Schulich MEDICINE & DENTISTRY

Western

November 20th, 2026
Program

DEPARTMENT OF OPHTHALMOLOGY

RESEARCH DAY 2026



Spencer Hotel & Conference Centre
551 Windermere Road
London, Ontario
November 20th, 2026

Schulich MEDICINE & DENTISTRY

Western

PROFESSOR AND CHAIR, DEPARTMENT OF OPHTHALMOLOGY

Cindy ML Hutnik MD, PhD



Welcome to the Annual Department of Ophthalmology Research Day. This event is one of the highlights of our academic year providing a day long opportunity to showcase the outstanding research and scholarly work being completed across our department. Thank you to all presenters, mentors, judges, and organizers for your contributions and continued dedication to education, innovation, and patient care. Immense gratitude to the members of the Research Committee and its Chair, Dr. Monali Malvankar-Mehta and our administrative team which began planning a year ago. Tremendous thanks also to our sponsors as none of this would be possible without the collaborative support of all mentioned.

This is the time we celebrate the achievements of our students, residents, fellows, faculty, and research teams. Their commitment to advancing ophthalmic knowledge and patient care continues to strengthen our academic community. We hope you enjoy this year's event.

Dr. Cindy Hutnik
Department Chair



RESEARCH DIRECTOR, DEPARTMENT OF OPHTHALMOLOGY

Monali Malvankar, PhD

Welcome to this year's Ophthalmology Research Day. Research Day highlights the strong commitment to scholarship, mentorship, and innovation within our department. Thank you to everyone who contributed their time, research, and support to make this event possible. We are excited to showcase the excellent work being done by our trainees, faculty, and research teams, and we hope you enjoy the presentations throughout the day.

Dr. Monali Malvankar
Research Director

Dr. David J. Mathew

MBBS, MS, FRCS(Ophth)(Glasg), PhD

Decoding Glaucoma Through the Aqueous Humor: From Molecular Signatures to Experimental Models



By the end of this session, participants will be able to:

- Describe how aqueous humor sampling and proteomic and lipidomic profiling can be used to investigate the molecular basis of glaucoma.
- Explain how bioinformatic and integrative pathway analyses can identify disease-associated pathways, biomarkers, and potential therapeutic targets.
- Discuss how findings from patient-derived samples can be investigated further using human trabecular meshwork cell culture and experimental animal models to better understand disease mechanisms and evaluate new treatment strategies.

BIO

Dr. David J. Mathew is a fellowship-trained glaucoma specialist and clinician-scientist at Toronto Western Hospital, University Health Network, and an Assistant Professor in the Department of Ophthalmology and Vision Sciences at the University of Toronto. He completed his glaucoma fellowship at the University of Toronto and subsequently earned a PhD in Laboratory Medicine and Pathobiology, where he investigated lipid mediators, neuroinflammation, and neuroprotective pathways in glaucoma. His translational research program uses patient-derived samples, particularly aqueous humor, combined with high-dimensional proteomic and lipidomic profiling, detailed clinical phenotyping, bioinformatics, and integrative pathway analysis to uncover disease mechanisms and identify biomarkers and potential therapeutic targets. Candidate pathways emerging from these human samples are investigated further using human trabecular meshwork cells and experimental animal models, creating a bedside-to-bench-to-bedside framework that connects clinical observations with mechanistic validation and the development of new treatment strategies. His current research encompasses primary open-angle glaucoma, primary angle-closure disease, secondary glaucomas, inflammatory and lipid-mediated signaling, and precision approaches to predicting disease progression and treatment response. Dr. Mathew has authored 41 peer-reviewed publications, contributed a chapter to the third edition of Glaucoma, delivered more than 50 scientific presentations, and received 12 peer-reviewed grants as principal investigator since 2022. He is actively involved in teaching and mentoring medical students, ophthalmology residents, fellows, and early-career researchers, and his contributions to medical education have been recognized with the University of Toronto MD Program Teaching Award of Excellence. He also contributes extensively to the scientific community as a reviewer for multiple journals, including the American Journal of Ophthalmology, Ophthalmology Glaucoma, Journal of Glaucoma, Scientific Reports, Eye and Vision, BMC Ophthalmology, and the Journal of Clinical Medicine.

Schulich MEDICINE & DENTISTRY

2026

AGENDA

Western

8:30 a.m. *Welcome and Introductions*
Dr. Cindy Hutnik & Dr. Monali Malvankar
Moderator– Dr. David Plemel

8:40 a.m. *Guest Speaker:* Dr. David Mathew

Decoding Glaucoma Through the Aqueous Humor: From Molecular Signatures to Experimental Models

9:10 a.m. – Dr. Richard Zhang, PGY3 (Resident)
Fellow Eye Conversion in Neovascular Age-Related Macular Degeneration: A Systematic Review of Meta-analysis

9:25 a.m. – Abigaile Beamish, Medical Student (Student)
Non-traumatic epithelial cysts of the orbit: Case report and systematic review

9:40 a.m. – Dr. Amy Basilious, PGY4 (Resident)
Predicting Surgical Etiology of Tearing from Patient Symptoms

9:55 a.m. – Alexander Kos, Research Fellow (Open)
Fluorescein Angiography Surveillance of Von Hippel-Lindau Syndrome Retinal Capillary Hemangioma: A Systematic Review and Meta-Analysis

10:10 a.m. – BREAK

10:40 a.m. – Dr. Lucas Foster, PGY5 (Resident)
Dynamic User Interfaces for an Ophthalmic Imaging Workplace - Integrating Research Grad Tools at the Point of Care

10:55 a.m. – Salem Abu Al-Burak, Medical Student (Student)
Watch at Your Own Risk: A Structured Ergonomic Audit of the Most Viewed YouTube Tutorials on Slit Lamp and Indirect Ophthalmoscopy Examinations

11:10 a.m. – Chris Zajner, PGY1 (Open)
Outcomes of Vitrectomy with Internal Limiting Membrane Peeling for Full-Thickness

11:25 a.m. – Dr. Hamza Inayat, PGY2 (Resident)
Optometrist-Led Vision Screening: Enhancing Child Eye Health in Underserved District Schools within Karachi

11:40 a.m. – LUNCH

1:00 p.m. – Welcome Back & Call to Order
Moderator: Dr. John Park

1:05 p.m. – Dr. James J. Armstrong, PGY5 (Resident)
Systemic Inhibition of the Angiotensin System Associated with Reduced Rates of Glaucoma Surgery

1:20 p.m. – William Herspiegel, PGY1 (Student)
Selective Laser Trabeculoplasty Response as Predictor for Gonioscopy Assisted Transluminal Trabeculotomy Success in Glaucoma Management

1:35p.m. – Dr. Anastasiya Vinokurtseva, PGY4 (Resident)
Long-term Outcomes of Gonioscopy-Assisted Transluminal Trabeculotomy: A Systematic Review and Meta-Analysis

1:50 p.m. – Tharin Silva, Undergraduate (Open)
Investigating the Effect of Topical Insulin on Tenon Capsule Fibroblast's Fibrotic Activity

2:05 p.m. – Dr. Khaldon Abbas, PGY2 (Resident)
Invesigating Ingtraocular Lens Tilt in Four-Point Scleral-Sutured Akreos AO060 IOL Implants: A Pilot Study

2:20 p.m. – Victoria Iannetta, Medical Student (Student)
Advancing Glaucoma Care Through Virtual Reality: Comparative Performance of Virtual Reality-Based Visual Field Testing and Humphrey Perimetry

2:35 p.m. – BREAK

2:35 p.m. – Judges Deliberation

2:45 – Awards & Closing Remarks

Dr. Richard Zhang, PGY3 (Resident)

Presentation Title: Fellow Eye Conversion in Neovascular Age-related Macular Degeneration: A Systematic Review and Meta-analysis

Supervisor(s): Dr. Thomas Sheidow

Collaborator(s): Chris Zajner, Alexander Kos, Amy Basilious, Omar Nawara, Andrew Maher, Monali Malvankar, Tom Sheidow

Background: Exudative neovascular age-related macular degeneration (nAMD) is a major cause of blindness. Early detection and intervention of it is crucial for better outcomes. nAMD often affects both eyes and the unaffected eye of patients with unilateral exudative nAMD is often at risk of progression. Published literature reports variable incidence rates of individuals progressing in their second eye.

Objective: To conduct a meta-analysis and systematic review examining the rate of conversion of the fellow non-exudative eye in patients with unilateral exudative neovascular age-related macular degeneration (nAMD) to exudative nAMD.

Methods: A systematic search of EMBASE, Web of Science, and OVID MEDLINE was performed for keywords related to nAMD and fellow eye conversion (last search August 4, 2026). Screening was performed on Covidence. The main outcomes for extraction and analysis were percentage of fellow eyes that converted, and time to conversion. Meta-analysis was performed using STATA 18.0.

Results: Over 2900 studies were screened and 88 studies, with a total of 271015 eyes were included. Among these, there were 16 studies with at least 5 year follow-up. The weighted mean final incidence of conversion to exudative nAMD was 24.7%, with a mean time to conversion of 18.3 ± 3.1 months.

Conclusion: In patients with unilateral exudative nAMD, the fellow eye demonstrates a substantial risk of conversion to exudative nAMD. These findings underscore the importance of surveillance of fellow eyes in patients with unilateral disease to facilitate early detection and treatment. The long-term incidence of fellow-eye conversion lacks evidence to firmly characterize due to a limited number of studies with extended follow-up periods.

Abigaile Beamish, Medical Student (Student)

Presentation Title: Non-traumatic epithelial cysts of the orbit: Case report and systematic review

Supervisor(s): Dr. David Plemel

Collaborator(s): Abu Bakar Butt

Background: Non-traumatic epithelial orbital cysts are rare benign lesions that can present with a variety of nonspecific orbital symptoms and imaging findings. The existing literature on this subject is limited to individual case reports and small case series. Consequently, there is limited understanding of the presentation, imaging characteristics, and management of non-traumatic orbital epithelial cysts. A case report and systematic review may improve recognition of orbital epithelial cysts and inform clinical management for future cases.

Objective: To characterize the clinical features, imaging findings, and management of nontraumatic epithelial orbital cysts through a case report and systematic review.

Methods: A local case is described while MEDLINE, Embase, and Web of Science were systematically searched from database inception until August 2026. Included cases include respiratory epithelial cysts of the orbit and other epithelial lined cysts of the orbit. Studies involving traumatic cysts, dermoid or epidermoid cysts, lacrimal gland cysts, conjunctival cysts, and cysts not involving the orbit were excluded. Data regarding patient demographics, clinical presentation, imaging findings, treatment, and outcomes were extracted.

Results: Of 693 studies screened, 16 studies met inclusion criteria and underwent data extraction. In addition to a local case, most studies were case reports (15/17, 88.2%), while two were case series, representing a total of 19 patient cases. The mean age of participants was 25 years (range 20 days to 88 years). Cysts were most commonly found in the superior or superomedial orbit (N=4, 23.5%), inferior orbit (N=4, 23.5%), and intraconal (N=3, 17.6%). Other locations, or cysts spanning large areas of the orbit were rarer. Computed tomography (CT) scans were the most commonly used imaging modality (N=11, 64.7%). Magnetic resonance imaging (MRI) was also used in some cases (N=4, 23.5%), particularly among pediatric patients. Imaging was primarily used to characterize cyst size, location, and relationships with adjacent orbital structures. Management was primarily either aspiration of the cyst or surgical excision, and all cases underwent treatment of some nature. Clinical outcomes were generally favourable, with four cases explicitly reporting improvement of presenting symptoms and seven cases reporting no recurrence during follow up. The remainder of cases did not report on long-term outcomes or recurrence.

Conclusion: Non-traumatic epithelial orbital cysts are rare lesions with variable clinical presentations and imaging characteristics. In this systematic review, the available literature was predominantly composed of case reports and small case series, reflecting the rarity of these lesions. Despite this heterogeneity, characterization of common presenting features, anatomical locations, imaging findings, and management strategies may aid clinicians in recognizing and managing these orbital cysts.

Dr. Amy Basilious, PGY4 (Resident)

Presentation Title: Predicting Surgical Etiology of Tearing from Patient Symptoms

Supervisor(s): Dr. David Plemel

Collaborator(s): Amera Khalaff

Background: Tearing is a common reason for referral to oculoplastic specialists, yet a substantial proportion of referred patients have reflex tearing or other non-surgical etiologies that do not require subspecialty surgical care. Identifying patient-reported symptoms that predict a surgically treatable etiology could improve triage of referrals and guide primary eye care management.

Objectives: To determine whether patient symptoms predict the presence of a tearing etiology requiring surgical management.

Methods: This prospective, single-center study enrolled adults referred to an oculoplastic specialist at the Ivey Eye Institute for tearing. Participants completed a 4-item symptom questionnaire and underwent a standard assessment for tearing. If patients were symptomatic in both eyes, the eye identified by the participant as having worse tearing was included in the study. If both eyes were equally symptomatic, the right eye was enrolled. Demographic data, referrer diagnosis, specialist diagnosis, and whether tearing had a surgical versus non-surgical etiology were recorded. Diagnoses were categorized as nasolacrimal duct obstruction, appositional abnormalities, punctal and/or canalicular stenosis, and ocular surface disorder/reflex tearing. Multivariate logistic regression modeled surgical etiology against four symptom predictors: epiphora, absence of symptom-free days, no worsening with environmental and/or visual-task triggers, and lack of response to conservative dry eye interventions (ie., artificial tears, warm compresses).

Results: The study included 72 eyes (69.4 ± 13.3 years; 52.8% female). Epiphora was reported by 86.1% (62/72), absence of symptom-free days by 43.1% (31/72), no worsening with environmental and/or visual-task triggers by 20.8% (15/72), and, among those who had trialed dry eye interventions, no improvement was reported by 54.1% (33/61). Tearing etiologies included nasolacrimal duct obstruction in 11 participants (15.3%), appositional abnormality in 10 (13.9%), punctal stenosis in 12 (16.7%), ocular surface disease/reflex tearing in 42 (58.3%), and one participant (1.4%) had a conjunctival cyst obstructing the punctum. Overall, 43.1% (31/72) had surgical etiologies. The referrer diagnosis matched the specialist diagnosis in 27.8% (20/72) of cases. In multivariate logistic regression, the overall model did not reach statistical significance (χ^2 = 9.51, df = 5, p = 0.09). No individual symptom independently predicted surgical etiology, although the strongest trends were seen for lack of response to interventions (adjusted OR 2.80, 95% CI 0.91–8.59; p = 0.07) and absence of symptom-free days (adjusted OR 2.51, 95% CI 0.88–7.16; p = 0.09). Epiphora (OR 2.29, 95% CI 0.48–10.98; p = 0.30) and absence of symptom triggers (OR 1.02, 95% CI 0.34–3.09, p = 0.97) were also not associated with surgical etiology. The model correctly classified 66.7% of cases overall, but performance was asymmetric: 85.4% of non-surgical cases were correctly identified versus only 41.9% of surgical cases.

Conclusion: Non-surgical (reflex tearing/ocular surface) etiologies accounted for over half of tearing referrals, and referrer diagnoses were correct in about one quarter of cases, underscoring a substantial triage gap. No single patient-reported symptom reliably predicted a surgical etiology; however, the conclusions of this study were limited by its sample size. These findings may suggest that symptom-based screening alone is insufficient or that larger studies or multimodal triage tools are needed.

Alexander Kos, Research Fellow (Open)

Presentation Title: Fluorescein Angiography Surveillance of Von Hippel-Lindau Syndrome Retinal Capillary Hemangioma: A Systematic Review and Meta-Analysis

Supervisor(s): Dr. Tom Sheidow, Dr. Phil Hooper

Collaborator(s): Dr. Chris Zajner, Dr. Verena Juncal, Dr. John Park, Dr. Monali Malvankar-Mehta, Salem Abu Al-Burak

Background: Von Hippel Lindau (VHL) is a genetic disorder where patients have an increased propensity to develop characteristic neoplastic lesions. Of these lesions, retinal capillary hemangioblastomas (RCHs) are often the earliest presenting sign of VHL, and can impact patient visual acuity and cause visual field defects. Screening method recommendations for VHL RCHs lack high-quality evidence, and currently expert opinion only endorses clinical examination for routine screening.

Objective: To compare the detection rates of RCHs in VHL patients using fluorescein angiography (FA) compared to clinical examination .

Methods: The protocol and full search strategy for this study was registered on PROSPERO (CRD420261290131) . A systematic search for studies reporting VHL and RCH detection using FA and clinical examination was conducted on OVID Embase, Medline, PubMed , and CENTRAL, all from database inception to January 21, 2026. Independent reviewers screened all studies and extracted data, from included studies. Risk of bias was assessed using the QUADAS-2 tool. Screening results were calculated using meta-analysis with random effects modeling, and reported as log- odds ratios.

Results: Fifteen studies were included, all being observational, constituting 478 total participants. Compared with clinical examination alone, FA was determined to have a 2.64 greater odds of detection in patients (95% CI: 1.52–4.53; p<0.001; I 2 =2.84%; 11 studies; 177 participants), a 2.23 greater odds of detection in eyes (95% CI: 1.39–3.53; p<0.001; I 2 =0.00%; 9 studies; 114 participants), and a 19.49 greater odds of detection of RCHs (95% CI: 8.08 – 46.53; p<0.001; I 2 =0.00%; 8 studies; 142 participants).

Conclusion: Our findings support that FA is superior to clinical examination in detecting VHL in terms of individual patients, individual eyes, and individual RCHs. While our results are not supported by evidence from randomized controlled trials, the minimal heterogeneity between included studies supports the validity of our findings. Our data strongly suggests that FA can play an important role in VHL screening and monitoring.

Dr. Lucas Foster, PGY5 (Resident)

Presentation Title: Dynamic User Interfaces for an Ophthalmic Imaging Workspace - Integrating Research Grade Tools at the Point of Care

Supervisor(s):

Collaborator(s):

Background: Ophthalmic imaging produces longitudinal, spatially rich data, yet clinical reports often reduce these measurements to static images and isolated summary values. We propose a shared evaluation program for dynamic interfaces that preserve the original measurement, show uncertainty and change over time, and place research-grade analyses beside—not in place of—clinical judgment.

Objective: To determine whether three dynamic workspace components provide reproducible clinical information beyond conventional reporting: visual-field analysis, OCT interval analysis for neovascular age-related macular degeneration, and provenance-gated artificial-intelligence decision support.

Methods: We will conduct three preregistered retrospective experiments using public, de-identified reference data and frozen comparators. Project 1 will compare reconstructed visual-field indices with manufacturer MD/PSD, test pointwise uncertainty maps against repeat-test error, and evaluate joint visual-field/OCT progression, myopia-conditioned norms, and explicit baseline resets against conventional global indices and fixed baselines. Project 2 will use expert-labelled OCT fluid data and a public longitudinal anti-VEGF cohort to test biomarker measurement and prediction of next-visit activity and visual change; a blinded reader experiment will compare next-interval decisions from a static report and a dynamic longitudinal view against an independently adjudicated treat-and-extend rule. Project 3 will use public ophthalmic cases and guidelines in a randomized blinded reader study comparing ordinary AI output with answers that must link each actionable claim to applicable evidence, disclose conflicts or missing support, and defer final action to the clinician. Splits will be by patient or case, and all analyses will be locked before holdout evaluation.

Results: Results are pending. For Project 1, we will report MD/PSD agreement; uncertainty calibration and repeat-test error detection; progression-rate error, false alerts, time to detection, subgroup calibration, and re-baselining error. For Project 2, we will report OCT fluid segmentation and volume error, next-visit activity discrimination and calibration, visual-acuity prediction error, interval agreement, decision time, and undertreatment safety violations. For Project 3, we will report unsupported or incorrect high-risk recommendations, citation entailment and source applicability, appropriate abstention, clinician-rated usefulness, decision time, and inter-rater agreement. Every estimate will include its denominator and 95% confidence interval; negative, discordant, and non testable findings will be reported.

Conclusion: This program tests whether dynamic interfaces can make complex imaging and evidence easier to use without disguising uncertainty or transferring clinical authority to an algorithm. It is designed to identify both benefit and failure; simulation or retrospective performance alone will not be presented as proof of improved patient outcomes.

Salem Abu Al-Burak, Medical Student (Student)

Presentation Title: Watch at Your Own Risk: A Structured Ergonomic Audit of the Most Viewed YouTube Tutorials on Slit Lamp and Indirect Ophthalmoscopy Examinations

Supervisor(s): Dr. Rookaya Mather

Collaborator(s): Ameen Alizada, MD(C); Hargun Kaur, MD; Rookaya Mather, MD

Background: Work-related musculoskeletal disorders are highly prevalent among ophthalmologists, with the neck, lower back, and shoulders among the most commonly affected regions. Slit lamp biomicroscopy and binocular indirect ophthalmoscopy require sustained postures that may contribute to this burden. At the same time, trainees increasingly use YouTube for self-directed clinical skills education, yet the ergonomics demonstrated in widely viewed ophthalmic examination tutorials have not been systematically evaluated.

Objective: To quantify the ergonomic risk of examiner postures demonstrated in high-visibility YouTube tutorials for slit lamp examination and binocular indirect ophthalmoscopy using the Rapid Upper Limb Assessment (RULA), identify common modifiable contributors to poor posture, and translate these findings into IDEAL-based educational videos demonstrating improved ergonomic technique.

Methods: A structured YouTube search was conducted using five pre-specified terms related to slit lamp examination and indirect ophthalmoscopy. The first 10 results for each term were recorded, with an additional popularity-sorted search for the primary slit lamp term, yielding 60 records and 48 unique videos after deduplication. Two reviewers independently screened videos using pre-specified eligibility criteria. For eligible tutorials, a standardized screenshot was captured at the first moment of technique engagement and examiner posture was assessed using RULA. Final RULA scores of 1–2 represent acceptable posture, 3–4 indicate that further investigation and possible change may be required, 5–6 indicate that change is required soon, and 7 indicates that immediate change is required.

Results: Fourteen videos yielded a scoreable posture, including 9 slit lamp and 5 binocular indirect ophthalmoscopy tutorials. No video demonstrated an ergonomically acceptable posture. Slit lamp tutorials had a median final RULA score of 5 (range, 3–7). All 5 indirect ophthalmoscopy tutorials received the maximum RULA score of 7, corresponding to a need for immediate ergonomic change. The major contributors to elevated scores were forward trunk flexion during slit lamp examination and the combination of shoulder abduction, cervical flexion greater than 20 degrees, and forward trunk lean during indirect ophthalmoscopy.

Conclusion: High-visibility YouTube tutorials for two foundational ophthalmic examination techniques consistently model ergonomically suboptimal working postures. These findings identify an important gap in ophthalmic education: instructional resources may teach the technical components of an examination while unintentionally reinforcing postures associated with musculoskeletal risk. In response to these findings, we developed IDEAL-based ergonomics educational videos demonstrating improved ergonomic technique for slit lamp examination and binocular indirect ophthalmoscopy, translating the study findings into practical educational resources for trainees. Ergonomic posture should be treated as a measurable component of instructional quality alongside technical accuracy, and future ophthalmic training should explicitly incorporate ergonomic education and optimal postural modelling.

Chris Zajner, PGY1 (Open)

Presentation Title: Outcomes of Vitrectomy with Internal Limiting Membrane Peeling for Full-Thickness Macular Holes: A Single-Surgeon Study

Supervisor(s): Dr. Tom Sheidow

Collaborator(s): Phil Hooper, Verena Juncal, Monali S. Malvankar-Mehta, Khaldon Abbas, Amy Basilious, Daiana Roxana Pur, Fahad Butt

Background: Idiopathic full-thickness macular holes are commonly treated with pars plana vitrectomy and internal limiting membrane peeling, achieving high rates of anatomical closure and visual improvement, though outcomes decline as hole size increases beyond the traditionally cited 400 µm threshold. Prior studies defining this threshold have been limited by small sample sizes, narrow size ranges, and inconsistent modeling of predictors, leaving the true relationship between hole size and closure probability poorly defined.

Objective: To identify patient and surgical predictors of primary anatomical closure and visual acuity in idiopathic full-thickness macular holes (iFTMHs), and to model primary closure as a continuous function of macular hole (MH) size.

Methods:

Design - Retrospective, single-surgeon, single-center cohort study.

Subjects - A total of 744 eyes of 744 patients with iFTMH who underwent pars plana vitrectomy (PPV) with internal limiting membrane (ILM) peeling between February 2015 and October 2025.

Methods - Demographics, symptom duration, MH size (minimum linear diameter), surgical technique, and best-corrected visual acuity (BCVA) were extracted by chart review. Outcomes were stratified by International Vitreomacular Traction Study (IVTS) size group and by a ≤400 versus >400µm threshold. Firth penalized logistic regression identified predictors of closure and ordinary least-squares linear regression identified predictors of final BCVA. Primary closure was modeled as a continuous function of MH size, and the size corresponding to 90% predicted closure was derived analytically.

Main Outcome Measures - Primary anatomical closure, final BCVA (logMAR), and the MH size at which predicted primary closure fell to 90%.

Results: Mean age was 68.6±7.9 years and mean MH size 365.8±175.5µm. Primary closure was achieved in 96.6% of eyes (99.5% small, 98.4% moderate, 93.4% large; p=0.0002) and 98.0% after reoperation; recurrence occurred in 1.2%. Eyes ≤400µm closed more often than those >400µm (98.9% vs 93.4%; odds ratio [OR] 0.16; p<0.001). BCVA improved from 0.70±0.33 to 0.40±0.34 logMAR (p<0.001), and the proportion achieving ≥20/40 rose from 6.7% to 42.7% (p<0.001). On multivariable analysis, MH size >400µm was the only independent predictor of reduced closure (OR 0.25; 95% confidence interval 0.08-0.75; p=0.013). Worse final BCVA was independently associated with MH size >400µm, longer symptom duration, and worse baseline BCVA (all p≤0.01). Predicted primary closure remained ≥90% up to a MH size of 695µm.

Conclusion: PPV with ILM peeling achieved high anatomical closure and visual gains across the size spectrum. MH size was the dominant determinant of both closure and vision, with closure remaining high up to 695µm, supporting an upward revision of the concept of a "large hole" threshold and a more selective, size-driven use of adjunct techniques.

Dr. Hamza Inayat, PGY2 (Resident)

Presentation Title: Optometrist-led vision screening: Enhancing child eye health in underserved district schools within Karachi

Supervisor(s): Dr. Karim Damji

Collaborator(s): Saima Jamil, Sana Hyat

Background: Vision impairment among school-aged children, from uncorrected refractive errors, represents a major public health concern. In Pakistan, organized school-based vision screening programs are limited, and there is insufficient evidence regarding their effectiveness. This study evaluates an optometrist-led, school-based vision screening intervention designed to enhance early detection, awareness, and correction of refractive errors among children in a group of underserved schools in Karachi.

Methods: A quasi-experimental study was conducted in Azam Basti, Karachi, targeting five low resource schools. Lady health workers received structured training from optometrists to screen visual acuity and detect ocular misalignment in 5–17-year-old students. Students with visual acuity <6/9 and/or obvious ocular pathology were referred for a complete eye exam by an optometrist. The optometrist also delivered education sessions to students. Baseline and 6-month post-intervention surveys assessed changes in knowledge, attitudes, and practices among students.

Results: A total of 384 students were screened with 72 (18.8%) identified as having refractive visual impairment; they were provided with prescription spectacles free of charge. Astigmatism (9.3%) and myopia (6.3%) were the most common refractive errors. Among primary students (grades 1–5), knowledge and eye health practices improved significantly post intervention (e.g., eye health knowledge: 31.3%–89.8%, $p < 0.001$). Among secondary students (grades 6–10) similar gains were noted (e.g., basic eye knowledge increased from 27.2% to 84.4% ($p < 0.001$), and correct eye care habits improved from 46.2% to 99.4% ($p < 0.001$)).

Conclusion: Optometrist-led school screenings, including interactive student education combined with standardized lady health worker training to assist with initial screening, effectively enhanced detection and correction of refractive errors while promoting sustainable eye health practices. These findings support the integration of similar programs into school health policies to reduce avoidable childhood visual impairment in underserved urban community schools.

Dr. James J. Armstrong, PGY5 (Resident)

Presentation Title: Systemic Inhibition of the Angiotensin System Associated with Reduced Rates of Glaucoma Surgery

Supervisor(s): Dr. Cindy M.L. Hutnik

Collaborator(s): Vinay Kansal, Jacqueline Slomovic, Brittney Le, Anastasiya Vinokurtseva, Blayne K. Welk

Background: Glaucoma has been associated with blood pressure dysregulation, and the use of anti-hypertensive agents with reduced glaucoma incidence and progression risk. Recent work suggests that angiotensin-modulating agents may have the most significant neuroprotective effect.

Objective: This study compares the time from initial medical or laser glaucoma treatment to first incisional surgical intervention in glaucoma patients on angiotensin-modulating therapy compared to other anti-hypertensive therapy or no anti-hypertensive therapy.

Methods: Patient records with an initial glaucoma medical or laser therapy between July 1996, and March 2009 were identified, and grouped by anti-hypertensive medication exposure: 1) no anti-hypertensive, 2) angiotensin-modulating therapy, or 3) other anti-hypertensive medication. Records were followed up to 25 years after diagnosis and examined for instances of incisional glaucoma surgery. The primary outcome was time to surgical intervention from initial glaucoma medical or laser treatment. A multivariable Cox proportional hazards model was used to calculate the hazard ratio of undergoing glaucoma surgery based on anti-hypertensive medication exposure and baseline characteristics.

Results: Records from 25,146 glaucoma patients were included, with 4,371 (17.4%) undergoing initial treatment with SLT and 20,775 (82.6%) receiving primary medical therapy. There were 12,591 (54.1%) patients on no anti-hypertensive therapy, 4,304 (17.1%) on angiotensin-modulating therapy such as angiotensin-converting enzyme inhibitors (ACEi) or angiotensin receptor blockers (ARB), and 7,251 (28.8%) on calcium channel blockers (CCB) or diuretics. The groups were well balanced in terms of age, sex, and comorbidity score. After 10 years follow up, the absolute event rate was 10.5% in the unexposed cohort, 7.6% in the ACEi/ARB exposure cohort, and 11.5% in the CCB/diuretic cohort. Compared to patients on angiotensin-modulating therapy, glaucoma patients without exposure to anti-hypertensive therapy underwent glaucoma surgery significantly more frequently (HR 1.2; 95%CI 1.1-1.4), whereas CCBs/diuretics did not have a significant hazard associated (HR 1.1; 95%CI 0.96 – 1.28).

Conclusion: Blood pressure control is an important consideration in glaucoma management. A significant reduction in the rate of glaucoma surgical intervention was associated with angiotensin-modulating therapy among patients diagnosed with glaucoma. Further studies are warranted to elucidate a causal relationship between blood pressure dysregulation, antihypertensive therapy, and glaucoma progression.

William Herspiegel, PGY1 (Student)

Presentation Title: Selective Laser Trabeculoplasty Response as Predictor for Gonioscopy Assisted Transluminal Trabeculotomy Success in Glaucoma Management

Supervisor(s): Dr. Tal Sharon

Collaborator(s): Haoran (Charles) Li, Yang (Doris) Liu, Mahraz Parvand, Frederick Mikelberg, Kulbir Gill, Steven Schendel

Background: Effective IOP reduction remains the only proven strategy to slow Glaucoma progression. Selective laser trabeculoplasty (SLT) is an established treatment that enhances aqueous outflow through the trabecular meshwork and offers a safe, repeatable alternative to chronic topical therapy. Despite this, SLT does not guarantee long-term or complete success; a significant subset of patients experiences late treatment failure, disease progression, development of cataract requiring surgery, wish or need to reduce drop dependency, or need for further IOP reduction, necessitating surgical intervention.

Gonioscopy-assisted transluminal trabeculotomy (GATT) is a minimally invasive glaucoma surgery that circumferentially removes the trabecular meshwork to allow free flow through Schlemm's canal collecting channels which improves aqueous outflow. As both SLT and GATT target the trabecular outflow pathway, the response to prior SLT may provide insight into the functional status of this pathway and predict subsequent GATT outcomes. Patients with a favourable SLT response may have preserved distal outflow function and therefore greater likelihood of benefiting from GATT, whereas poor SLT response may indicate more extensive outflow dysfunction and reduced likelihood of success with trabecular-based surgery.

Elucidating this relationship has practical implications in healthcare resource management, especially given the growing emphasis on MIGS procedures to balance efficacy and safety. Avoiding unnecessary surgical delays or failures can reduce patient morbidity, clinic burden, and healthcare costs, while improving long-term visual outcomes. Therefore, this study aims to provide evidence to guide clinical decision-making and optimize glaucoma management strategies in the evolving landscape of surgical glaucoma therapies.

Objective: To investigate whether selective laser trabeculoplasty (SLT) success can predict subsequent gonioscopy-assisted transluminal trabeculotomy (GATT) outcomes.

Methods: A retrospective chart review of glaucoma patients at Vancouver General Hospital Eye Care Center who underwent GATT was conducted. Patients were categorized into three groups: successful prior SLT (S), failed prior SLT (F), or no prior SLT (N). SLT success was defined as >20% IOP reduction at six weeks post-procedure, while GATT success was defined as >20% IOP reduction with IOP <21 mmHg (Criterion 1), <18 mmHg (Criterion 2), or <14 mmHg (Criterion 3) at follow-up without additional intervention. GATT outcomes were assessed at 1-month, 3-month, and 6-month follow-up.

Results: A total of 120 eyes (60 right, 60 left) of 120 patients (mean age: 67.0 years, 55.0% male, 60.8% primary open-angle glaucoma) were analyzed. Significant differences in IOP were observed among groups at 1-, 3-, and 6-month follow-ups. For Criterion 1, success at 1-, 3-, and 6-months was 80.0%, 75.0%, and 87.5% in the S group, compared to 62.5%, 70.0%, and 65.0% in the N group, and 55.0%, 50.0%, and 57.5% in the F group (p=0.054, 0.046, and 0.010, respectively). For Criterion 2, success at 6-months was 85.0%, 62.5%, and 47.5% (p=0.002), and for Criterion 3, 62.5%, 40.0%, and 25.0% (p=0.003) in the S, N, and F groups, respectively. The proportion of eyes requiring additional intervention at 6 months was 7.5%, 20.0%, and 32.5% in the S, N, and F groups, respectively (p=0.020).

Conclusion: Successful SLT was associated with higher GATT success rates, whereas failed SLT was associated with lower success rates and increased need for additional intervention. These findings suggest that SLT response may serve as a valuable predictor for GATT success, aiding clinicians in glaucoma management and optimizing surgical decision-making. Future prospective studies with longer follow-up periods and different patient populations are needed to confirm these findings and assess their clinical implications.

Dr. Anastasiya Vinokurtseva, PGY4 (Resident)

Presentation Title: Long-term Outcomes of Gonioscopy-Assisted Transluminal Trabeculotomy: A Systematic Review and Meta-Analysis

Supervisor(s): Dr. Tal Sharon

Collaborator(s): Salem Abu Al-Burak; Fahad R. Butt; Vitaliy Voznyy; Mouad Elganga

Background: Glaucoma is a leading cause of irreversible blindness, and IOP reduction remains the only proven modifiable risk factor. Gonioscopy-assisted transluminal trabeculotomy (GATT) offers a conjunctiva-sparing, bleb-independent surgical approach with a favorable short-term safety profile, but long-term outcomes remain incompletely characterized, limiting evidence-based surgical decision-making.

Objective: To evaluate the long-term efficacy and safety of GATT in patients with glaucoma through a systematic review and meta-analysis of studies with a minimum of 24 months of follow-up.

Methods: Ovid MEDLINE, Ovid Embase, Ovid CENTRAL, and Web of Science were searched from inception to March 20, 2026 (PROSPERO: CRD420261357398). Studies reporting outcomes of GATT with ≥24 months of follow-up were included. Primary outcomes were the pooled mean intraocular pressure (IOP) reduction and medication reduction from baseline. Secondary outcomes included qualified and complete surgical success rates, failure rates, reoperation rates, and complication rates. Random-effects meta-analyses were performed using inverse-variance weighting with restricted maximum-likelihood estimation for continuous outcomes and Freeman-Tukey double arcsine transformation for proportions. Risk of bias was assessed using ROBINS-I, and certainty of evidence was graded using GRADE.

Results: Twenty-four studies (1,961 eyes) met the inclusion criteria. The pooled mean IOP reduction was 12.13 mmHg (95% CI: 10.83–13.42; I^2=90.3%; k=18, 1,088 eyes) and the pooled mean medication reduction was 2.02 agents (95% CI: 1.58–2.46; I^2=96.8%; k=13, 1,178 eyes). Timepoint-specific analyses demonstrated durability of IOP reduction through 60 months. Subgroup analyses revealed significantly greater IOP reduction in secondary open-angle glaucoma compared with primary open-angle glaucoma ($p<0.05$) and in 360° versus sub-360° trabeculotomy ($p<0.0001$), with no significant differences by phacoemulsification status or threading device. The pooled qualified surgical success rate was 85.0% (95% CI: 77.9–90.9%; k=12), complete success rate was 45.5% (95% CI: 30.9–60.5%; k=6), failure rate was 23.7% (95% CI: 8.1–43.9%; k=6), and reoperation rate was 20.7% (95% CI: 11.5–31.5%; k=8). Hyphema was the most frequent complication reported (pooled rate 64.0%; 95% CI: 37.9–86.5%). All outcomes were graded as very low certainty of evidence.

Conclusion: GATT was associated with sustained, clinically meaningful reductions in IOP and medication burden through ≥24 months across glaucoma subtypes, with a favorable safety profile in which transient hyphema was the predominant complication and approximately one in five eyes required reoperation. However, the very low certainty of evidence and substantial heterogeneity, warrant cautious interpretation of the findings, and highlights the need of long-term comparative trials.

Tharin Silva, Undergraduate (Open)

Presentation Title: Investigating the Effect of Topical Insulin on Tenon Capsule Fibroblast's Fibrotic Activity

Supervisor(s): Dr. Tal Sharon

Collaborator(s): Hong Liu, Dr. James Armstrong, Dr. William Herspiegel, Dr. Cindy Hutnik

Background: Glaucoma is a neuropathy characterized by damage to the optic nerve1. Some surgical interventions aim to decrease high intraocular pressure (IOP) by creating an artificial drainage channel into the subconjunctival space2. However, postoperative success is impacted by excessive fibrosis at the incision site, particularly among Tenon's capsule fibroblasts (TCFs)3,4. TCFs are activated into a pro-fibrotic state by inflammatory cytokines5,6, causing drainage channel occlusion and reduced extracellular matrix (ECM) permeability. Interestingly, surgical failure rates, identified by a return of high IOP, are observed to be higher in diabetic patients8. Recent literature has shown topical insulin to decrease inflammatory cytokine expression and accelerate corneal epithelial healing in diabetic mice9. While topical insulin's role in proper corneal repair has been studied, it is unknown whether it can be leveraged to reduce fibrosis in TCFs following glaucoma surgeries, particularly in diabetic contexts.

Objective: The objectives of this study are to (i) identify an insulin concentration which optimally enhances TCF metabolic activity without cytotoxicity and (ii) investigate the effects of topical insulin application on cytokine (TNF-α, IL-1, and IL-6) and ECM-related protein (collagen, fibronectin, and α-SMA) expression in TCFs from diabetic and non-diabetic cell lines.

Methods: 4 diabetic and 2 non-diabetic primary TCF cell lines were incubated with insulin concentrations of 1, 5, 25, and 50 IU/mL alongside a DMEM control and assessed using MTT and LDH assays. Metabolic activity and cytotoxicity data were then integrated into a composite health index (CHI).

Results: Insulin concentration had a strong and statistically significant effect on MTT absorbance. MTT assay reveals a biphasic dose-response following insulin supplementation, with maximal metabolic enhancement occurring at 1-5 IU/ across diabetic and non-diabetic TCFs. In contrast to the MTT data, insulin had no statistically significant effect on LDH release. Mean CHI scores were highest at 1 IU/mL in diabetic cell lines.

Conclusion: These findings establish 1 IU/mL as an optimized topical insulin concentration for investigating pro-fibrotic TCF response modulation. Next steps involve investigating the effects of the optimized insulin dosage on cytokine and ECM-related protein expression within diabetic and non-diabetic TCFs. By bridging established knowledge of insulin's role in corneal wound healing within the underexplored context of TCFs, this work addresses a critical knowledge gap and supports the further exploration of topical insulin as a potential adjunct therapy to improve glaucoma surgical outcomes.

ABSTRACTS

Dr. Khaldon Abbas, PGY2 (Resident)

Presentation Title: Investigating intraocular lens tilt in four-point scleral-sutured Akreos AO60 IOL implants: A Pilot Study

Supervisor(s): Dr. Tom Sheidow, Dr. Philip Hooper, Dr. Verena Juncal

Collaborator(s): Dr. Monali Malvankar-Mehta, Dr. Chris Zajner, Dr. Alexander Kos, Danica White

Background: When capsular support is inadequate, four-point scleral suture fixation of the Akreos AO60 intraocular lens (IOL) is a well-established option, its four haptic eyelets allowing a square fixation configuration. Published series have used predominantly Gore-Tex suture, and data on polypropylene remain limited. IOL tilt and decentration can produce defocus, astigmatism and higher-order aberrations, yet almost all in vivo imaging data describe two-point or sutureless techniques. The positional stability of four-point polypropylene fixation has not been characterized.

Objective: To quantify IOL tilt and decentration in four-point scleral-sutured Akreos AO60 implants using anterior segment optical coherence tomography (AS-OCT) in vivo.

Methods: Prospective observational cohort study at the Ivey Eye Institute, London, Ontario. Consecutive patients who underwent pars plana vitrectomy with four-point scleral fixation of an Akreos AO60 using 8-0 polypropylene were imaged at three month follow-up. Horizontal and vertical anterior segment line scans were acquired using AS-OCT. Tilt was calculated as the angle between the IOL and a line bisecting the iridocorneal angles. Decentration, intraocular pressure, corrected distance visual acuity (CDVA, logMAR) and refraction were recorded. Wilcoxon signed-rank, Spearman correlation and exact binomial tests were used.

Results: Nineteen eyes from 18 patients were included. Mean age was 74.7 ± 10.0 years (range 55–93), 10 (56%) were male. Indications were IOL dislocation or subluxation (87%), pseudoexfoliation-related (20%) and trauma (13%). Mean axial length was 24.38 ± 1.03 mm and mean IOL power 18.2 ± 3.4 D. Mean horizontal tilt was 1.69 ± 1.48° (range 0.01–4.62) and mean vertical tilt 1.42 ± 0.76° (range 0.22–2.90), with no difference between axes ($p = 0.81$). Mean tilt was 1.54 ± 0.70°. No eye exceeded the 5° visually significant threshold. Horizontal tilt was directed nasally in 87% of eyes ($p = 0.007$). Mean decentration was 0.28 ± 0.23 mm horizontally and 0.22 ± 0.14 mm vertically. CDVA improved from 1.19 ± 0.69 to 0.26 ± 0.30 logMAR (Snellen 20/309 to 20/36; $p = 0.0015$), with 78% of eyes achieving 20/40 or better. Mean spherical equivalent was −0.78 ± 1.04 D, with 50% and 71% within ±0.50 D and ±1.00 D of target.

Conclusion: Four-point scleral fixation of the Akreos AO60 with 8-0 polypropylene achieved excellent positional stability, with tilt below that reported for two-point sutured and flanged intrascleral techniques and no eye reaching the visually significant threshold. Findings are limited by sample size. The consistent nasal direction of horizontal tilt suggests a systematic effect of fixation geometry meriting further study.

Victoria Iannetta, Medical Student (Student)

Presentation Title: Advancing Glaucoma Care Through Virtual Reality: Comparative Performance of Virtual Reality-Based Visual Field Testing and Humphrey Perimetry

Supervisor(s): Dr. Tal Sharon

Collaborator(s): Abiram Chandiramohan, Liv Lovering, Abdullah Sarhan, William Herspiegel, James Armstrong, Abdulla Sarhan, Patrick Gooi, Andrew Crichton, Cindy Hutnik, Tal Sharon

Background: Glaucoma is a leading cause of irreversible blindness worldwide, making early detection and accurate monitoring essential to prevent disease progression. The Humphrey Visual Field (HVF) test remains the standard method for evaluating, diagnosing, and monitoring progression of glaucoma. Despite its widespread use, test performance is highly dependent on patient cooperation, endurance, and sustained attention. Lengthy testing times and physical discomfort may adversely affect reliability, leading to increased rates of false-positive and false-negative responses. Virtual reality-based visual field (VR-VF) assessment represents a promising approach to overcoming these limitations due to its portability, cost-effectiveness, and improved patient comfort.

Objective: We aimed to assess the accuracy, reliability, feasibility, and user experience of the RVF200®, a Canadian-developed VR-based visual field system (RetinaLogik®, Calgary, AB) and compare it to the traditional gold standard HVF analyzer.

Methods: This prospective, single-center comparative study recruited healthy controls and patients with glaucoma of varying severity from the Ivey Eye Institute, London, Ontario. Each participant completed 24-2C SITA Faster protocol on the HVF and 24-2C SITA Fast protocol on the VR-VF system within three weeks. Mean Deviation (MD), Pattern Standard Deviation (PSD), and Visual Field Index (VFI) were compared using Pearson correlations, paired comparisons, and Bland-Altman analyses. Post-test questionnaires assessed patient comfort and device preference.

Results: Thirty-nine participants (mean age 68 years; 21 female). MD was similar between both devices (VR-VF: -4.89 dB; HVF: -3.8dB). VR-VF measurements of MD, PSD, and mean sensitivity were strongly correlated with HVF results (r=0.96, 0.93, and 0.96, respectively). Bland–Altman analysis of mean sensitivity demonstrated a bias of 1.35 dB. Mean test duration was comparable between devices (3.35 vs 3.32 minutes). Post-test questionnaires revealed that majority of patients ranked the test as comfortable.

Conclusion: Visual field-testing metrics showed high concordance between the RVF200® and HVF, supporting VR-based perimetry as a promising alternative for glaucoma monitoring. The second phase of this study will analyze the impact of VR-based perimetry on clinical decision making. Future studies should assess whether different body positions or visual field defect patterns influence VR-VF performance.

Awards & Recognition

The following awards will recognize outstanding research presentations at Research Day 2026. Awards are adjudicated based on research quality, scientific rigor, analysis, interpretation of results, and overall presentation.

Resident Research Award

- **Eligibility**: Residents presenting research completed during residency with active involvement in the project during the presentation year.
- **Criteria**: Highest-ranking resident presentation based on research quality, scientific rigor, analysis, interpretation, and overall presentation.

Undergraduate Student Research Award

- **Eligibility**: Undergraduate students supervised by an Ivey Eye Institute faculty member.
- **Criteria**: Highest-ranking student presentation based on research quality, scientific rigor, analysis, interpretation, and overall presentation.

Open Research Award

- **Eligibility**: Eligibility: MSc, PhD, ophthalmology fellows, external trainees, and projects not submitted under the Undergraduate or Resident categories.
- **Criteria**: Highest-ranking presentation based on innovation, scientific rigor, research quality, and overall presentation.

Each project may only be submitted to one award category; however, individuals may submit different projects to multiple categories, if eligible.

Award: Includes a $500 cash prize and up to $2,000 in travel support for presentation at a conference.

Learning Objectives

Critically appraise current clinical, educational and basic science research in Ophthalmology.
Discuss the research presentations and reflect on potential implications for patient care.

Study Credits

This event is an Accredited Group Learning Activity (Section 1) as defined by the Maintenance of Certification Program of the Royal College of Physicians and Surgeons of Canada, and approved by Continuing Professional Development, Schulich School of Medicine & Dentistry, Western University. You may claim a maximum of 4 hours (credits are automatically calculated).
Each participant should claim only those hours of credit that he/she actually spent participating in the educational program.

At least 25% of this program is dedicated to participant interaction.
Guest Speaker - 20 minute presentation, 10 minutes Q & A
Residents, Students, Open - 10 minute presentations, 5 minutes Q & A

Disclosures

I have / have not had in the past two years, a financial interest, arrangement, or affiliation with one or more organizations that could be perceived as a direct or indirect conflict of interest in the context or content of this educational program.

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