Cambridge Eye Trust Research Day 2025

AGENDA - 17th June 2025

08:30 – 09:25 Registration and refreshments

09:25 Introduction by **Cornelius René** (Chairman CET)

SESSION 1:

CHAIR, John Sharp

09:30 **Progress in corneal transplantation - A 15 years perspective**
Madhavan Rajan
Abstract & Poster 1: Clinical Research. Sub-specialism category: Corneal & Cataract

09:50 **The iCAM test - a single microarray pan-PCR card for rapid diagnosis of microbial keratitis**
Yunfei Yang
Abstract & Poster 2: Abstract type: Clinical Research. Sub-specialism category: Corneal & Cataract

10:10 **Risk of uveitis in JIA: Insights from methotrexate-treated cohort over 10 years**
Nimesha Alex
Abstract & Poster 3: Abstract type: Clinical Research. Sub-specialism category: Paediatric, Strabismus

10:30 **Is there a role for empirical ocular therapy for high-grade vitreo-retinal lymphoma?**
Erika Damato
Abstract & Poster 4: Abstract type: Clinical Research. Sub-specialism category: Ocular Oncology & Pathology

11:50 **Investigating the morphology, angle and insertional pattern of the inferior oblique muscle: Translational anatomy for strabismus surgeons**
Johannes Coetzee
Abstract & Poster 5: Abstract type: Laboratory Research. Sub-specialism category: Paediatric, Strabismus

11:10 Tea/coffee and poster viewing

SESSION 2:

CHAIR, Thomas Nixon

11:40 **Identifying unregistered blind glaucoma patients with a semi-automated algorithm**
Arun Thirunavukarasu
Abstract & Poster 6: Abstract type: Clinical Research. Sub-specialism category: Glaucoma

12:00 **The Accuracy of referrals for vitreomacular interface disorders to Addenbrooke's Hospital vitreo-retinal clinics**
Andrew Ross
Abstract & Poster 7: Abstract type: Clinical Research. Sub-specialism category: Surgical Retina

12:20 **Management of periocular basal cell carcinoma by Mohs micrographic surgery: A ten-year retrospective analysis of outcomes**
Robert Brady
Abstract & Poster 8: Abstract type: Clinical Research. Sub-specialism category: Ocular Oncology & Pathology

12:40 **KEYNOTE LECTURE**

OCT – my personal journey to discovery

David Huang
Wold Family Chair in Ophthalmic Imaging
Professor of Ophthalmology & Biomedical Engineering
Associate Director & Director of Research, Casey Eye Institute
Oregon Health & Science University
USA

13:10 Summing up and close

13:10 – 14:00 Networking Lunch and poster viewing

Poster-only

Immunotherapy-related uveitis: The Cambridge experience
Bhairavi Bhatia
Abstract & Poster 10: Abstract type: Clinical Research. Sub-specialism category: Medical Retina (inc. Uveitis)

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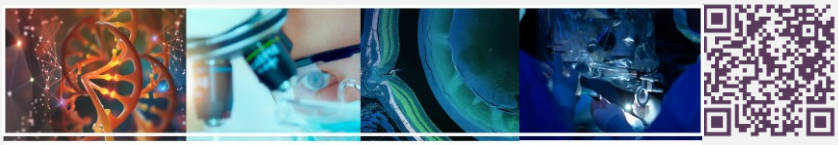
Contact Louise Richards, CET Administrator for more information: louise@healthology.eu, 07950 273790

Cambridge Eye Trust Research Day 2025

2025 CET Research Day Abstracts

Madhavan Rajan Cambridge University Hospitals NHS Foundation Trust. Abstract type: Clinical Research Sub-specialism category: Corneal & Cataract Oral presentation AND Poster Submitter Grade: Consultant/ SAS Doctor Role/Designation: Project CUH Consultant / Lead PI: CUH Consultant	**1 - Progress in corneal transplantation - A 15 years perspective** Abstract: This presentation will focus on the developments in human corneal transplantation over the last two decades both in relation to surgical techniques and the effect on rapid rehabilitation of patients with corneal blindness. We shall present the results of the research undertaken by our corneal research team at CUH over 15 years and conclude with future prospects and challenges in this field.
Yunfei Yang Department of Ophthalmology, Cambridge University Hospitals NHS Foundation Trust. Additional Authors: Ahmed Roble, Department of Ophthalmology, Southend Hospital, Westcliff-on-Sea, UK. Rashmi Deskmukh, Department of Ophthalmology, Cambridge University Hospitals NHS Foundation Trust, Cambridge, UK. James Myerscough, Department of Ophthalmology, Southend Hospital, Westcliff-on-Sea, UK. Martin Curran, Clinical Microbiology and Public Health Laboratory, United Kingdom Health Security Agency, Cambridge, UK. Abstract type: Clinical Research Sub-specialism category: Corneal & Cataract Oral presentation AND Poster Submitter Grade: Trainee Level Role/Designation Project CUH Consultant / Lead PI: Madhavan Rajan	**2 - The iCAM test - a single microarray pan-PCR card for rapid diagnosis of microbial keratitis** Abstract: **Purpose:** To validate the diagnostic performance of a custom 96-microorganism TaqMan PCR card (iCAM) for microbial keratitis (MK) from a single corneal epithelial sample. **Methods:** We performed a single site prospective clinical cohort study with approved ethical review. Patients >18 years old referred with MK were recruited between September 2021 to January 2023. An ocular specific, customised microarray card (iCAM) was constructed according to primer and probe sequences developed in our department to detect bacteria, viruses, Acanthamoeba and fungi commonly implicated in MK using a single sample. Microbial detection rate and positive predictive value (PPV) were evaluated. **Results:** Thirty-eight corneal epithelial samples from 32 patients with MK and 4 control samples from healthy participants were obtained from 36 consecutive patients. A causative microbe was isolated in 15/34 (44%) samples using the iCAM test, compared to 15 (44%) by conventional methods. iCAM test processing time was 6-24 hours compared to up to 7 days with conventional methods. Combined, detection rate was 65%, with correlation between methods in 62%. The iCAM test detected all major microorganism groups with 56% sensitivity and 60% PPV. **Conclusions:** The iCAM test was able to detect bacterial, fungal, viral and protozoan organisms using a single corneal epithelial sample compared to multiple techniques in conventional methods. The iCAM test provides a rapid solution to the appropriate selection of anti-microbials and avoids unnecessary use of multiple medications in the management of MK. The full clinical utility and cost-effectiveness of the iCAM test is being investigated in a multicentre trial.
Nimesha Alex Ophthalmology, Addenbrooke's Hospital, Cambridge. Additional Authors: Brinda Muthusamy, Addenbrooke's Hospital, Cambridge. Jayne M MacMahon, Addenbrooke's Hospital, Cambridge.	**3 - Risk of Uveitis in JIA: Insights from Methotrexate-Treated Cohort Over 10 Years** Abstract: **Introduction:** Juvenile idiopathic arthritis (JIA) is the most common rheumatological condition of childhood. UK guidelines advise regular uveitis screening due to the prevalence of JIA-associated uveitis (JIA-U) in up to 40% of patients. We hope to establish the risk of developing JIA-U in patients treated with methotrexate for 4 months or more.



Abstract type: Clinical Research Sub-specialism category: Paediatric, Strabismus presentation AND Poster Submitter Grade: Trainee Level Role/Designation Project CUH Consultant / Lead PI: Miss Brinda Muthusamy	**Methods:** Retrospective electronic chart review of patients with JIA, aged 2-17 years, receiving methotrexate at a tertiary referral centre between October 2014 and November 2024. Exclusion criteria was treatment with other disease modifying drugs and systemic arthritis. 341 patients met the inclusion criteria. **Results:** Average age at uveitis diagnosis was 4 years (5 SD). Oligoarticular JIA predominated (65%);66% were ANA positive. Of those treated with methotrexate, 275(80.6%) remained JIA-U free, while 66(19.4%) developed JIA-U. Of these, 40(60%) were diagnosed with JIA-U at time of JIA diagnosis with 18(45%) achieving remission on methotrexate alone; 22(55%) escalated to biologic therapy. 26(39.9%) patients did not have JIA-U when diagnosed, but 22 developed uveitis after 4 months on methotrexate with 18(81%) later escalating to biologic treatment. The average time taken for uveitis to develop in this subgroup of 22 patients is 39 months. Our study shows that of all patients (301) who did not have uveitis when diagnosed with JIA, 7.3% went on to develop JIA-U after methotrexate treatment was established. **Conclusion:** Although, methotrexate is shown to reduce the incidence of JIA-U, there is still a need to continue screening for evidence of uveitis as escalation of therapy may be required.
Erika Damato Ophthalmology, Cambridge University Hospitals NHS Foundation Trust. Additional Authors: Pavel Sharma, Cambridge University Hospitals NHS Foundation Trust. Philip Alexander, Cambridge University Hospitals NHS Foundation Trust. Abstract type: Clinical Research Sub-specialism category: Ocular Oncology and Pathology Oral presentation AND Poster Submitter Grade: Consultant/ SAS Doctor Role/Designation: Project CUH Consultant / Lead PI: Erika Damato	**4 - Is there a role for empirical ocular therapy for high-grade vitreo-retinal lymphoma?** Abstract: **Introduction:** High grade B-cell vitreoretinal lymphoma (VRL) is an aggressive malignancy with a high mortality associated with CNS disease. Diagnosis and treatment are often delayed due to the condition commonly masquerading as non-infectious uveitis and due to variable sensitivities in the diagnostic yield of vitreous biopsy. We propose that a subgroup of patients may benefit from empirical therapy with the primary aim of preserving vision. Such patients would be selected based on typical retinal imaging findings, an initial negative vitreous biopsy with a likely delay in or refusal of further ocular biopsy and an unsuitability for systemic chemotherapy. **Methods:** Retrospective case note review. **Results:** 11 patients were identified with high grade B-cell VRL at Addenbrooke's hospital between 2017 and 2024. Five patients experienced diagnostic delay due to an initially negative vitreous biopsy or a delayed vitreous biopsy. This led to treatment delay. All displayed typical and progressive signs on retinal imaging. CNS disease was pre-existent in three, developed in one within 4 months and was absent throughout follow-up in the remaining 7. Ophthalmic treatment was advised in 9. Five patients with localised ocular disease declined systemic therapy due to high risk of mortality with this treatment, opting to delay this should they develop CNS disease. **Discussion:** In the presence of typical and progressive retinal findings, empirical therapy may enable preservation of vision in patients reluctant for further ocular surgery and who decline or are unsuitable for systemic chemotherapy.
Johannes Coetzee Human Anatomy Centre, Department of Physiology, Development and Neuroscience, University of Cambridge, UK. Additional Authors: John Somner, Cambridge University Hospitals NHS Foundation Trust, UK. Robert Thomas Brady. Cambridge University Hospitals NHS Foundation Trust, UK	**5 - Investigating the Morphology, Angle, and Insertional Pattern of the Inferior Oblique Muscle: Translational Anatomy for Strabismus Surgeons** Abstract: **Introduction:** Successful surgery on the inferior oblique (IO) relies on detailed knowledge of its insertional pattern and proximity to adjacent structures. This study investigates variability in IO anatomy, develops heuristics to assist in surgical technique selection and tests the hypothesis that the two oblique muscles lie within a shared muscular plane. **Methods:** Dissection of 8 paired cadaveric orbit specimens were completed to expose the IO muscle along its course. The angle of the IO was measured relative to the visual axis from both lateral and inferior views. Measurements of the angle of the

Gavin Jarvis. School of Medicine, University of Sunderland, UK. Anthony Vivian. Cambridge University Hospitals NHS Foundation Trust, UK. Cecilia Brassett, Human Anatomy Centre, Department of Physiology, Development and Neuroscience, University of Cambridge, UK. Abstract type: Laboratory Research Sub-specialism category: Paediatric, Strabismus Oral presentation AND Poster Submitter Grade: Laboratory team member Role/Designation Project CUH Consultant / Lead PI: Johannes Coetzee	superior oblique (SO) muscle tendon to the visual axis, the morphometry of the muscle, nerve and insertional pattern were also completed. **Results:** Significant differences between IO and SO angles (p=0.0093) disproved the null hypothesis of a common plane. Using measurements of the insertional location, diagrams were constructed to create an intuitive scale-accurate visual map to help guide strabismus surgeons. These were paired with trace diagrams to show the variability in insertion shape. The inferior temporal vortex vein was found to have a relatively constant location as a key landmark for IO muscle capture during surgery. **Discussion:** Detailed knowledge of insertional variability and proximity to the optic nerve and ciliary arteries should improve surgeon confidence in identifying and manipulating the IO. IO angle measurements can be used to improve eye movement and surgical training models. This paper should improve surgical outcomes by providing a detailed insertional map of the IO, while simultaneously challenging long-held assumptions of the obliques' muscular plane.
AFTER BREAK	
Arun Thirunavukarasu Department of Ophthalmology, Cambridge University Hospitals NHS Foundation Trust. Additional Authors: Arun Thirunavukarasu, University of Oxford. Nikhil Jain, Bedfordshire Hospitals NHS Foundation Trust. Helmut Yu, University of New South Wales. George Nishimura, University of Cambridge. Ansh Tandon, University of Cambridge. Hamid Butt, University of Cambridge. Rohan Sanghera, University of Oxford. Rupert Bourne, Cambridge University Hospitals NHS Foundation Trust. Abstract type: Clinical Research Sub-specialism category: Glaucoma Oral presentation AND Poster Submitter Grade: Trainee Level Role/Designation: Project CUH Consultant / Lead PI: Rupert Bourne	**6 - Identifying unregistered blind glaucoma patients with a semi-automated algorithm** Abstract: **Introduction:** Severely sight impaired (blind) patients are eligible for social benefits but these require referral for a certificate of visual impairment (CVI) by an ophthalmologist. Certification criteria are ambiguous and subjective despite guidelines based on visual acuity and perimetry, and many patients consequently miss out on crucial support in the community. **Method:** We developed a semi-automated algorithm using visual acuity and perimetry data to identify blind glaucoma patients and offer an alternative referral pathway for certification. Using our algorithm, we performed a retrospective cross-sectional validation study of all glaucoma patients attending a tertiary referral clinic over twelve months. The algorithm used a computer vision application to interpret perimetry data and accepted numeric inputs for visual acuity. CVI-eligible (i.e. blind) patients were analysed further to explore the specific reasons for missed registration. **Results:** Of 5,620 glaucoma patients, 64 were blind ('severely sight impaired'). Of these 64 patients, 7 (11%) were misclassified due to lack of data from their healthier eye, and 36 (56%) were already CVI-registered. 21 of 57 blind patients (37%) were unregistered. Reasons for missed certification included administrative failure, patient refusal, reversible impairment, and co-morbidity. Our algorithm can screen glaucoma patients for blindness at large scale. **Discussion:** Many blind patients are not CVI-registered, with risk factors including frailty, co-morbidity, and reversible causes of visual impairment. Our algorithm could prompt ophthalmologists to consider registration or provide an alternative referral pathway. Screening for blindness may reduce the inequitable provision of social benefits due to subjective and inconsistent decision-making.
Andrew Ross Ophthalmology, Cambridge University Hospitals NHS Foundation Trust. Additional Authors:	**7 - The Accuracy of Referrals for Vitreomacular Interface Disorders to Addenbrooke's Hospital Vitreo-Retinal Clinics** Abstract: **Introduction:** Appropriate referrals to vitreo-retina (VR) clinics are essential for high-quality ophthalmic care. Referral quality can vary based on the referrer's experience, yet limited comparative data exists between optometrist and ophthalmologist

Philip Alexander - Cambridge University Hospitals NHS Foundation Trust, UK Abstract type: Clinical Research Sub-specialism category: Surgical Retina Oral presentation AND Poster Submitter Grade: Trainee Level Role/Designation Project CUH Consultant / Lead PI: Mr Philip Alexander	referrals. Additionally, most studies have not assessed the accuracy of urgency indicated in referrals. This study aimed to evaluate the accuracy and quality of vitreomacular interface disorder referrals to VR clinics at Addenbrooke's Hospital. **Methods:** All referrals to VR clinics at Addenbrookes Hospital were evaluated for 8 consecutive weeks. Data were collected from Epic, including referrer practice details, referrer impression, requested timeframe, and clinic. **Results:** A total of 93 referrals were analysed: 48.3% from optometrists and 39.7% from ophthalmologists. The most common reasons for referral were epiretinal membrane (ERM), macular hole, and vitreomacular traction (VMT), comprising 64.4% of optometrist referrals and 62.1% of ophthalmologist referrals. Optometrists consistently specified timeframes (100%), compared to 35% in ophthalmologist referrals. Ophthalmologists correctly identified the VR clinic in 97.2% of referrals, compared to 53.3% from optometrists. Most ERM referrals from optometrists were routine (69.2%), while 87.5% of VMT referrals were urgent. Timeframes were often omitted in ophthalmologist referrals for ERM (80%) and VMT (66.6%). **Conclusions:** Vitreomacular interface pathologies were the most common reasons for VR referrals. Optometrists consistently included timeframes but sometimes misdirected referrals, while ophthalmologists selected the correct clinic but often omitted timeframes (77.7%). Half of optometrist referrals for ERM/VMT were unnecessarily marked as urgent. These findings highlight the need for clearer referral guidelines to improve accuracy and optimise VR clinic resources.
Robert Thomas Brady Additional Authors Simon Woodruff, Addenbrooke's Hospital, Cambridge University Hospitals NHS Foundation Trust Cornelius René, Addenbrooke's Hospital, Cambridge University Hospitals NHS Foundation Trust Abstract type: Clinical Research Sub-specialism category: Ocular Oncology and Pathology	**8 - Management of periocular basal cell carcinoma by Mohs micrographic surgery: a ten-year retrospective analysis of outcomes** Abstract: **Purpose:** To determine the success of Mohs micrographic surgery (MMS) for periocular basal cell carcinoma (BCC) at Addenbrooke's Hospital, a tertiary referral centre in Cambridge, England over a ten-year period. **Methods:** This retrospective interventional case series investigated the medical records of 664 consecutive patients who underwent MMS for confirmed periocular BCC over a ten-year period. The main outcome measure was biopsy-proven recurrence of BCC at the same anatomical location after MMS. Secondary outcome measures included patient demographics, tumour site, histological subtype and length of follow-up. Results were compared with a previous 5-year audit (Jan 2003 to July 2008), to highlight the increasing impact Mohs surgery has had over a total period of twenty years at this centre. **Results:** 664 patients were identified as having undergone MMS for periocular BCC from October 2014 to March 2024. 658 (99%) of the surgeries were for primary BCC and 6 procedures (1%) were for recurrent or residual BCC. Three patients (0.5%) identified to have Gorlin Syndrome were included in the analysis. The mean follow-up was 40 months (range 1-70 months). The recurrence rate following MMS for primary BCC was 0.76% (5 patients) which is lower than the rate determined in the previous audit at 1.6% for those undergoing primary excision of tumours. The mean time to recurrence was 40 months (range 18-130). There was a significant drop in patients undergoing Mohs for previous WLE and a large increase in patient numbers when compared to the previous audit (104 versus 664 patients total). This represents a 300% increase in Mohs surgery, having become the primary management strategy, for peri-ocular BCC at this centre. **Conclusion:** MMS for primary BCC has a very high success rate for complete excision without recurrence and is comparable to international figures. We found the potential for recurrence was influenced by tumour characteristics, such as location, with BCC in high-risk areas demonstrating a higher likelihood of recurrence due to their anatomical complexity and certain histological sub-types.

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Additional Authors: Erika Damato. Department of Ophthalmology, Cambridge University Hospitals NHS Trust.

Abstract type: Clinical Research
Sub-specialism category: Medical Retina (inc. Uveitis)

Poster only

Submitter Grade: Consultant/ SAS Doctor
Role/Designation
Project CUH Consultant / Lead PI : Bhairavi Bhatia

POSTER ONLY - Immunotherapy-related Uveitis: The Cambridge Experience

Abstract:
Purpose: Immunotherapy-related uveitis is a well-documented side effect of immune-checkpoint inhibitors used in cancer therapeutics. Ocular side-effects are generally rare although their early detection is necessary to prevent significant impacts on vision and quality of life. Among clinical trials dry eyes were the most reported immune-related adverse events followed by uveitis. This study aimed to characterise the patients presenting with immunotherapy-related uveitis at Addenbrookes Hospital.
Methods: This retrospective study identified patients diagnosed with immunotherapy-associated uveitis seen in the medical ophthalmology clinic between January 2021 and March 2025. Data was collected from electronic patient records including the immunotherapy treatment, clinical characteristics, and treatment and course of the uveitis.
Results: Fifteen patients were identified over the study period: 8 patients (53%) presented with anterior uveitis, 2 patients with intermediate uveitis, 4 patients with pan-uveitis and 1 patient with kerato-uveitis. 46% of patients were taking nivolumab at the time of diagnosis. Most cases responded to topical treatment. Other data collected included duration of symptoms prior to diagnosis, recurrence and decision regarding continuation of immunotherapy treatment.
Conclusion: Immunotherapy-related uveitis represents a significant proportion of ocular immunotherapy-related adverse events. This study highlights the variations in the presentation of this condition: the majority of patients presented with anterior uveitis, however there were cases of intermediate and pan-uveitis. However, most responded to topical or local steroid therapy. A multidisciplinary approach to managing the ocular symptoms caused by immunotherapy is required, with liaison between the ophthalmology and oncology teams.