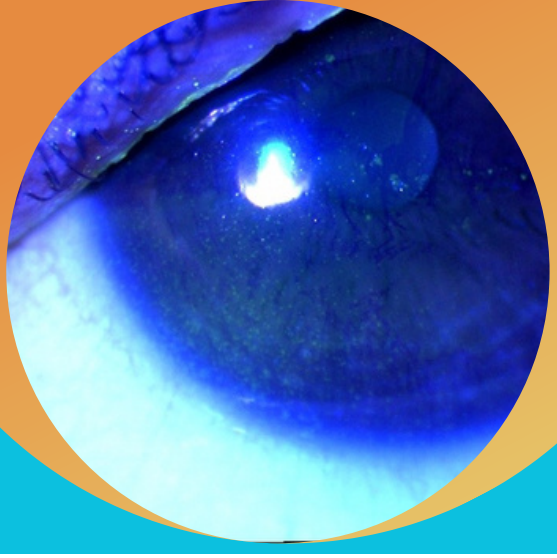
THE VIEW



Corneal Research Group Newsletter
The University of Sydney, Save Sight Institute

2024 | VOLUME 12

Welcome to the latest issue of "The View". I am extremely proud of the achievements of the Corneal Research Group highlighted in this issue. Corneal blindness continues to affect all ages and remains a significant cause of visual impairment worldwide. A notable highlight has been impactful publications and conference presentations which have improved outcomes for patients living with corneal disease.

Over the past year, our achievements received multiple international and national awards. Professor Watson, Professor Foster and Dr Tan received the Mamalis Award from Journal of Cataract and Refractive Surgery for the best lab science paper. Professor Watson was honoured with an Achievement Award from the Asia Pacific Academy of Ophthalmology; the Doug Coster Lecture at the Australian and New Zealand Corneal Society meeting, Gold Fellowship of the Association for Research in Vision and Ophthalmology (ARVO) and Fellowship of The Royal Society of New South Wales.

Dr Maria Cabrera-Aguas received the Best Paper prize at the Royal Australian and New Zealand College of Ophthalmologists Annual meeting and was awarded a place on the ARVO Board as the Member in Training representative; in this role, she will have the opportunity to contribute to global eye research programmes and advocacy. Dr Kandel was listed among the top 200 optometrist researchers globally; this was a remarkable acknowledgment of his dedication and contributions to the field. Dr Kandel, Kornhauser Research Associate, won the FMH Bright Ideas Grant 2023 for developing a comprehensive quality-of-life measure for keratoconus. Dr Ngozi Chidi-Egboka was invited to present on the dry eye registry at the American Academy of Optometry annual meeting. I am also pleased to introduce Dr Mojdeh Abbasi, an accomplished corneal researcher, who joins us from Linkoping University, Sweden.

Thank you again to our supporters, your assistance has inspired the team to continue their efforts to find answers for patients with corneal disease. To help us find new and improved ways to save sight please consider making a donation using the QR code or link on the right of this page.

Sincerely,

Professor Stephanie Watson OAM FARVO
Head, Corneal Research Group | Save Sight Institute

Newsletter Highlights

SUPPORT OUR RESEARCH

You can make a donation by scanning or clicking on the below QR code and select 'Cornea Research Group'

SCAN ME

Corneal Research Group Projects

The Corneal Research Group aims to improve the quality of life for people living with corneal diseases by using a unique and sophisticated platform for tracking the long-term effectiveness and safety of treatments and developing new solutions for corneal infection, trauma, and stem cell deficiency.

Fight Corneal Blindness (FCB!)

The Fight Corneal Blindness Project was designed to collect high-quality outcomes data from patients in the clinical practices. This project aims to track the effectiveness and safety of emerging therapies and surgical techniques on keratoconus and dry eye disease, that may cause ocular discomfort, vision impairment, or blindness. The Fight Corneal Blindness Project is part of the Save Sight Registries (savesightregistries.org)

Save Sight Dry Eye Registry

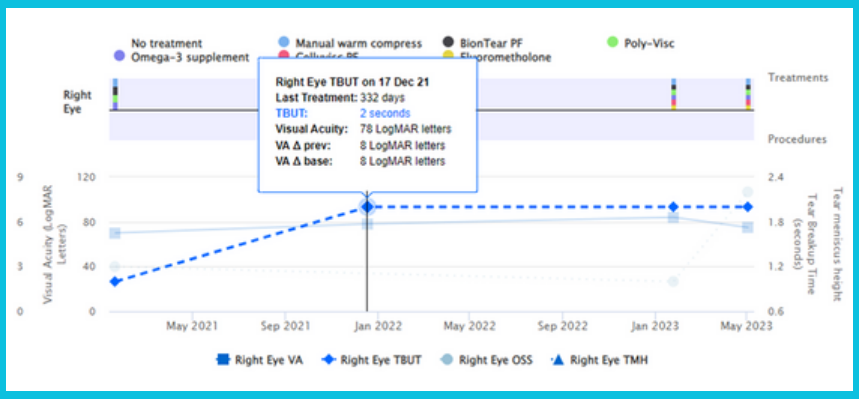
The Save Sight Dry Eye Registry (SSDER) was established in 2020 and is the first collaborative registry, across ophthalmology and optometry to collect data from everyday clinical practice on dry eye treatment outcomes over the long term. The ability to collect real-world data may also improve understanding of dry eye natural history which is currently poorly understood.

Patient-reported outcomes are also collected by the registry using the Ocular Surface Disease Index (OSDI), Ocular Comfort Index (OCI), and Primary Health Questionnaire 4 (PHQ-4) which will enable us to understand the impact of dry eye on the quality of life and the benefit to patients of treatments in the real world.

The SSDER team coordinated by Dr Ngozi Chidi-Egboka, under the leadership of Professor Stephanie Watson OAM, has published in leading journals and presented at key meetings to educate eye care researchers and workers.

As of January 2024, the SSDER registered baseline clinical visit entries has increased by 59% from January 2022 comprising data entered by ophthalmologists and optometrists from six countries including Australia, France, Germany, Nepal, Spain and the United Kingdom. The SSDER monitors the outcomes from 2,295 clinical visits of patients with dry eye disease.

Efficient capture of real-world data for dry eye disease



Save Sight Keratoconus Registry

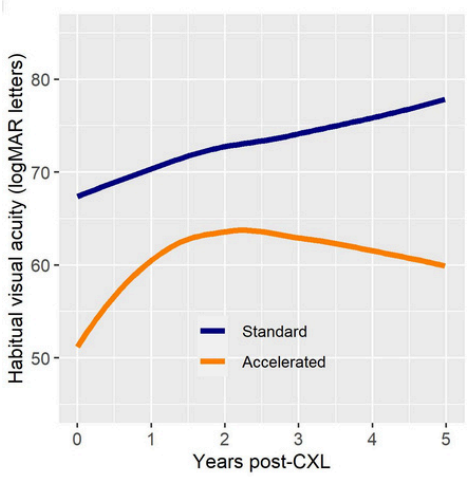
Long-term outcomes of corneal cross-linking for keratoconus

A study led by Dr Himal Kandel, Kornhauser Research Associate, and Professor Stephanie Watson OAM evaluated the long-term outcomes of corneal cross-linking (CXL) for keratoconus, a progressive corneal disorder that typically begins in the second decade of life, leading to poor vision quality and reduced quality of life. The CXL procedure aims to strengthen the cornea and stabilize keratoconus. This study compared the outcomes of two common CXL protocols: standard CXL (sCXL) and accelerated CXL (aCXL).

The study utilised data from the Save Sight Keratoconus Registry (SSKR), a multinational patient database of patients with keratoconus. The study found that both sCXL and aCXL were effective and safe in stabilising keratoconus and improving patient outcomes. Visual acuity improved in both groups, with a slightly better improvement observed in the sCXL group. Similarly, better corneal shape outcomes were found in the sCXL group. While aCXL resulted in greater corneal thinning than the sCXL, the difference was not statistically significant. Adverse events were minimal in both groups, with haze being the most common side effect, but it generally resolved over time.

The sCXL may have more favourable longer-term outcomes, but there is a need for further research to confirm these findings. Both sCXL and aCXL appeared to be valuable treatments for keratoconus, offering patients improved vision and corneal stability.

Figure shows changes in vision over time, in both CXL groups



Serious Ocular infections

Our project aims to investigate the causes and treatment interventions for a range of corneal infections including:

- **'The Bacterial Ocular Surveillance System' (BOSS).**

This project was established in collaboration with NSW Health Pathology to monitor antimicrobial resistance in bacterial corneal infections in Sydney in 2016. **The BOSS** expanded to Melbourne, Perth, and Adelaide with financial support from Australian Vision Research in 2020. This project promotes evidence-based antimicrobial use for bacterial corneal infection potentially saving sight. Coagulase-negative Staphylococci (CoNS) was the main bacteria causing this infection. One-quarter of these bacteria were resistant to cefalotin, one of the first-line antibiotics to treat this infection. An ongoing monitoring system is needed to provide up-to-date evidence-based recommendations on the initial antibiotic therapy to avoid complications such as vision impairment or blindness.

- **Deep learning for diagnosing infectious keratitis**

Dr Maria Cabrera-Aguas was awarded the Claffy Foundation-Bright Ideas grant to fund this project. This project aims to utilise artificial intelligence to diagnose the type of infectious keratitis: bacterial, viral or fungal. Patients will be recruited across 4 hospitals in Sydney for 1 year. Photographs of the affected eye will be taken using a mobile phone. The clinician will provide their estimated diagnosis which will be compared with the microbiology results. The photographs will be used to train artificial intelligence models. This potential rapid and accurate tool could be used in telemedicine in rural and remote communities.

Therapeutics and technology

We focus on innovative solutions to restore sight and eye health in corneal diseases, particularly in stem cell repair, sutureless surgery, dry eye and ocular trauma.

- **Stem cells - Sydney Nano**

Stem cells are programmable human cells that can be used to repair tissues. Disease or injury of the cornea's stem cells is a condition known as Limbal stem cell deficiency (LSCD) which can cause pain and impair vision. LSCD is usually managed with tissue grafts from donors, their success is limited by the availability of suitable tissue and rejection. We developed a world-first technique where stem cells were applied to the ocular surface with modern contact lenses to heal the cornea and restore vision. At the Save Sight Institute in collaboration with Sydney Nano, we are developing novel nano-therapeutics to optimise our stem cell technique overcoming the need for donor tissue. This technology will revolutionise the treatment of corneal diseases through stem cell delivery to the corneas. It may help stem cell failure from injury or conditions such as ectodermal dysplasia.

The work is currently being undertaken by Dr. Mojdeh Abbasi, a new member of our team, who is a Postdoctoral Researcher specialising in corneal disease. Since earning her PhD in 2020, she has focused on investigating corneal pathology to develop innovative therapeutic approaches targeting underlying mechanisms. Her primary aim is to improve patient outcomes and quality of life by addressing not only the symptoms but also the fundamental causes of corneal diseases.

Celebrating team members

Dr Maria Cabrera-Aguas work on the 'Bacterial Ocular Surveillance System, 2019-2020 national report' was selected as one of the 6 best papers at the Royal Australian and New Zealand College of Ophthalmologists annual meeting in Perth in October 2023.

Dr Annette K. Hoskin was awarded her Doctor of Philosophy degree in December 2023 for her thesis titled "Defining and Rectifying the gaps in our ability to record and measure eye injuries internationally".

Dr Himal Kandel was acknowledged in the esteemed Ophthalmologist magazine and listed among the top 200 optometrist researchers globally. Dr Kandel also won the FMH Bright Ideas Grant 2023 for developing a comprehensive quality-of-life measure for keratoconus.

Dr Ngozi Chidi-Egboka was invited to present on the dry eye registry at the American Academy of Optometry annual meeting in New Orleans in October 2023.

OUR TEAM

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EVENTS

DryEyeClub: Seeing Outcomes 2024

Join us for a free online webinar to hear from eye research experts and clinicians on the latest developments in treating dry eye disease and improving patient outcomes. This event will be hosted by Professor Stephanie Watson OAM. Save the date!

When: Thursday 18th July 2024, 5pm-6pm.
Where: Online, via Zoom.

Register SCAN ME

KeraClub 2024

The 9th annual community event for people with keratoconus will be held in November close to World Keratoconus Day. The KeraClub is co-hosted by Save Sight Institute, Sydney Nano and Keratoconus Australia. The latest advancements in keratoconus management will be featured. The speakers include Professor Stephanie Watson OAM, Dr Himal Kandel, Mr Larry Kornhauser OAM, and invited optometrists and patients with keratoconus. Save the date! Registration coming soon.

When: Wednesday 13th November 2024, 5pm-6.30pm.
Where: Online, via Zoom.

Contact or Follow us on our community media platforms to get alerts on the latest research findings

ssi.operations@sydney.edu.au

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Sydney Eye Podcast

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SUPPORT OUR RESEARCH

We can't do what we do without the support of our patients and community. Our research is funded 100% by grants, donations and bequests,

To help us find new and improved ways to save sight please consider donating to the Corneal Research Group via our donation form by scanning or clicking on the below QR code and selecting **Corneal Research Group**:

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Donations over $2 are tax deductible.

If you're interested in discussing and making a substantial contribution to the Corneal Research Group, please contact Amanda Craze (amanda.craze@sydney.edu.au or +61 422 943 686)

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