

# eyecure.

## WELCOME.

The stories in this edition of Eyecure show how QEI works at both ends of the research spectrum. Our clinical trial team tests new therapies which have generally been in development for years. Across the hallway, their colleagues are applying complex polymer science at the laboratory bench in a bid to unlock future cures.


I am grateful to Nicola Danielson for sharing her journey with vision loss and her experience with clinical trials at the Queensland Eye Institute. Volunteers like Nicola are vital to the research done here and around the world to bring new treatments to the market.

It is also with an eye to the market that QEI invests in patent applications. While patent applications are expensive, protecting our intellectual property is an important step in securing possible commercial outcomes from QEI's research, thereby reducing reliance on grants and donations for our scientific program.

Please enjoy this edition of QEI's newsletter.

Professor Mark Radford  
CEO and Executive Director  
Queensland Eye Institute



 Student Aiswaraya Sajeevan (Aisha) at work in the QEI laboratory

# CLINICAL TRIALS HOLD SPECIAL MEANING FOR NICOLA.

Nicola Danielson is deaf and has navigated the world in silence since birth. While Nicola thrived as a young child, when she was 12 years old she began bumping into furniture and struggling to hit tennis balls. An eye exam revealed Nicola had Usher syndrome, a genetic condition leading to vision and hearing loss.

Usher syndrome causes gradual vision loss from retinitis pigmentosa, which affects the layer of light-sensitive tissue at the back of the eye. Vision loss occurs progressively as the light-sensing cells of the retina gradually deteriorate. There is currently no cure.

Now aged 41, Nicola lives on the Gold Coast with her husband and three children. She has 8% vision in the centre of her visual field but nothing beyond that.

"It's like looking through a toilet roll holder," Nicola signs through her mother, Trish.

"I can see mum if I'm right in front of her, but I can't see above, below or to the sides," she says.

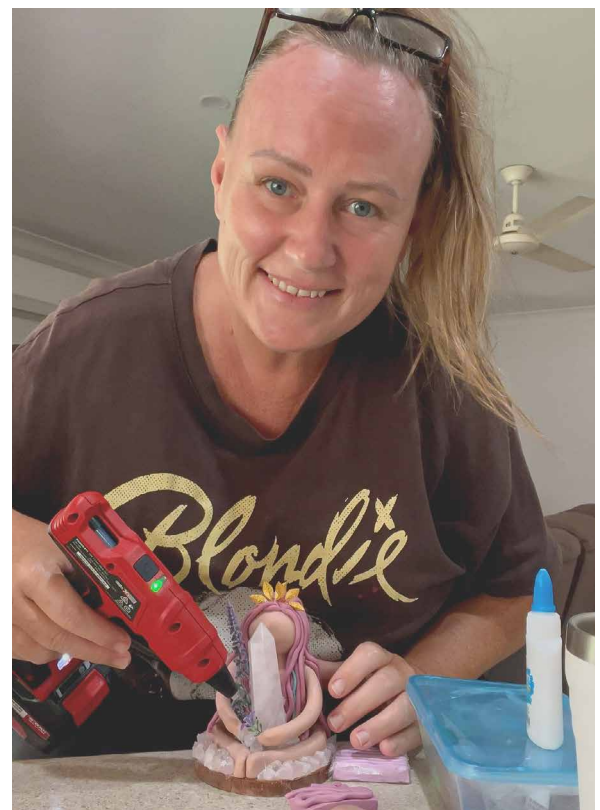
Queensland Eye Institute is part of a clinical trial testing the safety and efficacy of a new drug therapy for retinitis pigmentosa caused by Ushers. Nicola heard about the trial through a friend and contacted QEI to find out more. After extensive screening over two visits, the QEI clinical trials team

confirmed she was a suitable candidate.


Now in her second year on the trial, Nicola says the regular testing can be draining.

"I didn't think it would be this hard," Nicola signs, "but Brett (Caldwell, QEI Clinical Trial Manager) and all the staff here who work with me make sure that I'm happy. They support me, and I'm happy working with them because they're all one team.

"They know it's hard for me sometimes, so they work at my pace. They make sure it's all about me, not about them," Nicola says.





 Nicola (second from right) with her husband Danny and their children Bailey (19), Lily-Grace (17) and Tyne (10)

Brett Caldwell says one of the greatest challenges in recruiting people into clinical trials is distance, particularly in a state the size of Queensland.

“Participants might have to travel considerable distance to get here,” Brett says.

“This is particularly true for Ushers patients.

“Often their income is restricted because of their vision and hearing impairment, which forces them to live further out to ease cost of living.”

Nicola was born and raised in England but moved to Australia in her late twenties. As a young woman in England, she did a lot to raise awareness of deaf blindness, skydiving and doing stunts standing on the wings of a biplane among other things. In recognition of her work, Nicola was presented with the keys to the city and twice invited to meet The Queen, Her Majesty Queen Elizabeth II.

These days Nicola’s life is quieter, although it still holds some adventure. She recently returned from a holiday with

her sister and friends in Ibiza, Spain, to celebrate fortieth birthdays.

Nicola is creative, using a magnifying glass and a lamp to pursue her passion for craft, making shadow boxes and coiling paper (quilling) to brighten her world.

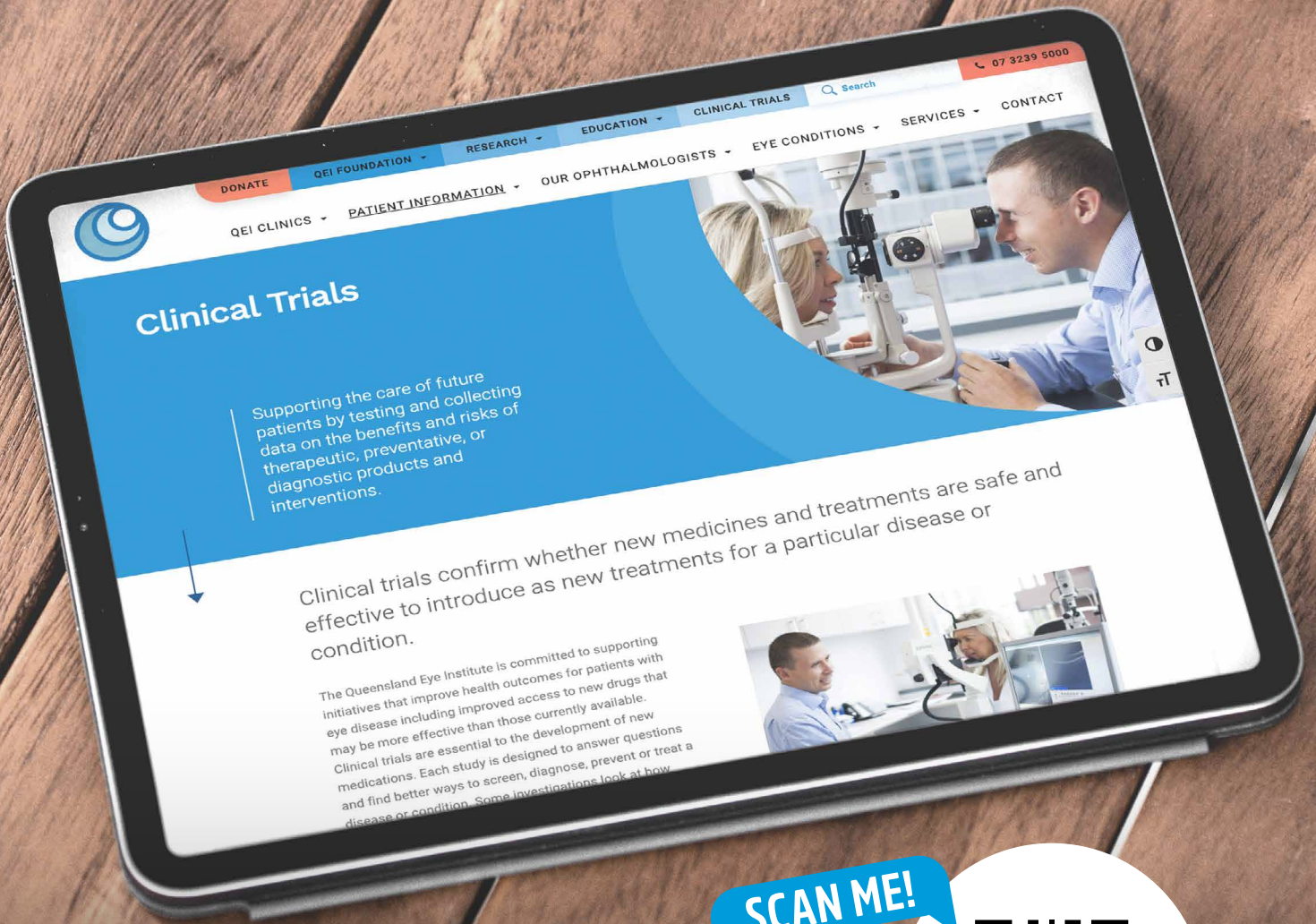
At Christmas she transformed her walking cane with tinsel and lights. “Strangers avoid people with a cane, but the decorations on Nicola’s make them smile and take an interest,” her mum says.

Nicola has more motivation than most people to help find treatments for retinitis pigmentosa.

“I don’t want to go blind,” Nicola signs. “It’s more important for the children. It’s hard enough having a deaf mother, let alone having a deafblind mother.”

Nicola is reassured her children have not inherited her genetic condition but knows it’s possible her grandchildren could.

“It seems crazy, but I could be saving my grandchildren’s sight,” she signs. “I’m doing this for the future.”



SCAN ME!



## ABOUT QEI CLINICAL TRIALS.

Our knowledge about the eye increases every day, leading to remarkable advances in treatments for conditions affecting sight. These advances are made possible by clinical testing or 'trials' using human volunteers.

Clinical trials for eye health therapies can be particularly complex, with many assessments ranging from blood tests

and electrocardiograms (ECGs) through to angiographic imaging of the blood vessels of the back of the eye.

To learn more about clinical trials underway at QEI, including those currently recruiting, visit the QEI website here:

[qei.org.au/clinical-trials](http://qei.org.au/clinical-trials)



# RESEARCH ON TREATING BLINDNESS FROM DERMAL FILLERS.

Cosmetic procedures using dermal fillers are becoming increasingly popular in Australia, with gel-like substances injected under the skin changing facial appearance without invasive surgery. The most popular injectable dermal filler for cosmetic purposes is based on crosslinked hyaluronan (hyaluronic acid, HA) due to its efficacy and safety compared to other fillers.

Although the risk of complications is low, dermal fillers can cause blindness by blocking the central retinal artery. If not treated within a very short time, this kind of blindness becomes irreversible.

QEI scientists are exploring different ways to treat this condition by delivering an enzyme

to the blocked retinal artery, to counteract the injected filler particles and restore sight.

Enzymes are a type of biomolecule that speed up chemical reactions. Encapsulating enzymes in nanoparticles is a cutting-edge technique aimed at improving enzyme stability, bioavailability, and targeted delivery. This approach protects enzymes from degradation, enhances their activity, and enables controlled release.

The study aims at establishing a way to encapsulate the enzyme hyaluronidase into polymeric microcapsules without using organic solvents.



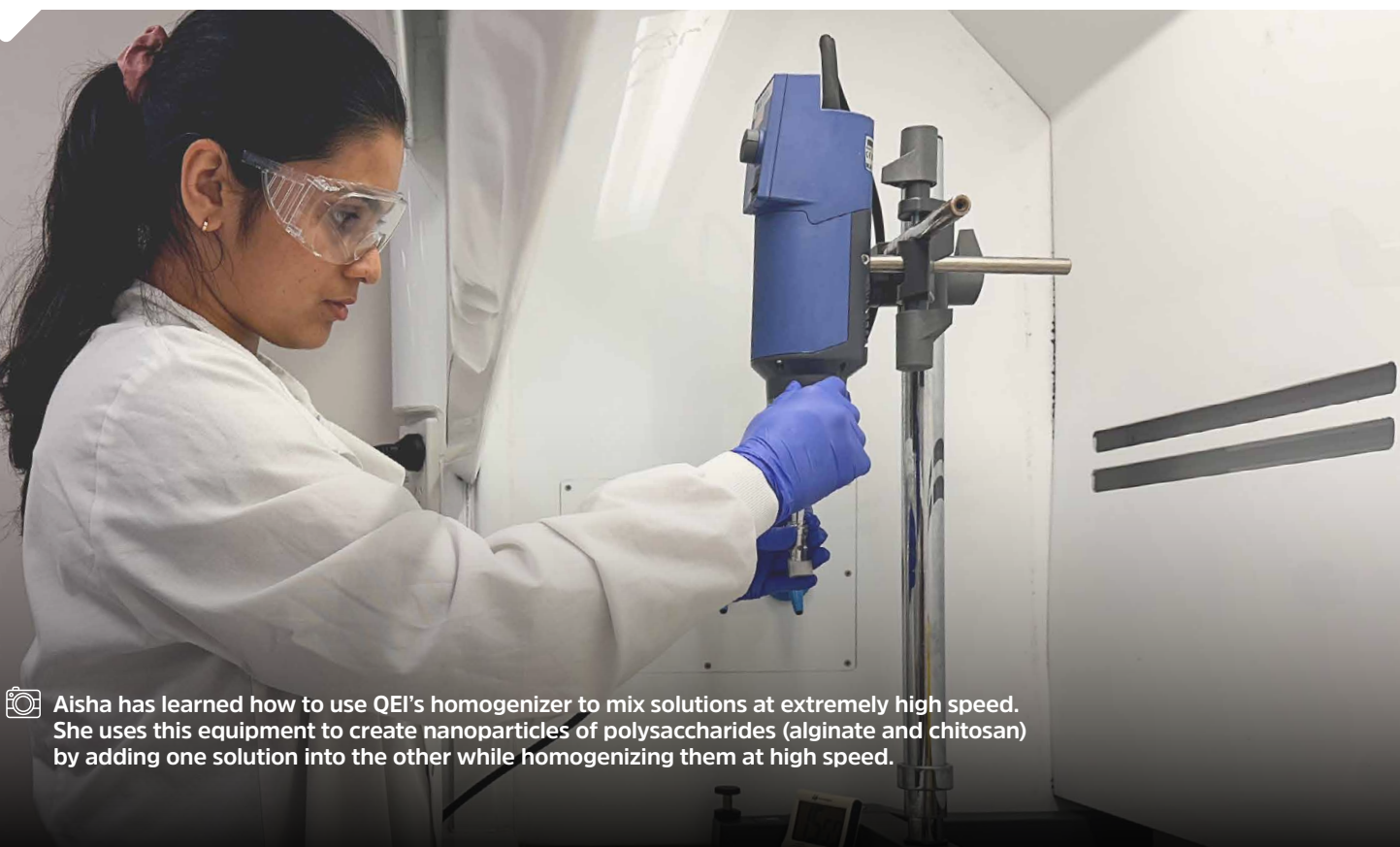
# STUDENT PLAYS VALUABLE ROLE IN QEI RESEARCH.


Aiswaraya Sajeevan (Aisha), a master's research student from the University of Queensland, is completing a research internship at Queensland Eye Institute (QEI) this summer.

Aisha's project involves creating nanoparticles for targeted drug delivery. Specifically, she is preparing poly electrolyte complexes to carry enzymes for treating eye diseases. The project aims to reduce nanoparticles from 250 microns to 10 microns in size. This is an important

step in QEI's research on treating blindness caused by dermal fillers.

Other scientists around the world have examined this approach to enzyme therapy, but their reports aren't always helpful, lacking the detail needed to run their experiments and reproduce the results. "I have to try different concentrations and proportions," Aisha says, "because the published protocol I'm using isn't very descriptive. I'd love to figure out what they have done."



 Aisha has learned how to use QEI's homogenizer to mix solutions at extremely high speed. She uses this equipment to create nanoparticles of polysaccharides (alginate and chitosan) by adding one solution into the other while homogenizing them at high speed.



Aisha (left) is supervised by QEI Chief Scientist Professor Traian Chirila (second from left) and honorary QEI Senior Scientist Associate Professor Idriss Blakey (second from right), with assistance from QEI Senior Research Officer Dr Shuko Suzuki (right).

Despite the challenges, Aisha has made some progress in the few weeks she's been at QEI. "I started producing particles measuring one millimetre, and then it came down to 250 microns, and I hope it will come to 10 microns very soon," Aisha says.

Aisha, who completed her undergraduate degree in India, is enthusiastic about the advanced equipment and experienced teachers available at QEI and the University of Queensland.

The young scientist also understands her contribution may not lie in a new discovery, but in ruling out approaches that don't work.

"It doesn't matter if my experiments are a failure," Aisha says, "because we'll get to know that all these things won't work."

"The person who comes after me can try something that I haven't done. So that's also a contribution," Aisha says.

# PRACTISE MAKES PERFECT.

Queensland's next generation of ophthalmologists practised their clinical skills in a simulated test environment at QEI in February, prior to sitting their final exam in Melbourne at the Victorian Eye and Ear Hospital.

The Objective Structured Clinical Examination (OSCE) is the final step for registrars working towards fellowship of the Royal Australian and New Zealand College of Ophthalmologists (RANZCO).

Exam candidates complete a series of timed activities (OSCE stations) in a circuit. Each station has a trained examiner who assesses the students' performance against a standardised scoring sheet.

QEI's Dr Geoff Ryan, who organised the recent practice exam at the Woolloongabba clinic, says the OSCE exam is extremely difficult and designed to ensure high quality Australian ophthalmologists.

"Candidates need to be at the top of their game to pass," Dr Ryan says.

"The time pressure of the exam can be a significant stressor on the day. Getting to practise the timing and how it will feel on the day increases their chances of passing," he says.

In addition to his QEI practice, Dr Ryan works at the Mater Public Hospital. He's also a member of RANZCO's Queensland education committee which selects doctors for the ophthalmology training program. This means he's well placed to talk to training doctors about the education opportunities offered by QEI.

"The public hospitals also offer practice exams but not on the scale QEI provides," Dr Ryan says. "The advantage of running a simulated OSCE here is the large number of ophthalmology specialists who can act as examiners."

The time pressure of the exam can be a significant stressor on the day. Getting to practise the timing and how it will feel on the day increases their chances of passing





 (L-R) Trudi Ferdinando, Danielle Manera and Sandie McMurray

# THREE IS A MAGIC NUMBER.

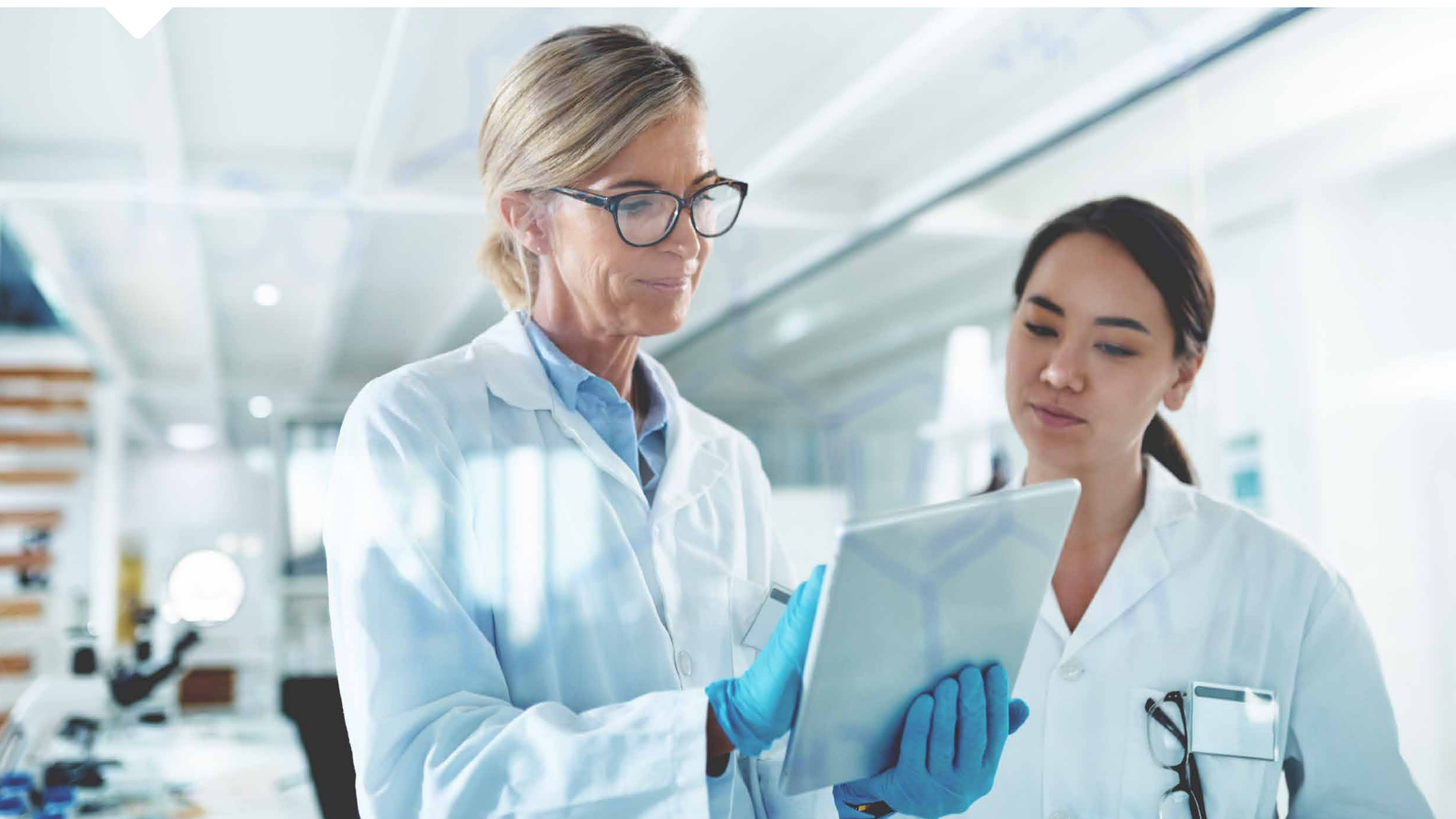
Meet the three dynamic women at the helm of QEI's ophthalmology clinics. Trudi, Danielle and Sandi share the Practice Manager role across the Woolloongabba and Clayfield clinics, enjoying the opportunity to build management skills while having some flexibility for a better work-life balance. QEI's Chief Operating Officer, Kelly Langdon, says the trio is a valuable asset to the practice. "No matter the challenge thrown at them, they never say 'no'," Kelly says. "They each bring unique skills to QEI but as a team they share a commitment to finding solutions."

# NEW NATIONAL FRAMEWORK FOR CLINICAL TRIALS.

The Queensland Eye Institute and its sister organisation, South Brisbane Day Hospital, are working to implement a National Clinical Trials Governance Framework. The Governance Framework, developed by the Australian Commission on Safety and Quality in Healthcare, has five components:

- Governance, leadership and culture
- Patient safety and quality improvement systems
- Clinical performance and effectiveness
- Safe environment for the delivery of care
- Partnering with consumers

The clinical trials team is working with clinical and administrative staff to identify where and how the framework can be applied here, to ensure QEI and South Brisbane Day Hospital meet the national standards.





# WATCH THIS SPACE.

Queensland Eye Institute Foundation recently lodged two patent applications with the United States Patent and Trademark Office. The patents relate to novel treatments for eyelid laxity, such as floppy eyelid syndrome, and dry eye disease.

Untreated floppy eyelid syndrome may result in sight-threatening conditions, including chronic irritation and inflammation of the eye surface. Due to corneal complications and associations with other eyelid disorders, a floppy eyelid can lead to blindness.

# PLEASE DONATE TODAY.

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## HELP THE FIGHT TO SAVE SIGHT.

With your support, QEI can continue to invest in people and programs addressing preventable blindness. Your donation directly funds QEI researchers and scientists, giving long-term certainty in their fight to save sight. **All donations \$2.00 and above are tax-deductible and are issued a receipt.**

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