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INSPIRE

RESEARCH AUSTRALIA SHOWCASES HEALTH & MEDICAL RESEARCH

AWARD Season

Research Australia Awards Night 2016

STANDARDS OF CARE

Discovery into the major cause behind breast implant infections

SALT SEEKER

The neuroscience behind the cravings

PLUS:

World first study of drug-releasing cochlear implant electrode

Helping those who hear 'voices'

Flying Blind: Mapping the consumer health journey

RESEARCH AUSTRALIA

CONNECTING • ENGAGING • INFLUENCING

Message from CEO

Welcome to the Summer edition of INSPIRE, Research Australia's showcase of health and medical research.

The year is coming to a speedy end and what an inspirational way to finish the year by recognising the contribution our members have had to health and medical Research through the Annual Awards Dinner in November.

The Health & Medical Research Awards showcased the drive and excellence in our industry as well as the ongoing innovation that researchers challenge science with each day. From page 16 you'll find out more about the inspiring folks who are shaping the new age of health and medical research – worthy winners they were! This year Research Australia received a record number of nominations – the calibre was incredible and a testament to the amazing everyday heroes we have in our country. A very large congratulation to all.

There is no doubt that this amazing evening, now in its 14th year would not be possible without our amazing partners who wholeheartedly embrace the occasion – this year they include Griffith University, GSK, Bupa, CSL, NSW Office of Health and Medical Research and UNSW – our deep appreciation to you all.

While we are still in awards season, I would like to give a special mention to the 2016 Bupa Health Foundation Emerging Researcher Award recipient, Associate Professor Gail Garvey. Her commitment to improving cancer treatment and outcomes for Aboriginal and Torres Strait Islander people and in evidently closing the gap is so powerful and ongoing work will be exciting to follow.

In the Spring edition, we mentioned the vital importance of technology and this buzz topic continues in this edition. Is the lack of health data connectivity in Australia a myth? If Australian health data fragmentation was overcome it would have several benefits including the impact on policy making, resourcing, managing and funding decision to name a few. I was inspired to read the recent Flying Blind report by CMCRC to see how they map the health journey and touchpoints of a consumer across several healthcare providers (p26). It is a clarion call to action by us all.

As always, our work in our amazing yet complex sector is not yet done and we look forward to connecting with you and sharing your inspiration in 2017. The Research Australia team wishes you and your families a happy and safe festive season.

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Who can submit articles?
Any current member of Research Australia who would like to share a relevant story that affects their organisation including, philanthropic donations and their outcomes, research findings, and any other related health and medical research topic that affects the Australian population.

Submission guidelines & deadlines
For information regarding how to submit and publishing deadlines visit the Research Australia website.

RESEARCH AUSTRALIA
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RESEARCH AUSTRALIA
HEALTH & MEDICAL RESEARCH
AWARDS 2016

Congratulations to all our 2016 Award Winners and thank you to the generous support of our sponsors.

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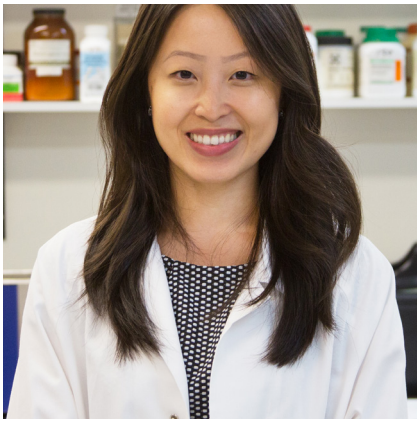


Monash University researchers find new approaches to injury and trauma

The World Health Organization states that injuries account for 9% of global mortality and for every death it is estimated that there are dozens of hospitalisations, with survivors incurring both temporary and permanent disabilities. The resulting global health, societal and economic burdens highlight the superlative need for trauma and injury research.

The Pre-hospital, Emergency and Trauma Unit in the School of Public Health and Preventive Medicine at Monash University is a dynamic research unit undertaking far-reaching and pioneering work that benefits many people in the community. Severe injury and trauma have the capacity to permeate many aspects of a person's life. Disability, employment, relationships and financial matters can all be dramatically affected after injury. These individual and societal tolls draw attention to the imperative need for research, optimum treatment and best practice.

Headed by Professor Belinda Gabbe, Monash's Pre-hospital, Emergency and Trauma Unit is home to many esteemed clinicians and researchers whose research is playing a fundamental role in improving health outcomes for people affected by traumatic injury. The Unit is also responsible for a number of leading clinical quality registries including the Victorian State Trauma Registry, the Victorian Orthopaedic Trauma Outcomes Registry, the Australian Resuscitation Outcomes Consortium Epistry and the Burns Registry of Australia and New Zealand. These registries play an important role in the health system and involve high-level interaction with senior industry, government, medical specialists and other professional and academic personnel.

The Unit also manages the NHMRC Centre of Research Excellence in Australian Resuscitation Outcomes Consortium, the NHMRC funded RINSE trial (the rapid infusion of cold normal saline by paramedics during CPR) and the Safe Emergency Elderly Discharge project funded by an Alfred Health Research Grant.

In 2016, a range of research and findings have stemmed from the work being undertaken in the Unit including the widely publicised results on *the decline in the incidence of severe traumatic brain injury* (TBI). In this Australian-first study, data from the Victorian State Trauma Registry on the incidence of hospitalised severe TBI showed that there were 2062 severe TBI cases hospitalised in Victoria during the nine-year study period, and severe TBI comprised nine per cent of all major trauma cases. The researchers found that the incidence of severe TBI declined in the nine year period, at a rate of 5 per cent per year, with the majority of the reduction observed in the road trauma group.

"We observed a decline in the incidence of severe TBI resulting from motor vehicle, cyclist and pedestrian collisions. From the road trauma perspective, this is a good news story. It is evident that injury prevention strategies are working in this group," said Dr Ben Beck, Research Fellow and Co-Deputy Head of the Unit.

However increases were observed in severe TBI stemming from low falls – a four per cent increase during the study period – ranking this type of trauma higher than TBI resulting from motor vehicle crashes in the most recent years. Mortality associated with TBI was highest for those aged 65 years or more, which is the same population in which the majority of severe TBIs resulting from low falls are seen.

Orthopaedic injuries are most common

In a shift in focus from injury patterns to injury consequences, Co-Deputy Head of the Unit, physiotherapist and Research Fellow Dr Christina Ekegren, is examining the long-term health impacts of orthopaedic injury, the most common of all hospitalised injuries. Following serious orthopaedic injuries, patients are often forced to drastically change their lifestyles and their confidence in performing normal activities can be altered – both physical and psychological limitations may persist in the long-term, leading to permanent behaviour change.

Members of the Pre-hospital, Emergency and Trauma group. Follow us on Twitter @EmergTrauma

She said people who are less active and more sedentary are at risk of developing illnesses such as heart disease, diabetes and some cancers, which represent the majority of healthcare costs in Australia.

"Public health campaigns encourage an active lifestyle to combat this, however for people who have suffered serious orthopaedic injury these activity targets are not easily met, and people with injuries may be at greater risk of chronic illnesses in the long-term," said Dr Ekegren.

With injury comes various aforementioned medical, personal and social flow-on effects; this can often mean compensation for trauma patients. Research Fellow Dr Melita Giummarra's research in the Pre-hospital, Emergency and Trauma Unit examines the role of the compensation systems in pain, mental health and disability after injury. Current research in this space indicates that people engaging with the compensation system after injury can have poorer health outcomes including worse pain and mental health.

"My ultimate goal is to identify whether aspects of compensation claim handling, client communication, and the provision of pain and mental health treatments and interventions may be improved in order to optimise health and socioeconomic outcomes for the injured person," said Dr Giummarra.

"I am hoping my research can lead to better claims management approaches such as stratification and early intervention for injured persons who are already at risk of persistent pain and/or mental health conditions as a result of their injury."

Another dynamic project being undertaken by the Pre-hospital, Emergency and Trauma Unit is the RESTORE (REcovery after Serious Trauma- Outcomes, Resource use and patient Experiences) study; a population-based project that describes the long term consequences of injury and recovery experiences of more than 2500 seriously injured patients. The study uses quantitative and qualitative data to provide a comprehensive overview of patient outcomes and experiences in the first five years after injury.

Data is providing insights into delivering better outcomes

"The results of this study will provide unique insights into patient experiences with recovery, including barriers and facilitators to recovery, as well as patient perceptions of the care provided," said Research Fellow Dr Sandy Braaf. Data collection for the study commenced in June 2014 and outcomes for patients five years post-injury are currently being collected. It is anticipated that these results will be hugely beneficial in identifying any unmet needs and potential improvements in the delivery and care of services to survivors of serious injury.

"RESTORE will provide a range of insights previously unknown about the recovery journey for injury survivors – this has the potential to help us critically analyse treatments and approaches and improve best practice," said Dr Braaf.

MONASH University

Scientists reveal why eating salt feels so good

Craving that after-work burger with fries? Florey scientists have pinpointed the brain receptor responsible for salt's rewarding feelings.

Dr Craig Smith from the Florey Institute of Neuroscience and Mental Health, has shown how a specific circuit in the brain's opioid system is responsible for making us seek out salt. The discovery points the way toward drug treatments that could reduce our intake of high salt foods.

Australians eat too much salt and we are putting ourselves at risk of high blood pressure which accounts for about half of all strokes, heart disease and chronic kidney disease deaths. Almost one in 20 deaths in Victoria is attributable to high salt intake, six times the annual road toll.

"Modern western diets high in salt also tend to be high in things like fat and sugar, which have also been shown to possess addictive properties. Put these three ingredients together and you have an almost irresistible recipe for obesity," says Dr Smith.

"Our bodies have multiple forms of 'natural opioids', those molecules released after you enjoy a particularly energetic session of exercise (or love-making), drinking water when thirsty or eating salt after sweating. Interestingly, these same molecules also control our craving of these rewards. Although scientists know that the opioid system regulates salt seeking, the exact circuit has, until now, remained a mystery.

Using mice that had salt removed from their diet for two days, Dr Smith and the team used three separate opioid blockers to work out which specific circuit was activated when the mice were given the option of drinking salty water. "Two blockers did nothing, and the mice drank about five per cent of their body weight over an hour. But a third, *naloxonazine*, drastically reduced the amount of salty water consumed by the animals, such that they only consumed two percent body weight, less than half, of what the control animals drank" he says.

As well as discovering the exact opioid receptor system involved in salt reward", the team has built upon four years of work to identify the part of the brain where it happens. Using a special immunohistochemical marker of brain cell activation called *Fos*, the team pinpointed the specific brain area activated by giving salt-depleted mice access to salty water. This area is called the amygdala, and is well known as a crucial brain structure for emotional processing.

Salt and emotions

Within the amygdala, the specific area where activated brain cells were found is called the *medial central amygdala*. This finding sits well with previous studies from other groups who have shown that the *medial central amygdala* is a major 'output' region for the amygdala, and is particularly important for selecting and initiating different behavioural strategies in response to environmental cues.

The biological basis for the pleasurable feelings we experience after consuming salt was becoming ever more clear.

Opioid receptors are of course found throughout the brain, but when the team used precise neurosurgical techniques to block opioids with *naloxonazine* specifically in that region of the central amygdala, the salt-depleted mice drank about one third as much salty water as their non-pharmacologically affected friends. This pointed to the key role that the central amygdala plays in regulating salt appetite.

MRI's pinpoint the salt pathways

According to Dr Smith: "Natural opioids, like endorphins, bind to receptors in the brain. These findings open the way for us to study this salt seeking circuit in humans using magnetic resonance imaging and other techniques, to then develop targeted drugs to inhibit salt craving and promote healthier dietary choices. If processed food producers are slow to respond to the need to reduce salt in their products, this could be another way to lower deaths associated with high salt intake."

The latest findings could also lead to improved treatments for other forms of addiction. Professor Andrew Lawrence, who heads the *Addiction laboratory* at the Florey Institute of Neuroscience and Mental Health, says "addiction to opiates like heroin is a phenomenon of the last 5000 years. Our research shows how opiates have 'hijacked' the ancient genetic organisation of salt appetite, which evolved over 300 million years."

Sodium is an essential dietary component required for our survival. It plays specialised roles including regulating blood volume and blood pressure, as well as conducting impulses along nerves that can be up to one metre long. During human evolution, environmental sources of sodium have often been scarce. Rainwater derived from marine water vapour initially contains sodium, but most of this is lost within 100–200 km of the coastline.

Soil and plants within a large area of the earth's continental interior, including jungle, mountain, and desert habitats, are sodium deficient unless there are adequate geological sources. As a result, there has been a powerful evolutionary selection pressure underlying the development of specific neural circuits, and networks of circuits, that causes animals to seek out sodium. It is a fantastic example of a neural circuit dictating instinctive behaviour, and one that is most amenable to being corrupted by pharmacological agents, like addictive drugs, that target the same physiological responses.

Opiates activate the same receptors in our brain that are stimulated by salt – except much more strongly than even the most delicious burger and fries. Just as future drug treatments might reduce salt craving, they might also reduce an addict's craving for heroin.

The research was funded with a National Health and Medical Research Council project grant, and published in *Proceedings of the National Academy of Science.*

THE FLOREY
INSTITUTE OF NEUROSCIENCE & MENTAL HEALTH

World first study of drug-releasing cochlear implant electrode

The Cochlear Implant is recognised as a great achievement in medical bionics. A recent study has investigated a new electrode design that releases anti-inflammatory drugs post implantation to improve efficiency.

Since coming to market in the early 1980s, the Nucleus Cochlear Implant, which can restore the perception of sound to children and adults with hearing loss, has benefitted from Cochlear Limited's continuous investment in research and technology development.

The externally worn speech processor has been miniaturized, using vastly improved sound coding and digital processing, and is interfaced with a state-of-the-art remote controller. The design of the cochlear implant electrode array has also been enhanced, to improve positioning within the cochlea, better preserve residual acoustic hearing and enable users to benefit from electronic hearing combined with their own residual acoustic hearing.

In a world-first study, a new design of electrode array has recently been trialled that not only sits neatly within the hearing organ and stimulates hearing nerves, but also slowly releases an established and widely used anti-inflammatory drug into the cochlea post-implantation.

The study, conducted by the HEARing Cooperative Research Centre (HEARing CRC), was the end result of several years of research and collaboration involving CRC member organisations Cochlear Ltd, the Royal Victorian Eye and Ear Hospital, the Royal Institute for Deaf and Blind Children, The University of Melbourne and The University of Wollongong.

Immune response

The cochlear implant electrode array must be surgically inserted into the patient's cochlea. The hearing organ is shaped much like a snail shell, and the electrode array is designed to sit within its coils. Sound is transmitted using tiny electrical pulses, which travel from the electrode to the nerve cells located on the inner wall of the cochlea. The surgery itself can result in some minor, short-term trauma to the cochlea and the presence of a 'foreign object' also attracts the body's immune system.

Research studies at The University of Melbourne showed that inflammation post-electrode insertion and growth of fibrous tissue around the electrode are triggered by the body's immune system, and that this could be reduced by introducing a widely used anti-inflammatory drug such as *Dexamethasone*. Researchers postulated that slow release of the therapeutic drug directly into the cochlea post-surgery might be more effective in reducing the body's immune response.

Feasibility

The early stages of the research looked at the feasibility of modifying the existing cochlear implant electrode design to incorporate the *Dexamethasone* so that it could be released post implantation to reduce the immune response locally within the cochlea.

HEARing CRC, CEO Prof. Cowan explained "Cochlear developed a modified cochlear implant electrode for use in the research study that incorporated the drug [*Dexamethasone*] so that it would slowly release from the surface of the electrode array after implantation."

He continued, "this work by Cochlear used outcomes from research collaborations with HEARing CRC partners on passive diffusion of drug from an electrode surface as a means of delivery of a therapeutic drug load into the cochlea over an extended period of up to six weeks".

Clinical trial

Extensive biosafety, surgical and pharmokinetic studies were then conducted by Cochlear and The University of Melbourne's teams to ensure that the device was safe and that drug-loading would not compromise surgical insertion. The next step was a first-time-in-human study of the experimental electrode array in a clinical trial with ten adult patients recruited from the Royal Victorian Eye and Ear Hospital Cochlear Implant Clinic in Melbourne and the RIDBC Sydney Cochlear Implant Clinic.

Experienced ENT surgeons Professor Rob Briggs and Professor Catherine Birman reassuringly reported 'no compromise' in surgical insertion characteristics with the experimental electrode array. Post-surgery, patients were closely monitored and no ill effects observed. Speech perception results were comparable to those of a control group who received the same electrode array without the drug. The key data to be collected and analysed to determine benefit from the new electrode design was impedance – this measure relates to the flow of current from the electrode to the hearing nerves. Results from the trial confirmed lower electrical impedance levels for the drug-eluding array patients, as compared with the control group, across the entire electrode array. These impedance levels continue to remain lower 12 months post-implantation.

"The most likely explanation for the lower impedance levels is suppression of the inflammatory reaction in the cochlea following electrode insertion. Lower impedance levels should improve and extend battery life of the implant, an important factor for users", said Prof. Cowan.

"It may also potentially contribute to a narrower spread of electrical stimulation, which could open new avenues for improved pitch perception, and may be a means of better preserving an implant user's residual hearing abilities when combined with slimmer electrode designs and newer surgical techniques," Prof. Cowan explained. "Preservation of acoustic hearing is important, as many candidates for cochlear implants have significant residual acoustic hearing, and want to be assured that they can use this together with their cochlear implants.

While the research study has demonstrated its feasibility, many steps would be required on the pathway to any commercial product. But the research has identified a new avenue for improving outcomes for cochlear implant recipients, and may encourage more people with severe hearing loss to consider cochlear implants as a viable solution".
Collaboration

"The HEARing CRC collaboration is an exemplar of how research developed to meet identified end-user needs can be implemented into clinical practice. Over its lifespan, HEARing CRC has contributed to commercial cochlear implant technologies that are now in world-wide use, as well as clinical diagnostic and fitting technologies for both cochlear implants and hearing aids, helping to maintain Australia's preeminent international standing in hearing research and service delivery." said Prof. Cowan.

THE HEARING CRC®

Re-defining standard of care for breast implant patients

Pioneering research into breast implant infection by researchers at Macquarie University's MQ Health, has led to the development of a proven strategy to significantly reduce the risk of contamination during surgery and minimise the risk of patients developing a rare form of cancer associated with breast implant infection.

Associate Professor Anand Deva

For Associate Professor Anand Deva and the Surgical Infection Research Group (SIRG) at MQ Health, the discovery that bacteria on the surface of breast implants are a major cause of infection was a light bulb moment, and the culmination of extensive research into the causes and impact of breast implant infection.

Head of the *Discipline of Plastic and Reconstructive Surgery at MQ Health*, Associate Professor Deva and his team, in collaboration with international experts from top cancer centers around the world, including MD Anderson Cancer Center in Houston and Peter MacCallum Center in Melbourne, discovered that bacteria attached to the surface of breast implants can cause contamination during surgery and lead to serious complications, including the onset of a rare form of lymphoma.

"For years we've known that *capsular contracture*, or a hardening of the tissue surrounding the breast implant – is the most common reason patients return for corrective surgery. We now understand, through over 10 years of research, that bacteria are to blame," explains Associate Professor Deva.

"Our research has found that bacteria gain access to the implant's surface, most commonly at the time the implant is inserted. Once attached to the implant, they secrete a thick sticky glue and become a firmly adherent bacterial biofilm. Biofilm infection can grow and ultimately cause capsular contracture."

The research, recently published in the prestigious journal, *Plastic & Reconstructive Surgery,* also identified a connection between biofilm infection during breast implant surgery and the onset of a rare cancer – a type of lymphoma – known as breast implant associated *anaplastic large cell lymphoma,* or BIA-ALCL. Associate Professor Deva's team discovered high levels of biofilm contamination in and around these cancer cells, supporting their theory that bacteria are a key factor in the development of breast implant-derived cancer.

Plan to minimise infections

"The best way to stop biofilm contamination is by adopting a series of proven surgical strategies to prevent bacteria contaminating the implant during surgery – what we call the *14-point plan*" said Associate Professor Deva.

Internationally-acclaimed for his work to minimise hospital-acquired breast implant infections, Associate Professor Deva's *14-point plan* is the first of its kind in the world and outlines a number of recommended steps that surgeons take when performing breast implant surgery to reduce the amount of bacteria attaching to implants and minimise the risk of potential complications due to infection.

Going one step further, Associate Professor Deva and MQ Health launched the world's first, and only, breast implant screening program in Sydney this December.

"Prevention and early diagnosis are key to reducing the risk of infection for women with breast implants. It is imperative that women are aware of the risks associated with breast implant surgery and ensure they get their implants checked on a regular basis," said Associate Professor Deva.

The launch of the first public breast implant screening service, established in partnership with Ramsay Healthcare and the Integrated Specialist Healthcare Education & Research Foundation, is a direct response to point 14 of the plan which recommends that women undergo regular surveillance after breast implant surgery. The service will provide access for women to undergo clinical and radiological assessment of their implants annually to ensure that any changes and signs of infection are picked up early and treated.

"We are urging surgeons to take the pledge to fight biofilm infection, adopt the proven surgical strategies and encourage patients to ensure they have their implants checked each year, said Associate Professor Deva. "So far we have 30 surgeons from around the world who have signed up and pledged their commitment to setting a new standard of care for breast implant patients."

To promote awareness of the importance of preventing breast implant infection, Associate Professor Deva, in partnership with *Integrated Specialist Healthcare Education & Research Foundation*, has also launched a new educational website saferbreastimplants.org through MQ Health.

Free checks

"Women can also register through this site for their free breast implant check. Nowhere else in the world is there a program offering this service to women with breast implants and we hope that our clinic in Sydney is the first of many in the years to come," said Associate Professor Deva.

Further translational research being undertaken by Associate Professor Deva and the SIRG team is focused on revolutionary anti-bacterial technologies that will prevent implant infection in the first place. This work is being performed in conjunction with both Government and Industry funding, and will lead to new smart implants being developed that are able to repel bacteria and result in a stable, long lifespan for all implants by reducing the risk of biofilm infection.

"At MQ Health we are very well-positioned to conduct translational research because of the integration of researchers and clinicians, with a state of the art hospital, on campus at Macquarie University. This recent discovery into a major cause of breast implant infection is a reflection of the exciting research being undertaken at the University that is going to make a real difference to patient lives," said Associate Professor Deva.

For more information on Associate Professor Deva's work, the *14-point plan* and breast screening program, please visit: saferbreastimplants.org through MQ Health.

MQ Health is the new name for the Macquarie University Health Sciences Centre, bringing together Macquarie University Hospital, Macquarie University Clinical Associates, the Faculty of Medicine and Health Sciences and clinical components of the Faculty of Human Sciences. MQ Health realises the true and seamless integration of patient-centric clinical care with life changing research and distinctive educational programs. The team at MQ Health believe that staying at the frontier of great clinical care requires linkages to evidence based research that transitions to the patient's bedside and a commitment to developing future healthcare professionals. MQ Health has the unique opportunity of integrating all three aspects under one governance structure.

MQ Health
MACQUARIE UNIVERSITY
HEALTH SCIENCES CENTRE

Helping people who hear 'voices'

Perth Voices Clinic provides an integrated approach to psychological treatment, teaching and research to improve the lives of people with hallucinatory experiences.

Research on auditory hallucinations has come a long way. Once considered synonymous with psychosis, it is now known that hearing voices no-one else can hear is much more widespread. These unusual perceptual experiences can arise in response to trauma, emotional distress or bereavement. They are also reported in people with psychological disorders, neurological disorders and in those with no disorder at all.

Officially launched by Richmond Wellbeing and the Hearing Voices Network WA, the Perth Voices Clinic is providing a dedicated psychological treatment service for people who hear voices or have other unusual perceptual experiences, regardless of diagnosis. Investment in clinical psychological research over the last decade has resulted in a range of new, effective psychosocial treatments for hallucinations becoming available, such as cognitive behavioural therapy and second-wave cognitive behavioural therapy approaches (such as mindfulness and relating therapy). However, access to these therapies remains limited, skilled therapists are in short supply, and the core mechanisms of change are only partly understood. With this in mind, the Perth Voices Clinic, led by Clinic Director Dr Georgie Paulik-White and Research Director Professor Johanna Badcock has been designed with the specific intention of integrating treatment, training and research for people who hear voices.

The Perth Voices Clinic, the first of its type in Western Australia and one of only four world-wide, has been developed in partnership with Murdoch University. Operating from the School of Psychology and Exercise Science, the Clinic provides a setting and service that is highly accessible to everyone. Referrals are encouraged to come directly from the voice hearers themselves, but can also be made by primary health care services or other health professionals. Detailed assessment of voice hearing and other hallucinatory experiences is provided, along with individual and group therapy. Dr. Paulik-White, a research-practitioner in clinical psychology, has extensive experience designing and delivering psychological therapies for voice hearers, including a novel intervention known as *Cognitive-Behavioural Relating Therapy*.

Perth Voices Clinic is working closely with other voice clinics around the world to ensure that therapeutic practice "on the ground" is rapidly evaluated, leading to new lines of research with a better fit to patients' needs. Facilitating this clinical-research nexus is the newly established research volunteer registry. Using a consent-to-contact method, the registry offers opportunities for people with hallucinations to get involved in research and evaluation projects. *The Research Advisory Committee,* chaired by Prof. Jo Badcock, an international expert on cognition and hallucinations based at the University of Western Australia, encourages the "co-design" of mental health research, through the active involvement of people with hallucinations in the research process.

At the heart of it all are the students. Perth Voices Clinic provides advanced training for students undertaking professional training in clinical psychology. Embedding students in the service ensures they gain the knowledge, skills and confidence to deliver psychological therapies for voice hearers across a range of presentations, from anxiety and depression to psychosis or trauma. Dr Paulik-White also provides training workshops on psychological assessment and interventions for hallucinations to qualified mental health professionals, with the aim to further up-skill Western Australia's mental health workforce and help destigmatise hallucinatory experiences.

Early feedback from both the student therapists and clients is encouraging. Therapists report valuing the opportunity to work with clients on their voices in a structured and supported environment, and that it has helped to erase the stigma and anxiety around discussing hallucinatory experiences with clients. Analysis of preliminary data from the first intake of clients shows a modest, but significant, improvement in negative affect (depression, anxiety and stress), voice frequency, distress, self-esteem, and functioning from pre -to post- the first phase of cognitive behavioural therapy (namely, coping strategy enhancement work). Importantly, feedback from clients suggests the Perth Voices Clinic is having a positive impact on the lives of people hearing voices, such as "[my] voices are more controlled, excluded, manageable than ever before", "I enjoy life without them around as much", "I'm more goal oriented, more positive - at least I'm learning to be".

Murdoch UNIVERSITY

THE UNIVERSITY OF WESTERN AUSTRALIA

RESEARCH AUSTRALIA HEALTH & MEDICAL RESEARCH AWARDS 2016

The 14th annual Research Australia Health and Medical Research Awards honoured some of the country's top minds and big hearts for their incredible contribution to health and medical research in Australia.

Research Australia is proud to have had such an extraordinary night with incredible researchers who have distinguished themselves in their careers, be it early stage, mid career or through a lifelong commitment to HMR.

It is with great pleasure that we present the 2016 winners of the Research Australia Awards over the following pages.

This year Research Australia introduced the inaugural Data Innovation in Health & Medical Research Award, which recognises this fast growing area of digital health and technologies that will fundamentally shape the way we approach our health and wellness.

Research Australia is proud to acknowledge our first Data Innovation in Health & Medical Research winners, the Capital Markets CRC, Health Market Quality team.

The Health Market Quality (HMQ) R&D program covers the application of advanced data sciences to all public and private healthcare settings representing a collaboration between 10 universities and 9 private and public health organisations that touch 60% of Australia's $150bn p.a. health spend. The Health Market Quality team builds upon the success of Capital Markets CRC's spin out company Lorica Health which provides data-analytics solutions to over 90% of Australia's private health insurers as well as a range of public health organisations.

The program focuses on improving data linkage across health, providing analytics to improve health market fairness and efficiency, and empowering and informing consumers. The Capital Markets CRC key core capabilities include data management, analytics and visualization intersected with medicine and health economics and informatics expertise.

Full detail of Capital Markets CRC Health Market Quality Team's achievements can be found here.

INAUGURAL DATA INNOVATION IN HEALTH & MEDICAL RESEARCH AWARD

Winner 2016

CAPITAL MARKETS CRC HEALTH MARKET QUALITY TEAM

David Jonas (second from left) lead his Capital Markets CRC Health Market Quality Team

GREAT AUSTRALIAN PHILANTHROPY AWARD

Winner 2016

McCUSKER CHARITABLE FOUNDATION

Tonya McCusker AM and Malcolm McCusker AC CVO QC

The Research Australia Great Australian Philanthropy Award recognises the vital role that philanthropy plays in enabling cutting edge Australian medical research and the outcomes of this research in new treatments and cures for the Australian people. Without individual philanthropy much of the research being conducted in Australia would cease. So it is these very generous individuals whom this award celebrates.

The 2016 Great Australian Philanthropy Award was presented to the McCusker Charitable Foundation, which is made up of four Trustees: Malcolm McCusker, his sister Carolyn, his wife Tonya and his friend, Justice James Edelman. The Foundation has dedicated more than three decades and $50 million to a diverse range of health and medical research and practice projects in Western Australia.

The Foundation was responsible for establishing the McCusker Centre for Action on Alcohol and Youth and the McCusker Centre for Citizenship. Plus the establishment of the Sir James McCusker Training Foundation to provide training for those caring for people with Alzheimer's and also funded the construction of the Lady McCusker Home which provides accommodation and care for those suffering from dementia.

Malcolm McCusker AC CVO QC has practised law for over 50 years. He was made an Officer of the Order of Australia for his services to law (2005) and a Companion of the Order of Australia for his services to the community (2012). He was the WA 'Australian of the Year' in 2011. Malcolm has been patron of more than 100 organisations and is Chairman of the McCusker Charitable Foundation.

Tonya McCusker AM is the Administrator and a Trustee of the McCusker Charitable Foundation working closely with more than 100 charities. She is a Trustee for Telethon and a board member with the Minderoo Foundation, Celebrate WA and the McCusker Centre for Citizenship. She has worked in youth development, with the Chamber of Commerce and is passionate about medical research. Tonya is married to Malcolm and has 3 children.

Read Malcolm and his wife, Tonya's full biography here.

HEALTH SERVICES RESEARCH AWARD

Winner 2016

PROFESSOR MICHAEL BARTON OAM

The Research Australia NSW Health Health Services Research Award recognises an amazing individual whose research leads to real improvements in the Australian health care system.

The 2016 NSW Health Health Research Award acknowledged Professor Michael Barton AOM's unending efforts in making cancer treatments more accessible across Australia and the world.

Nearly half of all cancer cases in Australia need radiotherapy, yet only two-thirds of those actually get it. Most of these people live in regional and rural areas, where availability of radiotherapy facilities is outstripped by demand.

The Ingham Institute for Applied Medical Research's Director of Research, Professor Michael Barton OAM, is internationally renowned for his work in oncology health services research and in particular, radiation oncology research and education. Over more than 20 years, Professor Barton's work has directly influenced investment of more than $1 billion in radiotherapy facilities and services across Australia.

In continuing to make the case for increases in radiotherapy services here and around the world, Professor Barton is leading the push for better access to cancer treatment in Australia, and in parts of the third world where radiotherapy is currently not available. This includes pioneering methods and funding for innovative low-cost and remote radiotherapy treatment.

Learn more about Professor Michael Barton's contribution to health and medical research.

Professor Michael Barton AOM (Ingham Institute of Applied Medical Research)

GRIFFITH UNIVERSITY DISCOVERY AWARD

Winner 2016

DR REBECCA COLL

The Research Australia Griffith University Discovery Award recognises an early career researcher whose discovery has already demonstrated its real impact. The 2016 award winner Dr Rebecca Coll is studying innate immunity and novel anti-inflammatory drugs at The University of Queensland's Institute for Molecular Bioscience.

Inflammation is the body's protective responses to infection, injury and/or disturbances in normal human physiology. Uncontrolled inflammation contributes to the progression of many diseases, including inflammatory bowel diseases, sepsis, fatty liver disease, asthma, arthritis, obesity, type 2 diabetes, cardiovascular and neurodegenerative diseases, and cancers. For some of these conditions, diagnosis is not specific enough or occurs too late, and treatment often brings only symptomatic relief without addressing the underlying issues.

Dr Rebecca Coll led the biological characterisation and activity of novel molecules that inhibit the NLRP3 (or Cryopyrin) inflammasome, an important mediator of many human inflammatory diseases. There are currently no drugs clinically available that specifically target NLRP3, which means Rebecca's work is an important advance towards identifying a first-in-class therapy for treating patients with NLRP3-mediated disease.

Rebecca's work has helped to identify novel anti-inflammatory compounds that are the subject of filed patents, where she is a named inventor and that are the subject of commercial interactions.

Watch Rebecca's acceptance speech here.

Prof Christine Bennett AO (Research Australia Chair), Dr Rebecca Coll, Sophie Scott

The Research Australia Leadership in Corporate Giving Award recognises big hearted companies not on the basis of the amount donated, but on the strong partnerships that develop.

Just like governments, corporates have the ability to effect real change in the health and medical research sector by putting their support into action. We are very proud to acknowledge Volvo Car Australia with the 2016 Leadership in Corporate Giving Award.

Volvo Car Australia has been a major corporate sponsor of Cure Brain Cancer Foundation since 2010. When this strong relationship was first forged, Cure Brain Cancer was a small organisation with just one research project.

Today, supported by Volvo Cars, Cure Brain Cancer has grown into Australia's leading brain cancer organisation for research, advocacy and awareness. It has a bold mission to increase survival from the current 20 per cent to 50 per cent by 2023 and is a key player in a global movement to accelerate treatments to people with brain cancer.

Cure Brain Cancer funds 24 innovative research projects, and was recently named Australian Charity of the Year 2016, and also the 25th most innovative company (and highest ranked charity) in the AFR most innovative companies awards.

Volvo Cars provides financial support to help fund this world-class research. It has also introduced Cure Brain Cancer to prominent contacts, such as rugby giants the NSW Waratahs, which became an additional corporate partner.

Learn more information about the Corporate Giving Award here.

LEADERSHIP IN CORPORATE GIVING AWARD

Winner 2016

VOLVO CAR AUSTRALIA

Nadia Levin (Research Australia CEO), Kevin McCann (Volvo Car Australia, Managing Director), Prof Christine Bennett AO (Research Australia Chair)

ADVOCACY AWARD

Winner 2016

BRENDA KING

Nadia Levin (Research Australia CEO), Senator the Hon. Kim Carr, Brenda King, Prof Christine Bennett AO (Research Australia Chair)

The Research Australia Advocacy Award recognises ordinary people doing extraordinary things to raise awareness and funds for vital medical research. Often through personal experience these generous people give so much of themselves to help find cures and treatments for our community's most devastating diseases. As is the case with the 2016 Advocacy Award winner, Brenda King who almost lost her own baby to Sudden Infant Death Syndrome (SIDS).

When Brenda came to understand what SIDS was all about and how fortunate she was that her son survived his episode, she vowed to help raise awareness, but also funds to help SIDS research continue in the field.

So whilst looking for ways to support SIDS research it was brought to Brenda's attention that the Children's Hospital had its own SIDS research lab which was under threat of closure due to funding constraints.

So the SIDS Stampede, a fun run in the Hawkesbury was born. The first event had 420 participants and raised $18,000. After this success Brenda decided that the fun run would be held annually on Father's Day, and to date has raised $134,000 from 5 events.

The SIDS Stampede has become an annual event to raise awareness of this tragic disease. "It is my hope that this funding helps drive down the SIDS rate and stops parents going through the pain and heartache of losing a child", Brenda says.

All funds raised assist the SIDS and Sleep Apnoea Research Department at Westmead Children's Hospital. Westmead researchers Dr Rita Machaalani and doctoral student Nicholas J Hunt, have had a breakthrough and found a 20 per cent decrease in a protein called Orexin in the babies who had died of SIDS.

There were more families affected then she would ever had thought and she believes that she is incredibly privileged to be in a position where she can bring awareness about SIDS and provide an event where the community, families and scientists can all rally together and hopefully save more lives.

THE PETER WILLS MEDAL

Winner 2016

PROFESSOR IAN GUST AO

The Research Australia Peter Wills Medal was created to honour the founder of Research Australia and a great leader in the Australian health and medical research sector, Mr Peter Wills. The best health and medical research requires innovation, drive, creativity and ingenuity, and the 2016 Research Australia Peter Wills Medal winner exemplifies all of these characteristics.

The 2016 Research Australia Health and Medical Research Awards most prestigious acknowledgement, the Peter Wills Medal went to Professor Ian Gust AO, in recognition of a lifetime of discoveries, including the Hepatitis A vaccination, which has saved thousands of lives worldwide.

Professor Gust is a distinguished Virologist, who has spent his career working to reduce the burden of viral diseases in the world. After graduating from the University of Melbourne, Ian trained as a Pathologist and Virologist at the London School of Hygiene and Tropical Medicine and at Ruchill Hospital, Glasgow, before being appointed head of the Virus Laboratory at Fairfield Hospital for Communicable Diseases, Melbourne.

During the 20 years that he spent at Fairfield, his laboratory developed an international reputation for its work on enteric, blood borne and respiratory diseases, established several WHO collaborating centres, an NHMRC special unit for AIDS virology and the National Reference Centre for AIDS virology and gave birth to the Burnet Institute, of which he was the Founding Director.

This phase of his career led to an active role in developing public policy, some 250 publications, several patents, 4 books, a role in development of the worlds first hepatitis A vaccine, the Wellcome Australian Award and a Fogarty Fellowship from NIH.

He was a founding member of the International Task Force for HB Immunization, the WHO groups that established guidelines for the use of HA and HB vaccines and responding to pandemic influenza, and was the Australian Government's Chief Advisor on the medical and scientific aspects of AIDS.

Professor Ian Gust AO

"Dimmer switch" discovery to revolutionise medicines

Ground-breaking Australian research could "flip the switch" on current treatments for chronic conditions. Through the discovery of a drug "dimmer switch", Professors Arthur Christopoulos and Patrick Sexton from Monash University, have challenged traditional views of how medicines were thought to work. Their outstanding work has been recognised with the *2016 GSK Award for Research Excellence*.

There is new hope for patients living with chronic conditions, such as diabetes and schizophrenia, following research that has identified a "dimmer switch" mechanism in drugs that could revolutionise drug development.

The award-winning research, coordinated by Professors Arthur Christopoulos and Patrick Sexton from Monash University, into *G protein-coupled receptors* (GPCRs) has started to unravel the complexities of drug action that could lead to more targeted, efficacious medicines. Both professors are world leaders in the study of GPCRs, the largest class of drug targets, and the application of analytical pharmacology to understand allosteric modulation.

The researchers and their team have demonstrated that these proteins can be "turned up" or "turned down", much like a "dimmer switch". Medicines developed according to this principle highlight an opportunity to treat conditions in a way that is more tailored to a patient's medical needs.

Almost half of all current medicines target protein receptors, treating them as an on/off switch. This means they either activate the protein and its receptors or, they block it.

Professor Christopoulos and Professor Sexton say their discovery means that medicines can target the "dimmer switch" of a protein, known as *allosteric sites*, rather than the on/off switch. As a consequence, it allows the activities of these proteins to be dialled up or down in a way that was never attainable before.

"We have found molecules that can subtly dial up or dial down the effect of the receptor protein, or even 'dictate' which pathways it can or can't signal to. This means we could in theory treat a range of diseases with this approach more effectively and safely by avoiding some of the side effects associated with standard on/off-type drugs. Because an allosteric mechanism is more subtle and 'tuneable', medicines based on this principle can allow patients to lead a more normal life, especially those with chronic conditions," said Professor Christopoulos.

Long term collaboration

Sexton and Christopoulos, who been collaborating for over 15 years, are at a very exciting point in their research. A new class of drug based on their work could mean chronic conditions, such as diabetes, schizophrenia and obesity-related disease, could be treated more precisely with medicines that operate more selectively.

A selective drug that targets one type of protein and not another related type of protein could revolutionise treatment. It would mean no matter how much of the drug you take, if it's exploiting this dimmer switch mechanism, you can have a safer medicine as well as a more selective and efficacious medicine.

"Many medicines have unwanted side effects because they work by simply turning receptors on or off, even though we know that most of these proteins have the potential for more graded levels of response that can become highly relevant in the contexts of tissue specificity, disease and individual patient profiles," said Professor Sexton. "We have discovered a more tailored way to exploit this functionality, by targeting regions on the receptors that act more like dimmer switches rather than on/off switches."

The research is gathering pace and support from the broader medical community. The potential of "dimmer switch" medicines could change the treatment paradigm, giving treating physicians more control and

Prof Sexton, Dr Andrew Weekes, Medical Director, GSK Australia and Prof Christopoulos

variability when prescribing medicines. In turn, patients would be able to better manage their condition, without the side effects commonly associated with existing drugs.

Winning the *GSK Award for Research Excellence* will help Professors Sexton and Christopoulos to progress their valuable work.

Both professors were congratulated on winning the *GSK Award for Research Excellence* at the annual *Research Australia Awards* in Sydney. The award is well recognised among the Australian medical research community and includes an $80,000 prize that will help the winners progress their work.

Prestigious acknowledgement

The *GSK Award for Research Excellence* is acknowledged as one of the most prestigious awards available to the Australian medical research community. It has been awarded since 1980 to recognise outstanding achievements in medical research with potential importance to human health.

Dr Andrew Weekes, Medical Director, GSK Australia, said GSK is proud to be able to support local researchers with the Award.

"The award has been given to some remarkable people over the years, many of whom are eminent academics in their field. GSK is honoured to support the research community and excited by their discoveries, which we believe will one day help patients," said Dr Weekes.

Professor Christopoulos said winning the *GSK Award for Research Excellence* is a great recognition of the efforts of all the scientists who have worked in this area over the years, often in the face of early scepticism.

"Science relies on the efforts and insights generated from dedicated people over many years. For us, this award is thus also an acknowledgement and testament to our colleagues, collaborators, students and postdocs who have helped us take a theoretical concept to the point where today we are creating a new paradigm in drug discovery," said Professor Christopoulos.

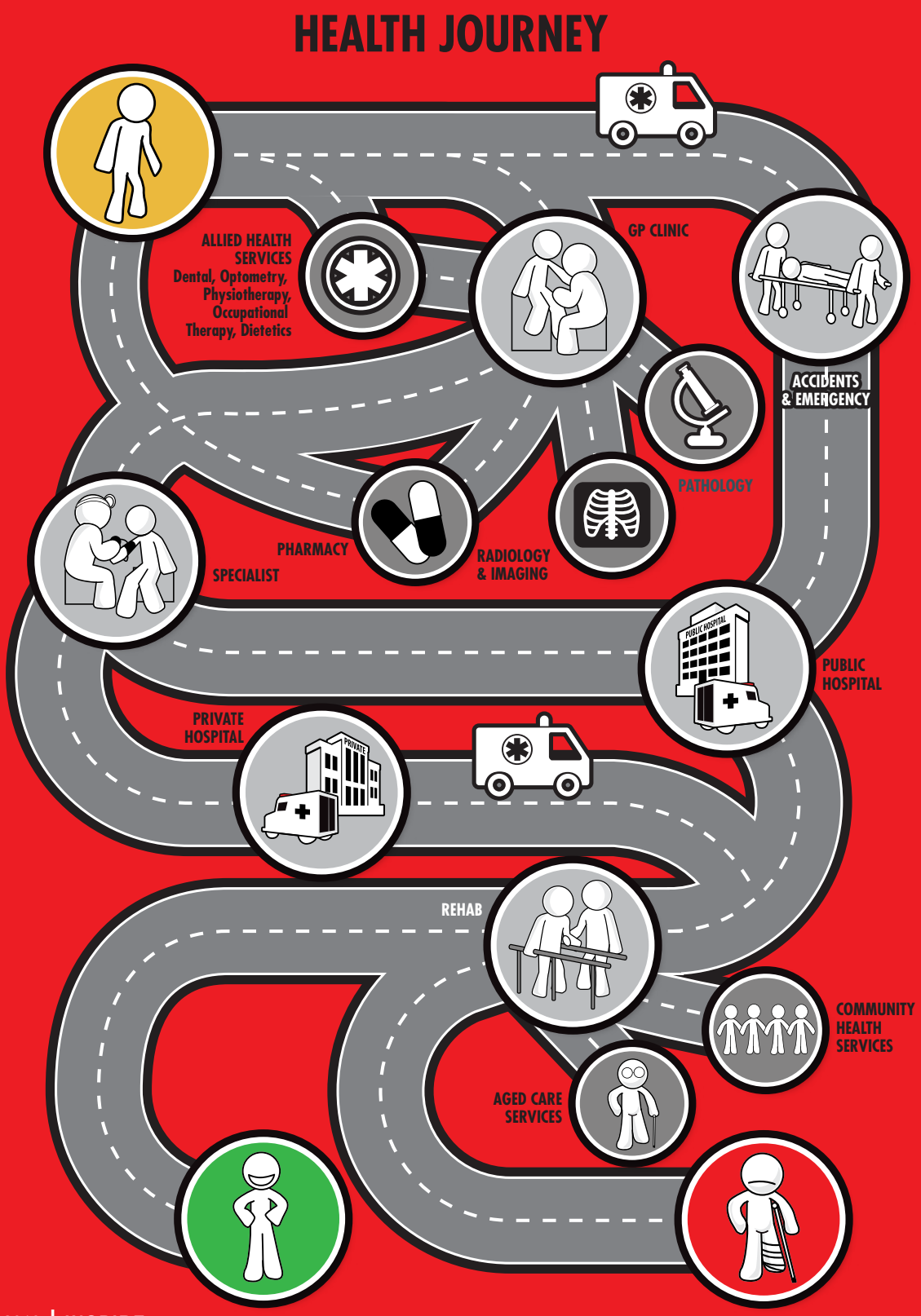
"This award will greatly assist us in progressing our research on allosteric modulation into new areas, and accelerate the possibility of helping patients suffering from a range of diseases that represent global health burdens but remain sub-optimally treated," said Professor Sexton.

Among the previous recipients of the *GSK Award for Research Excellence* are Australia's most noted scientific researchers, including Professor Tony Basten (1980), Professor Nicos Nicola (1993) and Professor Peter Koopman (2007). The 2015 GSK Award for Research Excellence was awarded to James McCluskey (University of Melbourne) and Jamie Rossjohn (Monash University) for their research into the immune system.

For more information about GSK and the GSK Award for Research Excellence visit au.gsk.com.

Flying Blind

Lack of health data connectivity in Australia creates an environment where individuals and their health practitioners and service providers are flying partially or completely blind when providing healthcare.



Did you know that the Australian health system records sufficient high quality data in digital form to support consistent and targeted, real-time personalised healthcare for every consumer?

The CMCRC's recently released study *Flying Blind* shows that the acute level of health data fragmentation not only stops this becoming a reality, it also impacts policy making, resourcing, management and funding decisions. Not only does it impact the public, private and non-government health service provider sectors, but health and medical researchers as well.

Some of results of this **data fragmentation** are:

- An inability to efficiently monitor and evaluate the use of medications.
- An inability to more rapidly identify defective prostheses, or complications from in market use of new medications.
- Preventive health measures being hamstrung.
- Impeding consumers from exercising appropriate choice for elective treatments.

For example, we have the health data that, if rapidly correlated, could identify prostheses that are failing, or even worse causing serious damage to patients' health. In the artificial hip joint case earlier this year, the DePuy case, over 100,000 people, (5500 in Australia), had received what proved to be a defective and dangerous artificial hip before this was widely exposed and the hip withdrawn from use. Effective and continual joining-up of data and analysis of this would have identified the problem far earlier, resulting in significantly less people being adversely impacted. On the other hand, we could also identify which artificial joints have the best patient outcomes.

While Australia has some registries, such as the Joint Replacement Registry, that capture base data, the lack of any linkage of this information to ongoing information regarding patient outcomes, (good, bad or neutral), means that we still have no early warning capacity.

If Australian health data fragmentation was overcome, it would have a number of other benefits, including significantly improving clinicians' ability to accurately diagnose patients' conditions. In particular, their ability to diagnose and manage rare diseases, which impact an estimated 8% of Australians, would improve. Better management of chronic disease in primary care settings would reduce low acuity emergency presentations and take unnecessary pressure off the system.

Health is the last bastion of no or low use of data science to guide practitioners. Today almost every profession from airline pilots to accountants and lawyers are supported by data science-based applications that assist the professionals to make better decisions at the point of service.

The medical profession is a significant outlier. Generally clinicians rely upon their memories and view of some past patient information they may have and supporting diagnostics around the 'single' condition that is under review. The short duration of consultations coupled with the unique 'features' and history of every patient and the rapid pace of discoveries of new more-targeted treatments makes this a highly unsatisfactory situation when every clinician could have a *digital assistant* that combined an analysis of each patient's health (and related) data with 'computable evidence and facts'.

Improved public safety and better health outcomes are also a likely result of more connected health data. A recent report on 'safer care' in Victorian public hospitals by Professor Stephen Duckett, notes that: "no one should accept avoidable harm as an inevitable and ineradicable feature of healthcare…. the Health and Human Services Department …does not have the information it needs to assure the Minister and the public that all hospitals are providing consistently safe and high-quality care."

Of course the Victorian health system does have the data, but are just not 'joining it up' appropriately. A significant percentage of re-admissions to hospitals are caused because the discharged patient has gone home and for example, have not taken their medications properly or not fed themselves properly – here the effective handover between 'health' and 'social/human services' agencies is dependent on sharing data which does not happen currently in any systematic way.

The CMCRC's *Flying Blind* report focuses on the health data that is routinely collected or created at all points in which Australian consumers interact with healthcare service providers, the *point of service* (POS) data. POS data is the most severely underutilised in the Australian healthcare context. It is also the most commonly collected and generated healthcare data and the most fragmented. It has significant variations in both depth and quality. At present, researchers have only limited access to POS data.

Flying Blind maps the health journey of a consumer across the spectrum of healthcare service providers, from primary care to specialists, from hospital to ancillary and allied services, from community health to aged care. It includes routine, emergency and elective admissions, as well as those related to work and traffic accidents. The study reviewed the primary translational data sources created by service providers and mapped the corresponding journey of the consumer's health data, looking for gaps in the flow of information that inhibit continuity of care across the sector.

Flying Blind is the first in a series of planned reports on this area by the CMCRC. It concludes with a number of calls to action. It states an important first step will be to articulate and gain broad community agreement as to what the 'light on the hill' is. That is, the need for consistent and targeted, real-time, personalised healthcare for all Australians, as well as improved evidence-based systems planning and management, and research. This should be followed by an assessment of possible 'solutions' recognising that a range of iterative short, medium and long term approaches is entirely appropriate.

The study proposes that the mandate to drive the implementation and ongoing management of this initiative could be given to the new Australian Digital Health Agency.

And the cost? If we recognise that rapid and successful implementation could be 'outsourced' across existing public and private sector health organisations, and appropriate, 'lightly engineered', iterative approaches are adopted, then 'eye-watering' budgets usually required of national initiatives may be avoided.

CMCRC
ASSURING MARKET QUALITY

Pictured: The Consumer Health Journey.

Access to therapy still a barrier to treating cancer

In the past year, demand for outpatient cancer services in south west Sydney rose by up to 10 per cent. Our population in this part of Sydney is among the fastest growing in the country and as population grows, the incidence of cancer in its many forms also escalates.

The latest report from South Western Sydney Local Health District Cancer Services showed that number of cancer patient visits across the district rose from 97,415 in 2011 / 2012 to more than 131,474 in the past year, a more than 25 per cent increase. That team does an extraordinary and commendable job ensuring supply of cancer services meets demand and addressing the global concern that availability of treatment is one of the single largest impediments to cancer survival rates.

Across Australia, the number of cancer patients grows by approximately 3 per cent a year. That's 5,000 new cases each year, about half of whom require radiation treatment. Of those, one in three don't get that treatment simply because they are not referred even though they may benefit, due to inadequacy of local services or they live too far away from where help is available.

This local problem is dwarfed by the enormity of the issue in other parts of the world; there are more than 30 countries, for example, that are without any cancer treatment services. These figures will surprise many in this day and age, particularly in a country that is widely considered to have one of the world's best public health systems. But it's not a new problem.

"The number of deaths to cancer is expected to hit 13 million people worldwide by 2030."

Professor Michael Barton OAM, Research Director at the Ingham Institute for Applied Medical Research has been working since the mid 1990s on researching and influencing policy around improving availability of cancer treatment and radiation therapy in particular, here and around the world. In November he was honoured to receive Research Australia's Health Services Research Award for 2016, in recognition of the impact of that work.

"It's wonderful that there are organisations like Research Australia that see the importance of a united effort to improve availability of cancer services. If everyone who needed radiation treatment had access to it, survival rates would immediately jump 10 per cent." Says Professor Barton.

"Our research has provided compelling evidence this approach also brings significant economic benefits. In *Expanding global access to radiotherapy,* published in *The Lancet* September 2015, my colleagues and I presented evidence quantifying worldwide coverage of radiotherapy services and costed addressing the shortfall based on nominal and efficiency models." Professor Barton goes on to explain.

The nominal model called for a total investment of US$26.6 billion in low-income countries, $62.6 billion in lower-middle-income countries, and $94.8 billion in upper-middle-income countries for a total of $184.0 billion between now and 2035.

Under the efficiency model, a total spend of $96.8 billion – $14.1 billion in low-income, $33.3 billion in lower-middle-income and $49.4 billion in upper-middle-income countries – in the same time period would see everyone who needs it, get access to radiotherapy services worldwide.

Economically, either approach would deliver a positive return on investment. Under the nominal model, scale-up of radiotherapy

Professor Michael Barton OAM, Research Director at the Ingham Institute for Applied Medical Research

capacity would deliver a return of $265.2 million in low-income countries, $38.5 billion in lower-middle-income countries and $239.3 billion in upper-middle income countries – a total of $278.1 billion by 2035.

The returns under the efficiency investment model are even more impressive over the same period, a total of $365.4 billion ($12.8 billion in low-income countries, $67.7 billion in lower-middle-income countries, and $284.7 billion in upper-middle-income countries.

In other words, if the absolute minimum was spent on making radiotherapy available to everyone who needs it, globally we would save nearly four dollars for every one we spend.

Whichever model were adopted, our research showed that "scale-up of radiotherapy capacity between now and 2035 based on current levels could lead to saving of 26.9 million life-years in low-income and middle-income countries over the lifetime of the patients who received treatment."

As that paper stated, "our results provide compelling evidence that investment in radiotherapy not only enables treatment of large numbers of cancer cases to save lives, but also brings positive economic benefits."

Working with national, regional and international policymakers to take action on the following targets:

- By 2020, 80 per cent of countries should have cancer plans that include radiotherapy.
- By 2020, 80 per cent of low-income and middle-income countries will have included radiotherapy services as part of their universal health coverage.
- By 2025, worldwide radiotherapy treatment capacity will have increased by 25 per cent against the 2015 base.
- By 2025, 7,500 radiation oncologists, 20,000 radiation technologists and 6,000 medical physicists will have been trained in low-income and middle-income countries.
- By 2025, $46 billion of investment has been committed to establish radiotherapy infrastructure and training in low-income and middle-income countries.

That we have such readily available cancer treatment services is a testament to the vision and action of successive governments and private organisations that have invested in the technology, training and people to address what is an ever-escalating need.

The fact remains though, that we continue to push to make cancer treatment more readily available throughout the world, and here at home.

Ingham Institute
Applied Medical Research

Bupa Health Foundation celebrates rising stars in pioneering health research

Associate Professor Gail Garvey was announced as the winner of the 2016 Bupa Health Foundation Emerging Health Researcher Award for her commitment to improving cancer treatment and outcomes for Aboriginal and Torres Strait Islander people.

Making inroads in closing the gap in Indigenous health is at the heart of Gail Garvey's research commitment. She will receive $25,000 to further her research to improve cancer treatment for Indigenous Australians.

"My research is focused on cancer and Aboriginal and Torres Strait Islander peoples, and I'm doing that because cancer has impacted on my family and my community and it's an important issue that requires addressing," said Assoc. Prof. Garvey. "My research involves looking at Indigenous people's participation in prevention strategies such as cancer screenings and investigating the support needs of Indigenous cancer patients and how that can impact on their uptake of services."

Bupa Health Foundation Executive Leader, Annette Schmiede, said a record number of nominations were submitted this year.

"There were many outstanding researchers so choosing the finalists was rather a daunting task. Our finalists are a very special group and I congratulate each of them and look forward to watching their careers' progress."

"Our *2016 Emerging Researcher Awards* finalists have already made significant contributions that have been recognized at home and globally," she said. "Early career researchers often work in an uncertain environment and the Bupa Health Foundation's funding helps to provide additional financial support."

"We want to keep encouraging our Australian researchers to think big and make breakthroughs that can improve the health of all Australians. Supporting and funding emerging researchers is vital to our research sector remaining a leader and globally competitive." she said.

Along with the winner's grant, the other four finalists were each awarded $5,000 to continue their research in clinical and translational science. Another five shortlisted researchers will receive $1000 to use towards their research career.

The Bupa Health Foundation is one of the country's leading private charitable organisations dedicated to health. The Foundation has invested almost $30 million since its establishment in 2005 to support over 100 projects to improve the health and wellbeing of Australians.

Research Australia were delighted to host the Emerging Health Researcher Award as part of its prestigious Health and Medical Research Awards night in November.

Prof. Sarah Hilmer (accepting on behalf of Dr Emily Reeve), A/Prof. Gail Garvey, Dr Johana Tello Velasquez, Dr Laura Dagley & Dr Joseph Doyle.

Bupa Health Foundation Emerging Health Researcher Award 2016 finalists

Associate Prof. Gail Garvey – Winner

Menzies School of Health Research

Area of research: *Improving cancer treatment for Aboriginal and Torres Strait Islander people*

Nominator: Professor Joan Cunningham, Senior Principal Research Fellow, Menzies School of Health Research

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Associate Prof. Gail Garvey is an Aboriginal research leader based in Brisbane, whose research is committed to closing the gap through improvements in cancer treatment for Indigenous Australians. Her project aims to reduce deaths from cancer through earlier detection and appropriate treatment, as well as improving overall quality of life for Indigenous people with cancer by reducing their unmet needs. An emerging leader in this field, Associate Professor Garvey's early achievements include pioneering a tool to assist with measuring the supportive care needs of Indigenous cancer patients, which is now being used across Australia.

Dr Laura Dagley – Finalist

The Walter and Eliza Hall Institute of Medical Research

Area of research: *Innovating more accurate ways to identify acute rheumatic fever in Aboriginal children*

Nominator: Dr. Andrew Webb, Laboratory Head, Proteomics, Systems Biology and Personalised Medicine Division at The Walter and Eliza Hall Institute of Medical Research

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When *acute rheumatic fever* (ARF) is left untreated, it can lead to rheumatic heart disease (RHD), with disease-affected children often requiring multiple open-heart surgeries over their lifetime. ARF and RHD remains disproportionally high in Indigenous communities where Aboriginal people are nearly 20 times more likely to die from RHD than other Australians. This project aims to combat a clear need, with diagnosis of ARF changing little over the last 50 years. Dr Dagley has helped to innovate more accurate ways to identify ARF in Indigenous children. This new test identifies certain diagnostic markers circulating within the blood and will be available to clinics, therefore having the potential to reduce instances of RHD and its burden on Indigenous communities and our health system.

Dr Johana Paola Tello Velasquez – Finalist

Eskitis Institute for Drug Discovery, Griffith University

Area of research: *Preparation for a large-scale trial that aims to repair spinal cord injury following recent successful restoration of partial function in a human*

Nominator: Dr James St John, Head of the Clem Jones Centre for Neurobiology and Stem Cell Research, Griffith University

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Dr Johana Paola Tello Velasquez is an emerging innovator in neuroscience who is preparing for an upcoming trial that aims to repair spinal cord injuries; a devastating condition that currently has no effective treatment. With around 12,000 Australians currently living with spinal cord injury, the total economic cost in Australia is estimated to be $2 billion annually. The upcoming trial follows recent exciting results – including the successful restoration of partial function in a human – that indicate the researchers are on the verge of a life-changing discovery. The trial will involve transplanting olfactory ensheathing cells taken from a patient's nose into their injured spinal cord, to promote repair and regeneration. Dr Velasquez will provide intellectual input in preparation for the clinical trial as part of a large team of experts.

Dr Emily Reeve – Finalist

Kolling Institute, Royal North Shore Hospital

Area of research: *Guidelines to withdraw low-value medication for people with dementia*

Nominator: Professor Sarah Hilmer, Head of Department of Clinical Pharmacology, University of Sydney

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Dr Reeve's research focuses on deprescribing (withdrawing) medications that are high risk or unnecessary, where the risks of taking the medicine(s) outweigh the benefits for people with dementia. Deprescribing is a neglected and under-researched area, despite its impact in improving health outcomes and reducing financial costs from low-value health care. Dr Reeve's current project will develop and implement deprescribing guidelines for people with dementia, which is important for our ageing population. She is already an emerging leader in this area, having developed the world's first questionnaire to understand patients' attitudes to deprescribing and developed this further to understand attitudes of carers of older people. It has been adopted across Australia, in Europe and in North America.

Dr Joseph Doyle – Finalist

Department of Infectious Diseases, The Alfred and Monash University

Area of research: *Improving Hepatitis C treatment in highly vulnerable patients to ultimately eradicate the disease in Australia*

Nominator: Professor Anton Peleg, Director, Department of Infectious Diseases, Alfred Health and Monash University

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Dr Doyle's research aims to improve hepatitis C treatment for vulnerable populations and ultimately eliminate it as a public health problem in Australia. His projects focus on delivering hepatitis C treatment to vulnerable people, with nearly 800 people in the community so far receiving care. He has achieved this through innovative models of care, with a focus on greater support services in community settings. Dr Doyle shares his expertise as an advisor to the World Health Organisation and plays a significant role in the Elimination of Hepatitis C Partnership, which is among the first programs set up to eliminate viral hepatitis globally. Improved health of people with hepatitis C, and reduced transmission rates due to effective treatment regimes, indicate that it may be possible to eliminate hepatitis C.

Due to the high calibre of this year's nominees, an additional 'Commendation Award' category has been included this year. Five nominees who were shortlisted but not selected as finalists will receive $1000 to use towards their research career:

- **Dr Quan Huynh, Baker IDI Heart & Diabetes Institute.** *Prediction and prevention of heart failure readmission*
- **Dr Ruth Webster, The George Institute for Global Health.** *Reducing heart attacks and stroke by innovative use of cardiovascular preventive medications*
- **Dr Andrew Gardner, Hunter New England Local Health District.** *Sports concussion and neurotrauma*
- **Dr Jocelyn Bowden, University of Sydney, Sydney Medical School.** *Optimising primary care management of knee osteoarthritis: the PARTNER project*
- **Dr Katy Bell, University of Sydney/ Sydney School of Public Health.** *How are tests driving over diagnosis, overtreatment and over servicing of patients with chronic disease and what can be done about it?*

The Bupa Health Foundation is listed on the Australian Competitive Grants Register. For more information, go to: bupa.com.au/foundation.

Small and mighty medical gains

From a pharmaceutical foundation to nanomedical breakthroughs.

Dr Susan Hua's research is proving that some of the greatest gifts to human health can come in the tiniest of packages. With a research focus in the cutting-edge field of therapeutic targeting, Dr Hua is making new and existing medicines work better with fewer side effects and less toxicity through nanomedicine.

Nanomedicine is the application of nanotechnology to medicine, and is a revolutionary field made possible by the convergence of chemistry, biology, mathematics, physics and engineering. This rapidly advancing area has the potential to transform the way we implement healthcare.

As a clinical pharmacist, Dr Hua is well aware of the side-effects caused when drugs harm healthy cells in the body. With cancer treatment, the side-effects of chemotherapy can rapidly decrease the quality of life of patients by causing debilitating side effects such as fatigue, nausea, vomiting, pain, hair loss, decreased blood cell counts and organ damage.

Quality of life affected

For people living with chronic pain, the treatments can sometimes feel worse than the cure. "Chronic pain affects the quality of life of so many people, with current treatments limited by sedation, confusion, gastrointestinal upsets, respiratory depression and organ damage," Dr Hua explains. After several years working as a pharmacist, Dr Hua moved into research to explore ways to improve existing treatment options for people who need medications to manage their conditions. "Most conventional medicines are essentially high-doses of free drugs that are distributed to all parts of the body," Dr Hua explains. "This means they're not very efficient and have an increased risk of adverse effects."

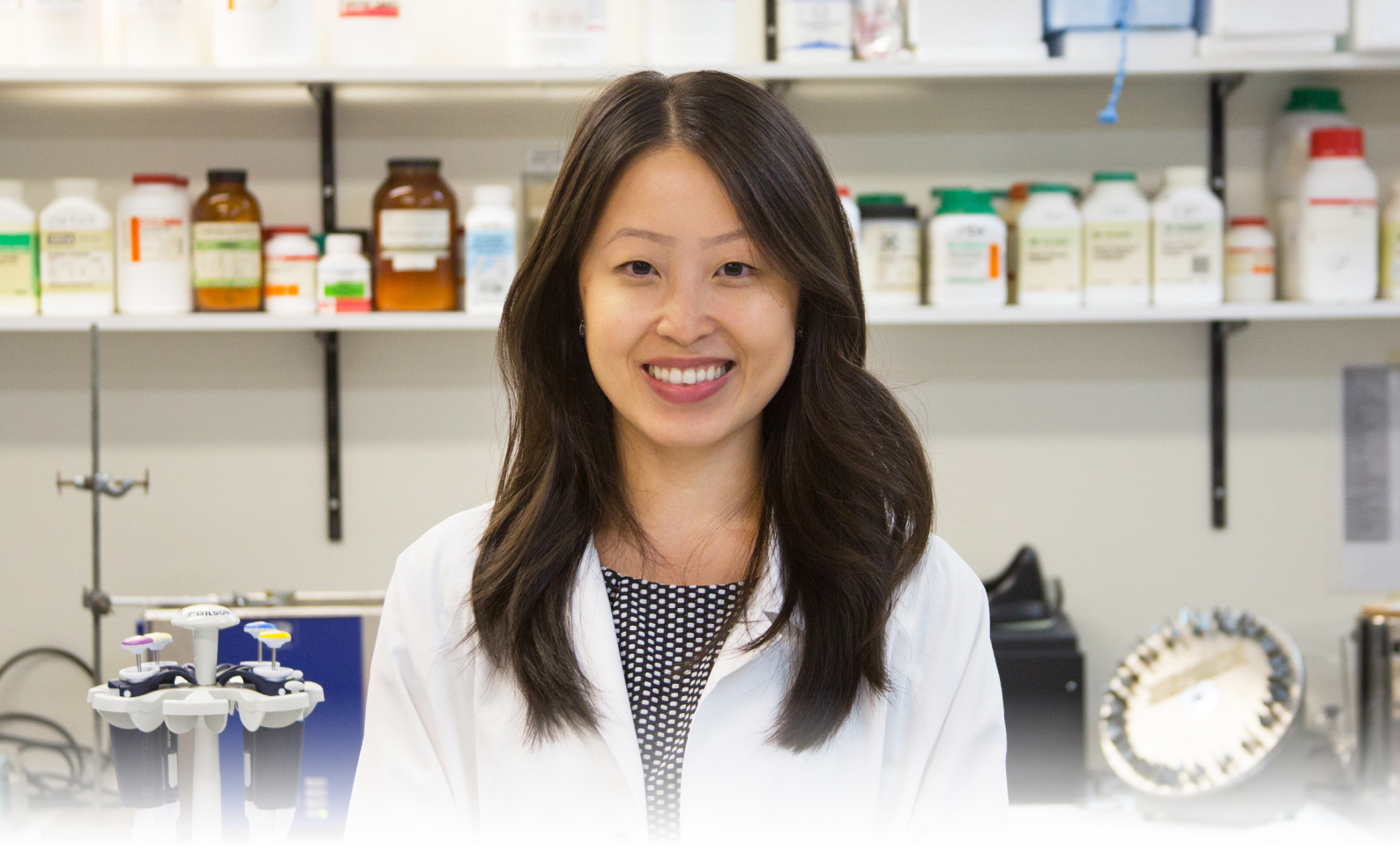
To reduce side-effects and increase the effectiveness of medications, Dr Hua has created nano-vehicles, tiny products which can work like a GPS to drive medications directly to the affected site in the body. The therapeutic agents are locked into the nano-vehicles which are then delivered directly to the site of disease. Once at the target site, the vehicles will open and deliver the medication precisely where it is needed.

Translational Nanopharmaceutics Laboratory and Research Program

Since joining the University of Newcastle in mid-2010, Dr Hua has established this program to focus on therapeutic targeting utilising novel drug delivery platforms in biomedical applications. The goal of her research is to use nanotechnology as a platform to study novel mechanistic pathways, as well as to develop more efficient therapeutic systems.

Dr Hua's research expertise covers the areas of advanced pharmaceutical formulation, in vitro cellular studies, and preclinical *in vivo* animal studies. This expertise provides a solid foundation to formulate and evaluate new drug delivery systems and to apply them to pathological disease states, in order to assess potential clinical applicability and identify novel therapeutic targets. Dr Hua's research provides a platform for the translational development of targeted therapeutics that will ultimately provide a novel therapeutic strategy in clinical disease management.

Nanomedicine has the potential to improve the way we treat a range of health conditions such as acute and chronic pain, reproductivepathologies, gastrointestinal diseases, skin conditions,



infections, and cancer. By loading bioactive compounds and imaging agents into carriers that are designed to bypass biological barriers which would ordinarily degrade or hinder their accumulation at the target site, Dr Hua is developing safer and more effective medications and diagnostic agents. This allows for maximum targeting efficacy as lower and less-frequent doses are required. Thus, it also reduces side effects and toxicity.

In a world-first study recently published in the American Journal of Obstetrics and Gynecology, Dr Hua collaborated with pregnancy researchers Laureate Professor Roger Smith and Dr Jonathan Paul to successfully use nanomedicine to target a hormone sensor predominantly found in the uterine muscle. “This project is exciting as we are able to deliver drugs specifically to the uterus using nano-vehicles targeted to the oxytocin receptor,” Dr Hua explains. “Oxytocin receptors are highly expressed in the uterus during the labour process, which makes it an ideal target for targeted drug delivery.”

Nanomedicine changes the game

The technology may allow a new generation of labour drugs to be developed. It can also be used to improve the delivery of existing therapies that deter or induce uterine contractions, which will allow lower dosages to be administered and fewer off-target effects. “This means we are able to develop more effective medicines to treat pregnancy-related complications that are also much safer for both the expectant mothers and unborn baby,” Dr Hua explains.

The team spent four years optimising and evaluating the system in both laboratory modelling and human uterine muscle tissue. The next stage is to conduct further safety studies in primate models before clinical trials to help characterise the biodistribution of the novel drug delivery system to confirm reduced maternal and foetal side effects.

Dr Hua is also using her nanopharmaceutics expertise to collaborate with clinical gastroenterology researchers, Laureate Professor Nick Talley and Professor Marjorie Walker, to develop new treatments for gastrointestinal diseases by targeting inflammatory cells in the gut. Gastrointestinal diseases are a major cause of illness in Australia, with many conditions limited by existing treatment options. “We have developed innovative platforms that allow imaging and therapeutic agents to bypass the mucosal defence mechanisms in the gut to better diagnose and treat chronic inflammation”, Dr Hua explains.

A number of her other projects are focused on translational pain research in the areas of peripheral analgesia and inflammation. Using preclinical models of acute and chronic pain, her team is interested in using nanotechnology as a means to investigate peripheral pathways that drive disease and to develop novel treatment platforms. “Our group and others have demonstrated that opioids display potent peripheral analgesic effects in various types of pain, including arthritis, acute tissue injury, bone pain, and post-surgery,” Dr Hua explains.

“The effect of peripheral opioids on inflammation has only recently been studied, and our results have potentially revealed a variety of complex regulatory activities in various tissues of the body,” Dr Hua concludes. This study can help determine the place for systemically and locally administered opioids in pain management, which would provide new therapeutic strategies for the treatment of chronic pain.

Dr Hua was awarded the *2015 HMRI Early Career Researcher of the Year Award, 2016 NSW Young Tall Poppy Science Award*, and *2016 Newcastle Innovation® Excellence in Innovation Award,* for her significant and valued contribution to the research community.

Dr Susan Hua, Pharmacist and Nanomedicine researcher at the University of Newcastle

Why do only some heavy chronic drinkers develop Alcoholic Liver Cirrhosis?

Australian led team investigates the genetic basis of alcohol-induced liver cirrhosis.

Alcohol causes more than sixty types of diseases and injury of which Alcoholic Liver Cirrhosis (ALC) has by far the highest mortality. The World Health Organisation's, Global status on alcohol and health 2014, highlights that worldwide 50% of liver cirrhosis mortality is due to alcohol, reaching as high as ~60% in America and Europe. In Australia, figures are comparable. Indeed, the mortality due to ALC exceeds that of road accidents attributed to alcohol. ALC also increases the risk of hepatocellular carcinoma, one of the fastest growing cancers.

As one would assume alcohol dependence adds to the complications of this disease, as patients with ALC also suffer from mental co-morbidities such as anxiety, depression and suicide ideation.

Previously considered to be a disease of middle aged men, recent alarming statistics show more young Australians under the age of 35 suffering from alcoholic cirrhosis. Within the spectrum of liver diseases in Australia, alcoholic liver disease affects less people than hepatitis C and non-alcoholic fatty liver disease, however, deaths in patients with alcoholic liver disease far exceeds those related to either of these.

It is no wonder that the liver is the most affected organ of chronic alcohol abuse, as more than 90% of alcohol is metabolised through the liver. In principle, all alcoholic liver diseases (alcoholic hepatitis, alcoholic cirrhosis) are preventable with appropriate public health responses, such as behavioral and lifestyle change, and pharmaceutical interventions for combating alcohol addiction that is associated with this disease.

Risky drinking prevails

So far there are no effective therapies except abstinence and/or liver transplant. Risky drinking continues to prevail in Australian society with a proportion of people succumbing to this hidden epidemic. Indeed, we could prevent this disease if we could only identify those drinkers who are at risk of developing cirrhosis. Since cirrhosis develops only in approximately a fifth of drinkers and ~80% remain disease free, the question arises "Why do only some heavy chronic drinkers develop alcoholic liver cirrhosis while others drinking similar levels do not?"

It is imperative to understand the factors that make some drinkers susceptible to cirrhosis while protecting others from developing this disease. Once we understand who is at risk, we will have the ability to target interventions to reduce their alcohol consumption and/or guide specific treatment to arrest disease progression. Regrettably, current technology does not allow us to identify the "at risk" drinkers before the disease reaches advanced stage. We suspect that genes play a role in increasing susceptibility or protecting against ALC, but a clear understanding of these genes is lacking.

Inspired by recent advances in technology that enables the screening of millions of gene mutations simultaneously in thousands of people, Associate Professor Devanshi Seth at the Centenary Institute began to search for gene mutations affecting this disease. This led her to initiate the quest to find novel genes involved in alcoholic cirrhosis. Fortuitously, the US National Institutes of Health and the National Institute on Alcohol Abuse and Alcoholism announced a funding mechanism for international collaboration for alcohol research. Which led Associate Professor Seth to invite several international experts who enthusiastically joined her in finding answers to this question.

In 2011 the team was awarded the prestigious US NIH/ NIAAA funding to conduct the study which led to the formation of the GenomALC Consortium headed up by Associate Professor Seth at the Centenary Institute and Royal Prince Alfred Hospital, Sydney, and Associate Professor Seth's US counterpart Dr Tim Morgan at the Southern California Institute of Research and Education. The Consortium has now grown to comprise more than 25 multidisciplinary expert researchers and clinicians in alcohol research, genetics, biostatistics and hepatology across seven countries namely, Australia, Belgium, France, Germany, Switzerland, the UK and USA.

Trials collect vast data

The team recently completed the initial recruitment phase and have assembled the world's first and largest collection of blood and comprehensive clinical data from >5700 drinkers, some of whom have liver cirrhosis (Cases) and others that have no liver disease (Controls). Importantly, lifetime alcohol intake i.e. risk exposure is similar between Cases & Controls. Associate Professor Seth and the team are very excited about phase two of the study - to screen the DNA and compare the gene mutations between the Cases and Controls, and eagerly await the results.

Meanwhile, analysis of a smaller group of drinkers provides evidence for the first time of a parental (father to son) link to this disease. In addition, novel biomarkers distinguishing drinkers with cirrhosis from those with no liver disease have been discovered. This is a significant step towards developing biomarkers to identify drinkers with an elevated risk of cirrhosis.

If those at risk of this deadly disease are aware of the risks, it can be argued they will be empowered to prevent this condition, by reducing drinking and changing unhealthy lifestyle habits. An outcome which could shake-up our national drinking culture as the population faces the reality of this disease and their own family history. As genetic risk factors enter our national awareness, we can hope that it won't be considered un-Australian to drink moderately and to turn down the next round at the pub or family barbecue.

Researchers' real-world impact on health services celebrated

Researchers whose work has had a real-world impact in the diverse fields of vaccine safety, maternal and reproductive health and Medicare funding have been recognised at the Sax Institute's annual Research Action Awards.

The Sax Institute established the awards in 2015 to recognise research that has had a significant impact on health policy, programs or services delivery, and made a real-world difference to people's health and wellbeing.

This year's three winners, selected by an independent judging panel, were announced at a ceremony in Sydney on 30 November. They will each receive $5000 towards their professional development.

"The commitment of researchers who are passionate about making a tangible difference is critical to improving our health system and individual health outcomes," said Sax Institute CEO Professor Sally Redman. "It is a testament to the quality of research being conducted that our judges had such a difficult choice in picking this year's winners."

The 2016 winners are:

Angela Dawson, Associate Professor of Public Health

Faculty of Health, University of Technology Sydney

- Equitable maternal and reproductive health for women

The impact of Associate Professor Angela Dawson's research into improving women's access to maternal and reproductive health services is being felt across the globe, from NSW to Sri Lanka to disaster zones such as Vanuatu in the wake of Cyclone Pam.

"My work is aimed at addressing the great inequity in health outcomes for women and adolescent girls, particularly those who are most vulnerable and with the lowest resources," she says, adding that 600,000 women die worldwide every year from complications of pregnancy and childbirth.

"I want to look for evidence-based ways forward and have been able to lead close collaborations with organisations in the public and non-state sectors to ensure my research is well known and that its outputs informed policy and action."

Associate Professor Dawson's research on maternal workforce needs and planning has resulted in dedicated funding from the Department of Foreign Affairs and Trade to build PNG's midwifery capacity and strategies to improve collaboration between teachers and midwives in Sri Lanka. Her research has also highlighted major gaps in sexual and reproductive health services within emergency responses to humanitarian emergencies and led to a project to develop a package of sexual and reproductive health care for use in humanitarian crises in the Asia Pacific region.

So far, the work has resulted in the training of 95 country coordination teams and 4000 national coordinators, as well as influencing 23 policy changes at national and provincial levels to better integrate sexual and reproductive healthcare delivery in emergency responses.

On home ground, research conducted by Associate Professor Dawson's research was integral in the development of the first NSW Health clinical practice guidelines on obstetric care for women with female genital mutilation, released in 2014, as well as the first continuing professional education program for the Royal Australian and New Zealand College of Obstetricians and Gynaecologists.

Kees van Gool, Deputy Director and Associate Professor at the Centre for Health Economics Research and Evaluation

University of Technology Sydney

- Strengthening the Medicare Safety Net

Associate Professor Kees van Gool has investigated the Federal Government's Extended Medicare Safety Net (EMSN) for more than a decade, with a focus on making it more equitable, sustainable and efficient.

It all started back in 2004 with a press release from then Health Minister Tony Abbott about the Medicare Safety Net, which was introduced in 2004 and pays 80% of all patients' out-of-pocket costs for out-of-hospital Medicare services above a certain threshold in a given year. "We analysed the partial data provided in the press release, which was broken down by Federal electorate, and we found that wealthier electorates were using the Extended Medicare Safety Net far more than those in poor and middle incomes electorates. This raised immediate concerns about the equity and overall cost of the safety net," said Associate Professor van Gool.

The timing of Associate Professor Kees analysis of the Safety Net couldn't have been better, as his team was then in good position to conduct the official review as required by the establishing legislation. This review had an immediate impact; demonstrating that the cost of the program had massively blown out, that wealthier sections of the community were the greatest beneficiaries of the scheme, and that for every dollar the government was spending on the Safety Net, around 43 cents went towards increased doctor fees

"The cost blowout and unfair distribution of the initial Extended Medicare Safety Net program clearly demonstrates the need for evaluating new healthcare policies to ensure they are equitable, efficient and delivering the best value for taxpayers' money," he said. His research gave rise to serious questions over the gaming of the

system by providers and the equity of a system. Subsequently, the Federal Government introduced legislation to cap the Safety Net payments on items such as private obstetric services, IVF, hair implants and varicose veins treatments, resulting in a 33% fall in Safety Net costs the following year.

Legislation that would extend caps across all Safety Net payments is before the Senate and Associate Professor Van Gool's team recently secured a three-year grant from the Australian Research Council to re-examine the safety net program.

Associate Professor Kristine Macartney, Deputy Director

National Centre for Immunisation Research and Surveillance
– Focus on vaccine safety

Working as a paediatrician in Australia in the early 1990s, Associate Professor Kristine Macartney treated children who were hospitalised with infections like measles and epiglottitis – illnesses that are now rarely seen thanks to successful vaccination programs.

Seeing the impact vaccination could have turned her focus to infectious diseases, and in particular, to a career devoted to researching the safety and the benefits of a wide range of new vaccines across their entire life cycle, from development through to policy-making, program implementation, and evaluation.

Associate Professor Macartney's work has included assessing the risks and benefits of new rotavirus vaccines; leading the HPV (human papillomavirus) vaccine safety review that has been used by peak immunisation advisory bodies worldwide and contributing to vaccine safety plans for all new vaccines introduced over the last four year, including the recently launched shingles vaccine for older Australians. Her research showing the benefits of vaccines offered in Australia outweigh risks of adverse events has helped to inform and reassure parents about the value of having their children vaccinated.

And her work has also led to a major change in the way vaccine safety is monitored in Australia, with the Federal Government this month (NOV) announcing the major expansion of the *AusVaxSafety National Surveillance System* – a vaccine monitoring system. From 2017, the system will actively monitor the safety of all government-funded vaccines for both children and adults using real-time reports of patients' vaccine experiences obtained via SMS or email.

"This is really changing the landscape for vaccine safety because for the first time, we will be continuously monitoring any reactions – or non-reactions – to all vaccines as they are given. This system can really give the public confidence that the safety of our vaccines is paramount," she says.

Associate Professor Macartney says collaboration – both with other researchers and with the policy makers seeking evidence on which to base decisions – has been the key to her research having a real-world impact.

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Sax Institute Research Action Awards 2016 winners (L-R) Angela Dawson, Kees van Good and Kristine Macartney

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