Glaucoma Australia
Saving sight

Glaucoma News

Spring 2025 / Issue 98

Our vision is for Australians to be free of glaucoma blindness

Glaucoma Research in Australia. Advancements, Challenges and Future Directions

Written by Glaucoma Australia

Glaucoma is one of the leading causes of irreversible blindness globally, and its prevalence is expected to rise due to an aging population.

In Australia, where the rate of glaucoma is steadily increasing, research into the disease has gained significant momentum.

Australian scientists are making strides in both understanding the underlying mechanisms of glaucoma and improving detection, treatment, and prevention.

Australia has a rapidly aging population, with people aged 65 and older expected to make up to 20% of the population by 2050.

As age is the most significant risk factor for glaucoma, this demographic shift means that glaucoma will become an even greater public health issue.

It is estimated that 379,000 Australians are living with glaucoma with half of them undiagnosed.

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From the CEO

Dear friends and supporters,

I hope you enjoy the latest Glaucoma News – our dedicated research edition.

We're delighted to contribute to a global mission focused on improving the lives of people affected by glaucoma. By funding vital research into better detection methods and treatments, we are moving closer to restoring vision and discovering a cure.

To date, we've invested more than two million dollars in Australian research via the Glaucoma Australia Quinlivan Research Fund. These precious funds have already been put to work in labs across our beautiful country by some of our most brilliant minds.

In fact, last year's grant recipient, Associate Professor Andrew White, has already reached a very exciting point in his research. His team are in the final stages of stability studies to assess the safety and efficacy of irbesartan administered as eye drops. This drug will be a world-first and recruitment for neuroprotective trials has begun.

So many good things are happening in the glaucoma research space as we advance towards a cure. You can read more about these advancements and challenges in our cover story.

Sincerely,

Adam Check
Chief Executive Officer

Cover Story

Glaucoma Research in Australia

Continued from page 1

Given this, it's crucial to invest in innovative research to better understand the disease and improve clinical outcomes.

Australian researchers have made several notable contributions to the global fight against glaucoma, particularly in the areas of early detection, treatment, and neuroprotection.

Innovative Diagnostic Tools

- **Optical Coherence Tomography (OCT):** Australian researchers have helped refine OCT technology, allowing for non-invasive, high-resolution imaging of the optic nerve head and retinal layers.

  This helps in detecting structural changes in the eye long before noticeable vision loss occurs, enabling earlier diagnosis.

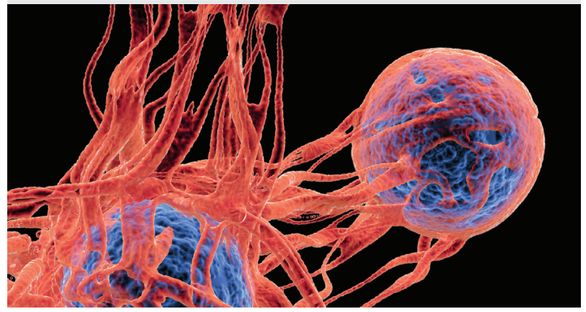
- **Genetic Research and Biomarkers:** Researchers are exploring the genetic basis of glaucoma. Understanding genetic risk factors could lead to earlier identification of at-risk individuals, especially those with a family history of the disease.

  Genetic markers are being investigated to predict the disease's onset and progression.

Treatment Innovation

- **Novel Medications:** Australia has been at the forefront of developing new classes of medications to lower intraocular pressure (IOP), the primary treatment for glaucoma. Researchers are testing new formulations and delivery systems to improve efficacy and minimize side effects.
- **Neuroprotective Therapies:** A very promising area of glaucoma research is neuroprotection—strategies aimed at protecting the optic nerve from damage.

Research teams are exploring how certain compounds, such as antioxidants, could help to safeguard nerve cells from the effects of IOP.



Regenerative Approaches

- **Regeneration of Optic Nerve Tissue:** Although optic nerve damage caused by glaucoma is irreversible, stem cell research offers hope. Researchers are investigating how stem cells can be used to regenerate damaged optic nerve fibers and promote healing.

  While still in the early stages, these regenerative approaches could one day provide groundbreaking treatments for glaucoma patients.

Laser Therapies

- **Selective Laser Trabeculoplasty (SLT):** SLT is a non-invasive procedure that helps reduce intraocular pressure by improving the drainage of fluid from the eye. Researchers are investigating the long-term effectiveness of SLT and its potential to replace or supplement traditional surgical treatments for glaucoma.

Access to Treatment

While Australia has a high standard of healthcare, access to cutting-edge treatments and technologies can be limited, particularly in rural and remote areas. There is a need for more widespread availability of advanced diagnostic tools and therapies.

The Future of Glaucoma Research

The future of glaucoma research in Australia is bright, with promising breakthroughs on the horizon. As research in stem cell therapies, neuroprotection, and advanced imaging techniques continues, there is hope that new treatments will help preserve sight and, ultimately, provide a cure.

Moreover, with Australia's strong focus on collaborative research, both nationally and internationally, there is great potential for future innovations in glaucoma care. Advancements in genetics, precision medicine, and personalized treatment plans may soon allow doctors to predict the progression of glaucoma on an individual basis, optimizing outcomes for patients.

In conclusion, glaucoma remains a significant public health concern in Australia, but the country's researchers are at the forefront of addressing its challenges.

Thanks to the kindness of our supporters, we are able to proudly invest in ground-breaking glaucoma research through Glaucoma Australia's Quinlivan Research Grant.

These precious funds are ensuring that Australian researchers are leaving no stone unturned in the search for a cure.

You can contribute to this year's Quinlivan Appeal at glaucoma.org.au/appeal2025

When Intervention is Less Intrusive: The Changing Face of Glaucoma Management

Written by Mivision

Glaucoma is the leading cause of permanent blindness worldwide, with prevalence projected to increase over time. Treatment of open angle glaucoma (OAG) focusses on reducing intraocular pressure(IOP), which has been established as the only proven modifiable risk factor in disease progression.[1-6]

While topical medications were once the first-line treatment for glaucoma management, Dr Phoebe Moore proposes that the paradigm is shifting towards early implementation of interventional and surgical treatment options.

The traditional paradigm for achieving IOP reduction for OAG patients has relied on topical medication therapy as the first-line treatment, with escalation of topical drop therapy as required, reserving surgical management for severe or uncontrolled cases.[1]

The 1990s saw an explosion of topical medication options for the management of glaucoma, revolutionising the ability to manage this progressive, blinding condition with a low-risk, intervention-free medication that was more effective than previous options.

The historical preference for topical therapy and reservation towards surgical management was understandable in bygone eras because of the high relative risk of interventional procedures and filtration surgery (with apologies to our more experienced colleagues for describing the 1990s as a bygone era).

Drops: An Unhappy Marriage

Clinicians are all too familiar with patients on 'maximal tolerated medical therapy', consisting of multiple drops and carefully communicated regimens that patients are required to strictly adhere to, lest they experience irreversible vision loss.

The clinician and patient form an almost-matrimonial agreement whereby drops shall be used 'for better or for worse, in sickness and in health, with red eyes or white eyes, until death do us part'.

However, faithfulness to the eye drop marriage vow is often punished, not rewarded. For many of our patients, the experience of a marriage to drops is more likely worse than better, more likely sickness than health, more likely red eyes than white eyes.

While an essential tool in the clinician's arsenal for glaucoma management, and notwithstanding the place they have held to avert preventable blindness, topical glaucoma therapy is accompanied by a host of undesirable consequences.[2]

In a bygone era, when choosing the lesser of all evils, topical medications were accepted as first-line therapy due to the risks of alternative therapies. However, in a changing era of glaucoma management options, there is also a changing face of first-line glaucoma treatment, and it no longer consists of peri-orbitopathy, hyperaemia, and dry eye.

Drop-related challenges familiar to both patients and clinicians are wide reaching and develop due to a plethora of patient-dependent and patient-independent factors.[7,8]

Compliance issues and drop nonadherence are widely reported among glaucoma patients, which confers an increased risk of disease progression. Complex regimens for patients requiring multiple drops per day can be challenging, particularly for older patients or those with cognitive decline. The challenges are compounded by difficulties with instillation and the ongoing saga of pharmaceutical product discontinuation, necessitating modifications in already complex regimens.[9]

Topical therapy is associated with greater circadian fluctuations in IOP compared to interventional treatment, even when used with perfect compliance, which in turn is associated with greater progression.[10,11]

Unwanted side effects are common, experienced by more than 50% of patients receiving topical glaucoma therapy, and often render treatment untenable for patients. Ocular surface toxicity is a common consequence of topical medications, experienced by up to 70% of patients.[2]

Ocular surface toxicity is not only distressing for patients but is also problematic should the patient require escalation to filtration surgery.[12-14]

While rare, topical therapy is not without more significant risk. These risks may be ocular, including intraocular inflammation, cystoid macular oedema, and periorbital fat atrophy.[2]

And the risks of topical therapy are not always confined to the eye. In a challenge to the commonly held notion that 'surgery is dangerous, drops are safe', topical glaucoma therapy is not without systemic respiratory and cardiovascular risk, morbidity, and albeit rare, mortality.[15]

Finally, the cumulative cost of medications is not an insignificant burden for patients requiring lifelong therapy, an issue that is heightened in the current economic climate and is an increasing factor for many patients with compliance issues.[16]

Considering all the above, it is little wonder that a patient's quality of life is negatively impacted both by a glaucoma diagnosis, and even further by topical glaucoma treatment.[17] Topical glaucoma therapy has been consistently shown to negatively impact quality of life, due to a combination of factors including side effects, difficulty with drop instillation, and treatment burden, which can further contribute to drop non-compliance.[7,9,17]

Conversely, the ability to discontinue drops or decrease drop dependence is associated with an increase in perceived quality of life.[18]

So, in 2025, as clinicians, we must ask the question: is it still acceptable standard practice to urge glaucoma patients to persist in unhappy matrimony to their drops?

Or should the red eye serve as a red flag that this may be a toxic relationship? Toxic not only to the ocular surface, but to the patient's overall wellbeing and quality of life.

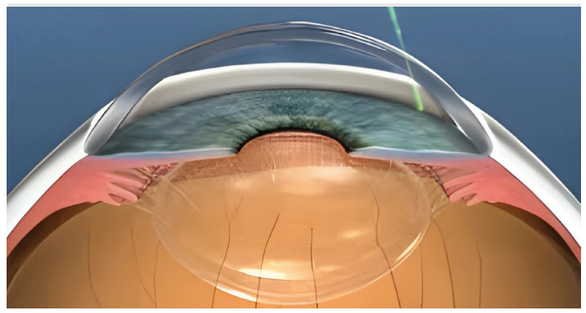
The Changing Face of Treatment Options

The historical paradigm of glaucoma management has overwhelmingly relied on topical therapy, with surgery reserved for recalcitrant cases. This was not a denial of the limitations and adverse effects common to

topical treatment, but rather a recognition of the high risk of traditional filtration surgery relative to topical therapy.

However, the 21st century has seen an explosion of treatment options for glaucoma, and with this, a shift in the risk profile of interventional glaucoma treatment relative to pical treatment. The traditional paradigm of glaucoma treatment is no longer fit-for-purpose.

The LiGHT trial[19] marked a shift in first-line treatment of glaucoma. There is a substantial evidence base supporting the shift away from drops and embracing selective laser trabeculoplasty (SLT) as an early intervention for glaucoma management.



Beyond SLT, interventional glaucoma management with minimally invasive glaucoma surgery (MIGS) has emerged as an umbrella term describing a group of procedures that lower IOP and minimise drop requirement, while minimising tissue or angle destruction and the procedural risk associated with bleb-forming or suprachoroidal procedures.[20-22]

This lower risk allows for earlier adoption of interventional management, effective and sustained reductions in IOP, and decreased requirement for topical therapy, while avoiding the risks associated with traditional filtration surgery.

Minimally Invasive Glaucoma Surgery

While cataract surgery alone will often achieve a degree of IOP reduction for glaucoma patients, combining planned cataract surgery with a MIGS device achieves greater reductions in IOP. Additionally, there is a greater likelihood of the patient achieving post-operative drop-independence compared to cataract surgery alone.[23-25]

Fan Gaskin et al.[25] reported that 57% of eyes with mild to moderate glaucoma undergoing cataract surgery with MIGS achieved drop independence versus 36% for patients undergoing cataract surgery alone.

Readers will be familiar with the current array of MIGS devices, the most common of which are Glaukos' iStent trabecular micro-bypass system in its various generations, and Alcon's Hydrus microstent.

Initially developed to be used in combination with cataract surgery, these MIGS devices lower IOP by enhancing conventional aqueous outflow. Both devices have demonstrated effective reductions in IOP and decreased medication requirement, with similar safety outcomes to cataract surgery alone.[26,27]

First released in 2004, there have now been four generations of the stent MIGS device, from the original iStent, to the iStent inject released in 2010, the iStent inject W released in 2019, all of which consisted of two implantable bypass devices.

Most recently the iStent infinite was released. This latest permutation has three implantable devices contained within a single preloaded injector. The implants occupy just 3% of the trabecular meshwork but optimise the aqueous outflow across 240°.[1,27,28]

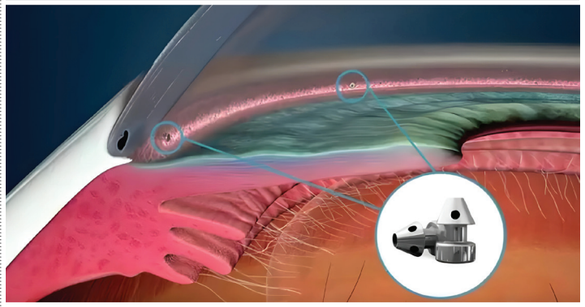
Since its release in 2004 and across its generations, the iStent has established a record of effective and sustained reduction in IOP for patients with ocular hypertension, mild to moderate primary glaucoma, and secondary glaucoma, with high rates of topical medication discontinuation and low rates of secondary filtration surgery.[1,29-31]

In the longest published follow-up to date of 10 years, Neuhann et al.[1] reported IOP reduction of 12.9–19% for patients undergoing cataract surgery combined with the first-generation stent. Of these eyes, 77.8% had IOP ≤18 mmHg, versus 50.8% preoperatively. Additionally, 47.6% achieved IOP ≤15 mmHg versus 25.4% preoperatively, and 33.3% of eyes achieved post-operative drop independence, versus 3.2% pre-operatively. Nearly all eyes maintained the reduced medication over the 10 years. No filtration surgeries were required over the 10-year follow-up.

While traditionally used for mild to moderate glaucoma, there is a body of evidence supporting the role of MIGS in moderate to severe glaucoma, with a positive risk-benefit profile when compared to filtration surgery.[32]

While traditionally reported in combination with cataract surgery, attention has more recently been given to MIGS as a successful standalone procedure, either in phakic or pseudophakic patients.[33,34]

Moraes et al.[35] report a 16.5% reduction in IOP and 72.3% reduction in medications with the iStent inject device over a five-year follow-up for patients with mild to moderate open angle glaucoma. Of these cases, 79% of eyes received the iStent inject in combination with cataract surgery, while 21% received the iStent as a standalone procedure in already pseudophakic eyes.



The procedure had a favourable safety profile and low complication rate. Intraoperative bleeding was reported in three cases. There was one case of peripheral anterior synechiae (PAS) into the implant ostium, treated with peripheral iridotomy under gonioscopic visualisation. Sixty-six per cent of eyes achieved drop independence, compared to just 1.8% pre-operatively, with the mean number of IOP-lowering medications reducing from 2.24 at baseline to 0.62 at last follow-up. Four eyes

required a secondary procedure – two required trabeculectomy and two received SLT.

Sarkisian et al.[36] evaluated the iStent infinite device as a standalone procedure in 72 eyes with open angle glaucoma not adequately controlled by prior surgical or medical therapies over a 12-month follow-up. Six of the eyes were phakic. Of all eyes, 76.1% achieved a ≥20% reduction in mean diurnal IOP (MDIOP) with 53% achieving ≥30% MDIOP reduction and 21.2% achieving a ≥40% reduction.

No serious device-related adverse events were recorded. There were three cases of significant hyphaema, two events of stent migration seen in one eye, and two cases of stent obstruction. With the exception of the stent obstruction, which was not treated, all device-related adverse events resolved completely. Six eyes receiving standalone iStent were phakic. There were no cases of progressive cataract, and no cataract surgery was required within the 12-month follow-up.

iStent vs Hydrus

In the INTEGRITY study, Ahmed et al.[28] compared the iStent infinite with the Hydrus microstent in adults with open angle glaucoma with six months follow-up published to date. MIGS devices were implanted as standalone procedures in both phakic and pseudophakic eyes. Ninety-one eyes received the iStent infinite, 89 eyes received the Hydrus implant.

At six months post-implantation, both the iStent infinite and Hydrus Microstent effectively reduced IOP. However, the iStent demonstrated a higher rate of significant IOP reduction (≥20% reduction) without medications and was associated with fewer adverse events and surgical complications.

In the iStent group, one eye had a fourth stent implanted as a result of one of the stents being improperly placed below the scleral spur. In one phakic eye receiving the iStent infinite, the device damaged the anterior capsule, requiring cataract surgery the following day. This eye developed PAS.

In the Hydrus group, implantation was aborted in one eye due to three unsuccessful attempts, positioning into the supraciliary space with iris prolapse requiring an intraoperative iridotomy. This eye developed PAS and dyscoria.

One of the pseudophakic Hydrus eyes also experienced vitreous prolapse due to significant capsular tear and required vitrectomy during the surgical procedure.

Seven additional Hydrus eyes were reported to have adverse events associated with improper placement. One eye was complicated by iridodialysis and inadvertent iridectomy with subsequent PAS.

Other reported complications related to the stent being less than ideally positioned. In the iStent group, PAS was reported in 4.4%, iris atrophy in 3.3%, and improper anatomical placement in 1.1%, with a reported surgical complication rate of 3.3%. The Hydrus group had higher rates with PAS in 10.1%, improper anatomical placement in 7.9%, and significant hyphaema in 4.5%, with a reported surgical complication rate of 16.9%.

There were no severe or vision-threatening complications in either group. As clinicians, we operate under the creed of primum non nocere – first, do no harm. This creed is outworked in the management of glaucoma through an approach of choosing the lesser of all evils. We are well aware that all treatment modalities carry risk and compromise, and it is our job to assist our patients in the prevention of vision loss while minimising this risk and compromise.

In a bygone era, when choosing the lesser of all evils, topical medications were accepted as first-line therapy due to the risks of alternative therapies. For generations, this balance of risk has swung in favour of topical glaucoma therapy, leading to the paradigm most of us are familiar with in the management of glaucoma: drops, drops, drops, drops, and then finally, surgery.

But in 2025, in an age of changing treatment options, the traditional paradigm of glaucoma treatment is no longer fit-for-purpose. As evidence-based, forward thinking, patient-focused practitioners, are we willing to have our paradigm challenged?

As clinicians, we are called to be holistic in-patient care. To consider their preference, their quality of life and do no harm. In 2025, we must consider the evidence and ask the question: when it comes to glaucoma treatment, where does the greatest harm lie? Is intervention less intrusive?

This is a question that has been asked widely in Australian clinical circles, and the response of our colleagues is a resounding push away from topical treatment towards early intervention in the form of SLT or MIGS procedures for glaucoma management [37].

We recognise that topical glaucoma therapy has held, and continues to hold, a vital place in the management of glaucoma. We also recognise that MIGS procedures are not without risk. However, in advocating for our patients, we need to weigh the one-time risk of an interventional procedure against the cumulative, life-long risk of topical therapy.

Our end goal in glaucoma treatment is to avoid preventable blindness and thereby preserve quality of life. Are we willing to accept that our traditional treatment modalities may be hindering the very quality of life we are endeavoring to preserve?

When it comes to holistic patient care, preservation of vision and quality of life, is intervention less intrusive?

Dr Phoebe Moore BMed (Dist) MMed FRANZCO is a general ophthalmologist with subspecialty expertise in retinal diseases, uveitis, and cataract. She is based in Tamworth, New South Wales, and practices in regional Australia.

This article was sponsored by Glaukos

To view the list of footnotes referenced in this document please see the original article

https://mivision.com.au/2025/09/when-intervention-is-less-intrusive-the-changing-face-of-glaucoma-management/

Lions Eye Institute Announces $14m Development of WA Facilities

Written by Insight

The Lions Eye Institute (LEI) has announced a $14.1 million redevelopment of its theatre complex at the Queen Elizabeth II Medical Centre (QEIIMC) in Nedlands, Western Australia.

A media release said this marked LEI's largest investment in its facilities in 30 years, underscoring its commitment to delivering world-class eye health care and innovation for Western Australians.

The redevelopment will transform the existing facilities into a state-of-the-art ophthalmic theatre complex.

LEI said key upgrades would include a complete redesign of the theatre complex, increasing the size of two operating theatres, creating a dedicated Laser Vision suite and modernisation of outpatient spaces to improve comfort and capacity.

"This redevelopment represents a significant milestone in the institute's history, as we continue to invest in the future of eyecare," said Dr Glen Power, managing director of the LEI.

"By modernising this complex, patient facilities will be made more comfortable and efficient, with new reception and waiting areas, new ophthalmic testing areas and shared facilities."

LEI medical director Professor Chandra Balaratnasingam emphasised the community impact of this investment.

"This redevelopment is a pivotal step in modernising our clinical capabilities, including purpose-built facilities for the latest Schwind Smart Sight Laser technology.

"The upgraded theatres and outpatient spaces will enable us to treat more complex cases and increase surgical throughput, while also enhancing care for young patients across the state.

"As a medical research institute, we have deliberately designed the new theatre complex to integrate clinical care with our laboratories and data platforms, creating a seamless pathway for translational research that will range from discovery science and prototyping through to first-in-human evaluation.

"This will accelerate investigator-initiated studies and industry partnerships, expand our capacity for advanced ocular imaging and biobanking, and ensure Western Australian patients can access cutting-edge therapies sooner."

Construction was set to commence in August 2025.

The upgraded facility will also see greater numbers of paediatric patients.

There will be new consulting suites for the glaucoma, eyelid, orbital and lacrimal surgery and paediatric specialists who practise adjacent to the theatre complex, as well as the addition of space for a second paediatric ophthalmologist practicing at the LEI. ●

Mark's Glaucoma Story

Mark was diagnosed with advanced open angle glaucoma at 44. With no noticeable signs or symptoms, the news hit hard, and he felt like his life was turned upside down.

Mark said: *"It's taken me a little while to get here, I won't shy away from that. It was pretty scary for a while. But what really helped me overcome that was the support I got from Glaucoma Australia and my beautiful wife Min."*

The key to managing glaucoma is consistent monitoring and adherence to treatment.

✓ Glaucoma Care Checklist

- **Keep appointments** – regular eye checks are vital.
- **Take treatment daily** – don't skip eye drops or meds.
- **Speak up** – tell your doctor about changes or side effects.
- **Stay healthy** – exercise, eat well, manage other conditions, avoid smoking.
- **Know your options** – drops, laser, or surgery may be needed.

Glaucoma Australia SiGHTWiSE Program

Let's get SiGHTWiSE

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The Estate of the Late Margaret Alison Gray

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Leaving a gift in your Will is an incredibly forward-thinking way of giving that will benefit glaucoma patients for generations to come – your family, friends and neighbours who may be diagnosed in the future.

After looking after your loved ones, any gift is greatly appreciated and allows us to plan ahead, to invest in the research that will one day find a cure and continue to support and care for families impacted by glaucoma.

If you are considering leaving a gift in your Will to Glaucoma Australia, you can reach out to our Fundraising Manager for a confidential conversation on 1800 500 880 or via email at betty@glaucoma.org.au.