-contact limbal irradiation with power settings standardized at 2.2 mJ and 120 shots delivered over 360°. Patients were followed up at week 1 and month 2 and month 4. All patients were prescribed nepafenac drops for a week after laser.
Results: The mean ± standard deviation baseline IOP (mmHg) in all eyes was 23.2 ± 1.3. At month 2, it was 17.3 ± 2.8 mm Hg (reduced by 25.1%; $p = 0.001$). At month 4, it was 17.0 ± 2.8 mm Hg (reduced by 26.3%; $p = 0.001$). Four patients required a re-treatment by month 4 and two patients were started on topical beta blocker due to suboptimal IOP. No serious adverse events occurred.
Conclusions: Over a short-term, automated DSLT appears to be an effective and safe noncontact modality for reducing IOP in patients with PAC and PACG.

Comparative outcomes of triple iStent W versus hydrus implant in glaucoma: A prospective cohort study in the real world

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Purpose: To compare the postoperative intraocular pressure (IOP) and the number of medications required in patients undergoing triple iStent versus Hydrus implant procedures over one year.
Method: The study was a prospective, consecutive cohort study that was conducted at a single center by a single surgeon. One hundred and five participants were included in the study, with 49 undergoing triple iStent insertion and 56 undergoing Hydrus implantation. Patients were assessed preoperatively, at day 1, week 1, month 1, month 6, month 9 and month 12. iStents were placed near collected channel sites but at least one clock hour apart, while the Hydrus was placed supranasal for right eyes and infratemporal for left eyes.
Results: The triple iStent group had a mean preoperative IOP of 15.27 mmHg. The IOP changed by −2.63 mmHg over 12 months (95% confidence interval [CI] −3.98 to −1.37). The Hydrus group had a mean preoperative IOP of 14.96 mmHg. The IOP changed by −2.30 mmHg over 12 months (95% CI −3.44 to −1.17, $p < 0.05$). The triple iStent group had a mean number of medications of 2.10. The mean number of medications reduced by 1.33–0.77 (95% CI −1.69 to −0.96). The Hydrus group had a mean number of medications of 2.20. The mean number of medications reduced by 1.36 to 0.84 (95% CI −1.70 to −1.01, $p < 0.05$).
Conclusion: Both treatments resulted in statistically significant mean IOP reductions and mean medication reductions at all postoperative time points compared to preoperative values, with no statistically significant differences in mean IOP reductions and mean medication reductions between the two groups at any timepoint.

Primary PreserFlo™ MicroShunt with intraluminal stent versus trabeculectomy: 12-month follow-up in the real world

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Purpose: To compare patient outcomes and safety profile of PreserFlo™ MicroShunt (PM) (Santen, Osaka, Japan) and trabeculectomy (Trab) as the primary bleb-forming procedure in eyes with glaucoma.
Methods: Retrospective cohort analysis of 91 (46 PM(24-M:22F):45 Trab(23M:22F) consecutive patients by a single surgeon using a standardised technique. Primary outcome measures: intraocular pressure (IOP), number of IOP lowering medications at day 1, week 1, months 3, 6 and 12. Secondary outcome measures: best-corrected-visual-acuity, visual field, mean NFL thickness, intraluminal stent removal, revision rate and adverse events.
Results: The IOP at 12 months in the PM group reduced from 23.0 to 13.0 mmHg and three medications to 0.5 medications and in the Trab group reduced from 24.0 to 11 mmHg and three medications to 0.2 medications. The intraluminal stent was removed in 28 (60.9%) at varying time points post-surgery, with no cases of clinically significant hypotony. In nine (19.6%) PM cases, open revision was required with or without further drainage procedure.
Conclusion: The IOP and medication lowering is less efficacious with the PM compared with the trabeculectomy, however the post-operative recovery is faster due to the less invasive nature of the surgery. Both procedures require mitomycin C application to reduce post-operative fibrosis. Active bleb management with topical steroids and 5-fluorouracil needling as required is critical for success. Open revision is required more often in PM to achieve a well-draining bleb, with the choice of revision technique depending on the appearance of the stent and the state of the surrounding tissues.

Real-world long-term patient outcomes of the hydrus microstent in cataract surgery patients with primary open angle glaucoma

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Purpose: This study aimed to investigate if real-world long-term outcomes of the Hydrus Microstent align with the HORIZON Trial results in cataract surgery patients with primary open-angle glaucoma (POAG).
Methods: Data from the International Glaucoma Surgery Registry (IGSR.org) was used, focusing on patients with mild-to-moderate POAG who received the Hydrus Microstent in combination with cataract surgery. This ambispective study collected both retrospective and prospective data. The primary outcome was the mean change in topical hypotensive medication use at 24 months from baseline. Secondary outcomes included the percentage of subjects not using hypotensive medication and changes in intraocular pressure (IOP). Exploratory outcomes assessed visual field mean deviation, further IOP-lowering procedures and post-operative ocular adverse events.
Results: The study included 270 eyes from 270 patients, mean age 74.0 ± 7.7 years, with 51.9% female and 48.1% male. Significant reductions in mean medication use were observed, with an 84.9% reduction at day 1, 49.2% at 12 months, and 51.2% at 24 months.
Conclusion: The Hydrus Microstent effectively reduces medication burden and IOP in real-world settings, comparable to the HORIZON Trial. This multi-centre study supports its use in cataract surgery for POAG patients, enhancing clinical decision-making and patient outcomes.

Trabeculectomy outcomes over two years: A retrospective longitudinal analysis

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Purpose: To analyse outcomes of primary trabeculectomies and phaco-trabeculectomies performed in a tertiary public hospital.
Methods: Retrospective review of consecutive procedures performed in a single centre over a two-year period (2019–2021) with 24-months post-intervention follow-up. Success was defined according to World Glaucoma Association guidelines. Patients with failure but incomplete follow up were included in success analysis at 24-months.
Results: A total of 282 cases were analysed with 177/231 (74%) trabeculectomy and 32/51 (63%) of phaco-trabeculectomy completing 24-months follow-up. Complete success was achieved in 101 (57%), partial success in 26 (15%) and failure in 50 (28%) patients undergoing trabeculectomy. Complete success was achieved in 19 (59%), partial success in 5 (15%) and failure in 8 (25%) patients undergoing phaco-trabeculectomy. Mean intraocular pressure at 24-months was higher in

trabeculectomy compared to phaco-trabeculectomy (11.3 ± 4.0 vs. 13.1 ± 3.8 mmHg), but average reduction in intraocular pressure did not significantly differ between procedures (51% vs. 45%, $p > 0.05$). Higher failure rates were observed in trabeculectomies performed by fellows (34%) than consultants (17%, $p < 0.05$). Trabeculectomies in patients with secondary glaucoma ($n = 82$, 35%), had a higher failure rate compared to primary glaucoma's (52% vs. 28%, $p < 0.05$). Return to theatre occurred in 48/231 (20%) trabeculectomies and 8/51 (16%) phaco-trabeculectomies. Bleb leaks occurred in 22 cases (8%), blebitis in three cases and endophthalmitis in two cases.

Conclusion: Trabeculectomy surgery performed at a tertiary referral teaching centre with a complex case-mix demonstrates outcomes comparable to published literature at 24-months.

Transcriptomic analysis of TGFβ1-mediated fibrosis in primary human Tenon's fibroblasts

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Purpose: To further understand the molecular mechanisms and causal pathways of ocular fibrosis following glaucoma filtration surgery (GFS) by identifying genes involved in myofibroblast differentiation in human Tenon's fibroblasts (HTF).

Methods: HTFs were isolated and propagated from explanted subconjunctival Tenon's capsules collected during GFS performed in three patients. HTFs were assigned to either the control or the TGFβ1 treatment group. RNA extraction was performed after five days post-treatment, and RNA sequencing was performed at a depth of 38–50 million reads per sample using Novaseq. Bioinformatic analysis was performed using DESeq2 to analyse differential gene expression in the two sample groups. We carried out detailed gene ontology, gene set enrichment analysis and KEGG pathway analysis.

Results: Following quality control, 3362 differentially expressed genes were identified, of which 1532 were upregulated and 1820 were downregulated following TGFβ1 treatment. We detected significant enrichment in genes associated with the gene ontology terms TGF-beta-signalling, Wnt signalling pathway, extracellular matrix organisation and regulation of cell cycle process. There was significant upregulation of 14 genes associated with myofibroblast activation including ACTA2, CTGF, TGFB1, EDN1, FN1, ITGA11, NOX4, NREP, SERPINE1, SERPINE2, DACT1, SCUBE3, TNC and TXNDC5. There were six significantly downregulated genes related to myofibroblast regulation/inhibition FGF16, LGALS3, PPARG, LTBP4, SOD3 and TNXB.

Conclusions: This work provides an important reference with unprecedented insights into the transcriptional landscape of HTFs myofibroblast differentiation. This is fundamental to advance our understanding of ocular fibrosis and identify novel therapeutic targets to limit formation of scar tissue following GFS.

Drop resistance and intolerance in glaucoma patients: A quantitative study

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Purpose: Eye drop non-compliance is a recognised risk factor of glaucoma-related vision loss. This study seeks to quantify factors driving non-compliance with topical therapy among preoperative glaucoma patients.

Method: Retrospective observational study of 448 adult patients planned for glaucoma surgery, recruited by 30 ophthalmologists across Australia and New Zealand. Patients self-completed the 12-item Drop Resistance and Intolerance of Patients Study questionnaire, categorised into compliance, adverse effects and accessibility. Associations were tabulated between each category and patient demographics, number of drops, time on drops, better eye best corrected visual acuity and visual field mean deviation (MD). Associations between each category were assessed.

Results: Stronger compliance was significantly associated with less adverse effects ($\beta = 0.21$, $p < 0.01$) and greater accessibility ($\beta = 0.15$, $p < 0.01$). Patients prescribed a greater number of drops were associated with significantly poorer compliance ($\beta = -0.56$, $p < 0.01$) and worse adverse effects ($\beta = -0.91$, $p = 0.02$). Greater accessibility was significantly associated with older age ($\beta = 0.30$, $p < 0.01$), and had near significant association with better visual field MD scores ($\beta = 0.42$, $p = 0.08$). Age ($\beta = -0.09$, $p = 0.10$), length of time on drops ($\beta = 0.05$, $p = 0.50$) and visual field MD scores ($\beta = 0.21$, $p = 0.18$) were not significantly associated with compliance.

Conclusion: Number of drops prescribed plays a significant role in glaucoma patients' experiences of adverse

effects and compliance with their treatment. While age and degree of visual field loss may impact patient accessibility, compliance may not be implicated. Quantitative evaluation of disease progression in single versus multi-drop regimens is warranted. Qualitative research may help deepen understanding of socio-economic factors driving barriers to accessibility.

Medical Retina

Switching treatment-resistant neovascular age-related macular degeneration patients to faricimab: Marginal gains in a treatment burdened population

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Purpose: To assess the frequency of intravitreal injections and other visual outcomes following switch to faricimab from alternative anti-vascular endothelial growth factor agents.
Method: Sixty-seven eyes of 60 patients previously treated for 3.9 years on average were switched to faricimab due to worsening neovascular age-related macular degeneration and/or to reduce injection frequency. Inclusion criteria were: (i) patients diagnosed with neovascular age-related macular degeneration previously treated with anti-vascular endothelial growth factor therapy; (ii) had at least four injections within 180 days before being (iii) switched to intravitreal faricimab; and (iv) had at least five intravitreal faricimab injections. Primary outcome was injection frequency recorded for the 12 months before and after this switch. Secondary outcomes were visual acuity and central macular thickness measured on optical coherence tomography.
Results: Patients' average injection interval lengthened from 7.05 to 7.39 weeks ($p < 0.02$). Wilcoxon matched-pairs signed rank test indicated a small but significant difference. Thirty-seven percent of patients gained at least one week between injections. Forty-six percent of patients remained at similar intervals and 16% had injection intervals decrease by at least one week. Final injection interval lengthened by 1.1 weeks compared to pre-switch. This effect had a negligible effect on drug costs to the Pharmaceutical Benefits Schemewhile patients required 5% fewer visits per year. Anatomical improvements (central macular thickness 331 um pre-switch and 301 um at end of follow-up, $p < 0.01$) did not translate to vision improvements (best corrected visual acuity 64.1 to 61.7 letters, $p < 0.02$).
Conclusion: There is a small significant difference in injection interval following a switch to faricimab. Interval-lengthening effect of faricimab may be less significant in patients with severe disease.

Blinding beauty: A case report on iatrogenic ophthalmic artery occlusion and comprehensive review of vision loss following cosmetic injectables

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Purpose: Facial cosmetic injectables have been gaining significant popularity worldwide. The lack of regulations and guidelines combined with increasing demand and access to these procedures, complications while rare are becoming increasingly prevalent. It is likely ophthalmologists can expect to see an increase in patients with ocular complications as a result. The most devastating and irreversible ocular complication is vision loss as a result of ophthalmic or retinal artery occlusion. Case presentation and comprehensive review of the current literature on vision loss following cosmetic injections will be presented. Good understanding of the causative agents, safe injection technique, facial and orbital anatomy, pathophysiology of complications as well as early recognition and management in the acute setting is imperative in reducing risk and improving visual outcomes.
Methods: Local case presentation and scoping review of the literature on vision loss following cosmetic injectables.
Results: Patient case presentation with a left ophthalmic artery occlusion following cosmetic injection of poly-D, L-lactic acid filler. Literature review discussing proposed mechanisms of vision loss related vaso-occlusive events following cosmetic injection, diagnosis and acute management options and risk reduction strategies.
Conclusion: Given the aesthetic rather than therapeutic purposes of these procedures, risks should be more carefully weighed and potential risks and complications carefully explained to patients. A comprehensive

understanding of cosmetic injectables, their vaso-occlusive complications, prompt recognition and management of these events as well as continued research into potential treatment options and risk reduction strategies are crucial improving visual outcomes.

Clinical outcomes of faricimab in treatment naïve and treatment-resistant neovascular age-related macular degeneration and diabetic macular oedema at a Queensland Public Hospital

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Purpose: To assess the short-term clinical efficacy and treatment burden of patients with treatment-resistant neovascular age-related macular degeneration (nAMD) and diabetic macular oedema (DMO) who were switched to or initiated on Faricimab intravitreal injections (IVI) at a Queensland public hospital.
Methods: Single centre, cohort study conducted at Caloundra Hospital. Retrospective analysis of clinical and imaging data of treatment naïve and treatment-resistant nAMD and DMO patients who received Faricimab between October 2023 and June 2024. Patients underwent Zeiss optical coherence imaging, slit lamp and dilated fundus examination. Clinical demographics including age, gender, diagnosis, best-corrected visual acuity, central macular thickness (CMT), presence of subretinal or intraretinal fluid, total number and type of previous IVIs in the last 12 months, total number of Faricimab IVIs and current treatment interval were collected. Treatment-naïve and treatment-resistant switch subgroups were statistically analysed separately assessing change in CMT, presence of retinal fluid, best-corrected visual acuity and treatment interval.
Results: Preliminary data analysis demonstrated significant improvements in CMT and reduction in retinal fluid in both treatment naïve and treatment-resistant switch groups. Final data analysis due for completion in July 2024.
Conclusion: Faricimab use in Australian public hospitals holds significant promise given its safety profile, clinical efficacy in improving functional and anatomical outcomes seen in nAMD and DMO, as well as its promising results with extended dosing intervals. It has the potential to reduce the overall treatment burden on individual patients and the public health service by achieving comparable or superior therapeutic outcomes with potentially fewer injections and clinic visits.

The PLATYPUS Study: A phase 1 first-in-human study of VP-001, a peptide-oligonucleotide conjugate designed to treat RP11

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Purpose: A phase 1 single ascending dose first-in-human study was conducted to evaluate the safety and tolerability of VP-001, an antisense oligonucleotide designed to reduce CNOT3 expression thus allowing upregulation of PRPF31.
Methods: Twelve participants with PRPF31-associated rod-cone dystrophy (RP11) were recruited in four cohorts. One eye of each participant received an intravitreal injection of VP-001 (3, 10, 30, and 75 μg) and followed for 48 weeks for adverse events. Dose escalation was determined by a safety review committee. Visual acuity, slit lamp examination, microperimetry, fundus autofluorescence imaging, optical coherence tomography, full-field sensitivity threshold and clinical chemistry parameters were collected.
Results: No significant drug-related adverse events or intraocular inflammation were observed during the 12-week follow-up period for the 30 μg cohort, and for at least 24 weeks in the 3 and 10 μg cohorts. Results for the fourth cohort receiving a 75 μg dose will be presented. One subject who received a 30 μg dose demonstrated >7 dB retinal sensitivity improvement in 6 of the 10-2 microperimetry grid loci in the treated eye compared to only one locus in the untreated fellow eye at eight weeks post-dosing, and the effect in the treated eye persisted for 15 weeks. OCT showed no significant change in central subfield thickness.
Conclusions: A single intravitreal injection of VP-001 was safe and well tolerated at 3, 10 and 30 μg doses. One case demonstrated significant retinal sensitivity improvement. Longer-term data from all four cohorts will be presented.

Utilisation of genetic testing of inherited retinal diseases in an Australian public tertiary hospital setting

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Purpose: We aimed to investigate the rate, outcomes and factors influencing genetic testing uptake for inherited retinal diseases (IRD) in an Australian public tertiary hospital setting.
Methods: We retrospectively reviewed the electronic records of adult patients presenting to two tertiary public hospitals between 2018 and 2024. We included patients with a clinical or genetic diagnosis of IRD and excluded suspected or uncertain diagnoses. We collected demographic, clinical and genetic testing findings, and analysed associations between age, gender, family history and socioeconomic status by postcode with odds of undergoing genetic testing.
Results: Of 114 included patients, 15.8% underwent genetic testing. There was a family history of genetic eye disease in 18.4%, with 47.6% of these aware of exact familial diagnosis. A documented family history of IRD significantly increased the odds of undergoing genetic testing (odds ratio [OR] 9.87, $p < 0.0001$). There was no association between gender (OR 0.72, $p = 0.57$), age (OR 1.00, $p = 0.97$), best-corrected visual acuity (OR 0.77, $p = 0.62$), age at diagnosis (OR 1.01, $p = 0.65$), or socioeconomic status (OR 0.88, $p = 0.43$). Retinitis pigmentosa (45.6%) was most common, followed by Best's vitelliform macular dystrophy (14.0%) and cone dystrophy (8.77%). The diagnostic yield of genetic testing was high (83.3%), with one case of inconclusive findings and one still awaiting results. The most reported disease-causing genes were PRPF31, RPE65 and GUCY2D. Of the eyes referred for testing, 72.2% had a clinical diagnosis of retinitis pigmentosa.
Conclusions: Improving testing availability and genetics unit capacity are required to improve the continued low rate of genetic testing uptake.

Retreatment interval lengthening in intensive anti-vascular endothelial growth factor therapy for macular neovascularisation after switching to faricimab at 12 months

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Purpose: Examine the retreatment intervals in patients with treatment-intensive macular neovascularisation (nMNV) who were switched to faricimab after 12 months.
Methods: This is a retrospective chart review of all patients with treatment intensive nMNV who had 12 months follow-up after switching to faricimab. Patients with diabetes, glaucoma or those who had received fewer than 16 injections of ranibizumab, aflibercept and/or brolucizumab before switching were excluded. Activity was defined as the presence of subretinal or intraretinal fluid using the Spectralis OCT30 X 25∘ 63-raster line protocol. Outcomes measurements included nMNV activity and retreatment interval.
Results: Thirty eyes of 26 patients were included. All eyes had active MNV and were receiving four to 6-weekly injections before switching. The median age was 85 years (interquartile range 75–97), and 66.7% were women. The median number of injections before switching was 27.5 (interquartile range 20.75–61.5). At 12 months, 66.6% (20/30) of eyes were inactive with a medium increased retreatment interval of was three weeks (range 1–4). In the 4-, 5- and 6-week baseline injection subgroups, 61.9% (13/21), 80% (4/5) and 75% (3/4) of eyes were able to achieve inactivity with an increased treatment interval.
Conclusion: This study demonstrates continued benefit beyond 6 months in those with longstanding four to six weekly treatment regimes prior to switching.

Don't blink or you'll miss it: Exploring barriers and solutions to diabetic retinopathy screening in Australian primary care

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Purpose: To evaluate current perspectives of Australian general practitioners (GP) on barriers and solutions to diabetic retinopathy (DR) screening in primary care.
Methods: Prospective, survey-based study of GPs across Australia with a focus on Western Sydney.
Results: Two hundred and eleven responses were received, with 204 included for analysis. Most respondents were from New South Wales (78.9%), with 34.1% working in Western Sydney. Most GPs believed that DR screening in primary care was important (93.1%). Referral to optometrists (87.1%) was the most frequently reported screening method. Only two GPs reported performing retinal photography themselves, with 80.9% of GPs unaware of current Medicare Benefits Schedule items for retinal imaging. The most frequently reported barrier to

screening was lack access to screening equipment (71.1%). There was a significant association between GPs who perceived time constraints as a barrier and referring to outpatient ophthalmology clinics for screening ($\chi 2 = 6.031$, $p = 0.014$). Exploratory factor analysis revealed a significant association between the barriers of low confidence in DR detection and lack of access to screening equipment ($p < 0.001$, Cronbach's alpha 0.544), and patient-related factors and lack of communication from eye services ($p < 0.001$, Cronbach's alpha 0.408). Increased education was the most preferred solution (73.0%). The greatest proportion of respondents received correspondence annually from eye services (53.9%), however 7.3% never received correspondence. Several GPs also highlighted their preference to outsource screening to optometrists due to significant workload pressures and inadequate financial incentives.

Conclusions: Most GPs are not currently aware of Medicare Benefits Schedule items for retinal imaging and do not undertake DR screening themselves, preferring to refer to optometrists and ophthalmology clinics. Multiple barriers prevent GPs from undertaking DR screening. However, GPs believe DR screening in primary care is important and see education as a key solution.

Intraocular pressure outcomes with intravitreal aflibercept 8 mg and 2 mg in patients with neovascular age-related macular degeneration through Week 96 of the PULSAR trial

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Purpose: To evaluate the effects of aflibercept 8 mg every 12 or 16 weeks (8q12/8q16), and aflibercept 2 mg every eight weeks (2q8) on intraocular pressure (IOP) in patients with neovascular age-related macular degeneration.

Methods: After three monthly doses, patients were randomized to receive intravitreal aflibercept 8q12 ($n = 335$), 8q16 ($n = 338$) or 2q8 ($n = 336$). According to prespecified dose modification criteria, treatment intervals could be shortened for patients receiving 8 mg aflibercept in year 1 and shortened or extended in year 2. IOP was measured pre-injection (bilaterally) and post injection (study eye) and managed if signs or symptoms indicated a higher IOP increase within approximately 30 minutes post injection.

Results: Through week 96, treatment-emergent adverse events of increased IOP were reported in 3.6% (8q12), 3.3% (8q16) and 3.0% (2q8) of patients. IOP was 14.9, 14.9, and 14.8 mmHg at baseline and 14.7, 15.0 and 14.5 mmHg at week 96 in the 8q12, 8q16 and 2q8 groups. The proportion of patients with any pre-dose IOP ≥ 25 mmHg through week 96 was 2.7% (8q12), 2.1% (8q16) and 1.8% (2q8). Mean $\pm$ SD change in IOP from pre- to post-dose was 3.4 $\pm$ 3.8, 3.5 $\pm$ 3.7, and 2.6 $\pm$ 3.6 mmHg (8q12, 8q16 and 2q8 respectively). The proportion of patients with any pre- or post-dose IOP ≥ 35 mmHg through Week 96 were 0.9%, 0.3% and 0.6% (8q12, 8q16 and 2q8 respectively).

Conclusions: The rate of IOP treatment-emergent adverse events were comparable across treatment groups. No clinically relevant differences in IOP change from pre-dose to post-dose were observed and no clinically significant changes in mean IOP were observed through week 96.

Response of large and serous pigment epithelial detachment to faricimab versus aflibercept in patients with neovascular age-related macular degeneration: A subgroup analysis from TENAYA and LUCERNE

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Purpose: Post-hoc analysis of TENAYA (NCT03823287)/LUCERNE (NCT03823300) to evaluate pigment epithelial detachment (PED) outcomes in patients with neovascular age-related macular degeneration.

Methods: Treatment-naïveneovascular age-related macular degeneration patients were randomized 1:1 to faricimab (FAR) 6.0 mg up to every 16 weeks ($n = 665$) or aflibercept (AFL) 2.0 mg every 8 weeks ($n = 664$) after loading. PED was defined as retinal pigment epithelium elevations that were ≥350 μm wide and graded predominantly/purely serous (serous PEDs) or predominantly/

only fibrovascular (fibrovascular PEDs). Assessments: baseline PED characteristics; proportion of eyes with baseline serous PED that had serous PED at week 12; time to first reduction (TTFR) of maximum PED thickness by 50% from baseline (TTFR 50%) through week 60 in eyes with baseline PED ≥125 μm/baseline serous PED.

Results: Baseline PED characteristics were balanced: presence of PED (FAR: 97.4%; AFL: 96.2%); maximum PED thickness (median (Q1-Q3) μm) (FAR: 185.0 [126.5-316.0]; AFL: 176.5 [125.0–300.5]); serous PED (FAR: 20.1%; AFL: 17.8%); mean serous PED thickness (FAR: 462.8 μm; AFL: 432.1 μm). In eyes with baseline serous PED: serous PED at week 12 was FAR: 3.9% vs. AFL: 12.3% (nominal $p = 0.0258$); 75th percentile of TTFR 50% was FAR: 52 weeks vs. AFL: not reached. In eyes with baseline PED ≥ 125 μm TTFR 50% was FAR: 48 weeks vs. AFL: not reached.

Conclusions: In TENAYA/LUCERNE, FAR elicited greater improvements in PED outcomes vs. AFL. These findings are consistent with the greater drying of retinal fluid observed with FAR.

Role of arctigenin in inhibiting proliferative vitreoretinopathy through inhibiting epithelial-mesenchymal transition of APRE-19 cell

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Purpose: This study aims to evaluate the inhibitory effects of arctigenin on the epithelial-mesenchymal transition (EMT) in retinal pigment epithelial (RPE) cells (ARPE-19) and to investigate the underlying molecular mechanisms relevant to Proliferative Vitreoretinopathy (PVR) treatment.

Method: Cytotoxicity of arctigenin was measured by MTT assay. Cellular morphological changes were detected by phase contrast imaging. Cell migration was detected by scratch and transwell assays and analyzed by ImageJ software. EMT-related markers and transcription factors were detected by qPCR and western blotting.

Result: The IC50 of arctigenin was 640 μM in ARPE-19 cells. Phase contrast imaging showed remarkable changes in cellular morphology after stimulation with arctigenin for 24 h. Cell migration was significantly inhibited in the arctigenin treatment group. The expression of mesenchymal markers, N-cadherin and vimentin, was decreased, and epithelial markers, E-cadherin, were increased in the arctigenin treatment group. TGFβ1-induced phosphorylation of Smad3 and STAT3 was downregulated after arctigenin treatment.

Conclusion: Arctigenin showed significant inhibitory effects on TGFβ1-induced EMT and migration in ARPE-19 cells in in vitro experiments. These findings suggest that arctigenin could be a promising candidate for the treatment of PVR. Further research, including in vivo studies using a PVR mouse model, is essential to validate its therapeutic potential.

Population pharmacokinetic modelling and simulation of ocular clearance for aflibercept 8 mg and 2 mg and association with durability of effect

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Purpose: To evaluate ocular clearance and duration of effect for aflibercept 8 mg and 2 mg using population pharmacokinetic modelling and compare model-estimated durability of effect to that in clinical trials.

Methods: A model was developed to characterise systemic and ocular disposition of 8 mg and 2 mg aflibercept after intravitreal administration. The model was developed based on free and bound plasma aflibercept concentrations in 2744 participants across 16 clinical trials, including CANDELA, PHOTON and PULSAR. The model simulated a combined patient population of diabetic macular oedema ($n = 5{,}000$) and neovascular age-related macular degeneration ($n = 5{,}000$). Target ocular concentrations were those required to bind vascular endothelial growth factor-A by 50%, 90%, and 99%, and model-estimated free aflibercept ocular concentration at the end of an eight-week dosing interval for aflibercept 2 mg.

Results: Unexpectedly, estimated ocular clearance of free aflibercept was 34.4% lower for 8 mg versus 2 mg (0.410 vs. 0.625 mL/day). Further, the corresponding median time that concentrations remained above ocular targets was 6-8.9 weeks longer for aflibercept 8 mg. These results were consistent with observed durability in the PHOTON and PULSAR trials. Model simulations for aflibercept 8 mg also estimated that 49.5% of patients maintain free aflibercept ocular concentrations above those required to bind vascular endothelial growth factor-A by 90% at 20 weeks after dosing.

Conclusions: For aflibercept 8 mg, the model estimated a 34.4% slower ocular clearance of free drug and a 6–8.9-week longer duration of effect. This is consistent with the longer durability of effect observed in clinical trials.

Intraocular pressure outcomes with intravitreal injection of aflibercept in patients with diabetic macular oedema through week 48

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Purpose: To evaluate pre-dose intraocular pressure (IOP) outcomes in study eyes receiving intravitreal aflibercept in the PHOTON trial.
Methods: In the randomised, 96-week, PHOTON trial (NCT04429503), patients with diabetic macular oedema received aflibercept 8mg every 12 or 16 weeks after three monthly doses (8q12 [$n = 328$] or 8q16 [$n = 163$]) or aflibercept 2 mg every eight weeks after five monthly doses (2q8; $n = 167$). IOP was assessed at all study visits. Mean pre-dose IOP and change in pre-dose IOP from baseline were evaluated through week 48. Cumulative incidence of the following outcomes was also evaluated: pre-dose IOP ≥25 mmHg at two consecutive visits and pre-dose IOP ≥ 30 mmHg at any visit.
Results: Baseline mean pre-dose IOP in the 2q8, 8q12 and 8q16 groups, respectively, was 15.9, 15.3 and 14.9 mmHg. Patients received an average of 7.7, 5.7 and 4.9 injections through week 48 in the 2q8, 8q12 and 8q16 groups, respectively. At week 48, mean pre-dose IOP with 2q8, 8q12 and 8q16, respectively, was 15.7, 15.1 and 14.8 mmHg with corresponding mean changes from baseline to week 48 of −0.1, −0.2 and −0.1 mmHg. Through week 48, the cumulative incidence of pre-dose IOP ≥ 25 mmHg at two consecutive visits was 0% across all three treatment groups. Cumulative incidence of pre-dose IOP ≥ 30 mmHg at any visit with 2q8, 8q12 and 8q16, respectively, was 0%, 0.3% and 0%.
Conclusions: In patients with betic macular oedema, pre-dose IOP outcomes in study eyes receiving intravitreal aflibercept 8 mg or 2 mg were comparable, with minimal changes from baseline through week 48 in all groups.

Can you use near infrared imaging to reliably measure macular atrophy in age-related macular degeneration?

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Purpose: Although fundus autofluorescence (FAF) was used to measure area of geographic atrophy in registrational clinical trials, clinicians have often historically collected near infrared (NIR) images as part of standard of care when carrying out OCT imaging. We assessed if NIR is comparable to FAF for measuring macular atrophy (MA) area.
Method: We collected NIR and FAF images of MA from patients seen in routine clinical practice at Fight Retinal Blindness! pilot study sites. Lesion areas were measured independently and in random order by two certified graders in a reading center, by manually outlining the lesion borders using Heidelberg Eye Explorer. Corresponding MA areas on FAF were measured using the semi-automated RegionFinder software. Inter-rater reliability and inter-modality agreement were evaluated. The study received RANZCO ethics approval and all patients provided opt-in consent.
Result: A total of 80 NIR and 52 FAF images from 21 eyes were graded, with MA area ranging from 0.1 mm2 to 24.7 mm^2. The intraclass correlation (A,1) for inter-rater reliability of NIR measurements was excellent at 0.98 (95% confidence interval 0.97, 0.99; $p < 0.001$). Bland-Altman analysis showed a mean difference of −3.2% (lower limit: −29.1% and upper limit: 22.7%) between FAF and NIR measurements ($n = 52$). Lesions with an area larger than 2.5 mm^2 ($n = 34$) showed a mean difference of −1.8% (lower limit: −16.4% and upper limit: 12.8%).
Conclusion: There was good agreement between NIR and FAF measurements of MA when lesions were greater than 2.5 mm^2. However, for lesions under 2.5 mm^2, NIR area measurements were not as strongly correlated with FAF.

Study design and rationale of the POYANG trial: A Phase III randomised controlled trial of faricimab for choroidal neovascularisation secondary to pathological myopia

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Purpose: To describe POYANG study design which will assess the efficacy and safety of faricimab, a dual inhibitor of angiopoietin-2 (Ang-2) and vascular endothelial growth factor A, in patients with choroidal neovascularisation secondary to pathologic myopia (otherwise referred to as myopic choroidal neovascularisation, or mCNV).
Methods: POYANG is a global, randomised, double-masked, multicentre, active comparator-controlled phase III study in adult patients with treatment-naïve mCNV. Patients are randomised 1:1 to receive either faricimab 6.0 mg or ranibizumab 0.5 mg. After an initial active intravitreal treatment administration at randomisation (day 1), subsequent treatment is administered as a pro re-nata dosing regimen. Patients are seen monthly over a 48-week study period, and active study drug is administered when protocol-defined retreatment criteria are met. Criteria are based on changes in best-corrected visual acuity, or central subfield thickness, or examination findings consistent with mCNV activity. A sham procedure is administered to patients at study visits when there is no active mCNV disease activity in order to maintain masking among treatment arms.
Results: The primary endpoint is noninferiority of faricimab versus ranibizumab in change from baseline in best-corrected visual acuity averaged over weeks 4, 8 and 12. Secondary endpoints (weeks 0–48) include change in central subfield thickness over time and number of treatments required. Incidence and severity of ocular and nonocular adverse events will be assessed.
Conclusions: POYANG is an actively recruiting Phase 3 registrational trial to investigate the efficacy and safety of faricimab vs. ranibizumab in patients with mCNV, the most common cause of CNV in young patients.

Reductions in intraretinal fluid levels due to low carbohydrate-healthy fat diets

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Purpose: Low carbohydrate, healthy fat (LCHF) diets have been the topic of numerous successful clinical trials in adjunct type-2 diabetes mellitus therapy. The subsequent impact on type-2 diabetes mellitus associated-retinal disease remains under-researched in both laboratory and clinical studies. We aimed to explore the impact of LCHF diets in patients with diabetic macular oedema.
Methods: We retrospectively analysed optical coherence tomography (OCT) scans of patients undergoing care for diabetic macular oedema at a private metropolitan ophthalmology practice. These patients had been advised to undertake various forms of LCHF diets. Patients receiving intravitreal injections were excluded. Scans from two years prior to commencing LCHF diets to present were analysed.
Results: Fifteen patients were identified, of which 11 were male (73.33%) with a median age of 69.5 years old (range 46–89). All patients were found to have decreased intraretinal fluid levels. Two eyes found to have stable disease with no improvement/worsening of IRF levels. There was evidence of significant sensitivity to IRF levels to dietary compliance with rebound IRF seen over periods of patient reported poor compliance. Two patients had evidence of complete drying of the macula in at least one eye.
Conclusion: Our results highlight the need for further research into the area, both in murine/biological studies and in the clinical environment. Quantitative analysis of retinal biomarkers and novel IRF volumetric studies will aid in exploring the impacts of LCHF diets on the retinal microenvironment. Adjunct therapies to help reduce intravitreal injection and appointment frequency are vital to improving ophthalmic system efficiency.

Long-term efficacy and safety of pegcetacoplan over 36 months including 12-month results of the GALE open-label extension study

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Purpose: To report 36-month efficacy and safety of pegcetacoplan in patients with geographic atrophy (GA) secondary to age-related macular degeneration.
Method: Following the phase 3 OAKS/DERBY trials, patients could enroll in the GALE three-year open-label extension. Pegcetacoplan-treated patients in OAKS/DERBY continued the same regimen, monthly (PM) or every other month (PEOM). Patients receiving sham crossed over to pegcetacoplan at the same dosing interval: sham monthly to PM or sham every other month to PEOM. Both subfoveal and nonsubfoveal GA were included. Safety and efficacy data over 36 months are reported.
Results: Overall, 83% ($n = 782$) of patients who completed OAKS/DERBY entered GALE and 92% completed the first 12 months. Between months 24 and 36, pegcetacoplan reduced GA growth vs. projected sham in nonsubfoveal GA by 42% with PM (p 250,000 injections through March 2024) in the real-world setting; this appears to be a first injection phenomenon (rate of ~1/4000).
Conclusion: Long-term efficacy and safety of pegcetacoplan were demonstrated in patients with GA. GALE is the largest long-term extension in GA. These 36-month results highlight the benefit of C3/C3b complement inhibition with pegcetacoplan.

Scleral implantation of dexamethasone implant: Surgical technique and outcomes

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Purpose: Ozurdex® is used for the treatment of macular oedema or non-infectious posterior uveitis. It is intended to free float in the vitreous however there are reported complications of this technique. The aim of this study is to describe a new modified implantation technique for scleral fixation of the implant and report the outcomes of 41 procedures.
Methods: A single-centre retrospective study of 20 eyes that had received scleral fixation of Ozurdex by a single surgeon (SB).
Results: Inner scleral wall implantation of Ozurdex was performed on 41 occasions, most frequently for diabetic macular oedema. The number of implantations per eye ranged from 1 to 6 (mean 2.15). Visual acuity and central macular thickness improved after implantation ($p < 0.05$). There were no reported intraocular complications or implant protrusion through the sclera.
Conclusion: This study shows proof of concept of self-fixation technique for Ozurdex implant. It appears to be safe and is effective in reducing macular oedema. Scleral implantation is likely useful for patients with risk of implant anterior migration of the implant and may reduce the risk of intraocular complications.

Functional vision and vision-related quality of life of patients with peri-foveal geographic atrophy

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Purpose: Patients with perifoveal geographic atrophy (PFGA) typically have a small foveal/para-foveal area of intact retina with good acuity but complain of difficulty with tasks such as reading. The aim of this study was to compare the functional vision and vision-related quality of life (VQoL) of patients with and without PFGA.
Methods: Prospective case control of patients with PFGA and age-matched controls. PFGA diagnosis was made by clinical exam, spectral domain optical coherence tomography and fundus autofluorescence. Fixation was measured using Macular Integrity Assessment (MAIA) microperimetry. Eye movements and gaze tracking were recorded using the Tobii Pro Fusion infra-red eye tracker while reading text. VQoL was assessed with the Impact of Vision Impairment questionnaire.
Results: Eight participants with PFGA and nine without (CG) with mean age of 80.6 and 74.6 respectively. Near acuity (PFGA = n14, CG = n5) and BCVA (PFGA = 6/12+, CG = 6/6) was worse in the PFGA group ($p < 0.05$). Fixation was worse ($p < 0.05$) for the PFGA group as measured by the MAIA (P1, P2, BCEA 63%, 95%). Fixation duration and frequency and number of saccades while reading was also worse for the PFGA group ($p < 0.05$) and they had a lower Impact of Vision Impairment score (PFGA = 51.63, CG = 73.33 ($p = 0.02$)). Significant correlations ($p < 0.05$) were found between fixation measured by the MAIA and the gaze and fixation data recorded by the eye tracker.
Conclusion: Despite presenting with good acuity, patients with PFGA perform significantly worse on a range of functional vision parameters. Further research on these outcomes in PFGA is warranted.

Characterising cone photoreceptor degeneration in a rat model of retinitis pigmentosa

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Purpose: To characterise cone degeneration and glial changes in a transgenic rodent model (S334ter-3) of retinitis pigmentosa (RP).
Method: S334ter-3 rats were euthanised at seven different timepoints. Eyes were embedded in paraffin for transverse sectioning of the retina, or, were dissected as retinal wholemounts. Tissue sections and retinal wholemounts were processed for single- or double-labelling immunohistochemistry for cone photoreceptor markers and for markers of microglial and macroglial activity.
Results: Cone segment degeneration commenced as early as 2 weeks post-natal. Labelling of cones with the pan-cone segment marker peanut agglutinin showed a progressive decline from 2 until 18 weeks. Loss of cone segments was characterised by irregular rings lacking segments that progressively enlarged over time. Similar findings were obtained using antibodies to S-opsin and M/L-opsin. In cone rings lacking segments, cone arrestin was still expressed, indicating ongoing survival of cone cell bodies within these rings. Microglial number and activity within the outer nuclear layer were very high during the period of rod degeneration, but remained elevated, albeit at a lower level during cone segment remodelling and degeneration. There was evidence of Müller cell gliosis at all-time points.
Conclusions: The findings from this study indicate that cone segment degeneration begins early post-natal with notable glial changes. These insights provide a better understanding of RP in S334ter-3 rats, aiding future therapeutic development, experimental planning and scientific interpretation in this model. This will enable better translation of research and treatment development for human patients with RP.

Aflibercept for diabetic macular oedema: Outcomes using a treat and extend protocol (ADMOS)

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Purpose: To investigate a treat and extend (T&E) protocol using aflibercept (Eylea) for diabetic macular oedema.
Methods: In this prospective, interventional, single-arm, open-label study, 24 treatment-naïve patients were enrolled. They received a T&E regimen of intravitreal injection (IVI) of aflibercept with a loading dose of three IVIs over three consecutive months followed by a per-protocol extension of two weeks to a maximum interval of 14 weeks. Primary endpoint was mean change from baseline in best corrected visual acuity (BCVA) at 24 months. Secondary endpoints included mean change in BCVA at 12 months, mean change in CST reduction at 12 and 24 months, gain of more than 10 letters on the Early Treatment of Diabetic Retinopathy Study and weeks between injections.
Results: Seventeen patients (71%) completed a two-year T&E regimen. At 12 months, mean improvement in BCVA and CST was 8.9 $\pm$ 6.4 letters ($p = 0.0003$) and 154 μm $\pm$ 114 μm ($p = 0.0004$). At two years, the mean improvement in BCVA and CST was 11.2 $\pm$ 6.3 letters ($p = 0.0001$) and 161μm $\pm$ 129 μm ($p = 0.0003$). Ten patients (59%) had an improvement of > 10 letters after two years. The mean number of IVIs administered was 13 $\pm$ 4.7. 15 patients (88%) and one patient (6%) had treatment extended up to 12 weeks and 14 weeks respectively.
Conclusions: This study suggests our novel T&E regimen results in significant improvements in BCVA and CST, and a T&E regimen with extension up to 12 weeks is a potential strategy for diabetic macular oedema treatment over two years.

An approach for reliably measuring area of macular atrophy and distance of the nearest lesion from the foveal centre in age-related macular degeneration

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Purpose: Both the area of macular atrophy (MA) and distance of the nearest lesion from the foveal centre point (FCP) have been included in a recent update to the Fight Retinal Blindness! (FRB!) Registry AMD module. We wished to assess whether these parameters could be reliably measured and provide guidance so clinicians can incorporate this approach into routine clinical practice.

Method: Participants with MA from a single site in the FRB! Registry provided opt-in consent for this study with RANZCO ethics approval. Two reading centre certified graders assessed images acquired from routine clinical practice from Heidelberg Spectralis devices. MA lesion area (within 6 mm Early Treatment Diabetic Retinopathy Study circle) measurement was semi-automated using Region Finder software on fundus autofluorescence images. The distance from the edge of the nearest MA lesion to the FCP for non-subfoveal lesions was manually measured using in-built calipers. We used a standardised protocol that employs a combination of OCT and near infra-red imaging to help co-localise the FCP and MA lesions.

Results: At total of 52 FAF and 57 OCT images from 21 eyes were graded. The intergrader correlation coefficient (ICC) for total MA lesion size was 0.97 (95% 0.95, 0.98; $p < 0.001$), and the nearest MA lesion to the foveal centre was 0.98 (95% confidence interval 0.97, 0.99; $p < 0.001$).

Conclusion: There was good intergrader reliability for both total MA lesion area and distance of nearest lesion to the foveal centre. The validated methods used here could be helpful for clinicians monitoring MA progression in routine clinical practice.

Investigating the role of optical coherence tomography angiography as an ocular imaging biomarker for peripheral arterial disease

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Purpose: Peripheral arterial disease (PAD) is a vascular condition that is associated with reduced blood flow to the limbs. Currently there is no ideal biomarker to screen for PAD, to risk stratify patients with PAD, or to monitor therapeutic response to revascularisation procedures. PAD has shown to reduce the blood flow in the ophthalmic artery and the central retinal artery and evaluation of the retinal microvasculature using optical coherence tomography angiography (OCTA) can provide valuable information about the early microvascular damage in PAD.

Methods: This pilot study involved 20 patients with PAD and 20 controls. All participants underwent a standard eye examination. A cirrus Zeiss OCTA device was used to determine the perfusion and vessel density of the parafoveal capillary network.

Results: The mean age of the participants was 65.2 years (SD = 5.11). The mean vessel density in 3 × 3 mm OCTA was significantly reduced in the PAD group compared to the control group ($p = 0.013$). Also, the mean perfusion density in 3 × 3 OCTA was significantly reduced in the PAD group compared to the control group ($p = 0.013$). Similarly, the mean vessel density and mean perfusion density in 6 × 6 mm OCTAs were significantly reduced in the PAD group compared to the control group ($p = 0.040$ and $p = 0.036$). However, there was no significant difference in the foveal avascular zone parameters between the PAD and the control group.

Conclusion: OCTA could aid as a quick, non-invasive and inexpensive imaging biomarker in PAD detection and monitoring.

Real-world 12-month faricimab outcomes after anti-vascular endothelial growth factor partial response for neovascular age-related macular degeneration and diabetic macular oedema

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Purpose: Landmark studies reported on faricimab efficacy and safety in treatment naïve patients. Long-term outcomes following switch from other anti-VEGF therapies are lacking. We evaluated outcomes in patients switched to faricimab after 12 months who previously had a partial response to other anti-vascular endothelial growth factor injections for neovascular age-related macular degeneration and diabetic macular oedema (DMO).

Method: Retrospective study at the Oxford Eye Hospital. Patients switched to faricimab from January to April 2023 were identified.

Results: A total of 116 patients (151 eyes) were switched to faricimab of whom 89 patients (120 eyes) had 12 month follow up. In the neovascular age-related macular degeneration group (68 patients, 84 eyes), mean visual acuity (VA) remained stable. Central subfield thickness reduced from 296 ± 77.1 mm at baseline to 269 ± 52.8 mm at six months, and 271 ± 53.2 mm at 12 months ($p = 0.008$, one way analysis of variance [ANOVA]). Treatment was extended in 49 eyes (58%), from a mean interval of 5.3 ± 1.7 weeks at baseline to 6.8 ± 2.3 at six months and 7.4 ± 3.4 at 12 months ($p < 0.0001$, one way ANOVA). In the

DMO group (22 patients, 39 eyes), mean VA remained stable. Central subfield thickness reduced from 351 ± 84.7 mm at baseline to 312.9 ± 75.8 mm at six months and 307.8 ± 84 mm at 12 months ($p = 0.052$, one way ANOVA). Mean treatment interval was extended in 24 eyes (63%), from 5.2 ± 1.8 weeks at baseline to 6.7 ± 2.6 weeks at 6 months and 7.7 ± 3 at 12 months ($p = 0.0002$, one way ANOVA). One eye developed anterior uveitis that resolved with topical dexamethasone treatment.

Conclusion: Switching to faricimab in treatment resistant eyes maintained VA at 12 months and allowed extension of treatment interval in over half our cases.

Indocyanine green angiography-guided focal laser photocoagulation of telangiectatic capillaries in retinal vascular diseases

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Purpose: Telangiectatic capillaries ("TelCaps") are recently-defined large microvascular abnormalities seen in a variety of retinal vascular diseases, and are proposed to cause macular oedema that is poorly responsive to intravitreal anti-vascular endothelial growth factor (anti-VEGF). A hallmark of such lesions is their superior visualisation by indocyanine green angiography (ICGA), compared to fluorescein angiography. The purpose of this case series is to describe three cases of persistent macular oedema secondary to TelCaps, each due to different underlying retinal pathologies, which responded to ICGA-guided focal laser photocoagulation.

Method: In this retrospective case series, three patients with persistent macular oedema and associated TelCaps were identified. The underlying pathologies in the three cases were diabetic macular oedema, branch retinal vein occlusion and radiation retinopathy respectively. Functional and morphological outcomes after ICGA-guided focal laser photocoagulation of the aforementioned TelCaps were evaluated.

Results: At a mean follow-up period of 27 months post-focal laser photocoagulation, there was no recurrence of the TelCaps lesions and all three patients showed substantial reductions in central macular thickness and improvements in best-corrected visual acuity. Subsequent adjunctive anti-VEGF injections were required in one case only.

Conclusion: TelCaps are large microvascular abnormalities that may underlie longstanding macular oedema poorly responsive to intravitreal anti-VEGF injections. Their detection may be facilitated by ICGA. ICGA-guided focal laser photocoagulation of such lesions can result in resolution of macular oedema and associated improvements in functional outcomes.

The effect on treatment interval from switching from aflibercept to faricimab for treatment of exudative macula neovascularisation

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Purpose: The Newcastle Eye Hospital switching audit: To audit the change in dose interval time, clinical responses, treatment efficacy and burden in patients switched from aflibercept to faricimab.

Method: A random audit of a cohort of patients from a multi-surgeon group medical retina practice who were switched at the start of 2023.

Results: Switching: Of 440 eligible patients who were switched from aflibercept to faricimab ($f = 329$, $m = 189$; 570 eyes), 35 (7.95%) did not experience a longer treatment interval and were switched back to aflibercept (44 eyes), five of whom (14.29%) were subsequently switched again to faricimab (six eyes).

Dose interval: Of 60 patients audited switched from aflibercept to faricimab, five (8.33%) were treated at reduced average dose intervals, three (5%) maintained the same average dose interval (±3 days), and 51 (85%) extended dose interval by >3 days. Average dose interval extension overall was 16.98 days, with those able to extend dose interval averaging an extra 23.07 days between treatments.

Conclusion: Switching from aflibercept to faricimab for the treatment of exudative macula neovascularisation allows an increased treatment interval of two and one half weeks, fewer injections and reduced treatment burden for patients.

Switching from aflibercept to faricimab for the treatment of centre-involving diabetic macula oedema

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Purpose: The Newcastle Eye Hospital switching audit: To audit the change in dose interval time, clinical

responses, treatment efficacy and burden in patients switched from aflibercept to faricimab.

Method: A random audit of a cohort of patients from a multi-surgeon group medical retina practice who were switched at the start of 2023.

Results: Switching: Of 110 eligible patients who were switched from aflibercept to faricimab ($m = 129$, $f = 76$; 180 eyes), 20 (18.18%) were switched back to aflibercept (33 eyes), 1 of whom was subsequently switched again to faricimab (1 eye).

Dose interval: Of 13 patients switched from aflibercept to faricimab, the average time interval extension was 20.71 days. Those that were able to be extended had a dose interval extension averaging 28.11 days between treatments. 23.07% were treated at reduced average dose intervals, 7.69% maintained the same average dose interval (±3 days), and 69.23% extended dose interval by >3 days.

Conclusion: Early switching results for faricimab for extension of dose interval in patients with diabetic macular oedema are encouraging but individual responses to treatment vary. Continuing audit would be beneficial in assessing long-term efficacy and potential for dose extension.

Doyne honeycomb retinal dystrophy (Malattia Leventinese) in four families: Clinical insights from novel histopathological findings

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Purpose: Examine penetrance, expressivity, and progression of Doyne Honeycomb Retinal Dystrophy (DHRD) and determine underlying histological and immunohistochemical features

Method: Retrospective review of a cohort of four families (24 patients, 48 eyes, up to 39 years of follow up) examined after proband diagnosis of DHRD. Histopathological analysis (two eyes from one proband donor): one formalin fixed, paraffin embedded for H&E, special stains and EFEMP1 immunohistochemistry; one glutaraldehyde fixed, epoxy resin embedded for electron microscopy.

Results: All proband cases (age: 58 ± 7.3) had extensive radial and peripapillary drusen; however, VA was relatively preserved (range: 6/5–6/18). Eighteen patients (34 eyes) were diagnosed with DHRD. Unaffected individuals were below age 16. Radial and peripapillary drusen were detected as early as age 18 and 17. Intra- and inter-family fundus findings were variable. Foveal sparing was evident up to age 71. Geographic atrophy (8 eyes, VA range: 6/9-HM) and choroidal neovascularisation (five eyes, VA range: 6/6-HM) was rare. Histological examination revealed a diffuse, thick sub-RPE deposit, located between the RPE plasma membrane and its basement membrane which persisted in areas of atrophy and choroidal neovascularisation. Furthermore, the deposit is pan-retinal, calcifications are common, light and electron microscopic appearances are distinctive, there is diffuse EFEMP1 immunostaining, drusen consist of the deposit itself and photoreceptors overlying the deposit remain relatively intact.

Conclusion: Variability exists in the penetrance and expressivity of radial and peripapillary drusen in DHRD. A thick, pan-retinal, sub-RPE deposit is the defining histological lesion of DHRD. Its impact on RPE and photoreceptor morphology appears modest and may explain relative preservation of vision.

Real-world observational study of faricimab for neovascular age-related macular degeneration

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Purpose: This study aimed to evaluate the efficacy of intravitreal faricimab in treatment-naïve neovascular age-related macular degeneration (AMD), comparing anatomical and functional results at four visits: baseline, second visit, after loading doses, and last visit.

Methods: We conducted a retrospective, real-world observational study at Sydney West Retina from January 2023 to June 2024. Data included demographics, choroidal neovascularisation type and location, intra-retinal fluid, sub-retinal fluid, pigment epithelial detachment, subretinal hyperreflective material, LogMAR best corrected visual acuity and central subfield thickness (Cirrus OCT). Treatment-naïve AMD patients receiving at least three injections were included. Descriptive statistics were

used, Friedman test compared non-normally distributed data ($p < 0.05$).

Results: Of 126 treatment-naïve AMD patients, 14 were excluded. This left 121 eyes of 111 patients (10 bilateral); average age was 76.1 years (SD ± 9.4); 59.5% were female. At baseline, 55.4% had Type-1 choroidal neovascularisation; 25% had Type-2, 3.1% had retinal angiomatous proliferation, and 10.9% had PCV. Mean BCVA increased from 51.4 ± 20.1 to 60.3 ± 18.7 logMAR letters, mean gain 8.7 letters ($p < 0.001$); median gain 8 letters ($p < 0.001$). Baseline central subfield thickness decreased from 373.9 ± 177.2 μm to 245.3 ± 88.7 μm ($p < 0.001$), mean decrease 128.7 μm. The mean number of injections was 6.2, with average follow-up of 32.2 weeks and a mean treatment extension of 10.8 weeks.

Conclusions: These real-world data demonstrate rapid visual gains from faricimab in treatment-naïve neovascular AMD. Extension to 12 weeks or longer was seen in 50.4% of the cohort. Sub-retinal fluid and intra-retinal fluid presence and pigment epithelial detachment height decreased significantly. Sub-retinal fluid recurred in six patients after loading doses and 10 at the last visit. Extended follow-up is needed to understand the benefits and challenges of faricimab therapy in neovascular AMD.

Real-world observational study of faricimab for diabetic macular oedema

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Purpose: This study aimed to evaluate the efficacy of intravitreal faricimab in treatment-naïve patients diagnosed with diabetic macular oedema (DMO) in a real-world study.

Methods: We conducted a retrospective, real-world study at Sydney West Retina from January 2023 to March 2024. Data were collected from medical records. Inclusion criteria were cases with no prior intravitreal injection (IVI) treatment, and at least four injections. Exclusion criteria included proliferative diabetic retinopathy-related complications, conditions other than DMO causing decreased visual acuity, conditions interfering with central subfield thickness evaluation, and major losses to follow-up. SPSS V23.0 was used for statistical analysis.

Results: A total of 181 eyes of 127 patients were included. The average age at diagnosis was 62.5 years; 63% were male. Mean baseline BCVA was 64.1 ± 13.6 logMAR letters, increasing to 68.4±13.8 at second visit and to 69.9 ±13.0 after loading doses ($p < 0.001$). In 137 eyes with extended follow-up (mean duration 40.7 ± 10.4 weeks), baseline best corrected visual acuity was 63. 2 ± 14.9 letters, increasing to 69.8 ± 13.4 at the last visit ($p < 0.001$), with a mean gain of 6.6 letters. Baseline central subfield thickness was 382.7 ± 125.0 μm, decreasing to 291.4 ± 58.3 μm at second visit, 275.1 ± 48.1 μm after loading doses, and 268.4 ± 49.2 μm at the last visit ($p < 0.001$). Treatment extension averaged 10.8 weeks, with 50% extending beyond 12 weeks and 14% extending to 16+ weeks.

Conclusions: Real-world data show rapid visual gains with faricimab in treatment-naïve DMO patients. Extension to 12 weeks or longer was seen in 50% of the cohort. Further investigation with extended follow-up is needed to fully understand faricimab's efficacy in DMO.

Switching to faricimab in neovascular age-related macular degeneration: 12-week outcomes of the FURGGHORN clinical trial

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Purpose: Faricimab (Vabysmo®) is the first approved bispecific antibody to inhibit two independent molecules involved in neovascular age-related macular degeneration (nAMD): VEGF-A and Ang-2. We report 12-week results of the ongoing phase IV FURGGHORN study, aimed at evaluating functional and anatomic outcomes in patients with nAMD after switching to faricimab from another anti-vascular endothelial growth factor.

Methods: FURGGHORN (ACTRN12623000215628) is a phase IV, prospective, single-arm, open-label, multicentre, investigator-initiated clinical trial. Patients with previously-treated nAMD meeting the inclusion criteria received four initial doses of faricimab 6 mg/0.05 mL every 4-weeks. The primary endpoint is change from baseline in best-corrected visual acuity at week 52. Key secondary endpoints included were change from baseline in central subfield thickness (CST), retinal fluid status, and treatment-related adverse events.
Results: Fifty-seven eyes of 57 patients with a mean age of 75.1 years (range 59–88) were included in this analysis. Mean best-corrected visual acuity change from baseline to Week 12 was +2.2 letters ($p = 0.003$, 95% CI 0.8–3.6). Mean central subfield thickness change from baseline to week 12 was −69.9 μm ($p < 0.0001$, 95% CI −53.5 to −86.4). The number of patients without intraretinal or subretinal fluid increased from 0 (0%) at baseline to 23 (40.4%) at week 12. There were no cases of intraocular inflammation, vasculitis or occlusive retinitis.
Conclusions: In this interim analysis of a prospective study, switching to faricimab was well tolerated in patients with nAMD switched from other anti-vascular endothelial growth factor agents. There was a small, but statistically significant improvement in visual and anatomic measures.

Bilateral cystoid macular oedema—Toxicity from oral kinase inhibitors: A case series and literature review

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Purpose: To highlight visually significant ocular toxicity related to commonly prescribed targeted oral chemotherapeutic agents
Method: Retrospective review of a case series of patients presenting with vision reduction from bilateral cystoid macula oedema. Patients presenting with best corrected vision LogMAR 0.3 or better and/or were phakic received treatment with topical corticosteroids, patients with best corrected vision worse than LogMAR 0.3 and were pseudo phakic received treatment with intravitreal corticosteroids and topical intra-ocular pressure lowering agent/s. All patients were co-managed with their oncology team which involved a temporary cessation of their chemotherapy or commencement of an alternative drug regimen. All patients underwent review at initial presentation and subsequent fortnightly intervals up to three months follow-up.
Results: In all patients vision returned to pre-morbid status with ocular treatment and cessation of their systemic chemotherapeutic agent. The average time of resolution of cystoid macula oedema was six to eight weeks with faster resolution of four weeks seen in patients who received intravitreal corticosteroids. There were no adverse events associated with corticosteroid use. All patients remained in remission with regards to their underlying cancer or auto-immune disease at three months follow-up.
Conclusion: The exact mechanism of macula oedema caused by oral kinase inhibitors is unclear but early identification of these medications as the aetiology is paramount. Localised ocular treatment in combination with cessation of the oral kinase therapy is warranted. Communication with the treating oncologist and prompt treatment is vision saving in these patients.

To compare obstructive sleep apnea among patients with and without diabetic retinopathy

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Purpose: Obstructive sleep apnea among patients with and without diabetic retinopathy (DR).
Methods: A prospective observational study of 80 diabetes mellitus patients. Patients at high obstructive sleep apnea risk, STOP-Bang score ≥ 5 and ESS score ≥10) underwent polysomnography. Based on Apnea Hypopnea Index (AHI), OSA was graded as mild (AHI = 5–14/h), moderate (AHI = 15–30/h) and severe (AHI >30/h). Statistical analysis was done using three models of outcome measures: No DR versus any DR, less severe DR versus More severe DR, and No DME versus DME.
Results will be presented.

Cryptotanshinone modulates epithelial-mesenchymal transition and inflammatory pathways in ARPE-19 cells: A potential therapeutic strategy for proliferative vitreoretinopathy

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Purpose: Proliferative vitreoretinopathy (PVR) involves retinal scarring and detachment and is the main cause of recurrent retinal detachment. Cryptotanshinone, a

bioactive compound from Salvia miltiorrhiza, exhibits anti-inflammatory and anti-cancer properties by modulating signalling pathways to downregulate epithelial-mesenchymal transition (EMT)-related markers expression. This study aimed to evaluate the effects and possible molecular mechanisms of cryptotanshinone in inhibiting TGF-β-induced EMT in ARPE-19 cells.

Method: The cytotoxicity of cryptotanshinone on ARPE-19 cells was measured by MTT assay. APRE-19 cells migration ability was detected by scratch assay and transwell assay. The protein expression of EMT and MAPK signalling pathways was detected by western blotting. The level of proinflammatory cytokines was measured by ELISA.

Result: The IC50 of cryptotanshinone on APRE-19 cell was 20 μM. Cryptotanshinone inhibited cell migration on TGF-β-induced EMT of ARPE-19 cells in a dose-dependent manner. The protein expression of EMT markers, N-cadherin and vimentin, was decreased and epithelial markers, ZO-1 and claudin-1, was increased in the cryptotanshinone treatment group. The phosphorylation of JNK and STAT3 was downregulated after cryptotanshinone stimulation. The TGF-b induced IL-6 expression was decreased in the cryptotanshinone treatment group.

Conclusion: These results suggested that cryptotanshinone could inhibit TGF-β-induced EMT and inflammatory responses, positioning it as a promising novel therapeutic for PVR.

Near-infrared light photobiomodulation treatment ineffective for treating retinal vein occlusion cystic macular oedema

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Purpose: Near-infrared (NIR) light at power densities a hundred times lower than conventional thermal treatments, gives a dose-related reduction in central macular thickness following 12 NIR light sessions (90 second/doses) in patients with diabetic macular oedema. We wanted to know if the same treatment to cystic macular oedema (CMO) caused by a retinal vein occlusion (RVO) would respond in the same way.

Methods: This was a Phase IIb clinical trial. Participants with CMO in one eye, secondary to RVO and meeting the eligibility criteria received thrice weekly 90 s treatments with NIR light for four weeks. Each eye received 200 mW/cm^2 for 90 s at each treatment. The central 1 mm was shielded so that the fovea was protected. Participants were followed, after the completion of the study (24 weeks) to monitor post-study changes in CMO and the requirement for rescue treatment.

Results: After seven patients had concluded the trial, a safety visit was conducted. The average letters lost was 9.1 and the average change in CMO thickness was 118 μm. Three patients required rescue treatment during the trial and 2 patients in the immediate follow up monitoring period. The safety committee concluded that the NIR treatment is not superior or equivalent to standard of care and the study was terminated due to failure of meeting primary efficacy endpoint.

Conclusion: Near-infrared light is not beneficial for treating CMO secondary to RVO when compared to current standard of care.

Efficacy and safety of the dexamethasone-releasing IBE-814 intravitreal implant for diabetic macular oedema and retinal vein occlusion: Results of the first-in-human Phase 2 trial

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Purpose: To evaluate the safety, efficacy and durability of a fully degradable dexamethasone intravitreal (IVT) implant that utilises novel sustained-release Epidel technology in diabetic macular oedema (DMO) or retinal vein occlusion (RVO).

Method: This Phase 2, randomised, single-masked, multi-centre, dose-ranging study compared two doses of the IBE-814 IVT Implant. Subjects received either one (low dose, LD) or two (high dose, HD) 70 μg implants at baseline and were eligible for retreatment with the IBE-814 IVT Implant between five and 12 months.

Results: Sixty subjects in four cohorts were treated with the IBE-814 IVT Implant: RVO LD ($n = 10$), DMO LD ($n = 23$), RVO HD ($n = 15$), and DMO HD ($n = 12$). At the Month 6 key endpoint, mean (SE) central subfield thickness (CST) reductions from baseline were −188 (60) μm (RVO LD), −68 (20) μm (DMO LD), −148 (45) μm (RVO HD), and −94 (23) μm (DMO HD). At the same time point, mean (SE) changes in BCVA were +6.4 (3.9) letters (RVO LD), −1.9 (2.0) letters (DMO LD), +5.5

(1.9) letters (RVO HD), and +8.7 (1.0) letters (DMO HD). After baseline treatment, at least 60% of subjects per cohort reached the 6-month visit without receiving supplemental therapy. The most common treatment-related adverse events were known steroid side-effects: elevated intraocular pressure and cataracts.

Conclusion: The IBE-814 IVT Implant was well-tolerated and was able to treat DME and RVO for at least six months in the majority of subjects. The polymer-free, sustained-release Epidel technology could potentially be applied to other ophthalmic indications where long-term drug delivery is needed.

Exploring the link between needle gauge and intravitreal infection

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Purpose: Intravitreal anti-VEGF injections (IVI) represent the gold standard treatment for many retinal diseases. Infectious endophthalmitis following IVIs remains rare but is acknowledged as a potentially debilitating complication. Reducing risk is integral to any procedure. Technique, patient and medication-related factors have been identified as potential risk factors. In recent years, the practice transitioned to 34 g needles for IVI. Our purpose was to understand if needle gauge size may impact IVI-related endophthalmitis.

Method: Retrospective audit of 10 retinal surgeons at two Melbourne practices. Data collected included basic protocol, location (theatre or consulting room), medication preparation and needle gauge size. All patients received topical anaesthesia and preoperative chlorhexidine into the conjunctival sac. Injection was via the pars plana and no peri-operative antibiotics utilised. Multivariate analysis was undertaken to determine variable impact.

Results: A total of 86,867 injections ($n = 3943$ eyes) were completed with an overall endophthalmitis incidence of 0.033%. Statistically significant risk factors included location, vial or prefilled syringe and needle gauge size. There was a significant difference in incidence between 32 g and 34 g needles sizes (0.039% vs. 0.013% respectively).

Conclusion: The incidence of endophthalmitis is equivalent to reported literature. Finer gauge needles have been shown to reduce post-injection reflux, a phenomenon shown to increase the endophthalmitis risk. Our results indicate that a finer gauge needle (34 g) led to reduced endophthalmitis incidence however, all aspects of the aseptic approach should be considered. This retrospective review represents the first significant cohort to indicate use of a finer needle gauge size positively impacting endophthalmitis rates.

Cumulative effect of metabolic syndrome on the risk of retinal vein occlusion in young patients

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This study aimed to investigate the impact of the cumulative burden of metabolic syndrome (MetS) on the incidence of retinal vein occlusion (RVO) in young adults. We included 1,408,093 subjects aged ≥20 and <40 years without a history of RVO who underwent four consecutive annual health examinations during 2009–2012 from the database of the Korean National Health Insurance Service. The metabolic burden was evaluated based on the cumulative number of MetS diagnoses at each health examination (0–4 times) and the cumulative number of each MetS component diagnosed at each health examination (0–4 times per MetS component). Cox proportional hazards models were used to estimate the risk of RVO according to metabolic burden. The risk of RVO was positively correlated with the cumulative number of MetS diagnoses over the four health examinations. All five MetS components were independently associated with an increased risk of RVO. Subgroup analysis for the impact of MetS on RVO occurrence revealed that MetS had a greater impact on female subjects ($p < 0.001$). Prompt detection of metabolic derangements and their treatment might be important to decrease the risk of RVO in young adults, especially women.

Lipidomic and metabolomic associations with diabetic retinopathy: A systematic review

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Purpose: Lipidomics is an emerging field that utilises chromatography and mass spectrometry to identify biomolecular predictors. This systematic review synthesises

clinical studies that evaluate metabolites associated with diabetic retinopathy (DR).

Methods: A search of the databases MEDLINE, Cochrane Central, Scopus, Emcare, and Proquest Central was performed. The inclusion criteria focused on targeted or untargeted lipidomic or metabolomic analyses among patients with diabetes utilising chromatography and mass spectrometry (or similar). Data extraction included study design, population characteristics, metabolomic markers and DR phenotypes. Key outcome measures included fold change, odds ratio and hierarchical clustering between cases and controls. The quality of the included studies was assessed (QUADOMICS).

Results: Initial searches yielded 858 studies, whereby 16 were included for review and primarily featured subjects of North Asian ethnicity ($n = 11$). Metabolites were analysed for all included studies with sample sizes ranging from 42 to 2642 participants. Significantly altered lipids concentrations and pathway expressions (i.e. gylcerophosphocholines/beta hydroxy acids) were varied between cases and controls, suggesting links to inflammatory processes, oxidative stress and lipid homeostasis. Amino acid alterations (i.e., tryptophan/glutamine) could be linked to increased degradation pathways related to immune activation. Dysregulation of secondary messengers and their precursors (i.e., myo-inositol) elicit downstream aberrant cellular communications present in proliferative DR.

Conclusions: The reviewed studies support the hypothesis that specific metabolites and lipid species are associated with DR, suggesting potential pathways for early prediction and therapeutic targeting. However, variations in study design and populations highlight the need for further research.

Neuro-Ophthalmology

From vitreous to ventricles: Serial imaging of intracranial silicone oil migration

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Intravitreal silicone oil endotamponade is indispensable to modern vitreoretinal practice, having been used to manage complex retinal detachment for over 60 years. While long-term placement of silicone oil is associated with several recognised intraocular complications, intracranial migration is exceedingly rare and thought to be associated with suboptimal post-operative intraocular pressure control and anatomical optic disc abnormalities, producing variable symptomatology. We present a 52-year-old male with advanced right eye proliferative diabetic retinopathy managed by ipsilateral placement of 1000 mPa.s viscosity Oxane® 1300 Silicone Oil (Bausch & Lomb Inc.), presenting with sudden loss of consciousness 31 months post-operatively. Serial neuroimaging over 53 post-operative months demonstrated intracranial silicone oil migration with unilateral optic nerve, optic chiasm, and bilateral mobile intraventricular deposits with progressive parenchymal atrophy. We analyse features on serial computed tomography and magnetic resonance neuroimaging, review possible migration pathways between the cerebrospinal fluid-filled spaces of the optic nerve and brain, and reiterate the necessity for vigilance towards potentially significant neurological sequelae.

The patient perspective on weight management counselling for idiopathic intracranial hypertension

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Purpose: Idiopathic intracranial hypertension (IIH) is a condition with strong associations with obesity and thus weight loss is a mainstay of IIH management. We aimed to assess the perspectives surrounding weight management from IIH patients in an Australian population.

Method: A cross-sectional survey was conducted on patients with IIH attending neuro-ophthalmology clinics in Sydney. The questions pertained to the patients' experiences with weight loss counselling and invited patients to give suggestions for improvements.

Results: Seventeen patients with IIH from three outpatient neuro-ophthalmology clinics in Sydney, Australia were surveyed. 35.3% of participants were made to feel that IIH was their fault due to their weight. 76.5% of participants who were advised to lose weight were not offered support to do so. 44.4% of participants who were offered support did not find the support to be helpful or appropriate.

Conclusion: Patients with IIH reported high rates of negative experiences when interaction with clinicians regarding weight management. Our results were more favourable compared to a similar study by Abbott et al. (2023) on IIH patients in the United Kingdom, where

only 20% of respondents felt "happy" with how their weight was discussed with them. The key themes identified were that clinicians should display more empathy in weight-related discussions and provide evidence-based, practical and personalised advice. Therefore, our clinical unit has developed two patient directed written resources intended for use as adjuncts for clinician counselling with practical local resources for weight management. Further enquiry into the effectiveness of this intervention will be performed.

Spontaneous retinal venous pulsations are correlated with intracranial pressure estimates in Idiopathic Intracranial Hypertension

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Purpose: Spontaneous retinal venous pulsations (SVP) are rhythmic changes in the calibre of the retinal vein over the optic nerve head. In this study, we objectively quantified SVPs and investigated their correlation with elevated ntracranial pressure (ICP) in patients with idiopathic intracranial hypertension (IIH).
Methods: A total of 51 eyes (33 IIH (all females) and 18 controls (17 females)) were included. All participants had their pupils dilated and a 30-second recording of the optic nerve head was captured using a smartphone-based retinal imaging device (Odocs Nun, New Zealand). SVPs were quantified using a custom-written algorithm. The association between SVPs, and ICP estimate was assessed using linear regression. The equation developed and validated by Jonas et al for non-invasive ICP estimation was used to calculate ICP (ICP (mmHg) $=(0.44 \times \text{BMI}) + (0.16 \times \text{DBP}) - (0.18 \times \text{age}) - 1.91$).
Results: The mean age and IOP in the IIH and control group were 33 ± 8, 30 ± 9 years and 14 ± 4, 16 ± 3 mmHg, respectively, with no significant difference observed ($p = 0.8$). Mean SVP was significantly lower in the IIH group (6.9 ± 3 μm) compared to the controls (10.9 ± 3 μm, $p < 0.05$). The mean estimated ICP was 15.3 ± 3 (cm H_2O) in the control group compared to the IIH group of 19.9 ± 4 (cm H_2O, $p < 0.05$). A significant correlation was found between SVPs and ICP estimates across the entire study cohort ($r = -0.11$, $p < 0.005$).
Conclusions: Our preliminary findings show that SVPs are markedly lower in IIH patients. The outcome of our results lay the foundation for developing an objective SVP-based assessment tool for a non-invasive and simple way of detecting elevated ICP.

Ocular Oncology

Retinal pigment epithelial hamartomas in familial adenomatous polyposis: Multimodal imaging in 24 eyes

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Purpose: To describe the multimodal imaging characteristics of retinal pigment epithelial hamartomas associated with familial adenomatous polyposis (RPEH-FAP).
Methods: Prospective, observational case series.
Results: Twenty-four eyes of 12 patients diagnosed with FAP were included. The mean age was 46.8 years (range 20–72 years). A total of 231 RPEH-FAP lesions were identified (mean 9.6 lesions per eye, range 1-31). Most lesions were outside the posterior pole ($n = 206$, 89.2%). The most common lesion appearance were small pigmented dots (42.4%). The mean dimensions for lesions were 0.6 mm × 0.2 mm (range 0.1–4.7 mm). Depigmented halos or fish-tails were seen in 112 (48%) lesions. The pigmented portion of the lesion was hypoautofluorescent in 137 of 147 (93%) of cases, and when present the depigmented halos were either iso- ($n = 36/76$) or hyper-auto fluorescent ($n = 29/76$). OCT was obtained for 48 lesions. The mean RPE thickness was increased to 37.8 μm, and irregular in 22 cases (46%). Retinal thinning of the outer retina was seen in most cases, with thinning or absence of the ONL in 83.3% of cases. Hyper-reflective retinal spots were seen in nine cases (18.8%) and pigment epithelial detachment in 11 cases (22.9%). No lesions demonstrated lacunae, cystic macular oedema, subretinal fluid or optical coherence tomography angiography blood flow.
Conclusions: New findings of RPEH-FAP include its high number (10) per eye, similar OCT and autofluorescent to typical congenital hypertrophy of the retinal pigment epithelium, presence of an iso- or hyperauto-fluorescent depigmented halo or fish tail in almost half of lesions, absence of associated lacunae or cystic macular oedema and presence of pigment epithelial detachments.

Oculoplastic / Orbit

Evaluating the endoscopic Jones primary dye test in lacrimal dysfunction

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Introduction: Endoscopic modification of the Jones primary dye test has previously demonstrated improved reliability. We sought to evaluate the results of endoscopic Jones (eJones) I and II tests in eyes with epiphora.
Methods: We performed a retrospective evaluation of patients presenting to a tertiary oculoplastic unit with epiphora. Patients with epiphora were eligible for inclusion if there was no prior lacrimal, lid, or punctal surgery, previous or current trauma or repair, reflex tearing, eyelid dysfunction, punctocanalicular causes, pathology on rigid nasoendoscopy or acute dacryocystitis. Included eyes underwent an eJones I and II test with rigid nasal endoscopy, dacryocystography (DCG) and dacryoscintigraphy (DSG). A positive test was defined as dye visualised on nasoendoscopy in the inferior meatus or nasal floor. Nasolacrimal duct obstruction (NLDO), nasolacrimal duct stenosis (NLDS) and functional epiphora were defined by the combined results of DCG and DSG.
Results: We included 26 symptomatic eyes (15 right, 11 left) of 21 patients (17 female, 4 male) with median age 69 (IQR 67–72). The cause of epiphora was NLDO in 14/26 (54%) eyes, functional epiphora in 5/26 (19%) eyes, and NLDS in 1 eye. A symptomatic but normal system on both DCG and DSG was found in 6/26 (23%) eyes. All cases of NLDO and the one case of NLDS were eJones I negative. All cases of symptomatic but normal systems on imaging were eJones I positive. Functional epiphora showed 3/5 eyes were eJones I negative. One case of NLDO was eJones II positive and 2/3 eJones I negative functional epiphora cases were also negative on eJones 2, with one unknown. The one NLDS case was eJones II negative.
Conclusion: eJones I was negative in all cases of anatomical obstructions and stenosis, but variable in functional epiphora. eJones I may not be negative in all cases of functional epiphora where there is a delay on DSG. Therefore, eJones I test may provide further confirmation of an anatomical obstruction but may miss cases of dysfunctional drainage otherwise detected by DSG. Further research with larger samples, or investigating the correlation of eJones testing with surgical success is needed.

Normative measurements of the infraorbital nerve by magnetic resonance imaging in an Australia cohort

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Purpose: To report the normative dimensions of the infraorbital nerve on fat-suppressed gadolinium (fs-gad) enhanced magnetic resonance imaging (MRI) and correlate with patient demographics in an Australian cohort.
Methods: A retrospective review of patients who underwent coronal fs-gad T1-weighted MRI from September 2021 to December 2023. One hundred and sixty-eight orbits were included. The maximum diameter of the infraorbital nerve (ION) and the optic nerve sheath was measured. Orbits were excluded if there was unilateral or bilateral pathology of the ION or optic nerve sheath, incomplete MRI sequences, poor image quality or indiscernible ION on radiological examination.
Results: The mean age of participants was 58 $\pm$ 16 years and 50% were females ($n = 42$). The mean normative measurements (mean $\pm$ standard deviation) on coronal fs-gad T1-weighted imaging: infraorbital nerve, 0.89 $\pm$ 0.22 mm and on coronal T1-weighted imaging: optic nerve sheath, 5.08 $\pm$ 0.67 mm. No significant differences were found between male or female participants in both the infraorbital nerve ($p = 0.757$) or optic nerve sheath ($p = 0.646$). There was no significant correlation between age and mean diameter of the infraorbital nerve ($r = 0.077$, $p = 0.320$) or optic nerve sheath ($r = 0.075$, $p = 0.336$). Additionally, no significant difference was identified between the mean diameter of the infraorbital nerve ($p = 0.079$) and optic nerve sheath ($p = 0.120$) across age groups. The mean infraorbital nerve to optic nerve sheath ratio was 0.18 $\pm$ 0.00.
Conclusion: Normative dimensions of the ION may be used to identify enlargement in conditions such as IgG4-related ophthalmic disease and reactive lymphoid hyperplasia.

Normative measurements of the frontal nerve by magnetic resonance imaging in an Australia cohort

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Purpose: To report the normative dimensions of the frontal nerve (FN) on fat-suppressed (fs) contrast-enhanced with gadolinium (gad) magnetic resonance imaging (MRI).
Methods: A retrospective review of patients who underwent coronal fs-gad T1-weighted MRI from September 2021 to December 2023. One hundred and sixty-eight orbits were included. The maximum diameter of the FN and the optic nerve sheath was measured. Orbits were excluded if there was unilateral or bilateral pathology of the FN or optic nerve sheath, incomplete MRI sequences, poor image quality or indiscernible FN on radiological examination.
Results: The mean age of participants was 58 ± 16 years and 50% were females ($n = 42$). The mean normative measurements (mean ± standard deviation) on coronal T1-weighted imaging: optic nerve sheath, 5.08 ± 0.67 mm. On coronal fs-gad T1-weighted imaging: frontal nerve, 0.74 ± 0.18 mm. No significant differences were found between male or female participants in both the frontal nerve ($p = 0.913$) or optic nerve sheath ($p = 0.646$). There was no significant correlation between age and mean diameter of the frontal nerve ($r = 0.14$, $p = 0.067$) or optic nerve sheath ($r = 0.075$, $p = 0.336$). Additionally, no significant difference was identified between the mean diameter of the frontal nerve ($p = 0.075$) and optic nerve sheath ($p = 0.120$) across age groups. The mean frontal nerve to optic nerve sheath ratio was 0.15 ± 0.04.
Conclusion: Normative dimensions of the FN may provide quantitative cut-offs for FN enlargement.

Objective radiological parameters to define asymmetric thyroid eye disease

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Purpose: To evaluate asymmetric thyroid eye disease (TED) using an objective, radiological based definition of asymmetry.
Methods: We conducted a retrospective study on TED patients with computed tomography scans of the orbits. Extraocular muscles volumes were determined by manually segmenting the muscles. The extraocular muscle volumes were summed in the right and left orbits. Asymmetry was defined by a ratio of greater than or equal to 1.4 between the total muscle volumes of both orbits. Unilateral disease was present if there was no muscle enlargement in the opposite orbit. Hertel exophthalmometry was performed on participants, and the difference between the right and left globe protrusion was compared.
Results: Fifteen out of 100 patients had asymmetric disease, of which nine had unilateral disease. The mean age of participants was 55 ± 15 years, and 66 were female. No correlation was found between asymmetry and age, sex, thyroid status, or hormone levels. The exophthalmos difference was significantly greater in asymmetric orbits compared to non-asymmetric orbits. A cut-off of 2.75 mm for the exophthalmos difference gave a sensitivity of 0.87, specificity of 0.79, and an area under the curve of 0.83 for identifying radiologically defined asymmetric TED.
Conclusion: There is currently no universally accepted definition for asymmetric TED. Current definitions rely on differences in clinical signs and symptoms between orbits and have been found to be unreliable. We present a cohort of asymmetric TED defined using an objective radiological marker of extraocular muscle volumes from computed tomography scans.

Lacrimal gland enlargement in thyroid eye disease

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Purpose: This study aimed to investigate lacrimal gland (LG) enlargement in thyroid eye disease (TED) patients on magnetic resonance imaging (MRI).
Methods: A retrospective review was conducted on TED patients who had undergone fat-suppressed contrast-enhanced T1-weighted MRI of the orbits. The lacrimal gland was segmented on OsiriX in consecutive axial and coronal slices to determine its volume. Enlargement was defined as a volume greater than 1100 mm^3, based on previous normative data. Asymmetric enlargement was defined if one side was enlarged but the contralateral side was not. Clinical data including presentation (active/inactive) and presence or absence of dysthyroid optic neuropathy was evaluated.
Results: The study population consisted of 88 orbits from forty-four patients with a mean age of 53 ± 15 years, with 29 (65%) being female. Twelve patients (27%) had LG enlargement, with eight (18%) having bilateral enlargement and four (9%) having asymmetric enlargement. There was no significant difference in age ($p = 0.17$) or sex ($p = 0.44$) between the LG enlarged and non-enlarged groups. There was also no significant difference in the clinical activity ($p = 0.46$) or prevalence of dysthyroid optic neuropathy ($p = 0.63$) between the LG enlarged orbits and non-LG enlarged orbits.
Conclusion: Lacrimal gland enlargement may be observed in approximately 30% of TED patients, with asymmetric enlargement in approximately 10% of cases.

Immunotherapy for orbital squamous cell carcinoma

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Purpose: To evaluate the demographics, clinical features and response of orbital squamous cell carcinoma treated with immunotherapy.
Methods: Retrospective, multi-institutional series. Patient characteristics, drug dosing, duration and response to treatment were evaluated.
Results: Nine patients from six centres were included. All patients had invasive orbital squamous cell carcinoma with perineural invasion in three patients. Seven patients received cemiplimab, while the other two patients received Pembrolizumab. No patients experienced significant side effects requiring treatment or cessation of immunotherapy. One patient died during follow up due to an unrelated cause. In all patients, measurable clinical and/or radiologic response was observed. Following immunotherapy, one patient underwent orbital exenteration and another patient had orbital mapping biopsies, with both patients showing complete pathologic response.
Conclusion: Our findings support the emerging role of immunotherapy in the management of invasive orbital cutaneous squamous cell carcinoma.

The use of fibrin glue for securing skin grafts in periocular surgery

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Purpose: To determine the efficacy of fibrin glue (Tisseel) in securing skin grafts in periocular surgery and to report on outcomes and complications.
Method: The charts of 21 patients from a single surgeon, in whom fibrin glue was used between October 2021 and April 2024, were retrospectively reviewed. Of the 26 recorded procedures, there were 22 ectropion repairs and four eyelid reconstructions post tumour excision. Seven patients were taking antithrombotic medications and were advised to withhold treatment one week prior to the procedure as per protocol. Four patients were taking Aspirin which was continued leading up to surgery, and one patient who was taking fish oil was also advised to cease this prior to surgery.
Results: All demonstrated good post-operative outcomes with a minimal of three-month follow up. Two patients experienced bleeding post-operatively. One patient developed purulent discharge with growth of gram positive baccili and Cornyebacterium species. These complications were managed promptly and resolved without

sequelae. There were no cases of wound dehiscence. All patients achieved satisfactory wound healing.
Conclusion: The use of fibrin glue for skin graft adherence in periocular surgery appears to be safe and efficacious, with minimal post-operative complications.

Case series at a quaternary children's hospital in Australia and literature review on management of paediatric orbital myositis

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Orbital myositis is a rare subtype of non-specifically orbital inflammatory syndrome characterised by inflammatory changes affecting the affecting the extraocular muscles.
In adults, it is known to be typically steroid-responsive with emerging associations between the occurrence of orbital myositis and concurrent systemic inflammatory or autoimmune disease. In paediatric population, there has not been a comprehensive case series and literature review comparing presentation, systemic association, and treatment approaches and no clear guidelines on management with systemic corticosteroids in paediatric orbital myositis. Therefore, presence of chemosis and gaze deviation are often misdiagnosed and treated as orbital cellulitis.
We present a case series of paediatric myositis treated at a quaternary children's hospital in New South Wales, Australia (Children's Hospital at Westmead) with literature review. This aims to summarise clinical presentation of paediatric orbital myositis, including the key radiological features of disease and general principles of treatment approach. We also aim to provide clinicians with a framework of focused clinical history or examination on important features of potential presence of associated systemic disease. This is to aid prompt diagnosis and management of paediatric orbital myositis and associated systemic disease.

Radiological differentiation between bacterial orbital cellulitis and invasive fungal sino-orbital infections

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Purpose: Invasive fungal orbital infections (IFOI) may be difficult to differentiate from sinogenic bacterial orbital cellulitis (OC). This study investigates the features differentiating OC from IFOI on magnetic resonance imaging (MRI).
Methods: Retrospective study of adult patients with sinogenic OC and IFOI with a pre-intervention MRI. Isolated pre-septal cellulitis (i.e.: no post-septal involvement), non-sinogenic OC (e.g.: secondary to trauma) and poor-quality MRI scans were excluded. Independent Sample's t-test and Fisher's exact test was conducted with $P<0.05$ deemed statistically significant.
Results: Eleven cases each of OC (Mean age: 41.6 ±18.4years-old, Male: 10) and IFOI (Mean age: 65.0 ±16.6years-old, Male: 9) between 2006 and 2023. Patients with IFOI were older, more likely immunocompromised and had a lower mean white-cell count (P-value=0.005, 0.035 and 0.017, respectively). The ethmoid and maxillary sinuses were most commonly involved in both OC and IFOI. Pre-septal and lacrimal gland involvement was more common in OC compared to IFOI (P=0.001 and 0.008, respectively). Infiltrative OC lesions were localised to the orbit and poorly demarcated, whilst those in IFOI were expansile/mass-like lesions invading the orbit from the adjacent paranasal sinuses. Specific IFOI features included loss-of-contrast-enhancement of paranasal sinus tissues with orbital extension. Extra-orbital and -sinonasal extension indicative of IFOI included contiguous skull base or pterygopalatine fossa involvement, retro-antral and masticator space stranding and vasculitis.
Conclusions: This study describes the key radiological features of IFOI on MRI including differentiating markers from OC. These specific features provide expedient identification of IFOI which necessitate early surgical intervention for microbiological confirmation of an invasive fungal pathology.

Primary dacryocystorhinostomy for acute dacryocystitis

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Introduction: Acute dacryocystitis is a common condition occurring secondary to nasolacrimal duct obstruction. We aim to assess the efficacy of primary dacryocystorhinostomy for the management of acute dacryocystitis.

Methods: A systematic search of the databases PubMed/MEDLINE, Embase and CENTRAL was performed to December 2023. Data extraction and risk of bias analysis was conducted in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses guidelines.
Results: Fourteen articles fulfilled inclusion criteria. The results demonstrated that for the treatment of acute dacryocystitis, primary dacryocystorhinostomy is anatomically and functionally efficacious, with low complication rates and minimal risk of recurrence.
Conclusion: Primary dacryocystorhinostomy is an efficacious management option for acute dacryocystitis. Further analyses of health-economics are required.

Patterns of recurrence in idiopathic orbital myositis

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Aims: To characterise patterns of disease recurrence in idiopathic orbital myositis (IOM).
Methods: Multi-centre retrospective cohort study of IOM patients. Serial imaging was also analysed. Patients with incomplete clinical records and specific orbital myositis (e.g. thyroid-associated ophthalmopathy) were excluded.
Results: Thirty-three patients (Female: 18, mean age: 40.8 ± 16.8-years-old) presenting between 2001 and 2023. Twelve (36.4%) patients had disease recurrence. There was no difference between age or gender predilection of patients with and without recurrence ($p = 0.107$ and 0.469, respectively). There was no association between patients presenting with multiple extraocular muscle (EOM) involvement, unilateral disease, anterior tendon sparing or lacrimal gland involvement with recurrence ($p = 0.328$, 1.0, 0.630 and 0.686, respectively). Recurrence with single EOM involvement occurred in eight (66.7%) patients, and 10 (83.3%) patients had recurrence involving different EOM(s) than on initial presentation. Seven (58.3%) patients had metachronous contralateral orbital involvement and one (8.3%) had simultaneous bilateral involvement. There was no association between age, gender, patients presenting initially with single EOM or lacrimal gland involvement with the development of contralateral orbital myositis (i.e. metachronous bilateral disease) ($p = 0.777$, 0.491, 0.109 and 0.236, respectively). Of the patients with a single acute episode, two (9.5%) patients experienced residual ocular symptoms, compared to four (33.3%) patients with recurrent disease ($p = 0.159$).
Conclusion: This study summarises the patterns of recurrence in IOM. Recurrence was not associated with age, gender, multiple EOM involvement, bilateral disease, tendon-sparing or lacrimal gland involvement. Recurrence was observed in a heterogenous sample of patients and may frequently develop contralateral disease or involve different EOMs (i.e. 'migratory' disease).

Tear inflammatory cytokine profiles in orbital inflammation: A pilot study

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Purpose: Tear inflammatory cytokines are a novel biomarker studied in a range of ocular surface diseases, periorbital and orbital conditions. This study characterises tear inflammatory cytokine profiles (Interleukin-1β [IL-1β], IL-2, IL-6, Interferon-γ [IFN-γ] and Tumour Necrosis Factor-α [TNF- α]) in orbital inflammatory disease (OID).
Methods: Single-centre prospective study enrolling patients with a clinico-radiological diagnosis of OID between 2022 and 2024. Patients had pre-treatment tear sample collection via micropipette, and cytokine analysis via multiplex bead array analysis. Healthy controls with no history of ocular surface disease were enrolled for comparison.
Results: Fifteen tear specimens from 14 OID patients (Males: 6, mean age: 52.1 ± 18.3-years-old), with one patient having repeat samples for recurrent inflammation in the contralateral orbit. Diagnoses included non-specific orbital inflammation (8/14, 57.1%), IgG4-related orbital disease (3/14, 21.4%), orbital granulomatosis with polyangiitis (1/14, 7.1%), giant cell arteritis with orbital apex inflammation (1/14, 7.1%) and herpes zoster ophthalmicus with orbital apex inflammation (1/14, 7.1%). OID patients with dacryoadenitis had higher IL-1β levels compared to those without ($p = 0.018$), and higher IL-6 levels compared to controls ($p = 0.01$). Idiopathic dacryoadenitis had higher IL-6 levels compared to healthy ($p = 0.004$), albeit there was no difference between idiopathic and specific dacryoadenitis ($p = 0.409$).

Conclusion: There is significant variability in tear cytokines profiles in OID. IL-1β and IL-6 levels may be a non-specific marker of dacryoadenitis, with IL-6 levels being significantly elevated in idiopathic dacryoadenitis. Tear cytokines may be affected severity, localisation and pattern of orbital inflammation. The clinical utility of tear cytokines in OID remains to be elucidated.

Enucleation and evisceration: A 10-year retrospective review of demographic and post-operative outcomes in an Australian hospital

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Purpose: This study will aim to provide information on demographic and post-operative clinical outcomes of patients who have undergone enucleation or evisceration surgery over a 10-year period at a major Australian tertiary public hospital. The results from this study will aim to provide clinically relevant information that may help to shape decision-making and improve post-operative anophthalmic surgery outcomes tailored to the Australian population.
Method: Retrospective data was obtained from patients who underwent enucleation or evisceration surgery at a tertiary Australian public hospital, between 1 March 2014 and 1 March 2024. These participants were identified by the procedural coding for enucleation or evisceration surgery. Participants were recruited via convenience sampling through the surgical procedural codes. All study participants were >18-years-old. Participants who were <18 years old; had no documented preoperative visual acuity or reason for surgery; or had prior anophthalmic surgery were excluded. After inclusion and exclusion criterion were applied, there were 73 eyes included in the study.
Results: There was a higher incidence of post-operative issues in enucleation surgeries (50%) than evisceration surgeries (20%) ($p = 0.007$). Patients who had undergone enucleation had a statistically significant higher incidence of implant extrusion (21.7%) compared to patients who had undergone evisceration (3.1%) ($p = 0.029$). The incidence of implant extrusion between evisceration and enucleation were not statistically significant for sex, ethnicity, reason for surgery, implant material or implant size.
Conclusion: Future research into other confounding variables is required to improve the incidence of post-operative complications and implant extrusion in anophthalmic surgery.

Improving the periocular Mohs service, a shift to patient centred care

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Purpose: To evaluate the impact of restructuring the Periocular Mohs Service from department based care (DBC) to a patient centred, integrated practice unit (IPU). DBC was delivered across two sites, with lesion excision and reconstruction on different days by separate teams. Reconstruction was completed in an operating theatre. In the IPU model, the oculoplastic surgeon completed periocular reconstruction immediately following lesion excision by Mohs dermatologist. The reconstruction was completed in a day procedure setting, without access to an anaesthetist. All patients in the IPU model were offered DBC.
Method: Medical record review of patients treated in the DBC model from September 2019 to March 2020, and those treated in the IPU from July 2020 to September 2022. A consecutive three month sample of patients treated in the IPU participated in a telephone satisfaction survey.
Results: Fifty-two patients were treated in the DBC model. One hundred and thirty-four patient were treated in the IPU model. There was no statistical difference in demographics, clinical risk factors, lesion type or complications between patients treated in the two models of care. One patient treated after July 2020 chose DBC. Patients treated in the IPU model reported high levels of satisfaction with their care.
Conclusion: Our study demonstrates the feasibility of an IPU model for periocular Mohs care. There were no adverse outcomes associated with reconstruction in a non-laminar flow setting. We found the IPU delivered improved value of care as it minimised hospital presentations, with no compromise to outcomes.

Deep learning based automated segmentation of extraocular muscles in thyroid eye disease

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Purpose: To develop a deep-learning-based automated segmentation model to automatically segment the extraocular muscles on orbital computed tomography images in thyroid eye disease patients and provide volumetric data.
Methods: Patients with thyroid eye disease who underwent computed tomography orbits were included. The extraocular muscles were manually annotated and used to train the deep learning algorithms. The data was randomly split into training and testing sets (80%/20%). A convolutional neural network model was developed for automatic segmentation of extraocular muscle volumes.
Results: Automatic segmentation of extraocular muscles was performed. Dice coefficient was recorded to be 0.72 and mean intersection over union of 0.62.
Conclusions: CNN-based deep learning algorithms are effective at automatically segmenting extraocular muscle volume. Further research with data from external centres may help to validate and improve the model.

Efficacy of tocilizumab infusions in thyroid eye disease patients with dysthyroid optic neuropathy: A retrospective case series

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Purpose: To evaluate the clinical outcomes of intravenous tocilizumab (TCZ) infusions in thyroid eye disease (TED) patients with dysthyroid optic neuropathy (DON).
Methods: Patients with DON who did not respond to conventional therapies such as intravenous methylprednisolone and/or orbital decompression surgery were treated with TCZ from September 2019 to December 2023. The medical records of these patients were identified and reviewed after completion of TCZ infusions. Patient demographics, including the duration of TED, smoking status, visual acuity, clinical activity score (CAS) before treatment and after the last TCZ infusion were analysed. Thyroid stimulating hormone receptor antibodies were also evaluated. Assessment was performed on subjective symptoms recorded with the thyroid eye disease quality of life questionnaire before and after completion of treatment.
Results: Three TED patients with DON were identified to have completed TCZ treatment with a mean of five infusions. There were no reported significant side effects, other than mild headache in one patient. Clinical symptoms before and after completion of treatment showed decrease in mean CAS of 5.66 points. Visual acuity improved in two patients and remained stable in the other. A reduction in mean thyroid stimulating hormone receptor antibodies by 11.96 IU/L was evident upon completion of TCZ infusions. There was an improvement in mean TED quality of life scores recorded of 11 points after treatment.
Conclusion: Tocilizumab can be efficacious in treating thyroid eye disease patients with dysthyroid optic neuropathy, showing good drug safety profile and reasonable response to inflammation with improvement in disease related quality of life, where conventional therapies have failed.

Other

Denoising the pattern electroretinogram

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Purpose: The pattern electroretinogram (PERG) has utility in assessment, diagnosis and management of central retinal and optic nerve disease, particularly in paediatric patients. PERG implementation in clinical practice has been limited by the small signal generated by the test and the relatively significant noise that can be seen in recordings. There has been limited progress in electrophysiology compared to other areas of ophthalmology. The aim of this study was to use denoising techniques to improve the reliability and utility of the PERG.
Methods: PERGs were performed on 70 eyes of 38 patients following ISCEV protocols. After a short break, a second recording was obtained to assess test-retest reliability of denoising. Denoising was performed on both recordings using various filters including Empirical Mode Decomposition (EMD), Ensemble Empirical Mode Decomposition (EEMD) and Complete Empirical Mode Decomposition with Adaptive Noise (CEEMDAN).
Results: Denoising algorithms generally improved test-retest reliability measured with intraclass correlation coefficient (ICC) and coefficient of repeatability (CoR). Unfiltered data showed reasonable reliability (ICC = 0.78), which improved with EMD (ICC = 0.88) and EEMD (ICC = 0.86) compared with CEEMDAN (ICC = 0.76). CoR improved from unfiltered data (CoR = 2.12μV) with EEMD (CoR = 1.99μV) and CEEMDAN (CoR = 1.85μV), but not EMD (CoR = 3.11μV).
Conclusion: The unfiltered signal from PERG has significant noise which impacts its use in clinical practice.

Denoising algorithms may increase the reliability of the pattern electroretinogram. EEMD provides the best overall improvement. More research is needed to further improve the utility of the PERG.

Utility of computed tomography localisation with surgical exploration in globe ruptures secondary to compression-decompression mechanisms

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Purpose: We sought to investigate the utility of computed tomography (CT) in cases of globe rupture secondary to blunt trauma and compression-decompression mechanism of scleral rupture.
Methods: We retrospectively reviewed adult patients presenting with acute blunt ocular trauma between January 2023 and December 2023. We included patients who underwent orbital CT imaging and subsequent surgical exploration. We excluded penetrating trauma from sharp instruments and cases that were not explored.
Results: We included 24 eyes of 24 patients (12 men). The median age was 69 (range 20–89) years. Injury was caused by fall (54%), assault (6%), accidental trauma (17%) and motor vehicle accident (4%). CT evaluation suspected globe rupture in 21 eyes (87.5%). Exploration showed the location of rupture was superolateral in 14 ruptures (50%), five superonasal (17.9%), three inferotemporal (10.7%), three mid-superior (10.7%), two mid-nasal (7.14%) and on midlateral (3.6%). The rupture type was circumferential in 12 eyes (42.9%), radial in 10 eyes (35.7%), and mixed or unassessable ruptures in six eyes (22.2%). Of the 27 surgically documented ruptures, 14 ruptures were Zone 3 (51.9%), four were Zone 1 (14.8%) and three were Zone 2 (11.1%) and six were not documented (22.2%). CT sensitivity for rupture was 63% for superior, 50% for inferior, 82 % for lateral, 50% for medial and 67% for anterior ruptures.
Conclusion: CT cannot identify rupture in all cases of bunt ocular trauma. The sensitivity of CT for location of rupture in blunt trauma is poor. Surgical exploration remains the gold standard of care.

Partnering with consumers and health professionals to identify the research priorities for inherited retinal diseases

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Purpose: Patient-centred approaches to research drive better patient-engagement and health outcomes. We undertook Australia's first Priority Setting Partnership (PSP) to identify the research priorities for inherited retinal diseases (IRD), from the perspectives of patients, caregivers and health professionals.
Methods: Following the James Lind Alliance methodology, we formed a multi-disciplinary and consumer steering group to guide our PSP. This involved: a survey to gather submissions on stakeholders' unanswered questions; consolidating submissions into research questions; reviewing the literature to identify which questions are truly unanswered; a second survey where stakeholders vote for 10 questions that they consider most important; and two workshops with stakeholders to finalise the priorities.
Results: Survey 1 received 227 submissions from 69 participants. Once consolidated, we had 42 research questions (deemed answered = 1/42). Survey 2 attracted 150 participants. Of the 41 unanswered research questions, those with the most votes were around treatment: to prevent, slow or stop vision loss ($n = 99$); to restore vision ($n = 83$); or that is gene-agnostic ($n = 48$). Other questions frequently voted for included understanding how: vision loss progresses ($n = 69$); environmental/lifestyle factors influence symptoms ($n = 57$); and to address the psychological impact of having an IRD ($n = 56$). Questions with the most votes will now be taken to stakeholder workshops, resulting in the final top 10 priorities.
Conclusion: Our PSP will drive more meaningful research in Australia and inform policy makers on the priorities of the IRD community. Empowering stakeholders to contribute to our PSP will also have positive effects on their attitudes towards, and engagement in, future research.

Eye care deserts. Long term impact of integrated eye health services on a very remote community

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Purpose: Remote and indigenous Australians suffer disproportionate visual impairment. Collaborative community eye health teams consisting of an Ophthalmologist and Optometrist have been addressing this in South Australia for over 20 years. This report presents the impact of the introduction of this service to the very remote community of Tjuntjuntjara, Western Australia, one of three Aboriginal communities of the Kakarrara Wilurra Health Alliance.
Method/Results: In 2011, the prevalence of severe visual impairment (<6/60) in at least one eye (SVI1) among those attending the first ever eye health visit to Tjuntjuntjara was 26% (6/23), predominantly due to surgically correctable cataract. Comparatively, in the same year, at the South Australian Kakarrara Wilurra Health Alliance communities that have a long-term eye health service, the prevalence of SVI1 was 5.8% (7/119), which was minimally attributable to cataract (<1%). A cataract surgical care pathway was instituted at Flinders Medical Centre to address this need, with the support of the Spinifex Health Service, and the Aboriginal Liaison office. Ten years later, in 2021, the Tjuntjuntjara eye health service found 13% (5/38) of patients with SVI1. Two of those were due to cataracts (5%), including one having travelled from another community to access this service.
Conclusion: Pockets of preventable blindness still exist in remote Australia. This study demonstrates the efficacy of collaborative community eye care integrated with public health systems, not limited by state boundaries, and supported by strong community relationships in addressing vision care deserts. These efforts led to a reduction in preventable blindness across the decade from 2011-2021.

Efficacy of a depth-based visual processing method in retinal prosthesis users to improve functionality

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Purpose: To compare orientation and mobility results using a novel depth based vision processing algorithm (LBE) with our original comprehensive vision processing algorithm (Lanczos2) in four participants with a suprachoroidal retinal prosthesis
Methods: Participants were tested in three 24 m urban outdoor locations after familiarisation with each algorithm. Each participant used their usual mobility aid during testing and were unmasked. Each route was completed twice, after training, once with LBE and once with Lanczos2. The outcomes measured were Time to complete; Object detection; Object identification; Number of collisions; False detection of obstacles, e.g. shadows; Disorientations and Interventions for participant safety.
Results: A total of 25 routes were completed across all participants using both LBE and Lanczos2, 50 in total. Time taken to complete the course was not significantly different between the two algorithms. A total of 275 objects were detected while using LBE and 331 using Lanczos2. This corresponds to an incidence-rate ratio of 1.20, meaning that the incidence of detecting objects with the device to be 20% greater using Lanczos2 ($p = 0.072$). Of objects detected, 138 (50.2%) were able to be correctly named using LBE and 138 (41.7%) were correctly named using Lanczos2 ($p = 0.081$). No shadows were mistaken for objects while using LBE but 31 shadows were misidentified with Lanczos2.
Conclusions: A depth based vision processing algorithm does not increase the number of objects detected but it improves identification of objects and in particular, it eliminates the misidentification of shadows as objects. This augments orientation and mobility in outdoor locations.

Pilot post-surgery automated text follow up program: Characteristics, acceptability and role in ophthalmic patient care

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Purpose: The initial recovery period represents the period of greatest concern and standard care provides the post-operative patient call to review symptoms and general comfort. This process may be frustrated by patient unavailability to the call. An automated text pilot system was undertaken for post-operative contact. The purpose of this study was to understand patient acceptability and usability of the process.
Method: This represents a nurse-led pilot where a text was sent to a prearranged contact to confirm routine follow up or follow-up call required. Data was retrospectively reviewed and analysed across a 9-month period across 2023-2024. Routine protocol flagged the text prior to patient discharge.
Results: A total of 306 patients were reviewed. Sixty percent patients were female and 2/3 aged 66 or older. Four patients (1.3%) requested a further call with 48.5% confirming their okay status. Fifty percent (50.2%) had no response. Of those requesting follow up, 2 patients had general questions about post-operative status, one confirmed post-operative instructions and one discussed concerns of wound dressing application. One complication was noted at surgery (0.3%). The patient was followed up separately with a direct call.
Conclusion: The study suggests patient acceptability of an automated process. The lack of response in 50% of patients was still considered positive, confirmed anecdotally with no issues at clinical follow up. This program automated one aspect of the post-operative process streamlining patient care and nurse utility increasing potential direct patient care time. Further analysis of the no-replies and expansion of the program will provide further valuable information.

Paediatric Ophthalmology

Functional vision assessments: What are they and what are they for?

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Purpose: All students have equal rights to a quality education and learning, however for students with a vision impairment, access to class materials and therefore educational outcomes, can be negatively impacted by their vision impairment. Current support for a student in education is based on vision function measures of visual acuity. This poster presents the results of a PhD thesis and highlights the necessity and impact of functional vision assessments to support students through education.
Method: Eighty students were recruited through the South Australian School and Services for Vision Impaired. Vision function measures (visual acuity, contrast sensitivity, and electrophysiology) were compared with functional vison measures (reading performance, vision processing, and visual search).
Results: Measures of visual acuity and contrast sensitivity were poor indicators of functional vision performance in children with a vision impairment. Additionally, electrophysiology measures indicated that children with pathology causing glare, and children with retinal dystrophies, had an improved reading performance using reverse polarity print (white writing on a black background). The results highlight the complexity of childhood vision impairment and its functional impact, which varies depending on the cause of vision loss and environmental conditions.
Conclusions: From these findings, a new and comprehensive assessment framework was developed, to tailor classroom support around an individual's functional vision, thereby enhancing curriculum accessibility. This framework is currently in use within South Australia to support students with a vision impairment, enabling a more inclusive and equitable educational experience, ensuring that unique visual needs are understood and adequately addressed in the classroom.

Retrospective comparison of ranibizumab and bevacizumab for the treatment of retinopathy of prematurity

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Purpose: To compare the outcomes of intravitreal injection (IVI) with bevacizumab and ranibizumab for the treatment of retinopathy of prematurity (ROP).
Methods: We retrospectively reviewed all neonates who underwent treatment with 0.625 mg in 0.025 mL bevacizumab or 0.023 mg in 0.02 mL ranibizumab for ROP from 2018 to 2024 at the Women's and Children's Hospital, South Australia. The primary outcome was time to

reactivation. Outcome was censored by death, loss to follow up, complete vascularisation or discharge to routine follow up.

Results: We included 39 eyes (19 right) of 21 patients. The median birthweight was 620 g (interquartile range [IQR] 580-720g) and gestational age was 24.4 (IQR 23.9–25.6) weeks. The median corrected gestational age at treatment was 33.9 (IQR 33.1–35.9) weeks. Stage (S) 3 Zone (Z) 1 ROP with Plus disease was seen in 13 eyes, S3Z2 with Plus in 13 eyes, S3Z1 and Preplus in six eyes, S3Z1 in three eyes, S2Z2 and Plus disease in two eyes, S2Z2 in one eye and S2Z1 with Plus Disease in one eye. Bevacizumab was used in 29 eyes, and ranibizumab in 10 eyes. Reactivation occurred in 4/29 eyes treated with bevacizumab and 9/10 eyes treated with ranibizumab. The median time to reactivation was 89 (IQR 66–101) days for bevacizumab and 56 (IQR 53-73) days for ranibizumab. Cox regression showed ranibizumab significantly increased the hazard of reactivation (hazard ratio 10.66, 95% confidence interval 2.56–44.30, $p = 0.001$).

Conclusion: We observed treatment with ranibizumab showed unfavourable outcomes regarding reactivation of ROP compared to bevacizumab.

Correlations between anterior segment parameters and myopia severity in Australian myopic children

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Purpose: Axial length elongation is known to be the primary determinant of myopia severity. However, the roles of other anterior segment parameters are less well documented. This study analysed anterior segment ocular biometry in a cohort of Australian children with myopia using data collected from Pentacam HR and IOLMaster 400.

Methods: This retrospective observational cross-sectional study used secondary data collected at the MQ Health Ophthalmology Clinic, Macquarie University. Participants included a cohort of 26 myopic children of mixed ethnicities. Anterior segment measurements were obtained using IOLMaster 400 and Pentacam HR and analysed using Pearson correlation coefficients.

Results: Mean spherical equivalents were -3.56 ± 0.93 D and -3.54 ± 2.14 D for the left and right eyes, respectively. Spherical equivalent was negatively correlated with the axial length for both eyes (left eye: $R = -0.598$, p 0.05).

Conclusions: Axial length/corneal radius of curvature ratio may be a stronger indicator of myopia severity in children than axial length alone, as it accounts for the dynamic relationship between axial length and corneal power during ocular development. Additional larger studies can confirm this across different cohorts and ethnicities.

Visual loss from vitamin A deficiency in children with autism spectrum disorder

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Purpose: To assess prevalence of autism spectrum disorder amongst children with xerophthalmia.

Methods: A series of 10 patients with vitamin A deficiency associated eye disease known to the Queensland Children's Hospital were assessed. Parameters included referral source, presenting complaint, risk factors for vitamin A deficiency, micronutrient biochemistry, visual acuity pre- and post-treatment and treatment modality.

Results: $n = 9$ had a restrictive diet, of these $n = 8$ had behavioural restrictive eating in the setting of autism spectrum disorder. $n = 7$ had serum vitamin A levels of 0.1 or less (reference range 1.1–2.8). Referrals were primarily via an optometrist ($n = 4$) or general paediatrician ($n = 3$). The most frequent presenting complaints were unexplained vision loss ($n = 2$), parental concern over lack of functional vision ($n = 2$) and suspected optic nerve head swelling ($n = 2$). $n = 3$ experienced a delay in diagnosis and treatment. Visual acuity improved with treatment in $n = 5$ cases, while $n = 4$ had irreversible vision loss secondary to vitamin A deficiency. $n = 5$ were screened for and found to have other micronutrient deficiencies. $n = 9$ were managed in an outpatient setting and $n = 8$ tolerated oral and topical vitamin A supplementation, with only $n = 2$ requiring intramuscular dosing.

Conclusion: Paediatric patients with autism spectrum disorder and behavioural restrictive eating are at increased risk of visual loss from vitamin A deficiency. Dietary screening in at risk children may aid timely diagnosis and improve outcomes.

Risk factors for recurrent retinal detachment in children—An observational cohort study

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Purpose: To describe the epidemiology and determine the risk factors for recurrent paediatric retinal detachments (RD) from a tertiary paediatric ophthalmology referral centre.
Methods: Retrospective, observational study of all children ≤18 years old who underwent RD repair at the Queensland Children's Hospital, Brisbane, from November 2014 to December 2022. Data collected included patient demographics, ocular history, detachment characteristics, surgical details and outcome data. The primary outcome measure was anatomic reattachment.
Results: Sixty-eight patients, for a total of 75 eyes (75% male) were included. Median age was 11 (interquartile range 8.5–13). Thirty-nine eyes (52%) had anatomic reattachment after initial surgery, improving to 50 eyes (66.7 %) at final follow-up. Univariable analysis identified age, presence of congenital cataracts, total RD and proliferative vitreoretinopathy (PVR) as predictive factors of recurrent detachment. Multivariable analysis found increased age to be predictive of successful reattachment (odds ratio [OR] 1.14, 95% confidence interval [CI] 1.01–1.31, *p*-value 0.045), while presence of PVR was a risk factor for recurrent retinal detachment (OR 0.35 95% CI 0.13–0.92, p-value 0.037), after the initial surgery. Factors predictive of successful final reattachment were myopia (OR 5.12, 95% CI 1.23–28.2, *p*-value 0.036) and presence of only one retinal tear (OR 21.1, 95% CI 3.07, 447, *p*-value 0.009), while presence of PVR was again a risk factor for redetachment (OR 0.26, 95% CI 0.07–0.89, *p*-value 0.038).
Conclusion: We identified several factors that significantly influence anatomical success after paediatric RD. Consideration of these characteristics would be important in preoperative counselling as well as in perioperative and post-operative surgical management.

Fluorescein leak and retinal vascularisation post bevacizumab for treatment of type 1 retinopathy of prematurity: A dose comparison

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Purpose: To compare the rate of fluorescein leak and length of temporal retinal vascularisation in eyes treated with 0.625 mg versus 0.3125 mg intravitreal bevacizumab (IVB) for type 1 retinopathy of prematurity (ROP).
Setting/Venue: A tertiary paediatric referral centre
Methodology: Retrospective cohort study of patients who received IVB for treatment of ROP between October 2018 and January 2023. Infants were included if they underwent fundus fluorescein angiography (FFA) for follow-up. Vascularised retina was measured from the centre of the optic disc through the fovea to the temporal vascular-avascular border. The length of vascularised retina was expressed in disc diameters (DD).
Results: Eighty-six eyes of 44 infants received IVB for ROP treatment during the study period. Of these, 75 eyes had FFAs available for review. Patient demographics and time to treatment were comparable between groups. Fluorescein leak was observed in 7.5% and 17.6% of eyes that received 0.625 mg and 0.325 mg IVB respectively, but this was not statistically significant ($p = 0.286$). Eyes treated with 0.625 mg had an increased temporal vascularisation of 12.13 DD compared with 11.6 DD in the lower dose group however this was not statistically significant ($p = 0.79$).
Conclusions: Patients who received a lower IVB dose for treatment of ROP did not have a significant difference in leak or temporal vascularisation on follow-up FFA.
Financial Disclosure: None

Paediatric ophthalmic services in Australia: Review of access across a multi-centre group

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Purpose: Global literature increasingly indicates a reduction in access to paediatric ophthalmologist services representing a potential major health care issue. Understanding access disparities at a local level is essential to developing potential solutions. The purpose of this review is to quantify disparities in patient access to paediatric services across multiple Australian states.
Method: Retrospective audit of patient location for 3 ophthalmologists offering paediatric services (Victoria, New South Wales and Queensland). All clinics were part of Vision Eye Institute. Patient comparisons were performed for patients under and over 10 years of age through calendar year 2023.

Results: Although variable, the percentage of patients attending from outside the SA3 area of the paediatric clinic was greater for younger patients in regional (Mackay, Tuggerah Lakes) and urban clinics (Melbourne, Drummoyne). The disparity ranged from 5.0% to 23.0% with disparity equivalent for urban and regionally located practices. Patients >10 years attending Chatswood (urban New South Wales) were more likely to be from outside SA3 area (13.8% difference). All ophthalmologists offered non-paediatric services also.
Conclusion: This simple analysis highlights that patients across Australia are prepared to, and required to travel further for paediatric ophthalmic care. Use of SA3 areas may introduce bias towards greater difference in urban locations however the mean difference in disparity remained similar suggesting a universal issue. The number and distribution of paediatric-trained ophthalmologists within Australia is a growing concern. This is potentially amplified by financial and social factors. Telehealth opportunities may increase availability however broader discussions around paediatric training and support may be necessary.

Remote telehealth screening for retinopathy of prematurity: A rapid review

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Telemedicine screening for retinopathy of prematurity (ROP) utilising retinal cameras has become a viable alternative to binocular indirect ophthalmoscopy (BIO), allowing for a remote, lower-cost method, that can be performed by non-ophthalmologists. The store-and-forward telemedicine model refers to images captured at bedside, uploaded to secure databases, and remotely screened by experts who grade the images and develop a treatment plan. We searched PubMed, Embase, and Scopus databases from 1 January 2015 to 1 May 2024. Studies evaluating the diagnostic performance of retinal imaging for ROP screening (retinal cameras or smart phone devices) compared to gold-standard BIO were included. 18 studies were included of 1547 screened. These studies screened 2127 total patients (range 27–608). In most studies ($n = 14$), the screening was performed by a non-ophthalmologist healthcare worker (nurse, ophthalmologic technician, paediatrician) while the remained 4 studies had a paediatric ophthalmologist undertake the imaging. The gold standard comparison for the diagnostic accuracy was BIO performed by paediatric ophthalmologist in 16 studies. The overall sensitivity and specificity for "Any ROP" was 90.75% (range 86-100) and 87.9% (range 70.6–99) respectively. The sensitivity and specificity for "Clinically significant ROP" was 92.37% (range 78–100) and 90.7% (range 35–100) respectively. Five studies included gradability metrics and the average gradability was 90.9% (range 69.4–98). One study included patient satisfaction was 97.4%. This review summarises the current literature in store-and-forward telehealth techniques for ROP screening and provides evidence that this method is highly sensitive and specific in the diagnosis of ROP, especially clinically significant ROP.

Assessing adherence to dilute Atropine therapy for progressive myopia and factors which influence it, in an Australian population

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Purpose:

1. To determine adherence to dilute Atropine therapy in an Australian population of children;
2. To determine factors which influence adherence to dilute Atropine therapy.

Methods: A survey was given to the parent/guardian of all children previously prescribed dilute Atropine eyedrops for the treatment of progressive myopia.
Results: A total of 65 patients aged 4-17 years old who were prescribed dilute Atropine eyedrops for the treatment of progressive myopia completed the survey. The majority of patients (59%) rely on their parent/guardian to instill eyedrops, 32% by themselves and 9% was shared between the parent and child. Sixty percent of subjects with poor compliance (< 5 nights/week) instill eyedrops on their own. Fifty seven percent experienced side effects and confronted barriers to compliance such as photophobia, forgetting to instill the drops, difficulty accessing a supply and cost. Despite the side effects and challenges they encountered, 75% of them still achieved excellent compliance. A large proportion (83%) found linking dilute Atropine therapy to another bedtime activity or placing it in a bedside location helpful for achieving compliance. Eighty two percent of the subjects have a myopic parent/guardian, and in this subset, only 9% showed poor compliance. It is surprising that all subjects who do not have a myopic parent/guardian had excellent compliance.

Conclusion: This is the first study of compliance in an Australian population. Having a parent/guardian instilling eyedrops appeared to be associated with compliance to dilute Atropine therapy regardless of if the parent/guardian have a history of myopia or not. The degree of compliance seems to be unaffected by Atropine concentration, presence of side effects, adverse events and barriers.

Combined cataract and strabismus surgeries: Our experience

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Purpose: To evaluate the results of combined cataract and strabismus surgeries.
Methods: Retrospective review of records of patients operated for combined strabismus and cataract between April 2021 and June 2023.
Results: Nine combined strabismus and cataract surgeries were performed on patients between the age 7 and 32 years (Mean age: 14.4 years). Seven procedures were performed for exotropia, one for esotropia, one for monocular elevation deficit. Presenting visual acuity ranged from 20/100 to perception of light. The mean deviation was 40.5PD. Standard surgical doses were used for all cases. Surgical outcome was satisfactory (within 10PD) in all cases. Visual outcome was good in patients who did not have any structural or retinal abnormality.
Conclusion: There were no complications arising from the combined surgery in addition to reducing the number of second surgical procedures, reduced anaesthesia risk, faster visual rehabilitation and cost effectiveness.

Refractive Surgery

Centration and torsion control following lenticule creation with smooth incision lenticule keratomileusis

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Purpose: To investigate the frequency of recentration and torsion adjustment following docking of Smooth Incision Lenticule Keratomileusis (SILK) procedure using the ELITA femtosecond laser.
Methods: This was a retrospective review of all patients who underwent the SILK procedure at the Singapore National Eye Centre. All patients underwent standard preoperative refractive assessment. Prior to the laser procedure the horizontal axis (0-180) was marked on the patient's eye as well as the visual axis using a slit lamp. Intraoperative videos of the docking and applanation procedure were obtained and assessed for manual centration frequency and torsional variation. All lenticules were created in standard width dimensions of 6 mmOZ with a 7.6 mm TZ, incision width was 3 mm.
Results: Fifty-nine consecutive SILK procedures were included in the study. The mean age of the patients was 30.1 years (range 22–38). There were 30 right eyes respectively. Mean refractive correction was −5.92D sphere, −0.83D cylinder, mean flat K 42.5 D steep K 43.8 D. Torsional adjustment was required in 50% of cases. The mean torsional adjustment was 2.1° (90% of counter-clockwise, 10% clockwise). Eighty-seven percent of eyes required centration adjustment. The mean applanation pressure was 38.5 with a deviation of 1, during lenticule creation and completion. There were no suction breaks or complications following lenticule extraction.
Conclusions: SILK a second generation lenticule extraction procedure, allowing accurate placement of the lenticule prior to creation. Following applanation the majority of patients need centration adjustment to ensure accurate creation on the visual axis, torsional control was less frequently required.

Uni- and bivariate repeatability and agreement of two flagship SS-OCT Optic Biometers: IOLMaster700 (IOLM) and Eyestar900 (ES)

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Purpose: To compare the repeatability and agreement of the IOLM and ES and to introduce a novel approach to accuracy analysis of bivariate data (KCyl).
Method: An analysis of left eyes presenting for routine cataract surgery at a single-surgeon clinic. Eyes were measured with both IOLM and ES, and repeated five minutes later (four scans). Cases with previous corneal surgery were excluded. Repeatability and agreement measures were calculated according to the British Standards Institution and Bland-Altman. Bivariate repeatability used pooled variances; agreement was calculated using the centroid of the difference, and the 95% limits

were defined using the modified F-distribution for the T2 statistic.

Results: 89 eyes, 56% female, with a mean age of 69.4 years. Compared to the ES, the IOLM had better precision for AL (Δr = –0.02) and Ix (Δr = –0.44). ES precision was greater for K1 (Δr =–0.9), KCyl (Δr= –0.18), LT (Δr –0.02), WTW (Δr =–0.04), and PD (Δr =–0.10). Significant ($p < 0.001$) systematic differences (ES-IOLM) were detected for AL (+0.01), ACD (+0.03), LT (–0.07), WTW (+0.05) and PD (+1.24). Bivariate analyses revealed a mean vector difference of (–0.01, 0.04), which produced a non-significant T2 of 4.91 ($p = 0.09$). The 95% limits were described by radii (0.58, and 0.43) for eigenvalues (0.05, 0.03) rotated to 169o.

Conclusion: We introduce a bivariate approach to repeatability and agreement in an analysis of two SS-OCTs. Numerous small differences were identified. The ES was notably less precise than the IOLM for the measurement of Ix.

The Mahalanobis distance: How to perform outlier analysis for keratometry data

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Purpose: To demonstrate the approach to outlier analysis for keratometry data using bivariate statistical techniques.

Method: We present an illustrated statistical explanation and worked example of how to simply and accurately perform outlier analysis for surgically induced astigmatism (or any keratometry reading) using a real dataset of 217 cases.

Results: When applying bivariate statistical principles to keratometry data, the centroid of the double angle co-ordinates reflects the central tendency, and the outlier cut-off is defined by a finite two-dimensional circumferential boundary. We demonstrate why a simple straight-line (Euclidean) distance is inappropriate for outlier analysis because of the potential for unequal variance and/or covariance. Accordingly, we explain the Mahalanobis distance as a "generalised" distance that is scaled by the covariance matrix of the co-ordinates. Because the squared Mahalanobis distance (MD2) approximates a chi-square distribution, a critical distance can be defined for a given dataset; similarly, one can compute a T2 statistic and use a modified F-distribution. These are the same principles used in centroid significance testing. In our worked example, the centroid was (–0.03, –0.02), and covariance matrix was (c(0.07, 0.01, 0.01, and 0.04), ncol = 2). We defined an outlier using (conservative); with 2 dimensions, the critical value was. Using this, we excluded 11 data points (MD2 min = 6.14, med = 7.19, max = 11.59).

Conclusion: We demonstrate the use of a generalised squared distance to identify outliers for bivariate keratometry data (i.e., surgically induced astigmatism).

Sutureless toric scleral fixated lenses: Insights from Far North Queensland

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Purpose: Capsular instability and zonular rupture poses a challenge to optimal lens placement post cataract extraction. This is amplified in a regional setting with limited access to subspecialty services. The purpose of this study is to evaluate the experiences and outcomes of a sutureless, toric, single-piece scleral fixated intraocular lens (FIL-SSF Carlevale lens, Soleko, Italy) in regional Far North Queensland (FNQ).

Methods: A retrospective case series was performed on six eyes from five patients receiving FIL-SFF Soleko lens implantation between June 2020 and March 2024 at the Cairns Hospital. Peritomy and scleral flaps were performed at the 3 and 9 o'clock positions. After IOL insertion, each haptic was grasped through both sclerotomies and the T-shaped self-blocking plugs secured the lens.

Results: The indications for lens placement were aphakia ($n = 4$), and subluxated crystalline lens ($n = 2$). Mean patient age was 65 ± 16.38 years. Preoperative visual acuity was LogMAR 0.940 (6/60+), which improved to a mean visual acuity of LogMAR 0.293 (6/12) at 3-4 months. Pre- and post-operative vector analyses revealed a mean reduction of 1.56 ± 0.877 diopters of cylinder and a mean change in axis of 22.22 ± 56.30 degrees. Post-operative complications included one retinal detachment with hypotony, and one with resolved cystoid macular oedema.

Conclusion: The Carlevale lens is an accessible treatment strategy for general ophthalmologists to address operative challenges of capsular instability and zonular rupture in a regional setting.

Refractive outcomes of triple surgery: Descemet membrane endothelial keratoplasty, cataract extraction and multifocal lenses

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Purpose: To evaluate the refractive outcomes of Descemet membrane endothelial keratoplasty combined with phacoemulsification and multifocal intraocular lens implantation (triple procedure) in phakic patients with Fuchs endothelial dystrophy.
Method: A retrospective, single-centre, consecutive case series of the refractive outcomes of 55 eyes of 32 patients who underwent triple procedure between 2019 and 2024. Main outcome measures were spherical equivalent (SE), rates of emmetropia, unaided and pinhole visual acuity and near vision.
Results: The mean age was 61 $\pm$ 8.43 years, and 53% (17 of 32) were female. Mean target refraction preoperatively was -0.30 ± 0.25 diopters (D) and subsequent post-operative SE was -0.17 ± 1.96 at three to four months ($p = 0.2297$, $n = 42$ eyes), -0.26 ± 0.55 at 6 months ($p > 0.999$, $n = 27$), and 0.03 ± 0.25 at >12 months ($p = 0.0977$, $n = 15$). The rates of emmetropia (defined as SE of 12 months. The mean unaided visual acuity before surgery was 0.48 $\pm$ 0.23 logMAR and increased to 0.18$\pm$0.17 at three to four months after surgery ($p < 0.0001$), and from six months onwards remained stable at 0.11 $\pm$ 0.11 ($p < 0.0001$). Most common near vision readings achieved were 19% of 37 eyes at N4, 5% at N4.5, 24% at N5 and 19% at N6.
Conclusion: Descemet membrane endothelial keratoplasty triple procedure with multifocal intraocular lens insertion is an effective combination surgery offering patients spectable free near vision post-operatively.

Taming the tremors: Examining the link between preoperative emotions and surgical discomfort in a refractive surgery setting

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Purpose: A highly anxious patient may be more restless during surgery leading to increased risk of complications. Understanding patient emotions prior to surgery and the impact on the perceived experience may help surgeons better prepare patients prior to surgery. This pilot review aims to understand the link between preoperative emotions and the surgical discomfort.
Method: Patients undergoing laser refractive surgery at a single clinic were provided the SRAI questionnaire prior to surgery to rank the following emotions (upset, frightened, nervous, jittery, and confused). This was provided prior to preoperative medication. At recovery, a single Likert scale question was provided to understand perceived level of surgical discomfort. Correlation between age, procedure, preoperative response and discomfort level were analysed.
Results: Mean age of participants was 35.3 $\pm$ 9.2 years with 68.7% female ($n = 120$). Mean discomfort score was 26.56 $\pm$ 24.4 (range 0–98). Patients scores of "moderate" or "very much so" varied (upset 2.6%, frightened 10.4%, jittery 14.8%, nervous 31.3%). Emotional state was variably found to be significantly correlated to gender and age ($p < 0.05$) but not discomfort score or procedure type.
Conclusions: We found that although most patients expressed some level of anxiety prior to surgery, this did not appear impact the perceived discomfort through the procedure. Although this may simply reflect the impact of the mild preoperative sedative, the findings suggest other factors contribute to the perceived comfort during surgery. The analysis helps understand the patient preoperative state undergoing refractive surgery and may aid clinics in further improving the preoperative patient experience.

A case-driven audit transforming infection control in SMILE surgery

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Purpose: Microbial keratitis (MK) following laser refractive surgery is a significant, yet uncommon complication. Identification of the causative organism is essential to optimising treatment while the identification of the potential source is critical to minimising further cases, both in the immediate and long-term. In the event of multiple cases, it is essential to review infection control protocols.

Method: Review of two cases of microbial keratitis in a single centre which occurred within three weeks of each other and the following protocol review.
Results: Following the first case, several minor protocol changes were implemented inclusive of mandatory mask wearing for staff and increased area of coverage for periocular betadine wash prior to surgery. Immediately following the second case, all laser procedures were halted pending further investigation which included internal (Quality & Risk Manager, Director of Nursing and respective state and site clinical managers) and external staff (clinical microbiologist and infectious diseases physician, infection prevention and control consultant, Senior medical virologist). The investigation process included a review of general procedures, infrastructure and equipment to understand possible infection points and areas for protocol amendments.
Conclusion: These two reported cases represent the only known cases at our practice spanning over 30,000 laser refractive surgery procedures. The presence of cases within a short period however suggested a potential cluster requiring immediate and critical review. We believe that these steps provide a strong baseline for future reviews undertaken across other practices and importantly, this raises our internal baseline for conducting laser refractive procedures.

Sustainability

An audit of unnecessary duplication of human leukocyte antigen testing for uveitis in an Australian tertiary hospital

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Purpose: Human Leukocyte Antigen (HLA) tests are commonly ordered for uveitis patients. Repeated testing does not provide new information since these are genetic tests. This study investigates the duplication rate of HLA tests at the Royal Adelaide Hospital.
Method: We retrospectively reviewed uveitis patients from November 2019 to May 2022. Data on HLA tests was extracted from electronic medical records to identify duplicates. We recorded the ordering specialty, position, result and timing of tests, and analysed the data using descriptive statistics.
Results: Of 286 HLA tests performed, 46 (16.1%) were duplicates: 1 HLA-A29, 5 HLA-B51 and 40 HLA-B27. Duplication was associated with a higher total number of total test orders (mean 319 vs. 174, $p = 0.02$). Neither the previous test result (duplicates constituted 17.4% of positive results vs. 16.0% of negative results, $p = 0.81$) or the seniority of the ordering doctor (12.4% of orders by junior doctors vs. 20.0% by senior doctors, $p = 0.10$) were significant factors. The median interval between the previous test and duplicate test was 24.7 months. Ophthalmology ordered 25 duplicates, rheumatology 7 and other/unknown specialties 14. The direct cost of duplicate tests was $1,865 based on the Medicare Benefits Schedule rebate.
Conclusion: We observed a high rate of test duplication. Duplicated HLA tests result in substantial indirect costs related to staffing, waste production and carbon emissions. Contributing factors may include insufficient time to review electronic medical records and the use of standard order sets. Implementing electronic medical records alerts to prevent test duplication could reduce costs and the carbon footprint.

Evaluating the impact of education and clear guidance on waste sorting and point-of-care recycling for intravitreal injections

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Background: Healthcare waste management has become an increasingly important aspect of medical care delivery globally. Majority of medical waste is sent to landfill, contributing to the healthcare sector's carbon footprint. This study aims to evaluate the effectiveness of education and clear guidance on proper waste sorting and point-of-care recycling of waste generated from intravitreal injections (IVI).
Methods: A prospective unmasked interventional study examining the effect of a systematic waste management

system was conducted over 12 weeks at a large tertiary referral centre. The waste management system involved: (i) a control period; (ii) pre-education period with no clear signage for IVI waste sorting; (iii) an intervention period with clear signage; and (iv) a follow-up period after three months with no clear signage. The number of injections administered and waste amounts were recorded. Before the intervention, a survey was also provided to staff to assess perceptions of IVI waste sorting practices.

Results: 94.1% of survey respondents stated that the greatest barrier to recycling was lack of knowledge. The control period ($n = 112$ injections) generated 26.9kg of waste (17 kg salvageable, 9.9 kg unavoidable). The pre-education period ($n = 107$ injections) generated 22.4 kg of waste, 47% of which was correctly sorted. The intervention period ($n = 108$ injections) generated 21.8kg of waste, 83% of which was correctly sorted. This represents a 36% increase in proportion of IVI waste that was correctly sorted ($p < 0.001$).

Conclusions: This study demonstrates a significant reduction in environmental waste generated from IVI using an easily implementable educational point-of-care recycling sorting strategy.

Alcohol is sufficient disinfection for reusable tonometer tips

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Purpose: We aimed to review the data on systemic and ocular infections caused by tonometry, and in vitro evidence on disinfection methods, to derive a health economic argument for changes to practice of disinfection of prisms for Goldmann applanation tonometry (tonometer tips).

Methods: This was a targeted literature review and we also reviewed suspected infections from tonometry at Royal Victorian Eye and Ear Hospital over nine years.

Results: There are no known cases of systemic disease, including prion disease, human immunodeficiency virus or viral hepatitis transmission attributable to tonometry. Corneal infections are multifactorial and tonometry is not recognised as a risk factor for any serious eye infection. Documented outbreaks of adenoviral epidemic keratoconjunctivitis (EKC) occur at eye clinics, but this cannot be shown to be caused or exacerbated by tonometry. In sum, there have been no quality adjusted life years ost due to complications of tonometry, and increased health expenditure to reduce this risk further is not justifiable or sustainable.

Conclusion: The actual risk of serious infection from tonometry is near zero and, despite perceived risk, we cannot justify any resource use to reduce it. This review has contributed to development of a new RANZCO guideline on routine tonometry, resisting the pressure to use single-use tonometer tips. The project identified how national disinfection standards were established that incorrectly designated contact with the tear film as high risk when it would appear to be extremely low risk.

Tracing the barriers to decarbonising ophthalmology: A review

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As climate change demands increasingly urgent mitigation of greenhouse gas emissions, the health sector needs to do its part to decarbonise. Ophthalmologists share concerns about climate change and seek opportunities to reduce their environmental impact. When measuring the footprint of ophthalmology, major contributions are from patient travel to clinics, and from the large amounts of single-use disposable materials that are consumed during surgeries and sterile procedures. Ophthalmic services in India have already demonstrated systems that consume far fewer of these products through efficient throughput of patients and the safe reuse of many items, while maintaining equivalent safety and quality outcomes. Choosing these low-cost low-emission options would seem obvious, but many ophthalmologists experience barriers that prevent them operating as Indian surgeons do. Understanding these bar- riers to change is a crucial step in the decarbonisation of ophthalmology and the health sector more broadly.

Eye on the horizon: Mapping the carbon footprint of our multi-state workforce

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Purpose: Carbon footprint attributed to healthcare represents approximately 7% of Australia's total emissions. The purpose of this audit was to identify the potential carbon footprint of a large, multi-centre ophthalmic group from the perspective of staff transport.
Method: Anonymous survey of staff work transport activity, distance travelled and sustainability knowledge. Analysis was applied to state, occupation and mode of transport.
Results: $N = 187$ replies (34.3% response) across four states (Victoria, New South Wales, Queensland and South Australia). Between 75.7% and 100% of staff across states worked >20 hours per week. Further, 72.70%–86.70% staff drove a car to work (range 4–532 Km per week). Petrol cars remained dominant leading to approximately 1.48 metric tons CO_2 emissions. Tram and bus activity estimated footprint of 0.07 and 0.30 metric tons respectively. The percentage of staff cycling or walking to work varied between 0% and 13.8% across states. Technical and administration staff travelled further to work. Over 40% of technical staff travelled >200 km each week to work. Work from home was variable with administration representing the largest cohort.
Conclusion: Although all aspects of healthcare practice contribute to the total carbon footprint, transport remains a significant factor. This remains difficult to minimise however understanding the relative impact remains a sound investment in increasing knowledge and understanding. Through a practice audit, we have estimated the carbon emissions due to staff transport. This is expected to underestimate the total contribution however remains both a novel and valuable assessment in local ophthalmic audit and practice.

Fewer follow-ups, fewer footprints: Estimating carbon savings from reduced post-op eye clinic visits

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Purpose: The "choose wisely" campaign aims to help patients minimise costs and time while maintaining optimal care. Australia has the highest per capita greenhouse emissions of industrialised countries therefore, reducing extra visits may have further benefits. Immediate post-operative care presents an option for refining the patient care process. The purpose of this audit was to identify potential reductions in carbon emissions following the decision to incorporate same-day post-operative visits in a busy refractive surgery centre.
Method: Analysis of refractive surgery patients across 12-month period at a single clinic in Sydney (2023). Total carbon emission calculated by patient address (km from clinic per Google Maps) based on average mileage/emissions (https://carbonpositiveaustralia.org.au/carbon-footprint-calculator/).
Results: $n = 603$ patients were operated on through study period (procedure requiring same or next day post-operative visit). Forty-six patients removed representing regional patients expected to stay locally and not be impacted by the additional full return post-operative visit. Total estimated kilometres saved were 15,396 which estimated a reduction of 4.40 tonnes of CO2 emission. Two eyes underwent a re-float procedure on same day representing a safety measure.
Conclusion: Incorporating the "Choose wisely" philosophy represents a balance of patient care and good practice. Moving to a same day post-operative visit saves time and decreases secondary financial costs for patients and carers. In the presence of a confirmed safety profile, this presented additional environmental benefits by reducing carbon emissions representing a small, yet tangible reduction to overall global emissions. This may represent an example for other clinics and potentially, other post-surgical review protocols.

Training and Education

A pilot survey of an Artificial Intelligence-generated presenter in a patient information video about facedown positioning

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Introduction: Video education is commonly used patient education tool, however the impact of integrating intelligence remains to be explored. This study aimed to examine the acceptability of an Artificial Intelligence

(AI)-generated presenter in patient information video about face-down positioning after vitreoretinal surgery.
Method: Participants who were planned for vitreoretinal surgery in which face-down positioning was recommended were prospectively enrolled at the Royal Adelaide Hospital. Participants were provided with an educational video, presented by an AI-generated presenter. A pre- and post-video questionnaire was administered electronically.
Results: There were 15 participants included in the study. In the pre-video questionnaire, most participants rated their awareness of special equipment for positioning as 'not aware' (33%) and 'slightly aware' (33%), with a median six-item Spielberger State-Trait Anxiety Inventory score of 12 (interquartile range 12-15). In the post-video questionnaire, the majority of participants rated the quality of the video as 'excellent' (73%) and would recommend it to others (73%). The majority of participants strongly agreed that they understood the AI presenter (60%), felt at ease with the presenter (60%) and that they trusted the presenter (60%). Four participants (22%) disagreed with the statement 'I was aware the presenter was computer generated'.
Conclusions: Video-based education may provide information that patients find useful, particularly for physical maneuvers such as face-down positioning. The use of an AI-generated presenter was well received by the majority of patients. Further research regarding the use of AI to develop educational video content is warranted.

Evaluation of human research ethics committees submission fee for low-or-negligible risk projects in Australia

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Purpose: Most research conducted by junior medical staff and students involve retrospective studies, which typically pose low or negligible risk to patients. Unclear human research ethics committees (HREC) requirements have led many journals and institutions to mandate HREC submissions for all research, burdening HRECs and prompting high fees. Many of these projects remain unpublished, adding to the financial and time burden for unpaid researchers. This study evaluates HREC submission fee for low-or-negligible risk (LNR) projects in Australia.
Method: An online search of HREC websites in Australia was conducted to review HREC submission fee for LNR projects.
Results: Average HREC submission fee for non-sponsored and commercially sponsored LNR projects were approximately $360 (range $80–$1000) and $1875 (range $220–$6250) respectively. Some institutions offered fee discounts or waivers for affiliates. New South Wales had the highest fee of $1000 for non-sponsored projects. In Victoria, fees varied among different hospitals, with some not charging for LNR projects. Fee schedules for Queensland, Tasmania and South Australia were not readily accessible online. This study reveals the financial strain of HREC submission for LNR projects, which may discourage junior medical staff and students from pursuing research. Despite potential HREC exemptions for retrospective studies, many journals and institutions still require a HREC review exemption letter. Some HRECs decline exemption letter requests, insisting on HREC submission and payment.
Conclusion: The financial burden of HREC submission fee across Australia for LNR projects warrants discussions of transparency and fee minimisation. Implementation of HREC exemption checklist or fee waivers for LNR projects may alleviate this burden.

Improving sympathetic ophthalmic risk communication in consent for intraocular surgery

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Purpose: Sympathetic ophthalmia (SO) is a rare complication of intraocular surgery that can lead to bilateral visual loss. Ophthalmologists may frequently omit the risk of SO during preoperative counselling due to the low incidence. We sought to investigate the rate of specific counselling of the risk of sympathetic ophthalmiaSO and factors that may influence this. Additionally, we present various probability frameworks to assist clinicians in communicating this risk effectively.
Methods: We retrospectively reviewed 1415 consent forms for ophthalmology operations performed at the Royal Adelaide Hospital between 12 March 2021 and 13 March 2022. Operations included vitreoretinal, cataract, glaucoma and oculoplastic surgeries. The primary outcome was the rate of documented preoperative counselling of the risk of SO. We derived probabilities of SO using binomial modelling in our dataset and in a hypothetical surgeon's lifetime.
Results: There were 52 (3.67%) cases where specific mention of the risk of SO was documented. Our sample had no SO cases after a minimal follow-up of 8 months.

Binomial distribution demonstrated that the risk of at least one case of SO within our dataset was 13.2%. In a hypothetical situation of 10,000 operations, the chance of encountering at least one case of SO yielded a 63.2% chance.

Conclusions: The risk of SO is infrequently included in preoperative risk counselling for ophthalmic surgery. A probabilistic approach to communicating for clinicians to understand this risk using binomial distribution and other statistical models may also improve clinician communication of this risk to patients.

Optimising surgical training in paediatric ophthalmology—Perspectives from a major tertiary metropolitan teaching centre

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Purpose: To quantitatively evaluate paediatric strabismus surgery teaching at one training institution and make recommendations to the current training curriculum.

Method: A retrospective review of strabismus surgery performed at the Royal Children's Hospital Melbourne over a five-year period. Statistical analysis was undertaken using IBM SPSS statistics (version 24). The data was analysed in each of the following sub-sets: trainee, Fellow, consultant as primary operator. Descriptive statistical methods were used to report the basic demographic and surgery details as per operator. Pearson's correlation was used to investigate the association between variables while chi-square tests were used to test the distribution of categorical variables. Multivariate analysis was undertaken to understand the contribution of variables towards the surgical outcome. *P*-values of < 0.05 were considered statistically significant.

Results: Findings relevant to surgical teaching included: operating time for a trainee was on average 57.8 min $\pm$ 16 min per case, surgical alignment outcomes were excellent in up to 45% of cases, there was a significantly higher incidence of adverse events in trainees compared to Fellow or Consultant cases (71.4% vs. 46.7%, $p = 0.003$).

Conclusion: We propose practical recommendations for surgical supervisors to consider implementing. Surgical operating time is impacted by case selection and reinforces the need for mindful preparation of surgical lists. Surgical teaching should focus teaching on common pitfall areas by using multimodal educational tools: didactic teaching, instructional videos, web-based tutorials. Ultimately this could be complemented by more sophisticated technology such as virtual simulators.

Are you more intelligent than artificial intelligence? The appraisal of ChatGPT as an effective learning medium

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Background: Ophthalmology education in medical schools is diminishing globally, resulting in poor knowledge and confidence in graduate doctors. Hence, developing novel strategies to bolster ophthalmic knowledge is crucial. Critical appraisal, a form of active learning, promotes learner engagement and increases knowledge retention. With the emergence of Artificial Intelligence-language models such as ChatGPT, this study investigated the effectiveness of critical appraisal of ChatGPT-generated answers on medical students' ophthalmic knowledge and confidence. Furthermore, we gauged student acceptance to determine its practicality and guide future improvements.

Methods: An educational evaluation study was conducted on 41 participants, with three key topics for appraisal: retinal detachment, glaucoma and orbital cellulitis/abscess. A 10-question multiple choice questionnaire (MCQ) was conducted before and after the activity to assess knowledge changes. A 5-point Likert scale was utilised for self-assessment of MCQ and ophthalmic knowledge confidence, and the student acceptance factors: enjoyment, perceived usefulness, and overall satisfaction.

Results: Mean MCQ scores demonstrated a 10% increase in knowledge, a 22.7% increase in MCQ confidence and a 15.61% increase in confidence regarding broader ophthalmic topics. While participants generally perceived the activity as "Somewhat useful", feedback suggested it was "slightly less enjoyable than other online learning activities". Overall satisfaction was heavily correlated with perceived usefulness and enjoyment.

Conclusion: With diminishing ophthalmic education and emerging Artificial Intelligence-language models, critical appraisal of ChatGPT-generated answers is

suggested to have a significant impact on bolstering medical students' ophthalmic knowledge and confidence. Critical appraisal should be utilised in conjunction with conventional teaching to provide valuable and enjoyable learning experiences.

Ophthalmologists of tomorrow: Evidence supporting criteria used in the Australian ophthalmology trainee selection process

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Purpose: To identify which criteria used in the RANZCO trainee selection frameworks predicts clinical performance during and after training.
Method: We conducted a cross-sectional analysis of the current Australian ophthalmology training selection frameworks. Results from a previously conducted umbrella review by Muecke et al., which explored which medical and surgical specialty training selection criteria predict performance during and after training, were compared to RANZCO's training selection criteria.
Results: We report that academic performance in medical school and traditional interview scores are the only criteria utilised by RANZCO that predict performance. There was not enough evidence in the umbrella review to make an informed conclusion regarding RANZCO's selection criteria of sport, clinical unaccredited experience, and multiple-mini-interviews. RANZCO selection criteria that we found to have non-predictive value include research publications, higher degrees, music, volunteering and leadership positions. We report no findings for the RANZCO selection criteria of Indigeneity, higher degrees, grants and scholarships, presentations and posters, and regional exposure.
Conclusion: Academic performance during medical school and traditional interview scores have the strongest evidence supporting ophthalmology performance. While other criteria utilised by RANZCO are not shown to predict performance, other applicant attributes including regional exposure, and diversity, equity and inclusion factors are vital to meeting the eyecare needs of a greater proportion of Australia. This study is limited as the syntheses included in the umbrella review were not specific to ophthalmology and were predominantly US based. The generalisability of US findings remains unknown, and as such, future research should aim to increase the evidence surrounding trainee performance prediction within Australia.

E-learning fundoscopy to optimise clinical skills

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Purpose: Recognising fundal pathology is crucial for the diagnosis of potential life or vision threatening conditions. We investigated whether an e-learning module could enhance identification of important fundal pathology.
Method: A comparative study involving 81 first-year medical students at Sydney University with no prior ophthalmology exposure was conducted. Students completed an assessment consisting of 10 cases validated by ophthalmology and emergency physicians. Students assessed whether the fundus was normal/abnormal, identified pathology and provided a diagnosis. They then completed a fundus education e-learning module before repeating the assessment two to four weeks after. Pre- and post-test responses were matched using unique IDs. Data was analysed using descriptive statistics and paired t-tests.
Results: The mean age was 24.2 years and 53.1% were male and 46.9% female. The average time for test completion decreased from 15.7 to 11.9 minutes (p <0.05) and the mean test score (out of 50) improved significantly from 29.9 $\pm$ 5.8 to 45.7 $\pm$ 2.5 (p <0.05). A large proportion of students who provided incorrect answers initially were able to accurately identify pathology in the second test (61.7% for papilledema, 60.4% for glaucoma, 56.7% for macular degeneration, 54.3% for retinal detachment, and 41.9% for vein occlusion). Moreover, 97.03% correctly identified whether a fundus was normal or abnormal after module completion compared to 38.3% pre-module. Students reported their understanding had greatly improved in 74.6% of cases.
Conclusion: The e-learning module significantly improved diagnostic accuracy and helped students distinguish between normal and pathological fundi. With the accessibility of non-mydriatic and smartphone cameras, this learning could prove even more practical.

Uveitis

Development of a novel decision tree-powered mobile app for differentiating uveitis phenotypes

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Purpose: To develop a mobile app (the 'Uveitis Tree') that aids in differentiating the 25 most common uveitis phenotypes using a consensus-based algorithm created with the Standardization of Uveitis Nomenclature (SUN) classification criteria and expert knowledge. The app is targeted for ophthalmology trainees and non-uveitis specialist ophthalmologists.
Method: Twenty-five of the most common uveitis phenotypes, as identified by the SUN group, were classified into anterior, intermediate, and posterior/panuveitis modules. A clinical vignette presentation was constructed for each phenotype, and the decision tree was developed to distinguish between each case. Each decision node was constructed based on the SUN classification criteria and expert knowledge, focusing on clinical features while minimising the use of laboratory investigations. The decision tree was refined until a consensus was reached among a panel of uveitis consultants and then integrated into the app.
Results: The Uveitis Tree included modules with 18 questions to differentiate 10 anterior uveitis phenotypes, four questions for seven intermediate uveitis phenotypes, and 12 questions for 18 posterior/panuveitis phenotypes. Cases the algorithm could not distinguish were diagnosed as 'Undifferentiated Uveitis'. The algorithms were validated with super-majority agreement (100%) by seven uveitis consultants, with comments reviewed and reconciled. The app was published for pilot usage.
Conclusion: We have developed the world's first mobile app that uses the SUN classification criteria and expert knowledge to help differentiate common uveitis phenotypes. This app is expected to enhance clinician learning and diagnostic accuracy in uveitis, potentially reducing the need for extensive laboratory investigations.

Incidence of uveitis and vasculitis following faricimab intravitreal injections

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Purpose: To determine incidence of uveitis and vasculitis following faricimab given via intravitreal injection (IVI) in the treatment of age-related macular degeneration and diabetic macular oedema.
Method: An audit of data at a multi-surgeon Australian group medical retina practice.
Results: 11,457 doses of faricimab had been given in total at the participating practice at the time of the audit, and instances of uveitis and vasculitis were recorded in three patients during that time (0.03%).
Conclusion: There is no statistically-significant association between the use of faricimab intravitreal injections for the treatment of diabetic macular oedema and age-related macular degeneration, and uveitis and vasculitis.

Clinical profile of 94 patients with anterior scleritis in a tertiary eye care centre in Eastern India

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Purpose: To study the clinical profile of 94 patients with anterior scleritis in a tertiary eye care centre in Eastern India.
Method: Retrospective observational case series of 94 patients between January 2008 and December 2022 with a minimum follow up of 6 months. Watson and Hayreh's classification was used to categorize the scleritis. A comprehensive ocular examination and a detailed laboratory investigations were done for all patients. Corticosteroid and immunomodulatory therapy were given under the supervision of an Internist.
Results: The mean age at presentation was 51.66 ± 14.71 years (range 14-87 years). Male to female ratio was 1: 1.29. Pain and redness were the commonest symptoms. Bilateral involvement was observed in 31.9%. 61.7% were idiopathic. 14.9% had rheumatoid arthritis, 8.5% had spondyloarthropathy and 7.4% had granulomatosis with polyangiitis as the underlying systemic autoimmune disorder. Methotrexate was the most common immunosuppressive used. Three patients with recalcitrant diffuse anterior non- necrotizing scleritis received biologics (adalimumab—2, infliximab—1). Recurrence of inflammation was observed in 22.3% patients. Cataract was the commonest complication (51.6%). Vision remained stable in 42.6% patients, improved in 41.5% and worsened in 15.9%.

Conclusion: Diffuse non necrotising scleritis was the commonest presentation in our cohort. Main underlying systemic associations were rheumatoid arthritis, spondyloarthropathy and granulomatosis with polyangiitis. A favourable outcome was achieved with adequate immunosuppression.

Vitreoretinal Surgery

Risk factors for iatrogenic retinal breaks in eyes requiring surgical induction of posterior vitreous detachment

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Purpose: To explore risk factors for retinal breaks (RB) during the surgical induction of posterior vitreous detachment (IPVD) and to evaluate the characteristics of break location in this population of eyes.
Methods: We retrospectively reviewed electronic records for all adult patients undergoing 25G or 27G vitrectomy surgery between November 2019 and January 2024 requiring intraoperative IPVD. We excluded pre-existing PVD. The outcome measure was non-sclerotomy related iatrogenic RB. We assessed the effect of age, gauge size (25G vs. 27G), surgical indication (ERM, MH/VMTS, VH, Other), and lens status (Phakic vs. Aphakic/Pseudophakic) on the odds of RB.
Results: Among 234 eyes included in our study, 12.8% experienced a RB during IPVD. Breaks were predominantly located in the inferior retina (82.6%). Multivariable analysis revealed there was no effect of gauge size on RB rate (27 compared to 25G, odds ratio [OR] 0.409, 95% confidence interval 0.149–1.12, $p = 0.082$), however inclusion in the model significantly improved model fit (generalized score test, p = 0.0387). Age (OR 0.978, 95% CI 0.955–1.00, $p = 0.062$), lens status (Phakic OR 0.589, 95% CI 0.229–1.51, $p = 0.172$) and surgical indication (all $p > 0.05$) were not significantly associated with odds of RB.
Conclusions: The high rate of iatrogenic RB in eyes requiring IPVD is consistent with previous studies. Age was not significant in contrast to previous studies. Similarly, neither gauge size, surgical indication, nor lens status was associated with RB. However, gauge size improved the model fit. Higher-powered studies are needed to further explore these associations which may inform operative planning.

Laser focused—Empowering rural communities with advanced therapies for diabetic macular oedema

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Purpose: Intravitreal anti-vascular endothelial growth factor (VEGF) injections (IVI) are vision saving in patients with diabetic macular oedema (DMO). However, poor compliance has been reported amongst rural and remote Australians due to various factors such as financial constraints, geographic isolation, occupational commitments and procedural anxieties. Subthreshold micropulse laser (SML) is a non-scarring form of macular laser that may be used as monotherapy or in combination with intravitreal anti-VEGF injections. Macular laser may reduce the number of anti-VEGF injections required as demonstrated in a recent study. SML may serve as a useful adjunct to anti-VEGF injections, particularly in rural and remote settings where a reduction in the number of anti-VEGF injections could significantly improve compliance and preserve vision.
Methods: A search of six databases was conducted. A meta-analysis of mean differences was performed including subgroup analyses where appropriate. Primary outcome was the number of IVI (anti-VEGF injections) at 12–14 months. The secondary outcomes were the change in central macular thickness (CMT) and best corrected visual acuity (BCVA) at 6–8 months, and 12–14 months.
Results: A total of 13 papers including 8 randomised clinical trials and 5 retrospective clinical studies were included in our study, capturing 625 eyes of 555 patients. Overall, the risk of bias was moderate for these studies. We found a significant reduction in the number of IVI at 12–14 months in patients with poor visual acuity at baseline (6/18 Snellen or worse) with combination therapy (IVI + SML); mean difference −2.25 (95% confidence interval −3.35, −1.15; $p < 0.05$). Our analysis also showed significant improvements to both BCVA and CMT at the 95% confidence intervals at 12–14 months −0.94 (−1.67, −0.20) and −1.92 (−3.52, −0.32) respectively with combination therapy (IVI + SML).
Conclusion: Our findings demonstrate a significant reduction in IVI burden as well as improved BCVA and a reduction in CMT in the combination group (IVI + SML) compared to IVI monotherapy group. SML would be a valuable and cost-effective addition to the management of diabetic macular oedema in rural and remote patients.

Combination therapy may improve patient compliance due to the reduced frequency of intravitreal needle administrations.

The role of patient demographics and interventions during vitrectomy on the development of post-operative ocular hypertension

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Purpose: This study aims to determine the influence of patient demographics and interventions during vitrectomy on the development of ocular hypertension (OHT) post-operatively.
Methods: A retrospective case note review of 561 patients who underwent pars plana vitrectomy from December 2019 to March 2021 was undertaken. Operation notes were reviewed and all interventions including the use of tamponade, cryoretinopexy, laser, scleral buckle (SB), intravitreal injection (IVI), phacoemulsification and intraocular lens implantation, lensectomy and secondary intraocular lens implantation were recorded. All patients were followed for up to 12 months, binary logistic regression and cox survival analysis were undertaken with the collected data.
Results: The mean age of participants was 65.16 ± 14.80 years, with 58% of patients being males. Approximately 26.5% of participants developed OHT in the follow up period. In the final binary logistic model male gender (odds ratio [OR] 1.770, 95% confidence interval [CI] 1.182–2.651, $p = 0.006$), increasing age (OR 0.979, 95% CI 0.967–0.992, $p = 0.001$) and SB (OR 2.829, 95% CI 0.937–8.547, $p = 0.065$) were found to be associated with the development of OHT post-operatively. In contrast IVIs (OR 0.413, 95% CI 0.223–0.766, $p = 0.005$) had an inverse association with the development of OHT. The cox-regression survival analysis identified the same patient demographics and intraoperative interventions to influence time to OHT development.
Conclusion: Males, younger individuals and patients who undergo SB during vitrectomy are at increased risk of developing post-operative OHT and may warrant closer monitoring.

A characterisation study of the anterior segment morphology of long-term oil patients

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Purpose: To characterise the anterior segment (AS) morphology of patients with long-term SiO for in situ (>12 months) following pars plana vitrectomy (PPV).
Methods: This prospective, comparative characterisation study was conducted between January 2022 to March 2024. Patients were included and sorted based on if they had undergone PPV without long-term silicone oil (SiO) or had SiO in situ for at least 12 months at the time of review and image collection. The Zeiss Cirrus HD-OCT (Carl Zeiss, Dublin, California, USA) was employed to image the ASs of study patients. Software within the OCT was used to collect the central corneal thickness (CCT), anterior chamber diameter (ACd), anterior chamber depth (ACD), chamber area, temporal irideocorneal angle and nasal irideocorneal angle.
Results: A total of 78 eyes from 42 total patients were included, their mean age was 63.74 ± 19.13 years and 64.29% (27/42) of participants were males. Patients who underwent PPV with and without long-term SiO were found to have no significant difference in central corneal thickness, ACd, ACD, chamber area and irideocorneal angles compared to their fellow unoperated eyes. The multivariate analysis of variance (of the pooled data noted a statistically significant difference in the ACd of PPV with long-term SiO eyes compared to PPV without long-term SiO and unoperated eyes ($p \leq 0.001$).
Conclusion: These findings suggest PPV with long-term SiO may influence the AS morphology of patients, its influence on the development of glaucoma remains unclear and warrants further investigation.

Pre-prepared fortified intravitreal antibiotics to reduce delay of initial treatment for cases of suspected endophthalmitis

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Purpose: Suspected endophthalmitis requires urgent intervention via a vitreous sample and intravitreal drug therapy ("tap and inject"). Literature suggests a <60-minute timeframe for this procedure. Current RANZCO guidelines recommend reconstituting intravitreal antibiotics as needed for suspected cases. This study evaluates the impact of pre-prepared intravitreal antibiotic syringes on real-world door-to-needle time and other delay factors in treating suspected endophthalmitis.
Method: A 10-year retrospective, single-centre cohort study reviewed all suspected endophthalmitis cases at the Royal Brisbane and Women's Hospital from January 2014-January 2024. Pre-prepared intravitreal antibiotic syringes were introduced in September 2020. Patients were divided into two groups: those with pre-prepared antibiotic syringes and those without. The primary outcome was door-to-needle time; secondary outcomes included other delay factors.
Results: The overall door-to-needle time averaged 180.6 minutes with a median of 159 minutes (95% confidence interval [CI] 152.5–208.6). Before pre-prepared syringes, the median was 162.5 min, with an average of 192.3 min (95% CI 143.4–241.1). Post-introduction, the median dropped to 150 min, with a mean of 169.6 min (95% CI 137.5–201.8), $p = 0.42$. The mean door-to-needle time improved by 22 min (11.8%). Median and mean presenting visual acuity was HM (IQR CF-HM). The average patient age was 72.9 years, median 75 years (IQR 67.3–80.8), with 53.4% female ($n = 31$). Expedited treatment was associated with out-of-business-hours presentation, rural residence and referrals from other healthcare professionals.
Conclusion: Pre-prepared intravitreal antibiotic injections improved door-to-needle time by 22 minutes and resulted in better final visual acuity (LogMAR 1.3 vs. LogMAR 1.7, $p = 0.21$). They also reduce medication reconstitution errors and nosocomial infection risks.

Scoping review of non-surgical treatment options for macular holes

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Purpose: Macular holes (MH) are full-thickness retinal defects affecting central vision. While vitrectomy with inner limiting membrane (ILM) peel is the conventional MH treatment, non-surgical alternatives are gaining interest to mitigate surgical risks. This study conducted a comprehensive literature review and analysis of non-surgical MH management.
Method: A systematic literature search was conducted on PubMed, Embase, Scopus, and the Cochrane Library from 1 January 1973 to 13 September 2023. Treatments included laser therapy, carbonic anhydrase inhibitors, non-steroidal anti-inflammatories, steroids (topical, subtenons, peribulbar, intravitreal), intravitreal gas, anti-vascular endothelial growth factors and ocriplasmin injections. Data extraction covered study details, patient characteristics, MH features, treatment outcomes, and recurrence rates.
Results: The initial search yielded 3352 articles, refined to 83 articles which met inclusion criteria following screening. Overall reported anatomical closure rates were 36% with laser photocoagulation, 37% with intravitreal ocriplasmin, 55% with intravitreal gas. Closures were more frequently observed with topical non-steroidal anti-inflammatories (79%), steroids (84%) and carbonic anhydrase inhibitors (73%). Closures were more often observed in patients with smaller MH and in the presence of cystic macular oedema.
Conclusion: Although non-surgical MH management approaches show potential for conservative therapy, evidence is limited to support routine use. Stage 1 and traumatic MH may benefit from a short period of observation but the gold standard approach for full-thickness MH remains to be vitrectomy with ILM peel.

Early pars plana vitrectomy (<72 hours) in the management of post-intravitreal injection related endophthalmitis

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Purpose: To assess the role of early pars plana vitrectomy (PPV) in the management of post-intravitreal injected (IVI) related endophthalmitis in relation to final visual acuity obtained in a quaternary hospital in Queensland, Australia and compare this to other countries.
Method: A retrospective cohort study was performed on all patients at a Queensland quaternary hospital who underwent an anterior or vitreous chamber paracentesis for suspected endophthalmitis from January 2014 and

December 2019. Inclusion criteria were a clinical diagnosis of microbial endophthalmitis confirmed by a consultant ophthalmologist, documented anterior chamber fibrin, hypopyon, vitreous opacities present clinically or on B-scan ultrasound. Primary outcome measure was change in visual acuity from presentation to last follow-up provided there was at least six months. Patients were classified by endophthalmitis aetiology and treatment: medical treatment, early PPV (within 72 h), and late PPV. The association between change in acuity and treatment in post-IVI related endophthalmitis group was assessed in subset analysis.

Result: There were 102 confirmed cases of infectious endophthalmitis, 74 exogenous and 28 endogenous. Post-IVI related endophthalmitis accounted for 27 cases. Amongst patients with six or more months of follow-up (82/102), there was a significant improvement in visual acuity. When stratified by treatment group, there was weak evidence for an improvement in the early PPV treatment group ($p = 0.07$). However, in subset analyses, there was no evidence for a difference in the post intravitreal injection endophthalmitis group ($p = 0.70$) with respect to final visual acuity.

Conclusion: Early PPV may improve visual outcomes for patients with endophthalmitis.

GORE-TEX re-suturing of existing intraocular lenses: Two-point fixation using radially oriented sclerotomies

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Purpose: Late dislocation of intraocular lenses is an increasing phenomenon, particularly older style polymethylmethacrylate lenses that were scleral sutured with Prolene. We present a technique for GORE-TEX re-fixation of existing intraocular lenses with two eyelets, using a simple suture technique through radially oriented sclerotomies.

Methods: Consecutive case series, May 2023–May 2024. Two radially oriented sclerotomies are made using a 25 G trochar, at 3.5 mm and 1.75 mm from the limbus, in the meridian of each eyelet that requires re-suturing. A CV-8 GORE-TEX suture is passed through the eyelet in the anterior vitreous, in a handshake fashion using end-grasping forceps.

Results: Fourteen eyes were included, 13 male patients and one female patient. Mean age was 63 years (32-80). Intraocular lenses included Alcon CZ70BD ($n = 12$), Bausch & Lomb P366UV ($n = 1$), and Bausch & Lomb enVista ($n = 1$). Indication for re-fixation included subluxation/dislocation ($n = 12$), uveitis glaucoma hyphema syndrome ($n = 1$) and exposed Prolene scleral suture ($n = 1$). Both eyelets were re-fixated with GORE-TEX in 10 eyes, and a single eyelet in four eyes. Median preoperative acuity (uncorrected) was 'counting fingers' (6/9–HM). Median post-operative acuity (uncorrected) was 6/9 (6/6–6/48). All lenses had excellent post-operative centration and stability. Complications included mild and self-limited hyphaema ($n = 2$) and hypotony ($n = 1$); one case of post-operative macular hole occurred due to contraction of an existing epiretinal membrane (final acuity 6/9 following membrane peel).

Conclusions: This technique offers reliable intraocular lens centration and stability without the need for lens explant, scleral flaps, or complex suturing.

Outcomes for scleral buckling after failed pneumatic retinopexy

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Introduction: To assess visual and anatomical outcomes of eyes undergoing secondary scleral buckle (SB) surgery following unsuccessful pneumatic retinopexy (PR) for rhegmatogenous retinal detachment (RRD).

Methods: Retrospective study over 12-year period on patients who underwent secondary SB procedures after failed primary PR. Clinical parameters such as: best-corrected visual acuity (BCVA), lens status, macula status and details of RRD and subretinal fluid were assessed at presentation, prior to additional procedures and follow-up time points (6 months, 1 year and last visit). Statistical comparisons were made using Brown-Forsythe and Welch analysis of variance tests with significance levels set at $p < 0.05$.

Results: Fifty-four eyes with adequate follow-up were included in the study. Forty-four out of 54 (81.5%) eyes had successful retinal reattachment with secondary SB alone, the remainder underwent subsequent PPV. Patients presenting with macula-on RRD and had successful secondary SB had no statistically significant change in BCVA from baseline (mean final LogMAR 0.23

± 0.25 (20/34), $p = 0.999$). There was statistically significant improvement in BCVA in those presenting with macula-off RRD who had successful secondary SB (mean final LogMAR 0.32 ± 0.36 [20/42], $p < 0.001$, mean change in logMAR −1.06 ± 0.85). Ten patients presented with macula-off RRD that also had failed secondary SB had significant improvement in final BCVA (mean final LogMAR 0.22 ± 0.28 (20/33), $p = 0.044$) despite the need for an additional PPV to achieve re-attachment.
Conclusions: Secondary SB remains a good option for RRD repair following unsuccessful PR and may avoid the need for PPV.

Aetiology and epidemiology of surgical vitreoretinal presentations in an Australian paediatric population: A seven-year retrospective study

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Background: Paediatric vitreoretinal pathology is distinct from adult cases in both presentation and surgical planning. Here we aim to report the aetiology and epidemiology in children 0–18 years requiring vitreoretinal surgery at a major tertiary paediatric hospital in Queensland, Australia.
Methods: Retrospective review of cases requiring vitreoretinal surgery between May 2015 and October 2022 was conducted. Demographics, ocular and medical history, surgical pathology, procedures performed, and epidemiology data were retrieved. Patients were grouped into three main aetiologies: traumatic, syndromic, or secondary.
Results: One hundred and twenty-four patients, the majority male (87, 70.2%) with a mean age of 10.3 years underwent vitreoretinal surgery. Trauma accounted for 32.3% of cases requiring surgery of which 47% were due to a penetrating eye injury. 35.5% were associated with a syndromic cause with common aetiology including coats, congenital cataract, sticklers, and retinopathy of prematurity. 32.3% developed secondary pathology and retinal detachment was the primary cause for surgery (55%). The average time from symptom onset to presentation was 30 days (SD 56.88) with patients living an average of 306.2 km (SD 558.9) away from the Queensland Children's Hospital. Older age was significantly associated with increased days to presentation in the traumatic group ($p < 0.05$).
Conclusions: This study provides an insight into the aetiology and epidemiology of paediatric vitreoretinal presentations in Queensland, Australia.

Endophthalmitis rate after aqueous-based chlorhexidine antiseptic preparation for intravitreal injections at Christchurch Hospital

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Purpose: There was a nationwide shortage of 5% povidone-iodine antiseptic solution. Our department began transitioning from povidone-iodine to aqueous chlorhexidine (0.1%) for intravitreal injections in June 2023. By the end of November 2023, we had used chlorhexidine for almost all cases of intravitreal injections. To ensure the safety of this transition, we conducted a retrospective study of the endophthalmitis rate.
Method: This is a retrospective audit. We collected all cases of vitreous aspirate and biopsy samples using the infectious control database (ICNET) from 1 June 2023 to 31 May 2024. We utilised pharmacy dispensary records of bevacizumab, aflibercept, ranibizumab, and Ozurdex® to correlate the number of injections.
Results: There were no cases of endophthalmitis related to intravitreal injections from 1 June 2023 to 31 May 2024. The total number of intravitreal injections during this period was 14,159. The previous recorded endophthalmitis rate was 1.2 per 10,000 (0.012%) in our department when using 5% povidone-iodine.
Conclusion: We have demonstrated that using aqueous chlorhexidine (0.1%) as an alternative antiseptic preparation for intravitreal injections is safe based on our one-year data. These results provide us with confidence to continue using chlorhexidine and monitoring its long-term safety profile.

Patient-surgeon discussion in phacovitrectomy surgery: An analysis of patient information, comfort and anxiety

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Purpose: The decision to proceed to a combined procedure is nuanced and involves discussion between surgeon and patient across disease severity, symptoms, potential vision and basic patient needs. The patient's comfort and level of understanding of the preoperative discussion prior to phacovitrectomy is essential to optimising the outcomes on clinical and patient levels. This review aims

to understand patient awareness in a cohort undertaking phacovitrectomy.

Methods: Participants include patients scheduled for phacovitrectomy surgery at Vision Eye Institute Chatswood. Questionnaires were provided prior to the procedure. Focus was on patient expectations, fears and understanding of intended refractive and visual outcomes.

Results: $N = 18$ patients (28 eyes) underwent phacovitrectomy. Mean age 67.2 ± 6.6 years. Mean preoperative metamorphopsia score was 0.24 (range 0–1). Preoperative spherical equivalent was −1.90 ± 5.21D (range −13.88 to 4.00D) with final absolute difference from intended target spherical equivalent 0.24 ± 0.31D. Mean values for patient comfort, understanding and expectations were high overall (range 71.83 "nervous" to 91.94 "understand reason for surgery"). Mean values correlated to expectations for the post-operative need for glasses at respective activities.

Conclusions: Cataract surgery in patients with concurrent ocular conditions require additional discussion to confirm the balance between potential outcomes, utilisation of IOL technology and personal expectations. This pilot study confirms the excellent visual and refractive outcomes possible for phacovitrectomy patients however, important to the surgery discussion, patient responses highlight a strong level of understanding and awareness prior to surgery to the risks, benefits and expectations.

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AUTHOR INDEX