IMPACT REPORT

FY21

FINDING TREATMENTS FOR TODAY AND CURES FOR TOMORROW
20 YEARS

EAR SCIENCE®
Institute Australia

Ear Science Institute Australia

Ear Science Institute Australia is a medical research institute dedicated to helping people with ear and hearing disorders through research, education and innovations in medicine and audiology.

For 20 years, Ear Science Institute Australia has improved the lives of people with ear and hearing disorders locally, nationally and internationally through patient-driven audiology, research, education and treatment.

As a world-renowned profit for purpose research institute, Ear Science Institute Australia upholds itself as a centre of excellence, bringing together a multi-disciplinary team of the brightest minds from across the globe.

Our researchers, audiologists, clinicians, scientists and surgeons all work together to enhance the lives of those with ear and hearing disorders, discovering and delivering innovative treatments.

We are committed to developing groundbreaking cures for tomorrow's generation.

On behalf of Ear Science Institute Australia, we thank everyone who has contributed to our 2021 Impact Report, including our scientists, clinicians, corporate teams, and clients whose stories we share.

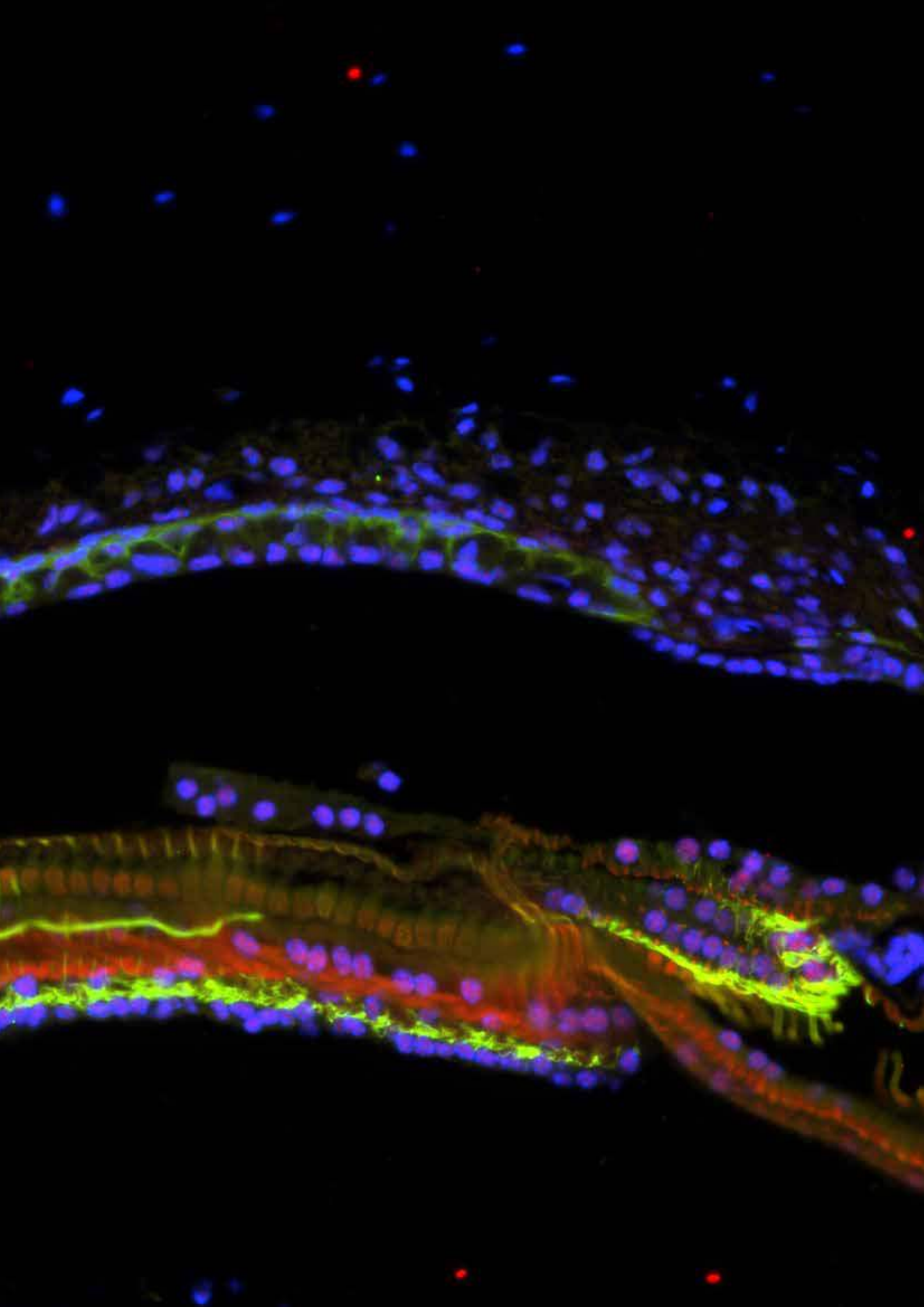


Table of contents

Ear Science Institute Australia respects all ways of communication

We acknowledge the Whadjuk people of the Noongar nation as the traditional custodians of this country and its waters that Ear Science Institute Australia stands on. We pay our respects to Noongar elders past and present, and acknowledge their wisdom and advice in our teaching and cultural knowledge activities.

Celebrating
20 Years of Ear Science

Ear Science's 20 Year Journey

2001 - 2021

2001

Professor Atlas returned to Perth as GPRWMF Chair of Otolaryngology and Ear Science was founded

Ear Science acquired the established Lions Hearing Clinic

2003

ClearDrum study commenced

The Tissue Engineering Lab opened

2009

500th hearing implant recipient

2011

Subiaco HQ opened

2017

Sarich buildin opened

2001

Garnett Passe and Rodney Williams Memorial Foundation establishment of the Winthrop Professor Chair in Otolayrngology

Indigenous hearing research commenced

The Gift of Hearing Appeal was founded

CENTRE opened

2010

Began clinical work on the ground with Indigenous communities

2014

organoi i

The story behind how Ear Science Institute Australia (Ear Science) began is both unique and humble. It was born out of passion and dedication from a young couple heavily committed to their Lions Club – Lorna and Arthur Dodd.

It all began with the Help to Hear bus

The story began in 1977 with Don MacGregor, District Governor of Lions Clubs Western Australia at the time, creating the Lions Hearing Foundation (first called the Lions Help to Hear Foundation). He asked Arthur Dodd to be chairman. The Lions Help to Hear Foundation served as a charitable organisation in Western Australia, raising awareness of the impact of hearing loss and supporting the hearing impaired.

Arthur and Lorna spent every weekend driving across the State, as far north as Northampton and south as far as Busselton, providing hearing testing in the Help to Hear bus. They were followed by a car full of student audiologists supporting them.

By the early 1980s, Don, Arthur and Lorna had helped many people, but they knew more needed to be done. The Lions Hearing Foundation established a Lions Hearing Clinic in Nedlands and Joondalup which was small but important to the community. With the encouragement of fellow Lion Doug Love and local Ear Nose & Throat Surgeons, they looked to the Lions Eye Institute for inspiration.

The Lions Hearing Foundation negotiated with the University of Western Australia and the Garnett Passe and Rodney Williams Foundation to help support an academic ear surgeon appointment. Dr Marcus Atlas, a Perth-educated ear and skull base surgeon then based in Sydney, was attracted to Perth in 2000 as the Foundation Professor of Otolaryngology at The University of Western Australia.

A new medical research institute in Perth, Western Australia

Professor Atlas set up a strategic planning session with eminent scientists and clinicians across Australia, which set the course of Ear Science Institute Australia.

Executive Board Member Susan Bergerson supported Professor Atlas, establishing the governance structure and constitution. Audiologist Kate Lewkowski set up a hearing aid clinic at Sir Charles Gairdner Hospital, and Ian Kelly, as the Lions Help to Hear Foundation chairman provided support. Professor Atlas was also

instrumental in establishing a private-public partnership with Sir Charles Gairdner Hospital for what would become one of the largest a cochlear implant programmes in Australia.

Ear Science Institute Australia (initially called the Lions Ear and Hearing Foundation) was founded in 2001. The Hon. Bob Kucera MLA, the Minister for Health, unveiled a plaque to commemorate the occasion. One of the first steps in growing the Institute was taking occupancy of the two Lions Hearing Clinics in A-Block at Sir Charles Gairdner Hospital and Joondalup and the existing audiology clinic in E-Block at Sir Charles Gairdner Hospital.

The number of Lions Hearing clinics has grown to 20 in 2021 and has solidified its place in the hearts of our community in Western Australia as the most trusted hearing care provider.

Excellence in ear and hearing research

Our research is driven by the needs of our community and linked to treatments in the clinics. Professor Atlas initially successfully attracted research funding to work in critical areas.

In 2001 Ear Science pioneered telehealth ear and hearing services, focusing on remote Indigenous communities in Western Australia. In 2005 Dr Mathew Mbao was our first post-graduate student, and he showed that video-otoscopy is an effective tool for telehealth.

Ear Science's research into designing a new treatment for tympanic membrane perforations started in 2003, inspired by Professor Fiona Wood's spray-on skin for burns. In 2017 this research and development programme was awarded a $3.7 million grant by the Wellcome Trust in the United Kingdom. It attracted a $993,500 grant from the Australian Government MTP Connect program in 2020 for continued development and clinical trials.

Ear Science's Brain and Hearing and Hearing Therapeutics research teams are paving the way with excellence in ear and hearing research, translated into clinical care to benefit our community, locally, nationally, and internationally.

WA's most extensive implant program

Ear Science Implant Clinic has grown to be the largest private implant clinic in Western Australia and one of the largest in Australia. The 500th device was implanted in 2009, and by 2021 1464 people have had their hearing restored with a hearing implant. Ear Science implants devices from four major international manufacturers, backed by an active research team that focuses on improving services and reporting on implantation outcomes.

In 2019, Ear Science launched a hearing implant campaign to raise awareness of this life-changing technology.

Here we grow again

In 2006, WA mining magnate George Jones AM requested Professor Marcus Atlas see him about his serious balance issues. Professor Atlas diagnosed George with severe Meniere's, which, when treated successfully, had a significant positive impact on Mr Jones, both personally and professionally. Mr Jones wanted to share the gift of hearing that Professor Atlas had given him, which kick-started the Gift of Hearing fundraising drive in Western Australia. Spearheaded by WA business couple John and Debbie Schaffer, this fundraising enabled the building of the Ear Science headquarters in Subiaco in 2011.

After many years of sharing space across various sites at Sir Charles Gairdner Hospital and The University of Western Australia, the Institute now had a brand new corporate headquarters at the George Jones Family Centre.

Attention turned to finding a suitable permanent location for our laboratory-based research. Through the vision and hard work of Professor Bryant Stokes AO and the generosity of the Ralph and Patricia Sarich family, the Ear Science research headquarters was opened on the QEII site at the Sarich Neuroscience Research Institute in 2017. We were able to acknowledge philanthropists Vern and Jo Wheatley, who have been longterm supporters of Ear Science. The second floor at the Subiaco Clinic HQ is named after the Wheatleys, and more recently the laboratory at the Institute's research headquarters has also been named in honour of the family's charitable foundation.

Improving access to quality hearing care

After modest beginnings with three Lions Hearing Clinics in the late 2000s, new clinics opened in Winthrop, Subiaco and Mt Lawley under the leadership of audiologist Gemma Upson. Growth continued in the following decade under the supervision of audiologist Lize Coetzee, Ear Science's Chief Operations Officer, and Sandra Bellekom, now Chief Executive Officer. Lions Hearing Clinic now has 44 Audiologists working across 20 sites in Western Australia, including a clinic in Bunbury, with over 35,000 patient appointments each year. Our Clinic staff provide evidence-based hearing treatments for adults and children

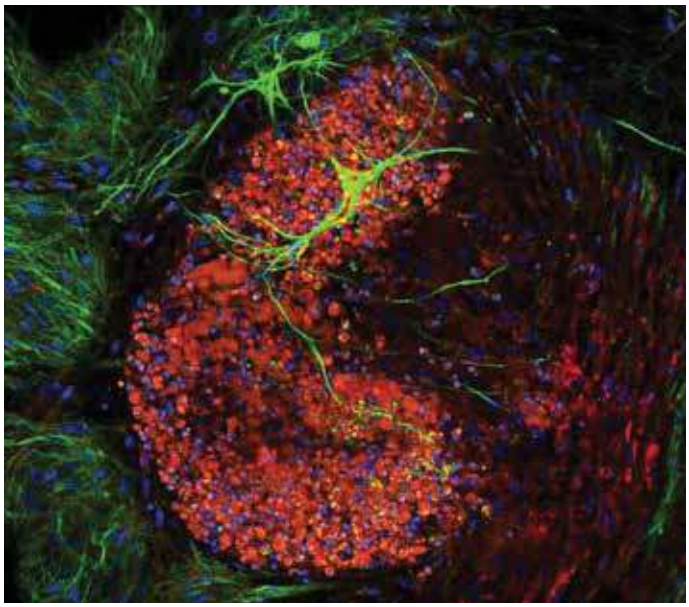
with hearing loss, including fitting and maintaining hearing aids, hearing implants, tinnitus, balance, noise protection, and childhood auditory processing disorders.

Ear Science has developed a bespoke clinical practice management system, which we affectionately call Earsuite, to manage clinical appointments and the resulting large amounts of clinical data and reports. Craig Lowrie, Gemma Upson and Lize Coetzee drove its development, and it now manages hundreds of daily appointments, test results, and data for research.

Exploring and expanding ear and hearing research

In the mid-2010s, the researchers at Ear Science commenced work in significant areas with the potential for global impact. Current principal investigators are:

1. Associate Professor Melanie Ferguson leads research on new digital technologies to improve device uptake and use, listening, cognition and quality of life
2. Associate Professor Hani Al-Salami is developing new drugs and treatments for ear disease
3. Adjunct Professor Rob Eikelboom continues our telehealth research and leads our epidemiology research to show the impact of hearing loss on overall health
4. Dr Dona Jayakody is leading our work in hearing loss and cognitive decline, including conducting a unique randomised control trial to determine whether hearing aids can change the course of cognitive decline (HearCog)
5. Dr Elaine Wong is endeavouring to regenerate delicate hair cells in the cochlear from simple cells like skin cells



6. Dr Bec Bennett is leading research on mental wellbeing in adults with hearing loss
7. Dr Cathy Sucher is developing ways to better provide long term care for hearing implant recipients, and
8. Dr Filippo Valente is continuing our work on developing new biomaterials to treat ear disease (ClearDrum).

In April 2020, Ear Science and Curtin University signed an affiliation agreement to provide the framework for cooperative research. This agreement was followed by a significant milestone with a joint venture signed between Ear Science, Curtin University, and the William Demant Foundation, a Denmark based charity.

Local focus and international influence

Ear Science Institute Australia now has a global presence.

Our researchers have published over 500 papers in international peer-reviewed scientific and medical journals with active collaborations with 50 national and international research organisations, manufacturers, and professional bodies.

Our scientists and clinicians are recognised thought leaders, invited to present at national and international conferences and take leading roles in professional bodies to set policies and future directions.

In 2019, Ear Science, working closely with Dr Shelly Chadha, was designated by the World Health Organization as a Collaborating Centre for Ear and Hearing Care. Ear Science strives to improve hearing health outcomes for people in the Western Pacific Regions, home to a quarter of the world's population.

With the help of many influential Australians, Ear Science has made 'hearing' a dinner time topic of conversation for many families. Our Ambassadors include Ita Buttrose AC OBE (2019-2020) and Justin Langer AM (2021), who have shared their hearing journey to break down the stigma of hearing loss and advocate for healthy hearing.

Nurturing the next generation

Over our 20 years, we have been active in raising awareness in the community about hearing loss prevention and hearing loss rehabilitation through events such as World Hearing Day.

Since 2001, we have provided research training to over 50 Honours, Masters and PhD students. 19 ENTs from 11 countries have spent 6 to 18 months at Ear Science for a surgical Fellowship with Professor Atlas. Advanced surgical training of local and international surgeons was enhanced with the opening of the Ear Science Training Centre in 2010, with the support of a $2.4m grant from the Australian government.

Managing organisational change and challenges

To manage the growth of the Institute and its day-to-day activities, Dr Brett Robertson was appointed as the General Manager in 2008, and the current CEO, Sandra Bellekom, took over the role in 2015. Our growth trajectory has accelerated under her leadership.

Hearing loss affects over 3.5 million Australians, yet only between 30 and 40% of those who may benefit from a hearing aid use one. Only 1 in 10 people with severe to profound hearing loss have a hearing implant.

Ear Science has led a public awareness campaign to highlight the importance of hearing health and the benefits of hearing aids and hearing implants. We actively reach out to the medical profession, especially GPs, who play a significant role in referring their patients with hearing loss.

In 2020, after many years of a successful private-public partnership with Sir Charles Gairdner Hospital, Ear Science ceased providing hospital-funded hearing implant services. Despite this setback, the number of hearing implants and follow up services we provide to Western Australians has continued to grow.

Notwithstanding the uncertainty brought on by the COVID-19 pandemic, Ear Science has continued to provide professional services to clients, and we continue to expand and grow.

Giving the Gift of Hearing

Ear Science does not receive any core funding from the Australian government, deriving income from providing services through the Lions Hearing Clinic and using the profit to fund growth and research activities.

Launched in 2010, the Gift of Hearing Appeal has raised over $10.5 million in cash and in-kind donations, supported by generous philanthropists, foundations and companies locally, nationally and internationally. These funds have been used to give the gift of hearing to more than 55 children and adults over the last ten years by providing hearing devices, surgery, rehabilitation, and life-long support. As well as supporting our ongoing research to one day find a cure for hearing loss.

Our annual Gift of Hearing Appeal Dinner is the Institute's flagship fundraising event, attended by many of Perth's most generous philanthropists, business groups and key industry leaders in hearing health and technology. Over the years, many prominent Australians have taken to the stage, including John Howard OM AC, Ray Martin AM, Tina Altieri, Kate Ceberano AM, Ita Buttrose AC OBE, Liam Bartlett, Li Cunxin, Casey Chambers, Mike Doohan, Professor Barry Marshall AC and Justin Langer AM.

VISION

A centre of excellence, enhancing the lives of people with ear and hearing disorders.

MISSION

We are dedicated to helping people with ear and hearing disorders through research, education, prevention and treatment.

The Ear Science
Impact in 2021

38050 Calls to our Hearing & Tinnitus Advice Line (31% increase on 2020)

64 Number of published peer reviewed articles (22% increase on 2020)

48% of publications with local and national collaborators

56% of publications with international collaborators

115 Number of implant recipients in 2021

1419 Children cared for in our Peadiatric clinics

6 Visits to the Pilbara

12 Number of hearing aids donated

379 Students attending our professional development courses

14 PhD and Honours Students

458 Free hearing checks

16 Healthy Hearing Pop Up Sites

43 New staff

4 Clinics opened

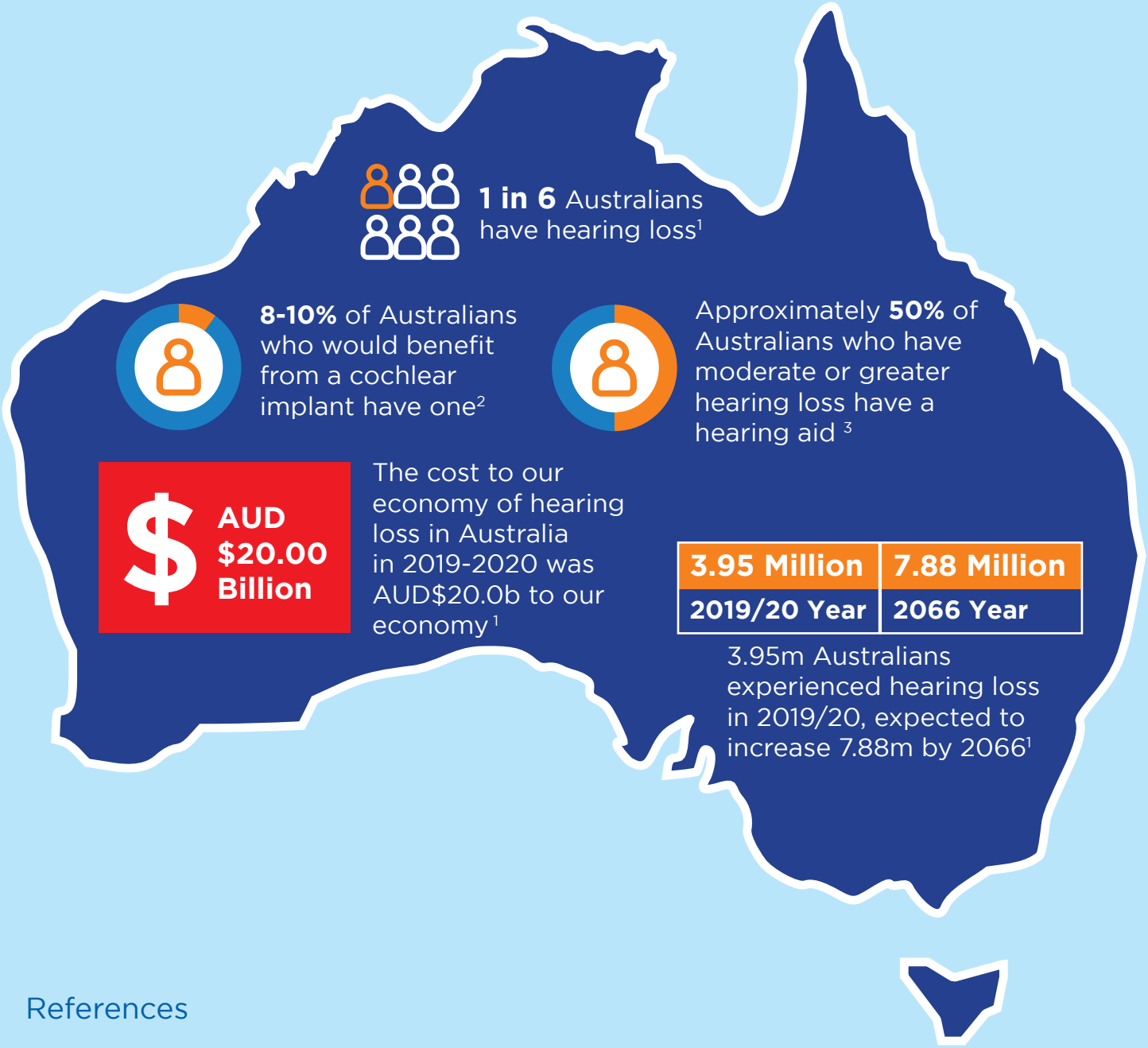
30 Patents maintained

36598 Appointments in Lions Hearing Clinic

1756 Appointments in Ear Science Implant Clinic

16758 People started their healthy hearing journey with Lions Hearing Clinic

Hearing is **Important**



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3. Bisgaard N et al. A model for estimating hearing aid coverage worldwide using historical data on hearing aid sales. International Journal of Audiology. DOI: 10.1080/14992027.2021.1962551
4. World Report on Hearing. Geneva: World Health Organization; 2021. Licence: CC BY-NC-SA 3.0 IGO.
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430 Million

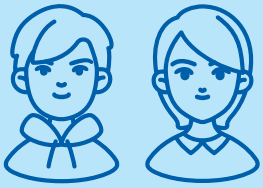
people world-wide have a disabling hearing loss [4]

200 Million

people have a chronic ear infection [4]

US$980 Billion

The annual global cost of unaddressed hearing loss is US$980b[4]



1.1 Billion

young people are at risk of noise-related hearing loss [4]

21,000

people each year die from the complications of ear infections [4]

Untreated hearing loss is **20%** of the potentially modifiable risk factors for developing dementia[5]

A message from the **Founding Director**

It is my great privilege that I report to you on the achievements of Ear Science Institute Australia as we celebrate our 20th anniversary in 2021.

Twenty years ago, I began the journey of Ear Science, making hearing a focal point for our local community. What we needed was to bring world-class research and surgery to the people of West Australia.

Fast forward 20 years, today, I am grateful to the entire Ear Science team for committing to research programs that improve our understanding of ear and hearing health. Putting us firmly at the forefront of internationally recognised research, providing world-leading education and shining a light on the importance of untreated hearing loss in our community, all from Perth in Western Australia.

Through solid leadership, organisational agility, and embracing technology, we have not only survived. We have thrived.

Over the last 20 years, Ear Science Institute Australia has been fortunate to have the support of wonderful board directors. Mr John Schaffer AM, Chairman for the last 8 years has set the pace for the Institute with a driven leadership style that sets the bar high, he is results-focused. John's style has filtered throughout the entire organisation. At Ear Science we celebrate women in leadership positions. Adjunct Associate Professor Sandra Bellekom, CEO and Director, is one of only a handful of female CEOs of medical research institutes across Australia. Working alongside Sandra is a dedicated team of professionals, all of whom have actively contributed to our strategic objectives.

I am indebted to the unwavering support and guidance from our Board. The additions of both Liddy McCall and Rob Gordon, took our Board to 7 members. Liddy has increased diversity, and brings a brings a biotechnology commercialisation background to the institute. Rob has a long and successful track record in building clinical businesses nationally. How grateful we are to them both for being so generous with their time and their dedication to Ear Science.

Ear Science continues to be financially sustainable and highly regarded in the current COVID pandemic. Business has been challenging, but we have successfully opened new clinics and expanded our research into new areas while remaining focused on offering quality hearing care to our community.

Over the year, we have responded to the often-evolving world of medical research, and it is with thanks to our supporters and their generous contributions of $2.2m, this year, that Ear Science can continue to make ear and hearing scientific breakthroughs in the delivery of new treatments for today and finding cures for tomorrow.

The increase in activity in all areas of the Institute has contributed to an exponential rise in new supporters. With 34 new supporters within our $1,000-$50,000 category, and overall, an increase in the number of active individual supporters and three new bequest pledges.

I want to acknowledge a few exceptional contributors, including Ms Barbara O'Connor, to fund research in Otosclerosis, the McCusker Foundation increased its annual support from $50,000 to $100,000 and the Community team at Roy Hill contributed $50,000 – just some of the significant contributions to our vital research.

With our organisation firmly connected with the Lions Hearing Foundation, I take great pride in knowing our research team are honouring this commitment daily.

A very generous pledge from the foundation has been used to fund research consumables, injecting a little bit of the Lions Hearing Foundation into every experiment and research project we undertake to achieve our purpose of finding treatments for today and cures for tomorrow.

Our community's generosity and dedicated network of supporters has allowed us to give the gift of hearing to 4 recipients. Our Gift of Hearing dinner took on a renewed format this year. Given the COVID concerns, we held a more intimate gathering of 140 guests in a marquee at John and Debbie Schaffer's home. The "Change a Life" auction raised an unprecedented $200,000. With presentations from Justin Langer, George Jones, and Sandra Bellekom leading the evening and concluded with a heartfelt thank you from our Chairman and host, Mr John Schaffer.

I am grateful to Mr Justin Langer AM for accepting our offer to be our Heathy Hearing Ambassador for 2021. Over the years, Justin has experienced hearing challenges that he has shared publicly to increase awareness. He has explained how ear-related challenges or problems have impacted his physical and mental well-being. Justin has explained his passion for helping also came from his father, who is completely deaf in one ear due to an acoustic neuroma that was removed, leaving him with complete hearing loss in his right ear. We are working on exactly these problems at Ear Science.

Justin has helped us remove some of the stigma associated with hearing loss and helped middle-aged men (in particular) and all those that prize their health, to start a conversation about their hearing and the impact that, when untreated, affects mental health. We are very thankful to have him agree to continue to be our Ambassador in 2022 with his profile, his personality and his tireless pursuit of excellence as the former coach of the Australian Cricket team, all assets to our Institute and our cause.

Each of our achievements highlighted in this report began with our supporters. I give you my heartfelt thanks on behalf of everyone at Ear Science.

Professor Marcus Atlas
Founding Director,
Ear Science Institute Australia

A message from the **Chief Executive Officer**

After seven years as Ear Science's CEO, I can guarantee that there is no sign of a seven-year itch. I am genuinely honoured and love leading and representing over 150 people in our dedicated team. All of them contribute their passion, intellect and energy to our remarkable Institute, all championing ear and hearing health locally, nationally and internationally whilst being given every opportunity to shine and grow in their area of expertise.

At Ear Science, our team knows that hearing is important.

For a mother to hear her baby's first words,

For children to hear their friends laughing at a joke,

To hear the words, "I love you",

For our future leaders to get the education they need to be an Engineer or to be our next Prime Minister when they grow up,

For our business executives to hear in the board room,

For families to say goodbye to their loved ones when that difficult time comes.

Our vision is to build on our solid foundations and grow our centre of excellence. Our team and Board are dedicated to improving the lives of people who are hearing impaired, guided by our values to deliver on this ambition through prevention, research, education, and treatment.

We carry out our cause through educating and advocating in our community on the impact of untreated hearing loss and the importance of prevention. Every day we support our community on their hearing journey to live their best lives with patient-centred care and treatments steeped in science. At the same time, we work tirelessly on cures in our medical research laboratories to develop novel drugs, therapies and devices.

We achieve this by maintaining our independence, treating each patient as if they were a member of our own family, and running a profitable and scalable business model that is unique in medical research across Australia.

Our purpose-built corporate headquarters in Subiaco is a shining example of the power of collaborating with industry. We have built a centre of excellence for ear and hearing health in Western Australia.

Since our founding 20 years ago, we have continued to uphold the values of excellence, success, authenticity and innovation. We now serve the needs of more than 35,000 West Australians with hearing impairment annually.

This year we continued our public awareness campaign in educating our community on why hearing health is important to our well-being and quality of life. Our successful self-funded campaign has contributed to a groundswell of understanding of the extensive impact of untreated hearing loss on our community. Through broadcast television, radio, digital and print channels, we have informed West Australians why their hearing plays

such a critical part in their overall health. The result has been a 30% increase in the uptake of our hearing services.

A critical element in our success is our multidisciplinary approach to research and clinical care. Our researchers work closely with our clinicians and administrative support personnel to define problems and collaborate to develop novel solutions. Twenty of our researchers who started their careers as clinicians have transformed into clinician-scientists.

Our Institute continues to grow sustainably with 10% revenue growth year on year (almost 50% in the last five years); our clinician-led research has been successful with a 500% increase in grant income in the same period. As success begets success, our work has attracted a 40% increase in philanthropic support, with an average of 8% growth year on year.

Our extraordinary patient outcomes and financial results have allowed us to attract great minds worldwide to join us, physically and virtually. Pre-COVID, we were in the enviable position of developing key collaborations nationally and globally. We have used online technologies to maintain and grow our network, including researchers at over 60 national and international organisations, manufacturers and professional bodies.

Ear Science commenced a joint venture with the world's second-largest hearing aid company, Oticon, based in Denmark, Europe, and Curtin University. Our research has demonstrated on a world stage that there is an association between untreated hearing loss and the development of dementia and mental health issues. We are now translating our research into treatments through this joint venture to stave off dementia and prevent health decline in our rapidly ageing population. With the recent release of the Royal Commission into Aged Care Quality and Service, now more than ever, we are playing our part to support our community to age with grace and ensure the humane care of our elders. Central to this new joint venture was the appointment of Associate Professor Melanie Ferguson to lead our Brain and Hearing research group.

We advanced our research, seeking the next breakthrough in treating and curing hearing loss. As one of only two labs in the world that can grow human hearing cells from ordinary skin cells in the laboratory, we continue the push to cure hearing loss.

We have commenced a program to develop drugs to treat chronic middle ear disease and potentially prevent hearing loss in children undergoing cancer treatment. The appointment of Associate Professor Hani Al-Salami gives us the capabilities and expertise to progress our research into drug-eluting implantable devices. The aim is to understand how we can improve healing and patient outcomes through the controlled release of active pharmaceutical ingredients into the surrounding tissue or the ear. Despite COVID, we continued to progress the development of ClearDrum™, the world's first prosthetic eardrum, collaborating with manufacturers in Salt Lake City, Utah.

I am very proud of our team, which provides research-led solutions throughout life's hearing journey.

With no shareholders at Ear Science Institute Australia, the owners of our organisation are every member of our community – You!

Sandra Bellekom
Chief Executive Officer, Ear Science Institute Australia
Adjunct Associate Professor, Curtin University

OUR VALUES

Armed with our values to guide us, we are motivated to exceed expectations, discover more through collaboration, and be driven by our community.

Excellence

We are motivated to exceed expectations and discover more. We celebrate our achievements that bring professional respect and global recognition.

Innovation

We challenge boundaries and technologies to lead the field and think outside the square. Our experience and drive ensure we remain at the forefront of our profession to discover new and better outcomes.

Success

Our independence and experience allow us to devise & tailor solutions to provide people with the most appropriate care. Our leadership position inspires collaborative work with other renowned research facilities to maximise & deliver the best results.

Authenticity

We remain honest, open, and approachable with our colleagues and clients. Our integrity ensures we promote and provide client-centred clinical care. We foster and encourage a supportive environment for all.

Ear & Hearing
Research

Finding new treatments for today and cures for tomorrow

We bring together some of the most influential academics and clinicians in the world, all with a shared passion to understand hearing and a shared goal to cure hearing loss. Our science continues to set best practice with a fully integrated model of clinical and research activities.

This allows us to translate our knowledge into tangible outcomes for our community and beyond.

Our exclusive Australian partnership with the World Health Organization, as a Collaborative Centre for ear and hearing research and education, has given us the opportunity to increase our impact on the global pandemic of hearing loss, expected to affect over a billion people by 2050.

We embrace multidisciplinary research and opportunities to collaborate allow us to develop strong, intellectually diverse teams that can answer complex research questions.

With our focus on finding treatments for today in the short term and working simultaneously on finding cures for tomorrow, we're constantly striving toward a healthy future, free of hearing loss.

The impact of our research has been recognised and cited in key international and national policy documents, such as the WHO World Hearing Report (March 2021) and Hearing Services Program review (October 2021).

Funding ground breaking research Grants

In 2020, we were successful in a Medtech grant for early-stage medical technology development and funding from the Australian Government's BioMedTechHorizons to aid the development and commercialisation of Cleardrum™.

For our hearing and dementia research, particularly HearCog, we received grants from the Royal Perth Hospital Research Foundation, the William Demant Foundation and the Rebecca L Cooper Medical Research Foundation.

In addition, we received grants from the Health Department and the Australian Government's Hearing Services Program to allow us to influence the standard of care by implementing tele-audiology.

Nurturing the next generation of WA researchers

We demonstrate our commitment to training the next generation of ear and hearing medical researchers, providing opportunities to build capacity and excellence across our research programs.

We have attracted very high calibre students, and in return, we provide the highest quality supervision, world-leading laboratory facilities and work environments, and offer career development opportunities.

Our students in 2021 included:

Farah Amat – *Master of Clinical Audiology*
Elise Cumming-Potvin – *Master of Clinical Audiology*
Rebecca Dsouza – *Master of Clinical Audiology*
Azadeh Ebrahimi Madiseh – *PhD*
Xinxing Fu – *PhD*
Dylan Hill – *Honours*
Grace Je – *Master of Clinical Audiology*
Lauren Joyce – *Master of Clinical Audiology*
Lawrence Liew – *PhD*
Joey Lye – *Honours*
Terry McGonigle – *Master of Clinical Audiology*
Kento Nakano – *Honours*
Huan Ting Ong – *PhD*
Andrew Peou – *Master of Clinical Audiology*
Robert Pike – *Master of Clinical Audiology*
N'Gadie Roberts – *Master of Clinical Audiology*
Suryanto – *Master of Clinical Audiology*
Ysraelle Tan – *Master of Clinical Audiology*
Hadeel Tarawneh – *PhD*
Susan Tegg Quinn – *PhD*
Christopher Zhao – *Master of Clinical Audiology*

Pursuing research excellence into **2022 and beyond**

Telethon backs the push to cure hearing loss

Thanks to the support of the Channel 7 Telethon Trust in 2022, our scientists can continue developing groundbreaking ear and hearing treatments. Three of our projects have been funded by Telethon:

1. Dr Elaine Wong will continue her research using our novel three-dimensional patient-derived inner ear cell culture system as a platform to screen and test new treatments for children with Usher syndrome.
2. Dr Fillipo Valente will further develop our internationally acclaimed novel scaffold to repair perforated eardrums to address the significant burden of Chronic Suppurative Otitis Media in children. The treatment will be advanced by providing local and sustained delivery of drugs to counter chronic infection and promote healing.
3. Associate Professor Hani Al-Salami will further our research on a nano-gel to be injected into the ear to prevent hearing loss in children undergoing chemotherapy. About half of the children with cancer permanently lose some or all of their hearing due to chemotherapy.

Developing novel innovations in hearing healthcare

The exciting joint venture between Ear Science Institute Australia, Curtin University and research colleagues at Oticon will gain momentum in 2022. Associate Professor Melanie Ferguson, Head of Brain and Hearing, leads a team that includes Ear Science's Dr Dona Jayakody and Ellen Bothe and engineers, Artificial Intelligence, and data scientists from Curtin University.

Together, they will develop novel hearing healthcare solutions to improve listening, cognition, and quality of life in adults with hearing loss, including those with cognitive impairment.

Healthcare success with patient empowerment

Patient empowerment encourages patients to be actively involved in their healthcare.

With emerging studies of health technologies, such as smartphone-connected hearing aids, Associate Professor Melanie Ferguson and Dr Bec Bennett are working with collaborators in Denmark and Sweden to develop a clinical and research outcome measure for adults with hearing loss to improve patient outcomes.

Fundamental change in the future of hearing healthcare

The influential and highly-cited Cochrane Review on the effects of hearing aids, previously conducted by Associate Professor Melanie Ferguson, is being updated to include two new domains: cognition and mental health.

The updated review will provide the highest level of evidence to show the effectiveness of hearing aids, to help inform future hearing healthcare policy.

Collaboration to **Amplify Impact**

‘Hearing Sciences’ new Joint Venture and Affiliation Agreement

We cannot achieve what we set out to achieve alone. Collaboration and strategic relationships have helped us realise our purpose of new treatments for today and cures for tomorrow. The most significant partnership in 2021 is Ear Science Institute Australia’s joint venture with the charitable arm of the world’s second-largest hearing device manufacturer, William Demant Foundation (Oticon), and a world-leading university (Curtin University).

The five-year enterprise in the brain and hearing space will be co-funded by the three organisations. It will focus on whether early treatment for hearing loss can reduce the impact of cognitive impairment and dementia and develop new interventions to improve the lives of those with hearing loss.

Another significant milestone is a new affiliation agreement between Ear Science and Curtin University. This agreement enables the interchange of researchers and students and the sharing of facilities. There were also joint appointments of Dr Melanie Ferguson as Associate Professor and Head of the Brain and Hearing Group and Dr Hani Al-Salami as Associate Professor and Head of the Hearing Therapeutics Group.

56% of publications with international collaborators

We are developing novel devices, new treatments and early intervention strategies for hearing loss.

We can better answer complex research questions by embracing multidisciplinary research and developing strong connections with diverse teams. In 2021, we collaborated with the following organisations and institutes locally, nationally and internationally:

OCEANIA

Australian Society of Medical Research
Busselton Population Medical Research Institute, Western Australia
Cochlear Ltd., Australia
Curtin University, Western Australia
Deafness Forum of Australia
Deakin University, Victoria
Edith Cowan University, Western Australia
Hearing Australia
Harry Perkins Institute for Medical Research, Western Australia
Hearing Care Industry Association, Australia
Lions Eye Institute, Western Australia
Macquarie University, New South Wales
MED-EL, Australia and Austria
Murdoch University, Western Australia
National Acoustic Laboratories, New South Wales
Otago University, New Zealand
Perron Institute, Western Australia
Puntukurnu Aboriginal Medical Service (PAMS), Western Australia
Royal Perth Hospital
Rural Health West, Western Australia
Soundfair, Victoria
Swinburne University of Technology, Victoria
Telethon Kids Institute, Western Australia
The Raine Study, Western Australia
The University of Sydney, New South Wales
The University of Western Australia
University of Auckland, New Zealand
University of Melbourne, Victoria
University of Notre Dame Australia, Fremantle
University of Queensland, Queensland
Western Australian Centre for Health & Ageing, Western Australia
Western Australian Centre for Rural Health, Western Australia

EUROPE

Ayus Gmbh, Germany
De Montfort University, Leicester, England
Denmark Technology University, Denmark
Medizinische Hochschule Hannover, Germany
Loughborough University, UK
Materials Research Center, Kyiv, Ukraine
National University of Ireland, Ireland
Naturality Research & Development, Barcelona, Spain
Oticon and Oticon Medical, Denmark
Politechnika Wroclawska, Wrocław, Poland
Sonova AG, Switzerland
The University of Manchester, UK
University of Nottingham, England
University of Novi Sand, Serbia
University City London, England
University Medical Centre, Amsterdam, The Netherlands
University Medical Centre, Utrecht, The Netherlands
West Aquila SRL, L'Aquila, Italy
Widex Signia Audiology, Denmark
William Demant Foundation, Denmark
World Health Organization, Switzerland
World Hearing Forum, Switzerland

AMERICA

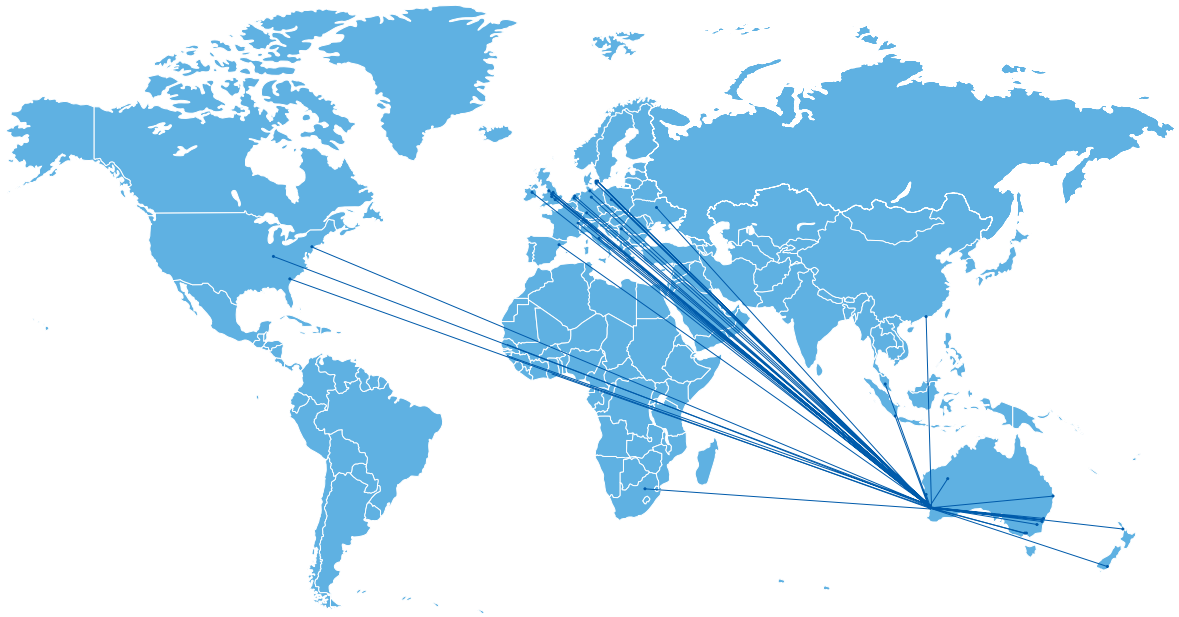
Medical University of South Carolina, USA
Mount Sinai Medical School, New York, USA
Vanderbilt University, Nashville, USA

ASIA

Sengkang General Hospital, Singapore
The University of Hong Kong, Hong Kong University of Malaya, Kuala Lumpur, Malaysia

AFRICA

University of Pretoria, South Africa



Ear Science staff with external appointments

Ear Science scientists hold honorary and adjunct appointments with universities in Australia and internationally, which recognise their academic standing and contributions to teaching and research.

Dr Marcus Atlas	Adjunct Professor, Curtin University Emeritus Professor, UWA
Sandra Bellekom	Adjunct Senior Research Fellow, UWA Adjunct Associate Professor, Curtin University
Dr Rebecca Bennett	Adjunct Senior Research Fellow, UWA Casual Academic, University of Queensland
Ellen Bothe	Adjunct Research Fellow, Curtin University
Emma Chaffey	Lecturer (Audiology), UWA
Lize Coetzee	University Associate, Curtin University
Azadeh Ebrahimi-Madiseh	Adjunct Research Fellow, UWA
Dr Robert Eikelboom	Adjunct Professor, UWA Extra-ordinary Professor, University of Pretoria Adjunct Professor, Curtin University
Associate Professor Melanie Ferguson	Adjunct Associate Professor, Macquarie University Adjunct Associate Professor, UWA Adjunct Associate Professor, University of Nottingham, UK
Dr Rebecca Heywood	Adjunct Senior Research Fellow, UWA
Denise Howting	Adjunct Research Fellow, UWA
Dr Dona Jayakody	Adjunct Research Fellow, UWA Research Fellow, WA Centre for Health & Ageing, UWA Adjunct Senior Research Fellow, Curtin University
Holly Menegola	Adjunct Research Fellow, UWA University Associate, Curtin University
Dr Cathy Sucher	Adjunct Research Fellow, UWA Adjunct Senior Lecturer, Curtin University
Dr Filippo Valente	Adjunct Lecturer, Curtin University
Dr Elaine Wong	Adjunct Senior Research Fellow, UWA Adjunct Senior Research Fellow, Curtin University

External scientists with appointments at Ear Science

Ear Science has conferred honorary positions on national and international researchers for their ongoing contributions to our research.

Associate Professor Helmy Mulders	University of Western Australia
Dr Rebecca Heywood	Advanced ENT Centre and SingHealth, Singapore
Professor De Wet Swanepoel	University of Pretoria, South Africa

2006 – 2021 | Visiting scholars

Ear Science has benefited from visits from leading international scholars. Their contributions have included presentations at our A Life Worth Hearing research symposia, sharing their expertise, and ongoing research collaboration.

Professor David Baguley	The University of Nottingham, UK (formerly at Cambridge University)
Professor James Hall III	Salus University, USA
Dr Ariane Laplante-Levesque	Oticon Medical, Denmark (formerly at the Eriksholm, Denmark)
Dr Carly Meyer	University College London (formerly at The University of Queensland)
Associate Professor Bryony Nayagam	University of Melbourne
Dr Cas Smits	Amsterdam UMC, University Medical Center, The Netherlands
Dr Inge Stegeman	University Medical Centre Utrecht, The Netherlands
Professor De Wet Swanepoel	University of Pretoria, South Africa
Professor Magnus van Unge	University of Oslo, Norway

Hearing Therapeutics
Therapeutics Research

Finding new treatments for today and cures for tomorrow

The Hearing Therapeutics team was bolstered by Associate Professor Hani Al-Salami's appointment as the new head. He comes with a strong track record in pharmaceutical design and development.

Regeneration of auditory hair cells

Hearing loss because of deteriorating auditory hair cells affects 100s of millions of people worldwide.

As these cannot regenerate, there is a global quest to develop new therapies to regrow them. Dr Elaine Wong is leading the efforts of Ear Science using adult stem cells, e.g. from the skin. These are transformed to have the potential to be another type of cell (called pluripotent) and are programmed to be ear cells.

We are one of a few labs in the world to successfully grow ear organoids from these cells.

When the techniques have been fully developed, this technology will first be used as a testbed for new drugs for many human ailments to ensure they do not cause hearing loss and for safety tests of other ear therapies. Our current work focuses on people with Usher Syndrome – a rare condition that causes deafness and blindness.

At the same time, we are also working on developing gene therapy for hearing loss. In a project funded by the Garnett Passe and Rodney Williams Memorial Foundation, we are expanding our knowledge of which genes are involved in progressive hearing loss and which cells in the cochlea are involved in the regeneration of hair cells.

This work is done in close collaboration with researchers at the Lions Eye Institute, Curtin University, and Murdoch University.

Cleardrum™

One of Ear Science's flagship projects is developing a silk-based device for the surgical repair of chronic perforated eardrums.

After many years of laboratory-based testing for effectiveness, safety and mechanical properties, the project is now being transferred to a commercial company owned by Ear Science. Dr Gillian Ravlic has been appointed as the Operations Manager. She oversees our regulatory activities, Dr Carel Smit manages our intellectual property portfolio, and Dr Filippo Valente manages the science behind Cleardum™. A 12-month implant study has been completed, and we are upscaling for manufacturing.

200m people have a chronic ear infection [4]

Cleardrum™ pipeline

Ear Science researchers are at the international forefront of research on the eardrum. Whilst Ear Science's ClearDrum™ is on the path to clinical trials, the research team led by Dr Filippo Valente is working on a pipeline of further discovery and innovation in biomaterials.

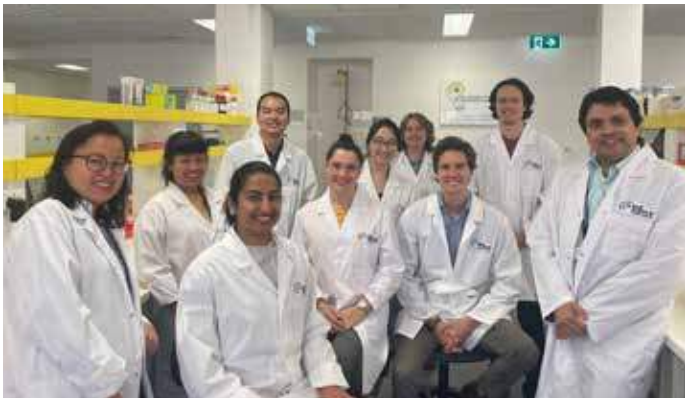
For one of his projects, he uses a specialised 3D printing process called two-photon lithography, better known for creating miniaturised computer chips. Dr Valente has used this technique to change the physical characteristics of a silk-based hydrogel (gel), a soft and absorbable material. With this technology, he can control how this gel degrades and its elasticity. The gel can carry human skin cells to help regenerate the damaged eardrum tissue and will be tested in the future as a drug carrier.

Dr Valente conducts his work in collaboration with the BRITElab at the Harry Perkins Institute of Medical Research in Perth, the Institute for Frontier Materials at Deakin University, and other national and international collaborators.

Treatments for eardrum perforations

The eardrum (tympanic membrane) is often perforated by ear disease in children and adults.

Whilst they usually heal by themselves, surgery is often needed, although there is room to improve treatments. Dr Filippo leads a cross-institutional project with Deakin University to develop materials to transport therapeutic biomolecules to a target treatment site. PhD student Lawrence Liew is developing a deep understanding of how the eardrum heals and what impedes healing. He has also shown that a protein called Connexin 43 plays a role in disrupting recovery, which can be a foundation for a new therapy. Dr Ting Ong was awarded a PhD for work showing that adult stem cells may play a vital role in new treatments to improve the healing of perforated eardrums.



Improving cochlear implant outcomes

Cochlear implantation is currently the best method for hearing restoration and has improved the speech understanding of most patients. However, the outcomes of cochlear implantation remain variable and can be unpredictable. One reason for this variability is scar tissue formation around the electrode, leading to device failure in some cases. This was identified by a study of our clinical data led by Dr Cathy Sucher.

Dr Cecilia Prele and Professor Marcus Atlas, with a team of collaborators, were awarded a highly competitive NHMRC Ideas Grant to determine if anti-fibrotic drugs can reduce the formation of this scar tissue.

Brain & Hearing
Research

The Brain and Hearing research group is multidisciplinary, including hearing science researchers, psychologists, neurophysiologists, engineers and clinical audiologists. The team was recently bolstered by the appointment of Associate Professor Melanie Ferguson as head of the group, who has a solid international track record in translational hearing research.

The primary research themes are:

- Cognition and hearing
- Wellbeing and mental health, and
- Service delivery models to increase accessibility and participation through early detection and intervention.

These are underpinned by theories, such as behaviour change theory and implementation science theory, using appropriate outcomes to evaluate novel procedures, devices and technologies.

The vision of the Brain and Hearing research team is to develop new knowledge and seek clinical strategies to enable and empower people living with challenges associated with their hearing, cognitive and mental health.

Connection between the brain and hearing

Hearing is one of our most complex senses. Hearing provides us with an awareness of our environment and helps us communicate orally. You hear with your brain, not your ears. Whilst the ear is responsible for collecting sounds and converting them into electrical signals, the brain makes these sounds meaningful. The Ear Science Brain and Hearing team aims to understand the connection between our brain and hearing and find ways to address the mental health and wellbeing issues arising from hearing loss.

The proven links between hearing loss and dementia highlight the growing need for early detection, treatment and a more proactive approach to protecting our precious sense of hearing.

Dr Dona Jayakody leads a large-scale randomised control trial (HearCog) to determine whether hearing aids will change the trajectory of cognitive functioning in those with mild cognitive impairment. In 2021, Dr Jayakody was awarded the Royal Perth Hospital Career Advancement Foundation Fellowship in central auditory processing in Indigenous populations.

This work is complementary to the work of PhD student Xinxing Fu, who is examining the association between hearing loss and cognitive functioning in a Mandarin-speaking population in Beijing.

PhD Student Hadeel Tarawneh uses electrophysiology tests of hearing to determine whether they may be used as a test for cognitive decline and early-stage dementia.

Helping Audiologists support the wellbeing and mental health needs of adults with hearing loss

Dr Bec Bennett, Raine Cockell Fellow at Ear Science, has shown that hearing loss affects the ability to hear and socially and emotionally connect with people. Importantly, this research has shown that adults with hearing loss expect their hearing healthcare clinician to discuss and support social and emotional well-being in hearing loss and hearing rehabilitation. Although hearing healthcare clinicians do not routinely provide this type of support, they report that they wish to expand their skills so that they can fully address the social and emotional needs of adults with hearing loss. Bec is now developing and testing an intervention to increase the frequency and quality of audiologists' social, emotional and mental well-being support.

This work has been published widely and was awarded the Consumer and Community Involvement award at the Science on the Swan 2021 Conference.

Embracing new technology for service delivery

Teleaudiology has become more critical since the COVID-19 pandemic. An international survey of hearing healthcare clinicians showed a significant increase in tele-audiology practices from before (41.3%) to the early stages of the COVID pandemic (61.9%; June to August 2020), with the uptake predicted to increase.

To understand better the telehealth experiences and preferences of adults with hearing loss, Dr Cathy Sucher surveyed over 500 Lions Hearing Clinics and Ear Science Clinic clients. The results showed that telehealth in all medical consultations posed a problem for those with hearing loss. Despite this, over a third of respondents were keen to consider telehealth appointments in the future and were willing to pay to do so.

The Australian Department of Health commissioned Ear Science to prepare a report to show evidence to support a range of ear and hearing services delivered by telehealth, written by Adjunct Professor Rob Eikelboom, Dr Bec Bennett, and Madison Brennan.

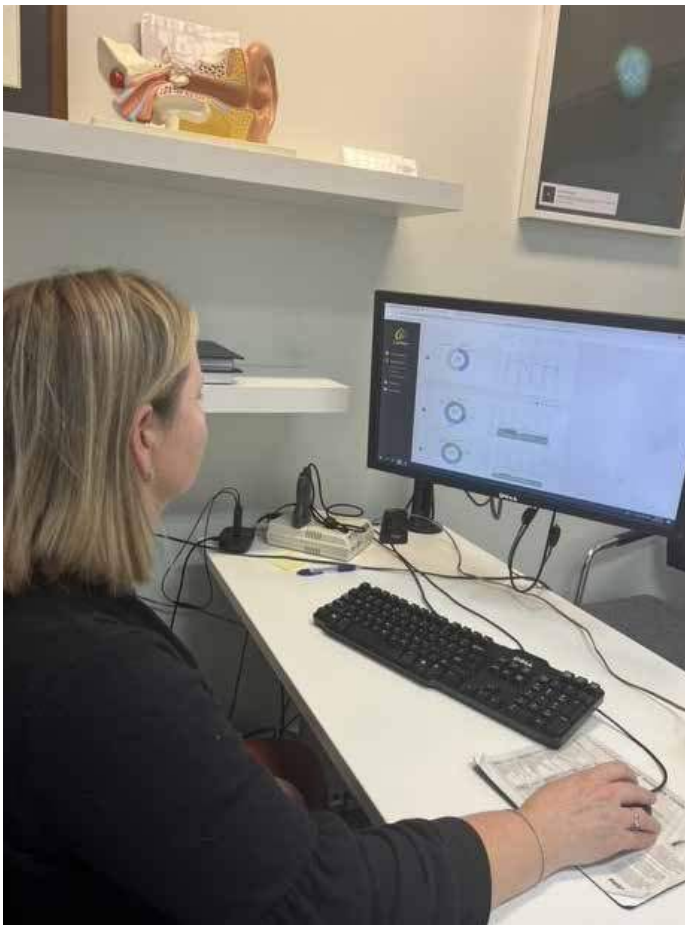
This led Dr Bennett to work with Hearing Australia, the Australian Council of Audiologists, Soundfair and the Department of Health to document the experiences of Australians with hearing loss and how they use telehealth. This resulted in the development of Australian clinical practice guidelines for telehealth.

New telehealth tools for at-home testing

Dr Cathy Sucher and Adjunct Professor Rob Eikelboom, in collaboration with Dr Cas Smits (Amsterdam) and Professor De Wet Swanepoel (South Africa), compared the current clinical speech-in-noise test (which requires reasonable levels of English proficiency, is prone to floor effects, and is only available in an American accent), to a simple test of speech perception that may be suitable for testing at home.

The new Australian Digits-in-noise (DIN) test only requires knowledge of numbers 1-10 and can be used on a mobile device or home computer by people with all degrees of hearing loss. The study showed that the Australian DIN provides equivalent results to the current speech-in-noise test via standard booth-based testing and a computer set-up. The DIN test could be used in future for home-based testing, thus reducing clinic appointment time.

Dr Cathy Sucher and Associate Professor Melanie Ferguson collaborated with cochlear implant recipients to test a remote at-home testing tool (RemoteCheck, Cochlear Ltd). This tool allows recipients to monitor their hearing status and speech perception through direct streaming and a smartphone app. Results show the app has good acceptability and could be used to improve service provision and time efficiency. An implementation science study, including a discrete choice experiment, aims to identify how to successfully embed Remote Check into clinical practice.



Hearing loss in the population

Ear Science has a long association with the Busselton Health Study, which tracks the health of over 5000 Baby Boomers. In addition to our previous work showing associations between hearing loss and other health conditions, we have reported the prevalence of tinnitus and hyperacusis(age-related hearing loss).

In collaboration with Drs Inge Stegeman and Diane Smit (Utrecht, The Netherlands), we have shown that both are significantly associated with mental wellbeing.

Artificial Intelligence and cochlear implantation

In an international project aimed at better predicting the outcomes of cochlear implantation, Ear Science researchers teamed up with IBM, Cochlear Ltd., Vanderbilt University (Nashville, USA) and Medizinische Hochschule (Germany) to use Artificial Intelligence (or machine learning). The study demonstrated that speech perception after implantation can be predicted with about 20% certainty and recommended that other factors that may influence outcomes to be included in future studies.

Ear and Hearing
Treatments

Hear Well, Live Well

We continue to educate the community on what they should expect from their hearing care provider. We have seen a 70% increase in self-referrals for hearing implants and a 30% increase in new clients over the last two years.

The annual global cost of unaddressed hearing loss is US$980b[4]

New clinic locations

As the Lions Hearing Clinics' geographical footprint continues to grow, our focus is on making our premium services more accessible and available, with the opening of 4 clinics in 2021 at:

- Shoalwater
- Woodvale
- Kwinana
- Mirrabooka

We continue to reinforce the fact that we are the only hearing care provider that is part of a medical research institute and provides care driven by Science.

Clinic integration

> “Since implementing Dr Bennett’s research into clinical practice. It’s been a seamless transition to adopt these practices with the new skills we have learned and the tools provided to deliver whole-person, holistic clinical care.” Dan Gerace, a Qualified Audiologist at Lions Hearing Clinic, highlighting the power of clinic and research integration.

We continue integrating the services from Lions Hearing Clinic and the Ear Science Implant Clinic to offer clients, where necessary, one hearing journey from hearing aids to hearing implants. With regular training to support our Clinicians, we are implementing a seamless referral pathway for clients who would benefit from transitioning to hearing implants. Clients and health professionals can be confident that we consider all appropriate treatment options.

This integrated approach has been very successful, with a 31% increase in clients transitioning from Lions Hearing Clinics to the Ear Science Implant Clinic.

Clinic integration with research

Our commitment to our clients is to integrate clinical service delivery and research to achieve our mission to enhance the lives of people with ear and hearing disorders. With clinical needs informing research and the latest research findings driving clinical practice, we continue to successfully translate our scientific discoveries and integrate new treatments into clinical applications.

Clinical applications have generated research, with clinic managers and staff partnering with the research team to co-design project proposals and clinic implementation.

We have successfully created an environment where clinicians have the opportunity to experience the wonders of research, with several now pursuing a future in a research career. We have many of our audiologists and clinicians involved in research. At Ear Science, we believe that for research to have a real impact, it needs to take the perspective of the clinicians and, importantly, the clients. That is why we encourage our clinicians and clients to get involved.

The Raine Medical Research Foundation funded Dr Bec Bennett, an audiologist and accomplished researcher, to conduct research into supporting the psychosocial needs of those with hearing loss.

Research led by the needs of the clinics to support clients with the psychosocial impact of hearing loss resulted in interventions being co-developed by clients, clinicians and researchers. These were implemented in the Lions Hearing Clinic in June 2021. "Current audiology training programs are lacking in developing the skills needed to support the social and emotional needs of adults with hearing loss. This research addresses this training gap by going into the clinics and supplying the staff with the skills, tools, and support to address their clients' holistic needs," said Dr Bec Bennett.

Audiologists developed skills and were provided with clinical tools to help detect, discuss and address their client's hearing needs and psychosocial needs concerning the impact of hearing loss.

Reduce the risk of dementia by treating the hearing loss with hearing aids

Dr Dona Jayakody leads the HearCog Clinic Trial, a real team effort across the entire Institute. The hearing assessment, hearing aid fitting, and reviews of the HearCog trial are conducted by the Lions Hearing Clinic clinicians, supported by the administration and marketing teams.

At the halfway mark, early indications show that 20% of respondents already have undiagnosed significant cognitive impairment and undiagnosed disabling hearing loss requiring amplification, both of which are risk factors for dementia.

"I didn't know how much I was missing. Being able to hear all the natural sounds around me, I feel more connected to reality". *HearCog Participant*

Blended service delivery model

With many of our clients vulnerable and at a high risk of harm from COVID, keeping our clients and our team safe and our clinics open is a priority. Pivoting to Tele-Audiology services during the lockdown, our clients had access to the health care they needed whilst staying safe at home.

Appointments were categorised depending on the client's needs, and where required, we offered an online appointment option.

We understand the impact of untreated hearing loss on people's well-being, and therefore we were determined to ensure we were available

The technology and service models available for online service delivery are still limited. In early 2021 Maddison Brennon, Dr Bec Bennett and Rob Eikelboom completed an Australian Health Department paper to guide tele audiology services.

New services

In response to our community's need, we increased the number of audiologists providing tinnitus services and aligned our tinnitus services with MyMirror, a psychology provider, to offer a multidisciplinary approach to our care.

Client feedback

When clients are fitted with hearing aids, we measure their outcomes on a 'Client Orientated Scale of Improvement (COSI)'. The COSI is set by the client and includes their personal hearing goals; 89% of clients reported performing 'better' or 'much better' on their personal hearing goals with their Lions Hearing Clinic prescribed hearing aid.

We use the Net Promoter Score®, or NPS®, to measure our client experience. It is a core metric we track on a month to month basis.

For the healthcare industry, the NPS® benchmark is 38. The Lions Hearing Clinic's monthly NPS is 90 (on average for 2021), a truly outstanding result and a true reflection of the entire team for delivering exceptional services in line with our values.

On average, 39% of respondents choose Lions Hearing Clinics based on a friend, family member, or medical practitioner's recommendation.

36598
Appointments in Lions Hearing Clinic

From Robert

Please pass on my thanks to Ellie, Jerry, and Liz for the care and professionalism they extended to me during my recent appointments at your Subiaco facility.

I received the best of care. All aspects of my hearing issues were clearly explained, as were treatment options and potential outcomes. I felt I was in the hands of people who knew what they were doing. Importantly, I felt I was being treated as a human being rather than a name and number on a piece of paper.

I am most grateful.

From Janelle

Great team, who really look after their patients. I found them to be very knowledgeable and helpful, and courteous. I have recommended them to my next-door neighbour, who then had hearing aids dispensed and is also very happy.

From Janice

I want to tell you what a great clinic you have in Rose St Bunbury! The staff are AMAZING and so helpful!

A fantastic receptionist in Jacinta who was so very helpful when I got lost and looked up maps to guide me and then because I was late (after getting lost) Jacinta and Jim (the audiologist) worked some magic and I was still able to have my appointment!

I can't praise the two of them enough. They were just so kind, helpful and caring and I just had to see that they are recognised!

Also, Jim suggested a way to help my hearing and it is working!! Many thanks to you all for having great staff.

Client Liaison Centre

Over the last 18 months, many companies moved towards a depersonalised service delivery model. We have always been committed to our clients, assuring them that we will be there when they need us. We turned this up during the COVID pandemic as we understand that our clients need us more in times like this. In response, we decided to personalise our service more, increasing the availability of our Hearing and Tinnitus Advice line and continued to open clinics even in the height of the COVID pandemic.

With extra support, training, and a renovated office, the Customer Liaison Centre team have delivered exceptional customer service to our community, even under the pressure of fielding 31% more calls to our Hearing and Tinnitus Advice line than last year.

38050
Calls to our Hearing & Tinnitus Advice Line (31% increase on 2020)

Training & **Education**

Excellence in ear and hearing training

Hearing Implant Series

At Ear Science, we are committed to increasing awareness of hearing implantation. This commitment led to the development of the Ear Science Education Series on Hearing Implants. Our Education Series on Hearing Implants is designed to support clinicians in maintaining clinical excellence and optimised hearing care for all clients.

The series covered the cochlear implant journey focusing on complex referrals and bimodal management and was accredited for Audiology Australia and Australian College of Audiology CPD points. Through interactive workshops and panel discussions, participants developed their knowledge of cochlear implant candidacy criteria, referral pathways and clinical outcomes, giving clinicians increased confidence to discuss hearing device options with their clients and complete complex referrals. With a focus on bimodal management, the series aims to further clinicians' knowledge of programming options for bimodal recipients to maximise hearing outcomes.

Approximately 50% of Australians who have moderate or greater hearing loss have a hearing aid [3]

Student medical training

Notre Dame University: In 2021, we delivered two online sessions to almost 200 medical students in the first and second years. We are dedicated to training the doctors of the future. We adjusted our delivery to online to ensure no medical student missed out on this crucial training in 2021. In an adapted online format, we delivered an engaging and interactive session. We brought together leading facilitators, including Audiologists, Researchers, ENTs, Registrars and Speech Pathologists. Feedback from the University was excellent.

Curtin University: We hosted an Ear and Hearing Education Session for Curtin University's 3rd Year medical students. In May 2021, we delivered the complete in-person session at ANZAC House for 92 students as their Medical Program grows year on year (58 students in 2019, 65 in 2020).

379
Students attending our professional development courses

Cochlear Implant Fellow | Dr Evie Landry

Dr Evie Landry (Canada) completed her 12-month Fellowship with Professor Atlas.

During the 12 months, Dr Landry undertook further training on surgical techniques with Professor Atlas.

Community

Raising Awareness of Heathy Hearing in our Community

Community services

With 39% of clients visiting Lions Hearing Clinics due to a referral, we continue to engage directly with GPs and Allied Health professionals.

We added 3 Community locations, bringing us up to 5 community locations co-located within a GP clinic. All three sites, Mirrabooka, Shoalwater and Kwinana, have been very successful, particularly Kwinana, which increased from 1 to 2 days.

16
Healthy Hearing Pop Up Sites

In conjunction with the Lions Hearing Foundation, we launched the Lions Healthy Hearing Pop Up initiative “with a bang” to celebrate World Hearing Day (3 March 2021). With a grant from the World Health Organization, we embarked on a three-day Healthy Hearing event in the Perth CBD. Justin Langer dominated the airwaves with significant interests from the media on the day.

The result was a massive uplift in visits to our website, calls to the Client Liaison Centre and new clients into the clinics, which resulted in over 16,000 people taking up the call to start their healthy hearing journey with Lions Hearing Clinic.

Healthy Hearing Outback

Our Rural Health West funded remote outreach service was branded – Healthy Hearing Outback - giving the service identity and recognition in the communities.

Lize Coetzee joined the Healthy Hearing Outback team as an audiologist on one of their visits. Lize witnessed first-hand the tremendous benefit our visits have on the communities, and she has highlighted the significant need for us to work with the communities to minimise the impact of hearing loss.

We successfully applied for funding from Rural Health West to extend our service in the Pilbara to a new tertiary (referral-based, appointment only) clinic at Puntukurnu Aboriginal Medical Service's new Health Hub in Newman, with biannual visits by our Healthy Hearing Outback team funded by Rural Health West. We now enter our final year of the Healthy Ears Better Hearing, Better Listening funding period (3 years), intending to shape our proposal for service delivery for the next period (2022-2025) to best suit the community's available resources.

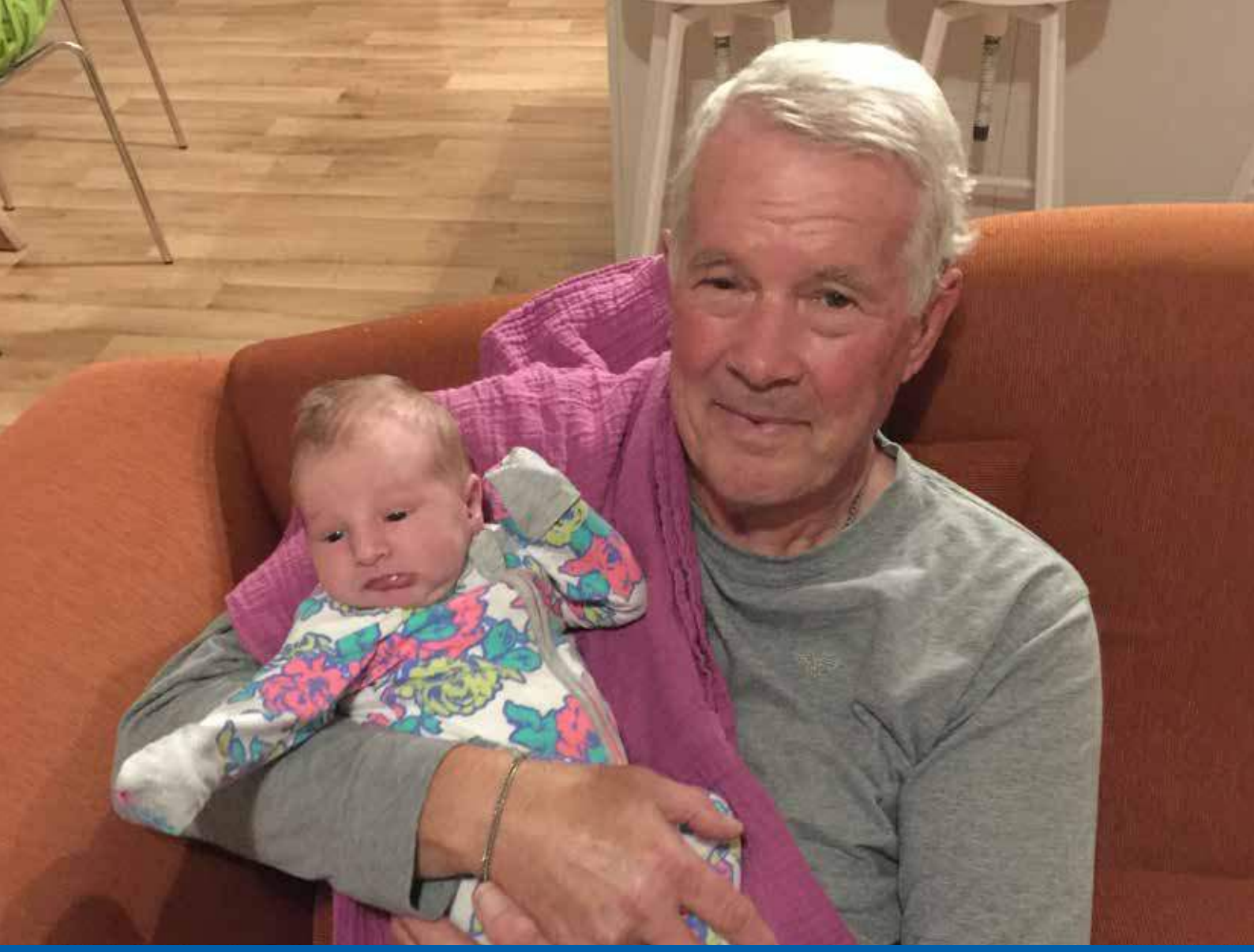
Lions Hearing Aid Bank

According to the World Health Organisation (WHO), developing countries have the most significant prevalence of hearing-impaired people, mainly in rural areas across Southeast Asia, the Asia Pacific and sub-Saharan Africa.

To help these people Lions Hearing Clinics, in collaboration with the Lions Hearing Foundation, donate many pre-owned hearing aids to areas in need through a joint initiative called the Lions Hearing Foundation Hearing Aid Bank. The hearing aids are donated to people in need worldwide and particularly to developing countries such as the Philippines, Indonesia and Kenya.

Through this efficient programme, the Lions Hearing Aid Bank is helping many children (and families) access hearing aids that would not have been available otherwise and allowing them to hear in class and gain an education.

430m people world-wide have a disabling hearing loss [4]



COCHLEAR IMPLANT GIVES FAMILY A CHANCE TO SAY GOODBYE

Imagine being in palliative care, profoundly deaf and despite a decade of being connected to the outside world through a hearing implant, you lose the ability to communicate and hear your loved ones. Compounded by COVID restrictions leaving you unable to say goodbye to your loved ones living on the other side of the world, the heart break would be significant. For long time patient of the Lions Hearing Clinic Anthony, that was his reality.

This was until Anthony's son sparked an idea. He knew Anthony's cochlear implant streamed to his phone, so he decided to try calling him and to their joy and surprise, after a week of not being able to communicate, he responded! Not only did his implant give his loved ones by his side the ability to say goodbye, but it also allowed Anthony to say goodbye to his family members, living thousands of kilometers away in the UK.

Anthony's Cochlear Implant reconnected him with his world, by giving him and his loved ones the ability to say their final goodbyes and share their final loving words with one another.

While Anthony's experience is uniquely heart-warming, the life changing impacts of Cochlear Implants and regaining ones hearing really are remarkable.

Healthy Hearing Pop-Ups

Our self-funded public health awareness and education campaigns have reduced the fear, anxiety and stigma associated with the treatment of hearing loss, making it easy for people to access quality hearing care.

We updated The George Jones Family Centre building wrap with our new Ambassador's call to arms "Tell them Justin sent you".

We refreshed the ‘Cheers for Ears” mural in the car park driveway at our Subiaco Corporate Head Quarters with the annual WHO message of ‘Hearing Care for All’ as part of our World Hearing Day celebrations. Thank you to local artist Susan Respringer.

World Hearing Day was celebrated with the support of the Lions Hearing Foundation, Healthy Hearing Pop Up in the Perth CBD. Over the three days, we performed 70 screenings, including screening the Lord Mayor, Mr Basil Zempilas.

Our dedicated community audiologist makes regular trips to doctors, Lions Clubs, Men's sheds, aged care homes, and other community groups to open the conversation about hearing health.

We took the Lions Hearing Foundation bus to 6 community events in Perth to make hearing checks accessible to as many people as possible and hosted Lunch and Learn sessions with 100 GPs and 30 nurses over 32 practices through lunchtime educational meetings.

We engaged with our community through 19 Lions Healthy Hearing presentations to Lions Clubs, Libraries, Retirement Living Communities, Aged Care staff, Allied Health and Corporations.

458
Free hearing checks

Launch of our Ear & Hearing Scientist programme for high school students

Collaborating with Scotch College, we developed a bespoke 10-week programme to allow students to immerse themselves in a real-life research project, impacting the lives of people with hearing impairment and contributing to our impact in the community to improve the lives of those with hearing loss.

In our Ear Science Implant Clinic, the students spent an hour each week with some of our Cochlear Implant recipients.

The implant recipients are keen to improve their hearing outcomes following hearing implant surgery and improve their communication and confidence in social situations.

The students directly contributed to the improvement of 'their' patient. We incorporated a research element into the programme, with students taking a baseline measurement from each patient and retaking those measurements to see improvements.

In the Brain and Hearing Research division, the students got the opportunity to learn about the new treatments for hearing loss we are developing and the importance of collaboration to make big things happen as we search for a cure for hearing loss. They worked with the Hearing Therapeutics team on curing hearing loss with a tour of our Lab.

Working with some of our scientists, the students workshopped ideas for how to influence their parents and grandparents to consider their hearing.

Live with Ear Science online panel discussion

With our supporters and collaborators from all corners of the globe, we hosted the Live with Ear Science event to showcase the advances in our research.

Professor Marcus Atlas and Associate Professor Hani Al-Salami led a vibrant panel discussion to share the latest in our ground-breaking ear and hearing research. The panel included a surgeon, a researcher, an audiologist and a recipient, resulting in a fascinating discussion from all perspectives.

The 30-minute session included:

- New & exciting hearing therapeutics and drug developments as we edge ever closer to a cure for hearing loss.
- What are the benefits of these cutting-edge discoveries and developments for those with hearing loss?
- Should people wait for a cure, or should they seek treatment now?

Gift of **Hearing**

The generosity shown by our many Gift of Hearing donors throughout 2021 exceeded all expectations, allowing us to continue our commitment to improving the lives of children and adults with hearing loss through research, treatment, education and prevention.

Together, we continue to help reconnect grandparents with their grandchildren, parents with their families, and children with their schools.

We are bringing music and laughter back into the lives of those who have lived in silence for too long and keeping storytelling alive in remote Aboriginal communities.

The Gift of Hearing Appeal Dinner

In the wake of the COVID pandemic, the annual Gift of Hearing Appeal Dinner looked somewhat different in 2021. We received overwhelming support despite a smaller format, resulting in a record-breaking fundraising total that surpassed $2.2 million in cash and in-kind.

Led by Ear Science's CEO, Sandra Bellekom, the evening comprised heart-warming stories, including those from Gift of Hearing recipients, Ray Vine and Corey Benson and special guests Justin Langer and George Jones. They all gave touching personal accounts of their experience with ear and hearing disorders and Ear Science's life-changing impact.

Change a Life Recipient | Corey Benson

Corey Benson is a 22-year-old mental health team leader who spends his days making a profound difference in the lives of countless members of his community. In May 2021, Corey received an Oticon Medical Ponto 5 Mini bone conduction implant through Ear Science's 'Change a Life' initiative.

After a lifetime of hearing loss in his left ear and further deterioration in his right ear, Corey has now regained his hearing and reconnected with his world.

'Being able to sit and be truly present in conversations has been such a massive improvement. Being able to go into any social setting and not feel something is holding me back. It really is life-changing.' Corey Benson

Thank you, Ian and Jillian Green, Oticon Medical and St John of God Subiaco, for generously supporting Corey's implant and collaborating with Ear Science Institute Australia to give Corey the gift of hearing.

Change A Life hearing device recipient | Laura Jones

Determined mum of three, Laura Jones, has had hearing loss since birth.

Laura's hearing loss greatly impacted her personal and professional life, particularly as she began growing a new home-based salon business. Without the support of hearing aids, she noticed her ability to concentrate continually declined, and she struggled to communicate with her clients at the salon.

On World Hearing Day, a friend of Laura's saw the Lions Healthy Hearing Pop Up in the Perth CBD and told the team her story, resulting in her referral to one of Lions Hearing Clinic's audiologists. Touched by Laura's story, her audiologist put her forward as a Gift of Hearing recipient and soon enough, Laura received the gift of hearing. After an emotional appointment, Laura was fitted with two brand-new Phonak hearing aids.

The impact of hearing cannot be understated, and we are truly grateful for our Gift of Hearing supporters that allow us to continue giving this special gift.

Giving the Gift of Hearing

Since its inception, Ear Science's Chairman John Schaffer and his wife Debbie Schaffer have been integral members of the Gift of Hearing Appeal. After driving the fundraising initiative to establish the Institute's headquarters in Subiaco back in 2010, they have remained passionate and influential donors of the Appeal for over a decade.

'Our passion for supporting Ear Science is reinforced every time we see the emotion experienced when the beauty of sound is gifted back into someone's life. We believe the life-changing work being done to treat those with hearing loss today and the expertise of the Institute's researchers may well be the key to one day unlocking a cure for hearing loss.

The Gift of Hearing Appeal is very close to our hearts. We look forward with excitement and anticipation to continue watching the impressive work of Ear Science's clinicians and researchers, made possible by the generosity of so many.'

John and Debbie Schaffer

The Ear Science **leadership team**

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Hani Al Salami
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Patrons

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Carley Anderson
Shivali Appaiah Konganda
Marcus Atlas
Sandra Bellekom
Sasha-Lee Benatar
Bec Bennett
Jordan Bishop
Natalie Bollen
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Emma Wilson
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Yee Man Elaine Wong
Jessica Yiannos
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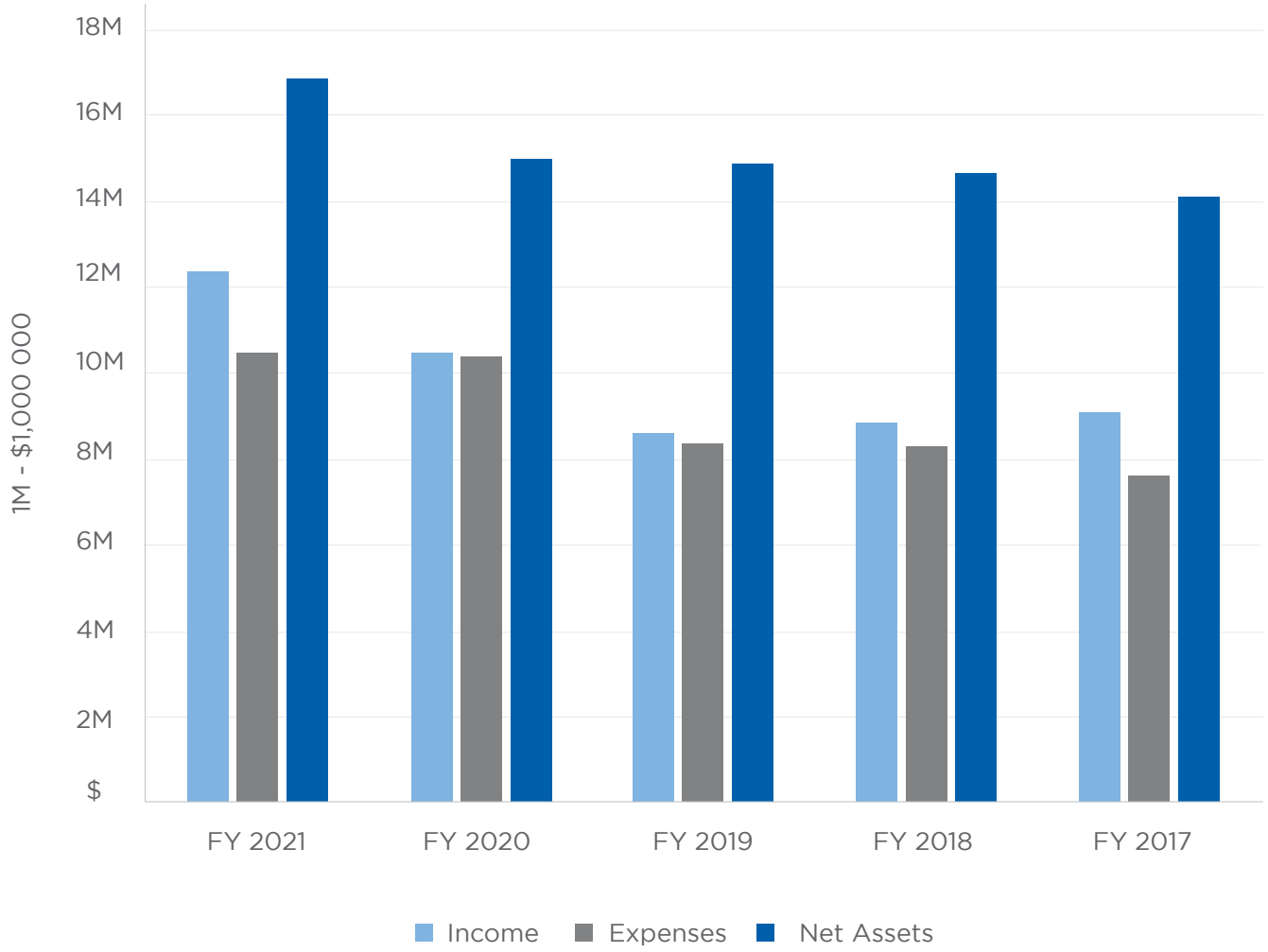
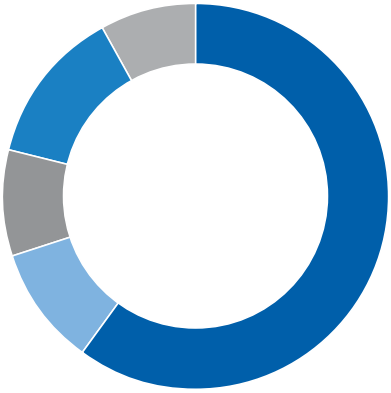
Financials

Financial summary for Ear Science Institute Australia for the financial year ending 30 June 2021

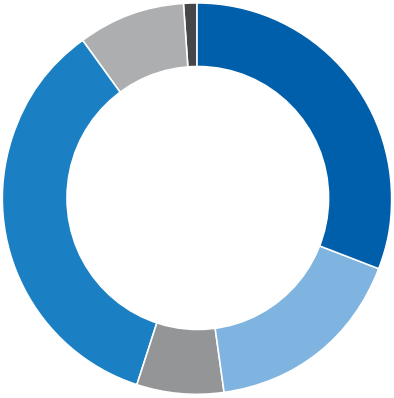


Operating Income



Gross surplus from Clinic Services	60%
Gift of Hearing fundraising, donations and sponsorship	10%
Rental income	9%
Research other grants	13%
Interest, dividends and other income	8%

Operating Expenses



Research expenses	31%
Rent, right of use and variable outgoings	17%
Office & general expenses	7%
Administration salaries & wages	35%
Depreciation and amortisation	9%
Interest and finance costs	1%

Thank You,
Gift of Hearing Donors

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Barbara O'Connor
Ian and Jillian Green
Jim Litis
John and Debbie Schaffer and family
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McCusker Charitable Foundation
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Robert Branchi
Sarah Harlock
Sue Fletcher
Todd and Julia Schaffer
Utah State University

Thank You,
Gift of Hearing Donors

Supporters

Acoustic Neuroma Association Australia
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Anne Marie Lopez
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Ruth Graieg

Publications

Publication of our research findings and presentation updates is paramount in promoting and communicating our research activities.

In 2021 Ear Science researchers published 64 peer-reviewed research papers. Almost 50% or published papers were with WA and Australian collaborators, and the remained with international collaborators.

1. Abdoola S, Swanepoel DW, van der Linde J, Glascoe FP. Detecting developmental delays in infants from a low-income South African community: comparing the BSID-III and PEDS tools. Early Child Development and Care. 191(4):545-554; 2021. 10.1080/03004430.2019.1628027

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Published April 2021