Lions Eye Institute

A History of Innovation in Improving Aboriginal Eye Health

The Lions Eye Institute (LEI) is proud of its long history of saving and improving the sight of Aboriginal Western Australians. In North West Australia in particular, high rates of sight loss exist in Aboriginal communities, where more than one in 10 people are vision impaired or blind. Aboriginal people report three times the amount of blindness than among non-Aboriginal people.

Since the 1970s, LEI ophthalmologists and other health professionals have undertaken outreach work in Aboriginal communities throughout Western Australia. They treat common eye problems including cataract, diabetic retinopathy and trachoma. Since 2010 this work has been accelerated through the establishment of Lions Outback Vision (LOV).

Early leaders in eye care services to **close the gap**

In Western Australia, the LEI has led the way in closing the gap in Aboriginal eye health, with its early work complementing and building on the pioneering efforts of English ophthalmologist Professor Ida Mann.

Professor Mann, who was known for her work in embryology and development of the eye, completed the first survey of trachoma incidence in the 1950s and 1960s. Working out of a caravan in the North West and far north of Western Australia, she screened Aboriginal people for eye disease.

By the 1970s, a number of ophthalmologists were working with Aboriginal people in Western Australia, including ophthalmologist and founding LEI Managing Director, Professor Ian Constable AO and LEI consultant Dr Richard Cooper. Dr Peter Graham also worked tirelessly for Aboriginal eye health over four decades, and many Western Australian eye surgeons contributed over the years, including Dr Philip House, Dr Ross Littlewood and Dr Fred Nagle.

In 1976, ophthalmologist Dr Fred Hollows AC won a grant to conduct eye screening programs throughout rural Australia.

During his work in the remote Kimberley region he was joined by Professor Constable, who subsequently made regular field trips to the Kimberley and the Ngaanyatjarra Lands in the Blackstone Ranges.

The same year, a state-wide diabetic retinopathy screening program was established with the support of the Lions club organisation. The outcomes of this work were documented and published by Professor Constable in 1984. This program evolved into remote photographic screening for diabetic retinopathy through the LEI.

Through Professor Constable, the LEI also has a decades-old commitment to the Gija people of Warmun and surrounding settlements, that has lasted to the present day. He is a co-founder of Gija Total Health, an active source of grant funding, health and social welfare projects for the Warmun community. Professor Constable has also provided ophthalmic services and advice to Aboriginal artists across the Kimberley and Northern Territory.

Since the 1970s, significant inroads have been made by LEI ophthalmologists and researchers through involvement in a range of programs that aim to close the gap in eye health, with Lions Outback Vision currently leading the way in delivering world-leading remote eye health services.

The introduction of **Lions Outback Vision**

In 2010 the LEI created the Indigenous and Remote Eye Health Unit, led by Dr Angus Turner, to address the many challenges faced by Western Australian Aboriginal communities in accessing ophthalmic care. The unit changed its name to Lions Outback Vision (LOV) in 2013.

LOV is a dedicated team of eye health professionals who are committed to improving eye health in the outback. Working throughout the Pilbara, Kimberley, Goldfields, Midwest and Great Southern regions, LOV provides optometry services, ophthalmology clinics, eye surgery, telehealth services, Aboriginal patient support, and diabetic retinopathy screening and education.

LOV's custom-built Vision Van was launched in 2016 and is a mobile eye health clinic that completes two circuits of Western Australian regions each year, working in: Albany, Katanning, Kalgoorlie, Leonora, Laverton, Wiluna, Newman, Meekatharra, Roebourne, Karratha, Port Hedland, Onslow, Exmouth, Broome, Derby, Fitzroy Crossing, Halls Creek, Kununurra, Wyndham and Warmun.

In 2018 Dr Kristopher Rallah-Baker made history while working on LOV's Vision Van, becoming Australia's first Aboriginal ophthalmologist.

In 2019, LOV commenced development of a North West Eye Health Hub in Broome, which will deliver critically needed eye health services in the Pilbara and Kimberley regions.

With a population of almost 100,000 people, Australia's North West should have three resident ophthalmologists to compare to urban access levels. Until the LOV's development in Broome, there were none.

The North West Hub will meet the increasing demand for eye health services in the north of the state, address health access issues for all North West rural and remote communities, tackle the high rates of vision loss and blindness in Aboriginal communities, create local employment and build local capacity. Importantly, LOV is delivering the world's best practice eye care to remote and regional Western Australia.

Dr Angus Turner has a deep passion for helping remote, rural and disadvantaged communities, in Australia and throughout the world.

As the McCusker Director of LOV and Associate Professor at The University of Western Australia, he has expanded LOV to be the leading provider of outreach health services in Western Australia. The team's work means that people no longer have to travel thousands of kilometres from home for sight-saving treatment.

Dr Turner has helped to build capacity in community and local health care providers, including from Aboriginal Medical Services, and has established ground-breaking telehealth services.

He was named the Western Australian of the Year (Professions category) in 2019, the same year his vision for an eye health hub in the North West of Australia transitioned to becoming a reality.

Lions Outback Vision

The Lions Outback Vision model is an example of **delivering appropriate, culturally safe services to rural and remote communities**, with Aboriginal and non-Aboriginal people and organisations working in partnership to bring complementary perspectives to the complexities of Aboriginal health care at the place of need.

In 2019-20, the LEI developed its Reconciliation Action Plan, with a vision statement:

LEI contributes to Closing the Gap in Aboriginal eye health and to reducing the incidence of blinding diseases among Aboriginal and Torres Strait Islander Western Australians through its Reconciliation Action Plan. By building relationships and mutual respect LEI will contribute to Aboriginal and Torres Strait Islander peoples' participation, knowledge and action for better eye health throughout life.

Eye disease among Aboriginal people

Common eye diseases and conditions in Aboriginal communities include trachoma, diabetic retinopathy and cataract, and the LEI works to treat all of these, as well as to prevent them occurring. Almost all (95 per cent) of vision impairment and blindness in Aboriginal people should be preventable.

Trachoma is an infectious disease caused by bacterium *Chlamydia trachomatis*. The infection causes an inflammation and roughening of the inner surface of the eyelids, and this can lead to pain in the eyes, breakdown of the outer surface or cornea of the eyes, and eventual blindness.

Between 1992 and 2003, Professor Bill Morgan, now the LEI's Managing Director, and others introduced eye screening and treatment programs in the Eastern Goldfields.

Through annual visits, they screened more than 3,800 children, and their work led to a drop in prevalence of intense trachoma from five per cent to less than one per cent in local communities. The documentation and publication of this work by Professor Morgan involved Aboriginal researchers.

The LEI's Professor Ian McAllister visited the Central Desert and Ngaanyatjarra Lands between 1986 and 2002, with annual 10-day visits for childhood trachoma detection, diabetic retinopathy and cataract screening, lid surgery and general ophthalmology. Over the period 1998-2001, Professor McAllister undertook trachoma screening and measured the prevalence of Polymerase Chain Reaction (PCR) detected disease in communities in the Kimberley region before and after dung beetle seeding. He published results on the seasonal correlation between the prevalence of trachoma and bush fly numbers. Professor McAllister continued annual surgical and general ophthalmology visits to the Aboriginal communities of the east and west Kimberley region up to 2005.

Other Lions Eye Institute representatives have also made long-term commitments to the eye health of Aboriginal people over many years, including Dr Jean-Louis DeSousa and Dr Mei-Ling Tay-Kearney, who have regularly visited the Wheatbelt and Gascoyne areas of Western Australia.

Dr Hessom Razavi is one of the LEI's ophthalmologists who works in outreach in remote and regional areas.

As the LOV Fellow in 2014, Dr Razavi saw more than 2,000 Aboriginal patients in rural Western Australia as well as at Perth's Derbarl Yerrigan Health Service. From 2015, he commenced outreach trips to Nauru and Manus Island, Timor-Leste, Solomon Islands, the Goldfields, Ngaanyatjarra Lands, Kimberley and the Pilbara.

Dr Razavi supports development of Aboriginal Health Workers through teaching diabetic retinopathy screening. He is the Principal Investigator on the 'OASIS' Trial (a randomised active-controlled non-inferiority trial of Ozurdex® intravitreal injection versus Avastin® intravitreal injection), which seeks to find the best treatment for sight-threatening diabetic eye disease in Aboriginal and Torres Strait Islander people. **The OASIS trial is the world's first ophthalmic clinical trial with exclusively Aboriginal or Indigenous participants.** Dr Razavi is a member of the RANZCO Aboriginal and Torres Strait Island Committee.

Eye health of **urban-based** Aboriginal and Torres Strait Islander peoples

Aboriginal Medical Service clinic staff are the enablers of Aboriginal and Torres Strait Islander patients at ophthalmology outreach appointments.

The LEI and Perth's Derbarl Yerrigan Health Service have trialled an 'urban pathway' to provide the services of retinal photography, optometrists, ophthalmologists and Aboriginal Health Workers in a culturally appropriate environment.

Audit data from 2019 was collected and used to demonstrate the effectiveness of this combined approach measuring the number of patients seen, attendance and waiting times for surgery or intravitreal injection.

The results showed the benefit of the collaboration between specialist eye-services and a culturally appropriate Aboriginal Health Service. 249 patients were seen at the eye clinic located at Derbarl Yerrigan in 2019 and half of these were 'walk-ins'. The surgical attendance rate of 88 per cent and the average wait time of 54 days were **significant improvements on previous data**. It is believed that similar models have the potential to result in programs which can begin to close the gap in visual outcomes for Aboriginal people.

Advances using **technology**

Diabetic retinopathy is a significant cause of vision loss and blindness, and the Aboriginal and Torres Strait Islander community has 14 times the rate of vision impairment from diabetic eye disease than the non-Aboriginal population.

Between 1990 and 2010, the LEI's Professor Ian McAllister and Chris Barry conducted hands-on training for Kimberley Aboriginal health workers in non-mydriatic camera diabetic retinopathy screening.

This was the first time these instruments were utilised for screening. Cameras were initially based in Broome and Kununurra, and health workers would take images using polaroid film. More than 65 per cent of all people with diabetes in the region were screened every two years. The images were posted to Perth where they were read and graded by Professor McAllister, who made recommendations concerning treatments or further screening.

Under the guidance of Professor McAllister and Mr Barry, this program was expanded to include camera screening in the mid-1990s in Perth through Derbarl Yerrigan, in Geraldton and in Warburton in the eastern Ngaanyatjarra Lands. In 2005, with a grant from BHP, the program was implemented in the Pilbara.

The polaroid cameras were utilised until 2000, as they were rugged and ideally suited to remote conditions.

The advance of digital imaging subsequently enabled these services to become significantly more efficient in terms of image quality and speed of image grading. This work has been adopted by LOV, with the team training many Aboriginal health workers and camera operators in the screening of diabetic patients.

By the 1990s, when the transmission of high-resolution colour images became possible with the advent of digital photography, **the LEI became the first organisation in Australia to transmit images of eye disease from overseas and remote destinations back to Perth.**

The first overseas tele-ophthalmology achieved by the LEI was a glaucoma screening from Indonesia.

In the early 2000s, the LEI developed a medical online web-based software program to improve state-wide management of medical records and communication.

The program provided a personalised private record for every individual, enabling storage of tests and medical images and the coordination of all branches of medicine serving the individuals involved.

In 2009 this new system was trialled by an LEI team in the Kimberley, where a week-long screening of the Gija people at Warmun and surrounding outstations was carried out. More than 350 residents including 120 children were screened for blinding eye disease and tested for the need for glasses. The LEI team was joined by local Kimberley optometrist Margie O'Neill and Dr Angus Turner.

The program was subsequently extended to the remote Ngaanyatjarra Lands, east of the Warburton Ranges near the South Australia/Northern Territory border. Professor Constable, Dr Richard Gardiner and the LEI team developed a service for the 1,800 people scattered among 12 of Australia's most remote communities.

Lions Outback Vision has been a global pioneer of telehealth technology to improve access to specialist care in remote and regional Western Australia. The World Health Organisation's first global report on vision in 2019 featured a LOV case study, "Engaging rural and remote communities through telehealth".

LOV is working with Google to evaluate the applicability of applying machine intelligence to patient records, in order to advance health care innovation and efficiencies. A collaboration with Topcon is working to introduce a remote monitoring system for the progress of patients with Age-Related Macular Degeneration and Diabetic Macular Oedema.

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Professor Ian Constable AO

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Dr Hessom Razavi

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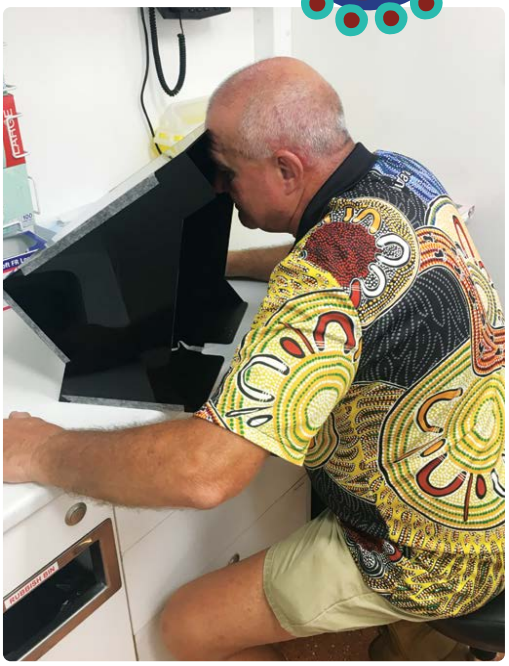

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