

Bringing a new level of eye health care to the North West

Lions Outback Vision is set to launch its first remote clinical hub in Broome later this year. It will have a clinic facilitating the northern corridor of Western Australia with four resident doctors who will deliver the highest quality optical care.

Thanks to a donation of buildings from the Hawaiian property group and Wen Giving Foundation, the Lions Outback Vision team will have the opportunity to increase services to remote and rural communities in the North West.

"It is important that we are able to offer specialist eye health care to Indigenous people and residents of regional and remote communities that don't have the same access to services as those in the metropolitan area," McCusker Director of Lions Outback Vision, Dr Angus Turner said.

"People don't need the added burden of travel and being away from family when they require specialist treatment."

The Vision Van and the outreach clinics of Lions Outback Vision currently visit 20 rural and remote communities across Western Australia twice a year and collectively sees 10,000 patients. However, this isn't keeping up with the growing demand in the North West.

Lions Outback Vision is now delighted to have the opportunity to transform what was previously backpacker accommodation into a North West vision hub. This location will be the platform for delivering training and education to regional clinical schools and health practitioners.

The refurbishment of the buildings is supported by the Australian Federal Government, Kerry and Christine Stokes (Australian Capital Equity) and the Fred Hollows Foundation.



What will you see at this hub?



Clinical space



Surgical facility



Education and
training



Diabetic nutrition



Research with local
Tertiary institution



The fight against

Glaucoma

Glaucoma

The time to talk about this condition is now



First degree relatives with glaucoma have up to 10 fold increased risk of developing glaucoma



Approximately 300,000 Australians have glaucoma



2 in 100 Australians will develop glaucoma in their lifetime



Currently, 50% of people with glaucoma remain undetected

The 10th Annual World Glaucoma Week is being held this March, providing an opportunity to raise awareness of this eye condition on an international scale. Glaucoma is a condition that anyone can develop; however the incidence increases with age.

Glaucoma is the overarching name given to a list of eye conditions where there is vision loss due to optic nerve damage. The loss of sight from glaucoma is usually gradual, and a considerable amount of peripheral (side) vision may be lost before there is awareness of any problem at all.

The Lions Eye Institute is a global leader in translational glaucoma research that has resulted in a number of surgical innovations. Two examples are the Xen® Gel Stent and the Virna Glaucoma Drainage Device (GDD). Both reduce intraocular pressure in the eye - the biggest risk factor of glaucoma.

Xen® Gel Stent has been implanted in more than 100,000 patients worldwide and the Virna GDD has been implanted in more than 1,000 patients in Indonesia.

The Lions Eye Institute is also currently working as a member of the National Health and Medical Research Council Partnership project, to undertake research Targeting At-Risk Relatives of Glaucoma cases for Early Treatment (The TARRGET study).

This study involves the Lions Eye Institute screening first-degree family members of a patient with diagnosed glaucoma, to determine if they too have the condition, and working to then determine the relationship between genetics and conditions such as glaucoma.

It is thanks to your generous donations that the Lions Eye Institute is able to provide state-of-the-art care for our glaucoma patients and to continue our work to reduce the numbers of Australians affected by glaucoma.

Famous people with glaucoma:

Bono - The U2 frontman

Whoopi Goldberg - Comedian and host of "The View"

Roseanne Barr - "Roseanne" in the 1990s

Did you know?



Researcher spotlight

Meet Dr Livia Carvalho, one of our head researchers here at the Lions Eye Institute, who has a huge passion for her job. Sunday March 8 was International Women's Day, so we felt it fitting to spotlight one of our many inspiring female researchers who continues to drive positive patient outcomes.

International Women's Day

March 8 was a global day celebrating the social, economic, cultural and political achievements of women. The day also marks a call to action for accelerating women's equality.

We sat down with Livia to ask a few questions...

Firstly, how did you get into science?

At school the subjects that truly sparked an interest for me were history and biology. As a student I was always fascinated by the "why" and the "how". These subjects address both of those questions. But in the end it was the open possibilities and discoveries of nature that pushed me towards a degree in biological sciences. During my undergraduate degree in biology in Brazil many years back, I took part in a research project that studied the colour vision of small south American monkeys. As it turns out, this was just the beginning of doors opening in the world of vision research for me.

What's your area of research?

I am involved in researching gene therapy treatments for inherited visual degeneration – which means I study the ways diseases that are inherited through your genes can cause blindness. Some other areas of interest are in photoreceptor (the way your eyes detect light) cell death, retinal (back of the eye) development/changes during disease, and the cell and molecular mechanisms behind retinal degeneration.

What is it that gets you out of bed each day and eager to continue on with research?

One of the most exciting parts of my role is waiting for results. This waiting game is thrilling and then you begin to imagine the possibilities that could open up with these findings and the potential benefits it could bring to the wider community. It is the feeling that this is just the start of something bigger – this is a priceless feeling and something I am lucky enough to have felt in my role.

How do you engage with the patients who can benefit from your research?

Engaging with the people that my research impacts is key, it's an emotional driver to the work that I do. In days gone by, the relationship between researcher and patient would often be siloed - the two parties would hardly interact. Today, the cohesion of engagement is so valuable and essential to the work I do. In my work I try to engage directly with patients via many of the open public events led by the Lions Eye Institute but also via direct research support from patient foundations around the world. This engagement has been a crucial pillar of my studies and really brings it home as to why I do what I do.

Seeing the future together

This year the Lions Save-Sight Foundation [WA] is celebrating its 50th year. Over that time it has become recognised as one of the leading volunteer eye health organisations in Australia. Its primary focus is supporting and raising money for the research and treatment of major causes of blindness; supporting the training of new ophthalmologists; research outcomes and providing eye health services to rural and remote regions of Western Australia.

In January 1970, on the Australia Day long weekend, the Lions Clubs of WA established the Lions Save-Sight Foundation [WA] (LSSF) at its annual convention in Albany with the sole purpose of preventing and treating eye disease.

The LSSF's vision included many 'firsts' – one of which was the establishment of the Lions Chair in Ophthalmology at the University of Western Australia

"We must continue the fight against blindness and work to establish new frontiers for sight."



in 1974. Professor Ian Constable was appointed the inaugural Lions Chair of Ophthalmology at UWA and it was his leadership that inspired the LSSF to sponsor the formation of the Lions Eye Institute.

Congratulating the LSSF on its 50th anniversary, the Lions Eye Institute's Managing Director Professor Bill Morgan said; "We are indeed grateful for the foresight of those involved with the LSSF and Lions Clubs of WA 50 years ago.

"I am keen to build on this strong legacy by expanding our research agenda and capacity, supporting ophthalmic training here in Western Australia, and growing our rural and remote health services.

"But I recognise we can't do any of these things without the continuing help and support of the LSSF, Lions Clubs of WA and you, our donors.

"We must continue the fight against blindness and work to establish new frontiers for sight.

"As people age and live longer, we know that there will be even more challenges to overcome. However, if we work together as a team I know we can achieve the extraordinary."



The glaucoma screening van in the 1960s.

No lectern too tall to stop this storyteller



Eamon presenting at
Parliament House in Canberra

Huge congratulations to one of our youngest and most inspiring Lions Eye Institute patients, six-year-old Eamon Doak, on winning the Prime Minister's Award for Courage late last year.

Speaking to the topic of "My Hearing Future" at the award presentation in Parliament House Canberra, Eamon told the audience that he and his brother have Usher Syndrome.

Usher Syndrome is a genetic condition that impacts vision, hearing and balance.

Eamon's speech told of how Usher Syndrome resulted in both boys needing "super hearing" – also known as cochlear implants, and how lucky they have been to have each received them.

More information about Usher Syndrome



Usher Syndrome accounts for around 50% of all hereditary deaf-blindness



Usher Syndrome is a genetic condition



Research treatments for Usher Syndrome are focussed on four main areas:

- Drug therapy
- Gene therapy
- Retinal implants, and
- Stem cell therapy



There is currently no cure for Usher Syndrome

More about the Lion Eye Institute's current research

We are investigating how to make cells in the retina from Usher patients' cells. If these cells can be turned into retinal cells, we can use them to understand and develop drugs to correct the mutation or even put them back into the retina after converting the mutation to restore sight.

Did you know?

With nothing stopping this determined youngster, Eamon spoke to his career plans and explained that the doctor has said both he and his brother "might lose their eyesight", but that wouldn't stop him or get in the way of his future plans. "I am strong, I am courageous, I am fearless and mum is right – I am going to make the world beautiful," Eamon said.

While only six years old, Eamon understands the opportunity he has to make an impact by doing something truly brave – telling his and his brother's story.

The Lions Eye Institute's Dr Fred Chen and his team of researchers, are working tirelessly to find a cure for Usher Syndrome. "We hope to provide answers and a solution to families just like the Doaks in the near future," Dr Chen said.

"We are so grateful to you, our donors, because without your support we wouldn't be able to continue this level of detailed research into rare inherited genetic diseases."



New imaging technique supports early detection of diabetic eye disease

Diabetes remains the leading cause of irreversible blindness in Australian adults, yet evidence shows us that early detection and timely treatment can prevent the majority of diabetes-related vision loss.

The shape of diabetic retinopathy. This image shows a diabetic retina and depicts the tiny blood vessels that can be damaged as a result of diabetes (Image by Dr Dong An)

Diabetes damages blood vessels all over the body including those in the eyes. In diabetic eye disease, sugar blocks and damages the tiny blood vessels (capillaries) of the retina (the light-sensitive layer of tissue in the back of your eye).

Until recently, our understanding of the earliest blood vessel changes that characterise diabetic eye disease such as diabetic retinopathy, prior to vision loss, has been limited by the availability of precise retinal imaging tools.

Diabetes is the leading cause of irreversible blindness in Australian adults



1.7 million Australians (approximately) are affected by diabetes

3x

Aboriginal and Torres Strait Islander adults are three times more likely to experience vision loss or blindness



By 2030 an estimated 2.45 million Australians will suffer from diabetes

This limitation has been a significant contributing factor in the delay and difficulty of identifying patients with diabetes that are at high risk of vision loss.

Even with advances in state-of-the-art cameras and colour photography technology in recent times, it has not been possible to detect damage with these tiny capillaries that have a diameter of 7-8 microns (one micron is equivalent to one one-thousandth of a millimetre).

That is until recently, when we here at the Lions Eye Institute developed a new high resolution imaging technique to measure the variation in capillary size, using Optical Coherence Tomography Angiography (OCTA). It is now possible to precisely image the retinal capillaries in a clinical setting using this non-invasive technology, that is – it does not require a dye injection.

Our research group has pioneered much of the work on OCTA over the past five years through technology validation and also the development of a prototype OCTA device in partnership with the Department of Biomedical Engineering in Simon Fraser University, British Columbia, Canada. In doing so we are addressing a major gap in the clinical management of diabetic eye disease and the occurrence of sight-threatening complications.

More broadly, as a result of the advances in early detection imaging techniques, this platform will expand its collaboration to include detecting at risk children from more widespread diseases involving the brain and kidneys.

Look after your eyes

Often there are no warning signs of diabetic eye disease or vision loss when damage first develops. If you have diabetes, have your eyes checked regularly, at least every two years, to pick up the early signs of damage.

To look after your eyes and prevent vision loss

- 1 Have your eyes checked regularly
- 2 Control your blood glucose levels
- 3 Maintain a healthy blood pressure and cholesterol levels
- 4 Eat a healthy diet
- 5 Get moving by doing regular exercise
- 6 Quit smoking
- 7 Seek treatment immediately if you notice changes to your vision



On average 1 in 3 people with diabetes will develop some form of diabetic eye disease



98%

Up to 98% of vision loss from diabetes is preventable if detected and treated early



New Ophthalmologist for Murdoch Clinic

The Lions Eye Institute is delighted to announce a new addition to its team of highly skilled Ophthalmologists, Dr Rhuju Mehta. Dr Mehta's areas of clinical speciality include medical and surgical glaucoma, cataract surgery and general ophthalmology. "I enjoy interacting with, and educating patients about their ocular health," Dr Rhuju Mehta, said. "I am passionate about glaucoma and cataract surgery and find it a privilege to help improve my patients' vision."

Dr Mehta completed her medical degree at The University of Western Australia, with Honours. She undertook her ophthalmology training at the prestigious Royal Victorian Eye and Ear Hospital in Melbourne Victoria, before returning to Perth in 2017. Dr Mehta has also completed a Glaucoma Fellowship at Royal Perth Hospital.

If you are interested in seeing Dr Mehta, she is located at our Murdoch clinic:

Lions Eye Institute Murdoch
Suite 24, Level 1, Murdoch Medical Centre,
100 Murdoch Drive, Murdoch
PH: (08) 9381 0765
LionsEyeMurdoch@lei.org.au

A bright future thanks to Christmas giving

We would like to thank you, our donors, for your generosity in donating to our last appeal. Your donations enable our researchers to continue their cutting-edge work toward developing cures and treatments.

At Christmas, we shared Aidan's story with you, and we were overwhelmed by the community response to this 29-year-old's reality. Aidan suffers from diabetic retinopathy – a common complication of type 1 diabetes that causes damage to tiny blood vessels in the retina at the back of the eye, and can cause blindness.

It is with deep appreciation that we say thank you - for not just taking the time to listen to Aidan's story, but also for taking the next step and donating. With your support, we have raised \$66,500, and these funds support our continuing research into future eye treatments and cures in the Lions Eye Institute's quest to save sight.

If you missed Aidan's story but would like to donate now, please see the back page of this newsletter for the donation form or call Carolyn in fundraising on (08) 9381 0777.



Collaborative effort shoots for the stars

At the forefront of eye health in Western Australia, the Lions Eye Institute has extended its expertise to NASA, partnering with the organisation to investigate vision complications in space.

The unusual pairing has sought to bring together the best and brightest in aeronautics and eye health research to treat vision loss in astronauts. According to NASA, astronauts on the International Space Station – generally orbiting roughly 400km above Earth – report vision loss thought to be related to the lack of gravity. Lions Eye Institute Managing Director Professor Bill Morgan said his organisation was helping NASA learn more about the skull pressure changes causing this impairment, as well as determining how to prevent it.

“Left unchecked, elevated intracranial pressure (ICP) can cause vision loss by increasing pressure and squeezing the optic nerve,” he said.

“Astronauts are at risk of developing fluid congestion in the head, as they don’t have gravity to pull body fluids down to their legs and feet.

“This pressure and related vision change causes SANS – space flight-associated neuro-ocular syndrome.

“The condition creates significant visual change, with increased ICP in at least 50 per cent of astronauts in space for six months or more.”

Not too long ago, Professor Morgan and his research team discovered retinal vein pulse waves were determined by ICP, and have since found a better way to measure that pressure using a new pulse wave measurement system. The non-invasive breakthrough, developed at the institute, is a welcome departure from the previous method of measuring ICP, which included drilling holes into a patient’s head or inserting needles into their back.

“Lions Eye Institute is currently building a small prototype device that could be taken into space to take these measurements,” Professor Morgan said. “This will allow ICP to be measured frequently in astronauts.



“The space work is important because any flight to Mars will take at least eight months and cause ICP problems to occur in the majority of astronauts.

“The Lions Eye Institute is also working with NASA to develop ways to mimic the effect of gravity upon the cerebrospinal fluid around the eye using modified swimming goggles, which could be used as a preventative treatment.”

The Lions Eye Institute’s research has also been having an impact locally. Since the opening of an ICP Assessment Clinic in 2018, the Lions Eye Institute has given vital information to neurosurgeons and neurologists about optic nerve function and managing ICP-related disorders. There is also hope the new measuring technology will be helpful in hospital clinics and emergency, following a five-year research project at Sir Charles Gairdner Hospital where Lions Eye Institute researchers examined patients before invasive pressure-determining procedures.

“This has allowed the refinement of the technique where it is feasible to build and test a smaller system that can be used in hospital clinics and emergency departments, as well as in space,” Professor Morgan said.

“Assessment of ICP is critical in diseases affecting the optic nerve, such as glaucoma, as well as in diseases of high intracranial pressure, such as idiopathic intracranial hypertension, brain tumours, traumatic head injuries and other neurological disorders.”



Kate's story inspires a glaucoma gift

There are stories that inspire action, and for Eric, Kate's story was it.

Kate was born with cataracts, and – when she was only nine weeks old – had them surgically removed. Unfortunately, after the surgery, she began to develop glaucoma caused by fluid not draining properly from her eyes.

For Kate's ophthalmologist, the Lions Eye Institute's Professor Bill Morgan, the challenge was to manage the glaucoma until Kate's eye developed sufficiently for replacement lenses to be implanted.

With the resulting pressure building in her eyes, Kate was facing serious damage to her optic nerve and the prospect of vision loss, even blindness. For Kate's ophthalmologist, the Lions Eye Institute's Professor Bill Morgan, the challenge was to manage the glaucoma until Kate's eye developed sufficiently for replacement lenses to be implanted. Through a regimen of medications and eye drops – sometimes 12 times a day – Professor Morgan was able to stave off Kate's surgery for four years.

But when Kate was eight, the pressure in her eyes began to build again. In September 2015 Professor Morgan implanted a drainage system called a Molteno Tube into Kate's left eye, with great success.

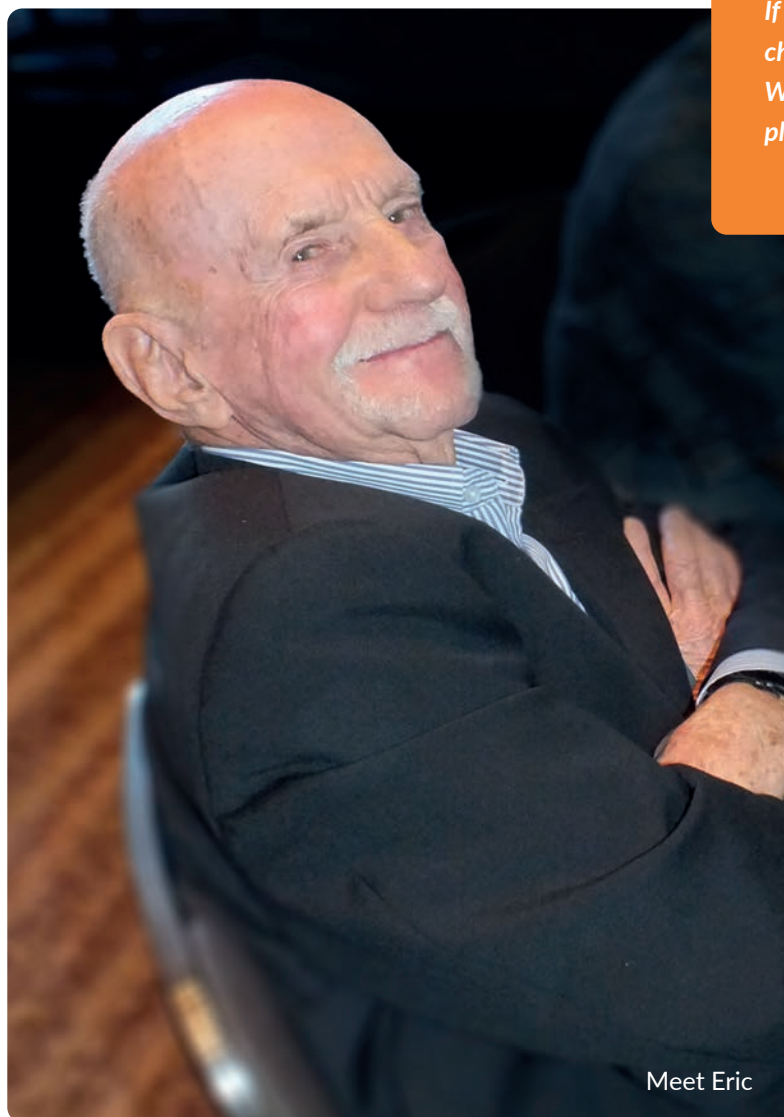
Four years later, and now an irrepressible teenager, Kate is wearing contact lenses, using eye drops only twice daily, playing netball, volleyball, swimming for her school and pondering a career in drama. "I see Professor Morgan every two months," she says. "At the moment, the pressure in my eyes is stable."

With continued management, and improvements in glaucoma research and treatments, Professor Morgan hopes that by the time Kate needs replacement lenses, instead of having to replace them regularly, lifelong lenses will be available.

*And Eric? Where does Eric fit into this story?
Well, Kate's story had a double resonance for him.*

In 2016, he read a story about Kate's courage and the sight-saving treatment she received from the Lions Eye Institute and Professor Morgan.

Eric had his own experience with cataract surgery when the Lions Eye Institute's Dr Andrea Ang removed his cataracts and implanted lenses in his eyes.



Meet Eric



Eric and Kate both benefited from the Lions Eye Institute's cutting-edge treatment and research.

Eric expressed his gratitude by leaving a gift in his will for glaucoma research.

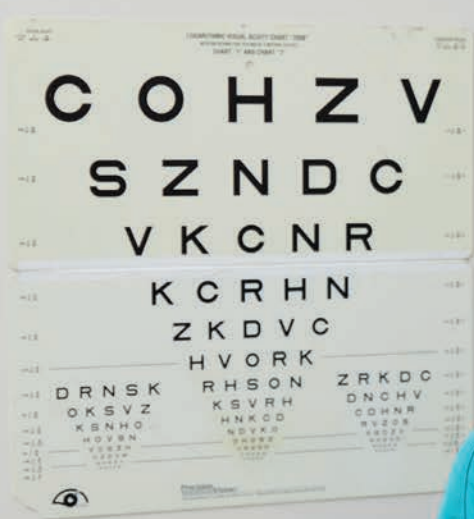
We are immensely grateful to Visionaries like Eric whose generosity make exciting breakthroughs in eye health research possible.

If you would like to become one of our cherished Visionaries by leaving a gift in your Will and support future sight saving research, please call Alisa on (08) 9381 0708.

At that moment, Eric joined the ranks of the Lions Eye Institute's cherished Visionaries – the special group of people who share the Institute's vision and realise the impact a gift today has for others in the future.

At the time he said: "The precision surgery needed in eye care and the vast improvements to someone's quality of life that it brings, made me realise that the Lions Eye Institute is an organisation I wanted to support long term. "I believe bequests are essential in supporting research because of the importance of future progress and developments."

Eric passed away last year, leaving the Institute a gift of \$20,000 in his Will specifically for glaucoma research and treatment. And Kate's response when she learned about her role in prompting Eric's gift? "That made me feel good."



The Raine Study

Three decades of research

Celebrating its 30th birthday, the Raine Study is one of Australia's longest running cohort studies and it is based right here in Perth.

More about the Raine Study



Between 1989 and 1991 nearly 3,000 pregnant women volunteered to be part of the study



Mary Raine donated her estate towards medical research in 1960. The research is now aptly named "the Raine Study"



All of the volunteers delivered their babies at King Edward Hospital



The study's focus is to examine the effects of repeated ultrasound and placental blood flow during pregnancy

Study participants are encouraged to incorporate their own children and parents into the study.

Findings from Professor Mackey's research with the Raine Study:

- **Eye length**

Is a major determinant of myopia

- **Young adults**

With myopia have lower vitamin D levels in their blood. Vitamin D deficiency was also associated with a higher risk of myopia

- **Time spent outdoors**

There is a relationship between myopia and amount of time spent outdoors

- **Sun exposure**

Is associated with different eye issues, such as myopia and pterygium

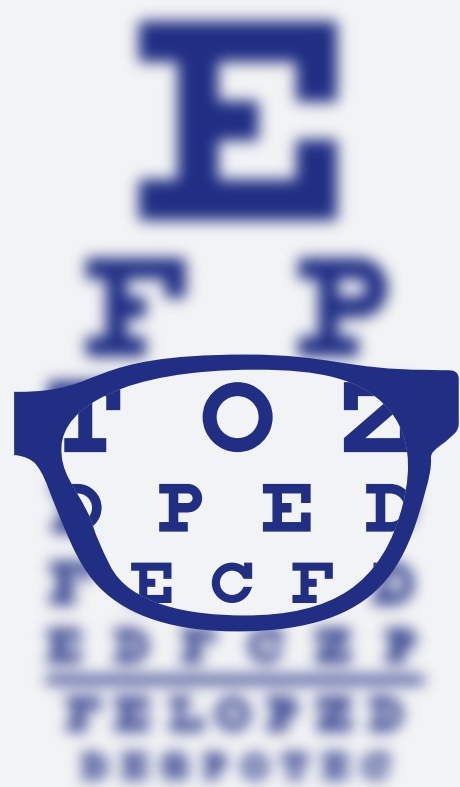
As part of the Raine Study, our own Professor David Mackey AO, is playing a crucial role in the Senses Special Interest Group which has a focus on research relating to the eyes and ears. This area of study specifically focuses on eye screening and extensive eye examinations: photographing the back of the eye, detecting UV exposure, measuring structures of the eye and several other tests in adulthood.

Professor Mackey has also worked with the Raine Study on the "28-Year Vision and Vessels Follow-up Study" researching the association of Myopia with lack of time spent outdoors. His group is using several different markers to study Myopia, including measures of sun damage to the eye and levels of vitamin D in the participants' blood.

Working with the Raine Study has provided Professor Mackey with the data to associate some common eyesight issues to various factors such as genetic variations or environmental risk factors. Researchers across the globe are utilising the data being collected through the Raine Study to examine how events during pregnancy, childhood, adolescence and adulthood influence health and well-being in later life.

The Lions Eye Institute's relationship with the Raine Study continues. This strong partnership is a unique opportunity that allows us to continue ground-breaking eye-health research.

More about Myopia



- Myopia is a condition in which close objects are in focus but distant ones are blurry
- Myopia tends to run in families
- The condition may develop gradually or rapidly

Become a Sight Saver today

By becoming a Sight Saver, and donating to the Lions Eye Institute each month, you can help uncover research breakthroughs, transform lives and give hope to those facing blindness and eye disease.

Sight Savers members receive:

- research updates;
- event invitations throughout the year; and
- a tax deductible receipt at the end of each financial year.

Giving monthly allows the Lions Eye Institute to plan ahead for future sight saving research with the knowledge that your support is ongoing.

90% of vision loss is preventable or treatable. Together we can be the solution.

- You choose the donation amount
- All donations over \$2 are tax-deductible and a receipt is sent automatically at the end of each financial year
- We now offer direct debit and credit card payments – for your convenience
- You can opt out or change your donation amount at any time

Please fill out the form below (indicating monthly payment) and return it in the reply paid envelope provided, or call Carolyn in fundraising on (08) 9381 0777 to set up your automatic monthly donation.



Yes I want to save sight

Please accept my donation of \$..... (Donations over \$2 are tax deductible)

☐ Please make my donation monthly, I want to be a Sight Saver

Please find enclosed my ☐ cheque ☐ Money Order OR, please debit my ☐ Mastercard ☐ American Express ☐ Visa

Card No: - - - Expiry Date: /

Cardholder's Name: Signature

Tax Receipt Details:

Name:

Address

Suburb: Post code:

Telephone: Email:

☐ I would be interested to learn more about how I can include the Lions Eye Institute in my Will.

☐ I have already provided for the Lions Eye Institute in my Will.

☐ Your donation saves sight. We recognise the generosity of our donors on our donor recognition board, on our website and in our annual report. Please tick here if you would like to be included in such recognition.

Your donation helps eradicate blindness

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Lions Eye Institute,
Reply Paid 62815
Nedlands WA 6009
(No stamp required)
Or call (08) 9381 0777