THE UNIVERSITY OF WESTERN AUSTRALIA

Health and Medical Sciences Semester Two 2019 Highlights

Developing the next generation

Hear from the Faculty's Associate Deans of Research and Learning & Teaching about their respective areas and how our collective efforts are contributing to developing the next generation of health experts.

"The University of Western Australia is a proudly research-intensive university. Within the Faculty of Health and Medical Sciences, the aim of our research is to find solutions for problems that affect the physical and mental wellbeing of our community, and ultimately contribute to the building of a more prosperous and cohesive society.

"Our pioneering research work in many fields continues to have an impact on the health of people worldwide, be it in preventing preterm birth, discovering the genetic basis of inherited and acquired disorders, or regenerative medicine."

Aside from an increasingly competitive funding environment, one of the greatest challenges faced by the clinical research workforce across Australia is succession planning. While we have many talented clinical professors, we acknowledge that at some stage they will need to pass the baton over to our emerging researchers. Therefore, support for early career researchers is integral to the continuation of ground-breaking discoveries into the future.

We are leading this support through the inaugural UWA Health Research Awards (Scholarly+ recipients listed on page 10) which aim to ignite a passion for research in our students and graduates. Supporting these bright minds can lead to a new generation of research-capable leaders.

This publication tells the stories of some researchers who received support from The Raine Foundation early in their career and have gone on to be internationally-recognised in their field (pages 16-17). It also highlights some of the exciting research being undertaken by both our students and staff."

Professor Osvaldo Almeida
Associate Dean of Research

"We live in a rapidly changing world where the global demand for health and medical expertise is needed now more than ever. At the forefront of what we do as educators is to prepare our graduates for the complex and ever changing situations, challenges and opportunities they will face. One way we are achieving this is through the integration of research into the learning environment at UWA.

"Research facilitates the development of critical thinking, leadership, time management and communication skills, and having early exposure to the world of research encourages lifelong learning."

We have actively sought to embed research into the curriculum of our postgraduate degrees, in particular through offering professional to practice courses in medicine, dentistry and podiatric medicine at the doctorate level.

We find that research-led teaching results in students taking an active role in shaping their futures, searching for health discoveries and being at the forefront of advancements in their field. You can read more about the work our students are undertaking on pages 8-9 and 22-23.

Our curriculum also balances clinical learning with practicum placements to bridge the gap between academic theory and real-world experience. As well as placing students in metropolitan environments, we immerse students in the unique cultural and social environments of regional and remote communities so they are better equipped to deal with the health challenges these communities face. Hear from some students about their rural placement experiences on pages 4-5."

Associate Professor Daniela Ulgiati
Associate Dean of Learning & Teaching

Rural placements offer real-world experience for Pharmacy students

In the face of ongoing medical workforce shortages in rural Australia, initiatives have been introduced to improve recruitment and retention in rural and remote pharmacy practice. One of these Federal Government initiatives provides funding for students studying a Master of Pharmacy degree to enrol in rural placements.

UWA's Community Pharmacy Rural Placements Coordinator, Associate Lecturer Amanda Mannolini, says this funding has made it possible for students to experience life as a pharmacist, appreciate the challenges and rewards of being a rural pharmacist, and to inspire them to think of a career beyond the city limits.

"Students who complete a clinical placement in rural Australia have a unique opportunity to add value and diversity to their learning experience.

"Students are exposed to different cultural and social profiles compared to metropolitan placements and quite often a different scale of health issues.

"Experiencing rural and remote pharmacy practice during a student's formative years can often dispel preconceived ideas and perhaps open them up to a possible rural career," Mrs Mannolini said.

This year saw the largest cohort of UWA Pharmacy students apply for rural placements; 15 out of 36 students applied for placements in 14 rural towns between Derby and Esperance, a 20 per cent increase on last year.

Sophie Tipper

Pharmacy student

"My time up North has been amazing, I have been able to collaborate with different health care professionals, learn about the different health schemes in place for rural or Indigenous populations, live independently and be exposed to an environment I wouldn't normally work within.

During my time in Derby, I was able to visit both the Derby Aboriginal Health Service clinic and the nursing home. It was here I got out of my comfort zone to observe medication changes, educate patients on their medicines and come up with medication regimes. I enjoyed being able to engage with patients and listen to their concerns in a setting they were more comfortable with. This was the same when we visited the dialysis unit in Broome and observed my preceptor going through a patient's medications whilst they were undergoing dialysis."

Andrew Morrissy

Pharmacy student

"The Pilbara Rural Community Placement should be the first choice for any pharmacy student looking for adventure and a challenge. Working in four different pharmacies and learning from 13 different pharmacists provided me with life experience and insight into community pharmacy, living outside of the city and greater independence.

The transition between different working environments and immersion into pharmacy related programs made the rural placements in Newman and Karratha much more than a conventional community pharmacy placement. It has fast tracked my knowledge and skills going forward with my career as a pharmacist."

Kurtis Gray

Pharmacy student

"My placement in the Pilbara was one of the best experiences of my life and professional career so far. It was amazing to experience the different cultures; it gave me a taste of rural life and led me to consider working rurally in the future.

One of the most eye-opening experiences was when I had the privilege of helping the Indigenous population, learned about their history and culture and I've now developed a passion for working with the community."

Social Work students enrich learning through immersion in regional WA communities

For Master of Social Work students, having rural placements as part of their studies provides for an enriching and invaluable opportunity. The inter-professional learning program, managed by the WA Centre for Rural Health, aims to integrate students' knowledge and skills to practice, to develop their sense of identity as a practitioner and open their eyes to the diversity of communities they may serve.

Social Work students also undertake a 16-week placement in a contrasting practice setting to build on and extend the professional knowledge and skills acquired on their first placement.

Allowing for the transfer of learnings across client populations and organisational environments facilitates a greater depth for learning and the development of professional identity.

Islah Alderson

Social Work student

"In the months that have passed since my placement in Geraldton, I have spent many moments thinking about my experience and how to summarise it in a way that does justice to the people I met and places I visited. Prior to the placement, I had little experience in Australian regional towns. What I learnt and what will stay with me for the rest of my life is the power that exists in a community.

As a student, it was incredible to witness how services collaborated to meet the needs of the community members. I was able to see this first-hand through the primary school I was placed at. Local agencies worked together to deliver a weekly afterschool program that educated students on the importance of physical and emotional wellbeing, in addition to providing extra academic support. These lessons and experiences I gained while on placement in Geraldton will stay with me as I continue to work towards graduating and joining the social work profession."

Giorgia Finnigan

Social Work student

A unique aspect of the placements is the professionally and personally rewarding volunteering program. Undertaken outside of placement hours and in a voluntary capacity on a regular basis, students can work with local support agencies, youth organisations or children with disabilities.

"Perhaps one of the most enriching experiences Islah and I had was becoming involved with the Jambinu Warranan Singers at Mitchell Street Community Centre in Geraldton which enabled us to experience as much learning outside of the placement setting as it did inside.

Each Thursday we made our way to Mitchell Street and met with Theona, Sarah and the girls. Our evenings were punctuated by laughs, dancing and singing.

We often found ourselves stumbling onto topics of a more serious nature, and were able to explore these in a safe space with trusted friends.

Being invited into the space was a privilege for us both, where we were able to learn about Yamatji culture and even try our hand at singing in Naaguja and Wajarri language.

While we had the role of 'team leader', we feel very much that we had the role of observer and learner. Getting to know the communities and contexts in which we practice, developing relationships and partaking in meaningful community initiatives was an invaluable experience."

WA Centre for Rural Health celebrates 20 years

The Western Australian Centre for Rural Health (WACRH), in partnership with The University of Western Australia, celebrates its 20th anniversary in 2019.

Established in Geraldton in 1999 as the first University Department of Rural Health in Western Australia, WACRH has worked tirelessly to improve the health and wellbeing of people living in rural and remote locations across the state.

Professor Sandra Thompson, Director of WACRH, reflects on the developments over the last decade.

"We have seen significant growth in our facilities, education programs and accommodation services throughout the Midwest and Pilbara regions, as well as robust research and community development programs addressing the social determinants of health within rural communities.

"Another defining aspect is our rural placement support offered to Allied Health, Nursing and Pharmacy students from universities in Perth and across Australia.

"Many of our rural placements include non-traditional and immersive experiences, with students working within a service learning framework. This approach aligns with the needs of the local community so we can best serve their health requirements.

"Collaborative partnerships with health providers, universities, non-government organisations, community services and their members have been fundamental to our success," she said.

Self-reported allergies are leading to an increase in super bugs

In Australia, 18 per cent of adults report an allergy to antibiotics, however current research by UWA suggests that over 90 per cent of people who believe they have an allergy are needlessly avoiding certain antibiotics. Self-reported antibiotic allergy is restricting antibiotic choices for doctors to treat infections, and increasing the prescription of broad spectrum antibiotics, which are associated with the emergence of super bugs in our hospitals.

While the process of reporting and recording antibiotic allergy is important to protect a patient from potential serious adverse reactions, if the reported reaction has not been further investigated, and confirmed by a suitably qualified doctor, the assumption of allergy may be incorrect and the patient's allergy status uncertain.

UWA Clinical Professor, Immunologist and Allergist Michaela Lucas said, "Self-reported antibiotic allergy is a big problem, and is having a significant impact on the health sector. It is estimated less than 10 per cent of adult and paediatric patients carrying an antibiotic allergy label are truly at risk of a significant allergic or adverse reaction."

Dr Lucas said it was important to raise greater awareness in the community and encouraged people to consult with their medical practitioner if they think they have an allergy to antibiotics.

"We also urgently need to increase resources to enable patients to seek specialist advice to allow for a medical assessment of their drug allergy status. Education concerning antibiotic allergy is vital to optimising allergy management and patient safety."

Inspiring undergraduate students to lead women's health research

Globally, a gap exists between the health outcomes of men and women. While life expectancy is higher for women in most countries, a number of biological and social factors combine to create a lower quality of life for women across their lifespan.

With these profound health circumstances in mind, award winning academic Dr Demelza Ireland from the Medical School's division of Obstetrics and Gynaecology and the School of Biomedical Sciences, designed, developed and delivered a series of three broadening units in women's health.

"The overarching aim of these units is to inspire and encourage more students to become health professionals or undertake research careers to address women's health issues and help close the global gap in women's health outcomes," said Dr Ireland.

"The benefit of broadening units at UWA is that they are open to all undergraduate students from any study discipline, not just targeted to those interested in a health profession. They help ensure our graduates have a well-rounded education across a broad range of areas required to join the global workforce."

As Coordinator, Dr Ireland guides the students through the three transdisciplinary units. In the Level 3 unit – IMED3301: Issues in Women's Health Research – students experience firsthand the challenges and rewards of research. The unit requires students to design their own research proposal to address an unanswered question in women's health.

"I match the students with research mentors who help them along the way and by the end of the 12 weeks they present their research proposals to women's health experts," said Dr Ireland.

In 2018, the first 11 students completed the unit with several now carrying out the projects they designed. One such student is Josaphine Sadler, a second year medical student who developed a proposal seeking to understand attitudes towards breastfeeding in women electing to deliver via caesarean section.

"I think the women's health broadening units certainly made me more aware of the broad scope of women's health, and how much it affects the health of kids, men and general society as well," said Josaphine.

Josaphine was matched with Dr Donna Geddes, a lactation specialist and senior research fellow at UWA, as her project mentor. Dr Geddes described Josaphine as an inquisitive and eager student and felt that her proposed project was an important piece of the puzzle as to why breastfeeding durations are low. She said the results would have the potential to guide or target support for breastfeeding.

Since working as her mentor on the project proposal, Dr Geddes has taken Josaphine into her team so that she can complete the research study she designed.

Dr Ireland has been recognised for her innovative approach to teaching, winning several awards including the UWA Teaching Excellence Award (Early Career), presented by Deputy Vice-Chancellor of Education Professor David Sadler, to acknowledge her outstanding service to teaching (pictured). In addition, Dr Ireland has been nominated by the University for the national Australian Awards for University Teaching (AAUT).

She is also completing a Master of Education within which she would like to evaluate the impact of her broadening units on student learning and the women's health sector.

With her first study, Dr Ireland will collect perspectives on women's health by undergraduate students completing her series of broadening units. The outcomes of this study will help inform future improvements in the units and assist with alignment of the curriculum with the needs of the women's health sector and students' future career paths.

"I'm passionate about using evidence based teaching to enhance the student learning experience. By developing rich and inspiring content I see firsthand the excitement students show not only towards their education but to visualising the future impact they could make to the health of our communities. This is extremely rewarding for me."

Faculty award winners

Below is a snapshot of staff achievements over the past six months. We congratulate the staff on their outstanding accomplishments.

Professor John Newnham (pictured)
2020 WA Senior of the Year

Dr Tim Inglis
Jill Porteous Memorial Award
WA Health Excellence Awards

Dr Gareth Baynam
Minister's Award
WA Health Excellence Awards

Ms Kirsty Freeman
Fellow, Society for Simulation in Healthcare

Professor Tim Davis
Fellow, Australian Academy of Health and Medical Sciences

Dr Demelza Ireland
UWA Excellence in Teaching Award – Early Career

Professor Minghao Zheng
Finalist, WA Innovator of the Year

Dr Chris Brennan-Jones
WA Young Tall Poppy Science Award

Dr Willem (Joost) Lesterhuis
WA Young Tall Poppy Science Award

Associate Professor Asha Bowen
WA Young Tall Poppy Science Award

Senior Adjunct Research Fellow Sandra Bellekom
Australian Financial Review 100 Women of Influence for 2019

Dr Lakshini Herat
People's Choice Award, Women in Technology WA Tech [+] 20 Awards

NHMRC INVESTIGATOR GRANTS

Associate Professor Christopher Blyth
Dr Asha Bowen
Professor Jonathan Carapetis
Dr Erin Kelty
Professor Ryan Lister
Professor Mark Nicol
Professor Andrew Whitehouse
Professor Dao-Yi Yu

NATIONAL HEALTH AND MEDICAL RESEARCH COUNCIL MERIT AWARDS

Dr Livia Carvalho
Adjunct Assoc/Prof Jenny Downs
Assoc/Prof Nicholas Gottardo
Mr Thomas Iosifidis
Clinical Prof Wai Lim
Clinical Prof Michaela Lucas
Mr Francis Mitrou
Mr Shakeel Mowlaboccus
Dr Melissa O'Donnell
Ms Kara Perks
Dr Tara Richman
Dr Hamid Alinejad Rokny
Dr Stefan Siira
Dr Tao Wang

SCHOLARLY+ SCHOLARSHIP RECIPIENTS

Joshua Jones
Victoria Meadows
Maddison Muller
Jack Paterson
Clara Ta
Owen Taylor-Williams

Professor Britta Regli-von Ungern-Sternberg
Early-Mid Career Research Impact Award

Associate Professor Lisa Wood
Early-Mid Career Researcher Media Award

Dr Koya Ayonrinde
Early-Mid Career Researcher Most Cited Publication Award

Professor Markus Schlaich
Senior Research Impact Award

GLOBAL MEDICAL PROGRAM AND WINTER SCHOOL, FACULTY OF HEALTH AND MEDICAL SCIENCES

Finalist, International Health and International Education and Training, Industry and Export Awards

Please contact comms-hms@uwa.edu.au with news of awards and achievements.

Thank you to our Executive Dean, Professor Wendy Erber

The Faculty of Health and Medical Sciences wishes to acknowledge the vast contributions of Professor Wendy Erber who has led our Faculty as Executive Dean since late 2015.

Commencing the role during a challenging and complex time of change, Professor Erber guided the Faculty through the 2016-17 University-wide renewal and restructure, which saw our nine schools amalgamated into five.

Professor Erber oversaw the $7 million refurbishment and renaming of the J. Robin Warren Library and the formal establishment of the UWA Health Campus, which has become an innovative and technology-rich educational hub, enhancing the student experience.

Under her leadership, the Faculty introduced the Bachelor of Biomedical Science degree, along with three new majors. Formalised under her leadership was the pioneering UWA Biomedical Sciences Articulation Program, a partnership with Zhejiang University in China which has been nominated twice in the WA Industry and Export Awards.

The monthly Dean's Distinguished Lecture Series was established by Professor Erber to showcase our most distinguished professors, bringing together Faculty staff, students and alumni. The guest speakers took us on a journey from diagnosis to clinical care, exploring the causes behind our most pressing health problems and the research underway to beat them.

Professor Erber has played a significant role in advancing the Faculty's research successes, through developing initiatives to support researchers at all levels of their careers. Under her leadership the University achieved a meteoric rise to 8th in the world and 1st in Australia in Clinical Medicine in the 2019 Academic Ranking of World Universities (ARWU). Professor Erber has no doubt contributed to this ranking with her own research achievements, leading her team to develop the innovative Immuno-flowFISH, an automated method for rapid leukaemia detection. The team received national recognition for this work, winning the ANSTO 2018 Eureka Prize for Innovative Use of Technology, and a Foundation for Australia-Japan Studies grant which will see them collaborate with Sysmex Corp Japan to further develop the project.

Professor Erber has been unwavering in her dedication to teaching the next generation of health leaders, continuing as a teacher, mentor and supervisor throughout her tenure. She is an early adopter and champion of integrating new technologies into teaching, including the state-of-the-art e-Learning Suites.

Reflecting on her time as Executive Dean, Professor Erber said it has been an honour to lead the Faculty over the past four years.

"Looking back over this time, I am proud of what we have accomplished together. It has been a privilege to work with many talented academics and professional staff. Together we have made a difference to the lives of students whom we have taught, and to the health and wellbeing of society. I look forward to having more time to focus on education, research and haematology."

Going forward, Professor Erber will continue her internationally recognised career in diagnostic and translational haematology research, as well as teaching endeavours in her substantive clinical academic position as Professor of Pathology and Laboratory Medicine. We wish her every success and thank her for her leadership of the Faculty and her contributions to the University Executive.

The University is pleased to announce the appointment of Professor Jon Watson from Deakin University, who will join us in February 2020 as the incoming Executive Dean.

Brave individuals tell of lived experience with mental health to improve professional care

A research project led by the School of Allied Health has brought together six people with mental health conditions to offer insight into how treatment can be improved and to break down the stigma surrounding mental health.

The project Depth of Field, funded by Healthway, draws on the experiences of people affected by mental health conditions and uses art to develop resources to educate health professionals.

The project tracked the journey of the six individuals over 18 months to understand their mental health experiences, how the mental health system worked for them or not, and if they felt stigma attached to their condition.

Research participants and their lived experiences include Katherine – in recovery from borderline personality disorder; Rosalie – explores Indigenous intergenerational trauma; Donna – on hearing voices (schizophrenia); Shannon – speaks about an eating disorder; Clinton – living with multiple mental illness diagnoses; and Pamela – a carer for her son who has schizophrenia.

Project leader Dr Gabrielle Brand, from the School of Allied Health, said that drawing from people's real-life experiences, and the care they received, offered valuable clues into how health care professionals could provide effective care.

"There were a few strong themes that came out from the experiences of the brave individuals involved in this project," Dr Brand said.

"Unconscious bias was a strong factor inhibiting treatment and recovery, meaning that some health care professionals found it difficult to understand or relate to a particular condition, making it harder for them to assist in providing the most effective treatment."

"One factor highlighted is that the stigma attached to some conditions causes mistrust of health services and can lead to reluctance of individuals to seek treatment. Some individuals reported that when their condition was characterised as a 'disease' or 'disorder' they felt blamed or that they were somehow responsible for the condition which made recovery harder."

"There was also a feeling from individuals that some health care interactions focused on treating the condition rather than the person. Because mental health conditions affect each person differently, it's important for a two-way dialogue to occur between patients and professionals to fully understand an individual's circumstances, which is critical for holistic treatment.

As part of the Depth of Field project, the participants sat for portraits with award winning photographer and graphic designer, Steve Wise. The body of work aims to look past what is typically seen on the surface, instead representing the personal lived stories and emotions of the participants.

WA Chief Psychiatrist Nathan Gibson and the research investigators also sat for portraits to expose their own vulnerabilities to send a powerful message for the need to refocus mental health care towards the person (not just the illness) and to honour these people as the experts.

This cross-discipline project involved contributions from Dr Gabrielle Brand, Professor Rhonda Clifford and Assistant Professor Liza Seubert from the School of Allied Health; Associate Professor Christopher Etherton-Beer from the Medical School; and Carli Sheers, a Lived Experience Educator recruited through the Consumer & Community Research Network.

Early career researcher discovers concerning rise in multiple medicine use amongst older Australians

Clinical pharmacist Dr Amy Page is fast becoming recognised as a national expert in the quality use of medicines for older people. Her research and clinical practice focus on optimising medicines for use among people with chronic medical conditions, dementia and polypharmacy – the concurrent use of multiple medications.

Along with being an adjunct senior lecturer with the School of Allied Health, NHMRC Early Career Research Fellow at the Monash Centre for Medicine Use and Safety, and Lead Pharmacist Rehabilitation Aged and Community Care Services at Alfred Health, Dr Page continues to practice clinically as one of the first Australian pharmacists to work within a general practice. She has also worked across a variety of non-traditional practice areas, including in rural and remote areas and in developing countries.

By undertaking this interdisciplinary approach of clinical practice and research, Dr Page is in a unique position to lead the development of innovative projects that engage multidisciplinary teams and bridge the gaps between clinical practice, research and education to improve outcomes for patients.

It's this body of work that sees Dr Page recognised as one of Australia's leading pharmacists. The Australian Journal of Pharmacy named her as one of the 14 most influential people in pharmacy and the second most influential agenda setter in pharmacy in 2019. In 2015 she was recognised as the Australian Young Pharmacist of the Year by the Pharmaceutical Society of Australia. It seems this legacy has been passed through the generations at UWA, with second year Master of Pharmacy student Alice Hashiguchi being named the 2019 Pharmacy Student of the Year.

A recent study led by Dr Page received national media attention after its publication in the Medical Journal of Australia. The study found that the number of Australians over the age of 70 taking five medicines or more a day has risen to nearly one million people and is increasing.

"The use of medicines among older Australians is common, particularly for those who live with multiple chronic illnesses. While this medicine use can bring a lot of benefits, using several medicines concurrently can place people at risk of side effects, including more frequent hospital admissions and falls."

Researchers analysed a 10 per cent sample from the Pharmaceutical Benefits Scheme between 1 January 2006 and 31 December 2017 and compared the data over an 11 year period.

They found there was a 52 per cent increase in the number of people taking at least five medicines between 2006 and 2017, rising to 935,240 people in 2017. People aged in their

80s were most likely to take at least five medicines a day, and women were more likely to than men (36.6 per cent compared to 35.4 per cent).

Dr Page said that the medicines looked at did not include those purchased without a prescription such as vitamins, minerals, herbal supplements or medicines not listed on the Pharmaceutical Benefits Scheme, meaning that the estimates in the paper may be conservative. The rates in comparable years are also much higher in Australia than in the US or the UK.

"While some of these increases could be attributable to a growing population and a growing ageing population, the percentage increase indicated there is work to be done in the health sector to ensure careful management of combining multiple medicines," said Dr Page.

"There have been many awareness raising activities in recent times about the issue of taking multiple medicines and there is evidence of poor health outcomes in older people. However behaviour does not appear to have changed in the past decade.

"Strategies to increase understanding of the complexity of prescribing and taking multiple medications are needed that target both health professionals and the public.

"Taking multiple medications may be required, but it needs to be carefully assessed by a medical professional and balanced against the risks which may contribute to adverse health outcomes."

On the overall response to the research, Dr Page said it's pleasing to see the strong interest from the public on this pertinent topic. Having conversations and furthering education about appropriate medication use is important to the health outcomes of our ageing population.

The Raine Medical Research Foundation celebrates 60 years of supporting researchers

For 60 years, the Raine Medical Research Foundation has been supporting medical researchers to answer questions that improve and save lives.

The Raine Foundation was established by a generous bequest from Mary Raine, an astute businesswoman who owned a large portfolio of properties and hotels in Western Australia, including the Wentworth and Windsor Hotels. Mary was devastated when her husband, Joe, died prematurely from a sudden and severe stroke at the age of 67. She couldn't understand why doctors couldn't save him and wanted to do more to help others avoid the terrible loss of their loved ones to diseases such as arteriosclerosis.

In August 1957, Mary Raine signed the Deed of Trust bequeathing her property empire to The University of Western Australia for the purpose of funding medical research. The Raine Medical Research Foundation represents the largest bequest received by the University for medical research.

The Foundation has allocated close to $50 million towards medical research to-date, including major research projects, priming grants, fellowships, and travel awards. The Raine Foundation was also the first funder of The WA Pregnancy Cohort Study in 1989, later named The Raine Study. The Foundation currently distributes close to $3 million each year towards research programs, which has been strengthened by generous public donations and partnerships with organisations that are aligned with its vision to improve health outcomes in WA.

The Raine Foundation has a strong reputation for ensuring thorough and equitable grant review processes. Importantly, its funding strategy recognises the critical need to support the next generation of WA medical research leaders who are dedicated to finding answers to our health problems.

This legacy has already made an enormous impact on improving the health and lives of Western Australians. Through the generosity and vision of this remarkable woman, the Raine Medical Research Foundation has been able to support cutting-edge research that has investigated some of the most challenging diseases and disorders facing the world today – including cancer, osteoporosis, diabetes, renal failure and cardiovascular disease.

The Raine Foundation has a proud history of supporting more than 500 WA researchers and has helped launch the careers of many internationally recognised researchers, such as Professor Peter Klinken AC (Chief Scientist of WA), Professor Peter Leedman (Director, Harry Perkins Institute of Medical Research), Professor John Newnham (Director, Women and Infants Research Foundation), Professor Fiona Stanley AC (Former Director, Telethon Kids Institute), and Professor Fiona Wood AM (Director, Fiona Wood Foundation).

Here are just some of the many researchers who have been supported through the Raine Foundation and the crucial work they are undertaking.

Professor Anna Nowak

Professor Anna Nowak from the UWA Medical School was awarded a Raine Priming Grant in 2006 for her project *Chemo-immunotherapy: characterising and exploiting the immune response.* This project aimed to examine cancer-specific responses to combined chemotherapy and immunotherapy treatment in a mouse model of malignant mesothelioma.

Professor Nowak is a leading oncologist and clinical trials researcher in the fields of malignant mesothelioma and neuro-oncology. She has led many national clinical trials in mesothelioma, with a particular focus on chemo-immunotherapy.

This work has led Professor Nowak to develop the first published validation of the use of a quality of life tool in clinical trials in mesothelioma. She has also developed the Modified RECIST Criteria for tumour assessment which has been widely accepted for use in clinical trials in this disease.

The Raine Foundation's support early in Dr Nowak's career has led to a 480-person international randomised clinical trial of chemoimmunotherapy that will start in early 2020.

Professor Kevin Pfleger

Professor Kevin Pfleger was awarded a Raine Priming Grant in 2010 for his project *Investigation of novel mutations in vasopressin V2 receptor linked with kidney disorders*, at the Harry Perkins Institute of Medical Research. This project aimed to investigate previously uncharacterised mutations that affect water absorption by the kidneys, leading to significant kidney disorders.

Building on his expertise in molecular pharmacology profiling relating to kidney disorders, Professor Pfleger co-developed a therapy for treating chronic kidney disease. He is Chief Scientific Advisor for Dimerix Limited, a UWA spin-out company that has recently completed recruitment for two phase II clinical trials investigating treatment of two forms of this condition; diabetic kidney disease and focal segmental glomerulosclerosis.

Image of Kevin Pfleger credited to Diabetes Research WA

Clinical Associate Professor Kwok-Ming Ho

Clinical Associate Professor Kwok-Ming Ho was awarded a Clinician Research Fellowship in 2014 for his project *Detailed assessment of risks and benefits of inferior vena cava filters on patients with complicated injuries (the da Vinci Trial)*, at the Department of Intensive Care, Royal Perth Hospital.

This project was the first clinical trial in the world to explore whether putting a titanium-nickel alloy filter in the great vein of the body can prevent migration of blood clots from the legs to the lungs following major trauma, in patients at high risk of bleeding. Published in The New England Journal of Medicine, and presented at the International Society on Thrombosis and Haemostasis 2019 Scientific Meeting, the results are expected to change the way these medical devices are used in trauma centres worldwide.

The Clinician Research Fellowship program – an initiative of the Department of Health in partnership with the Raine Medical Research Foundation – has been crucial in supporting Dr Ho to become an internationally respected clinical researcher and mentor for many research students.

Dr Lisa Martin

Dr Lisa Martin was awarded a Raine Priming Grant in 2019 for her project *Postburn growth and coping: Resources to reframe*, at the Burn Injury Research Unit, UWA. Dr Martin was named the Raine/Cockell Fellow – a fellowship resulting from joint funding from the Raine Foundation and a bequest from Edith Elaine Cockell to UWA, to facilitate research into the cause and treatment of mental illness.

Dr Martin's project builds on doctoral research that assessed why some people cope better after a burn injury than others. The aim of her current project is to work with consumers to develop and evaluate resources to help adult patients at Fiona Stanley Hospital, and paediatric burn patients and their parents at Perth Children's Hospital, cope better with the challenges of their burn injury.

The outcomes will include a self-help resource for adults, containing expert information and advice, with exercises and techniques, along with patient stories. The parents' resource will be an educational guide about how to help their child when they are in hospital, following discharge and reintegrating into the community after a burn. The impact will optimise psychological recovery for burn patients in WA.

The Raine Study
celebrates 30 years of changing lives

One of the most extensive longitudinal studies of pregnancy, childhood, adolescence and adulthood ever carried out, in 2019, the Raine Study marks 30 years of world-class research. Producing pivotal findings that have changed medical practice on a global scale, the Raine Study continues to enhance our understanding of human health and improve wellbeing across generations.

Established in Perth in 1989 with funding from the Raine Medical Research Foundation, the Raine Study was the first of its kind to track participants from before they were born, to determine the role that early life events (from the womb onwards) had on later life.

Today, the Raine Study is a multi-generational cohort study with its discoveries continuing to impact policy, practice and education, enhancing lives across the globe.

Professor Peter Eastwood, Director of the Raine Study said the study is vital, not only in WA, but also internationally.

> "In Australia and across the globe the Raine Study is known as a really unique resource which stands out from most other studies in the world.

"The multi-generational and multi-institutional structure makes the study very distinctive and provides valuable data on the longitudinal effects of both environmental and genetic factors, crucial to the understanding of health and disease and to the development of innovative healthcare solutions," Professor Eastwood said.

Over the past 30 years the children and families of the pregnant women initially involved have taken part in a number of follow-up assessments, participating in surveys, medical examinations and fitness testing. Each of these follow-ups has added to the increasingly powerful pool of data used to provide better education and global advancements in medical practice and research, ultimately impacting human health and quality of life.

First cohort of 2,900 pregnant women took part from 1989–1991

30,000 pieces of data generated

30 million pieces of genetic information held on each participant

500+ research papers written by over 200 researchers worldwide

Our Key Findings

Some of the Raine Study's major discoveries include:

- Ultrasounds on pregnant mothers are safe and international standards have been set for ultrasounds during pregnancy
- Mothers who don't smoke during pregnancy increase the outcome of having a happier and healthier child
- Young adults who participated in sport more as children have stronger bones
- Children who were breast-fed for four months or longer have healthier weight and less asthma and allergies
- Children with better sleep patterns have better mental health in later life
- Vitamin D is good for eye health
- Working less than 38 hours a week decreases your risk of heart disease

The Raine Study relies on the support of its participants, researchers and university joint venture partners to continue its crucial research. To commemorate this milestone, a special event will be held in May 2020 to celebrate and thank all those who have been involved with the Raine Study over the last three decades.

You can hear more about the Raine Study in UWA's Meaning of Health podcast available at soundcloud.com/meaningofhealth/episode-6-the-raine-study.

the Raine Study

Program reveals kids are lagging behind in basic physical skills

A program run by UWA's School of Population and Global Health and School of Human Sciences has found many Perth children are falling short of developing basic physical skills.

The UWA team tested more than 4000 children and found they lacked basic skills ranging from balance to running, jumping and ball skills. The team developed an eight week program concentrated on those areas and saw vast improvements.

The UWA KIDDO program, the largest of its kind in Perth, involved children aged between three and eight years with support from 41 schools and 11 early childhood education and care centres.

UWA KIDDO Program Director Amanda Derbyshire, from the School of Human Sciences, said if children did not develop basic movement skills by the time they were 10 there was a strong chance they would be less active throughout childhood and as an adult, have less social confidence, and have a higher risk of mental health issues and other health problems such as obesity and diabetes.

"It's vital we get children moving early and make physical development a key component of their daily routine when at school or in early childhood education and care. A quality program at school and early childhood education and care is crucial because they spend a large amount of their time there.

"There was a 61 per cent improvement in over-arm throwing, and a 13 per cent improvement in general movement skills through the program. The average pre-primary child who could throw three metres at the start of the program could throw 4.8 metres in just eight weeks," Ms Derbyshire said.

Associate Professor Hayley Christian (pictured), Senior Research Fellow at UWA's School of Population and Global Health and the Telethon Kids Institute said many early childhood education and care providers were falling short of meeting basic physical activity requirements with only 16 per cent having a written physical activity policy.

"Because there are no standard policies to guide early childhood education and care providers, it is up to their own judgement to determine a suitable physical development program," Dr Christian said.

"We need national programs and sustainable funding models to support early childhood education and care providers and help our kids move well for optimal health, development and life success."

Through the Play Spaces and Environments for Children's Physical Activity (PLAYCE) NHMRC Partnership Project, Dr Christian is leading work to develop, implement and evaluate physical activity policies and practices for early childhood education and care, so children can be more active and healthy.

"The success of the KIDDO program provides a case study of just what could be achieved if national policies were in place," she said.

"Our research indicates that the average kindergarten kid can bounce a ball eight times in 20 seconds, whereas 20 years ago they could bounce and catch the ball 14 times."

The KIDDO team recently launched an online physical literacy resource and training centre which includes e-learning, session plans, hundreds of activities and other resources to allow early childhood educators and coaches to deliver the KIDDO program and help children become confident and competent movers.

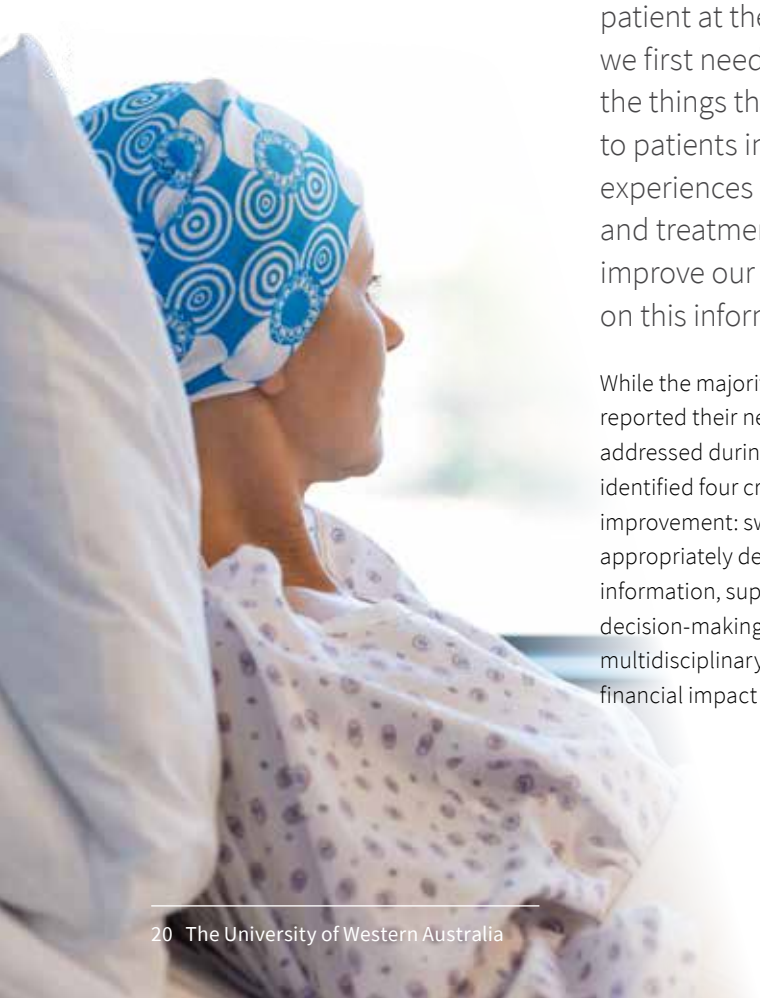
The KIDDO program is made possible with support from Healthway, Sport Australia and the NHMRC. Healthway supports evidence-based initiatives to deliver positive health outcomes for the WA community. More information and training resources are available at kiddo.edu.au.

Patient survey reveals flaws in cancer treatment

An international survey of more than 4000 cancer patients and carers, including 850 Australians, has highlighted the need to tackle shortcomings in diagnosis, treatment and psychological support as well as high medical costs.

The survey is believed to be the biggest-ever international study specifically aimed at obtaining patient perspectives on inefficiency in cancer care, defined as anything that does not focus on what matters most to patients.

Coordinated by All.Can, the first international, multi-stakeholder initiative dedicated to tackling inefficiency in cancer care across 13 countries, the study also provides the first opportunity to compare the lived experience of Australians with cancer to that of patients in 10 other countries.



The global study included responses from 850 Australians affected by cancer, with a quarter of those surveyed from Western Australia. Of the Australians who took part in the survey, 68 per cent had breast cancer, seven per cent had lymphoma and five per cent had prostate cancer while the remaining 20 per cent had various other cancer types.

Lead researcher of the WA component, Professor Christobel Saunders, Head of the Medical School's division of Surgery, said the survey provided an invaluable insight into what it was like for patients who had been diagnosed with cancer.

"This survey is so important because it's pinpointed the areas where we need to improve our care of cancer patients," Professor Saunders said.

"In order to really put the patient at the centre of care, we first need to understand the things that matter most to patients including their experiences of their disease and treatment and then improve our services based on this information."

While the majority of respondents reported their needs were sufficiently addressed during their care, the survey identified four crucial areas in need of improvement: swift, accurate and appropriately delivered diagnosis; information, support and shared decision-making; integrated multidisciplinary care; and the financial impact of cancer.

The majority of respondents (89 per cent) were female with 11 per cent male. Most (67 per cent) were aged 25 to 64, 32 per cent were aged 65 or older and one per cent were aged 0 to 24.

They identified delays in diagnosis and managing ongoing side effects as the biggest cause of inefficiency. Some reported a lack of empathy from physicians and poor timing – such as being told they had cancer without a family member present or having to wait several days to speak to a specialist.

One in eight (12 per cent) respondents whose cancer was detected outside a screening program waited more than six months to be diagnosed while half reported not receiving enough support to deal with ongoing symptoms and side effects during and after treatment.

Some respondents said they felt overwhelmed because too much information was given at once and would have preferred to receive relevant information at appropriate points along the entire care pathway.

In addition, 41 per cent said they had not received enough understandable information about the signs and symptoms indicating that their cancer might be returning or getting worse.

Lack of access to psychological support was a common finding with 64 per cent of respondents reporting they needed some kind of psychological support during or after their cancer care but, of those, 35 per cent said it was not available.

Another common finding was respondents felt there was often a lack of coordination in care – reporting they had no written care plan nor a primary point of contact to whom they could direct questions.

Environment and population key to reducing child deaths in Africa

An international study led by The University of Western Australia and Flinders University has found children under the age of five in Africa are more likely to die than those in wealthy countries due to a degraded environment and increasing population density.

Key factors found to affect high child mortality rates included air pollution, unclean water, poor sanitation, large household sizes, and environmental degradation.

The World Health Organisation estimates that 5.6 million children under five years of age died in 2016 and in sub-Saharan Africa one in 13 children dies before turning five.

The researchers who published the paper in the journal BMJ Open, analysed data to explain the correlation between increased child mortality, environmental degradation and the population density of all mainland countries across the African continent.

Paediatrician Professor Peter Le Souëf, from UWA's Medical School, said that health professionals had for some time ignored the negative consequences of overpopulation and environmental degradation – including climate change – on child health in developing nations.

The relationship between child-health outcomes and causes is based on the most recent data and presents a snapshot in time, rather than what might have been more important historical challenges.

Professor Corey Bradshaw, from the Global Ecology Lab at Flinders University, led the analysis and said the study provided the first empirical evidence that large households were linked to worsening child health outcomes in developing nations.

"Population size in many African countries will increase rapidly over the coming decades, raising concerns that the added pressures on infrastructure and the environment will further compromise child-health outcomes," Professor Bradshaw said.

The results suggest that environmental degradation is now already at a point where it is compromising food production, water or air quality, or defence against infectious disease.

The study also emphasises the importance of continued investment in clean water and sanitation services, measures to improve air quality, broad-scale family planning and efforts to restrict further environmental degradation.

"Our research highlights there is a direct correlation between child deaths, population density and environmental degradation," Professor Le Souëf said.

Dentistry students at the forefront of innovative research

The UWA Dental School Research Day is an annual event to showcase the breadth of innovative and stimulating research being undertaken by its students for the benefit of the community and the advancement of dentistry worldwide. Presentations were given in just six short minutes from Doctor of Dental Medicine (DMD), Doctor of Clinical Dentistry (DCD) and PhD students.

The following highlights some featured research projects.

Knowledge and attitudes of Western Australian dentists towards reporting child abuse

Sambavi Kugananthan and Tina Nguyen (DMD)

Child abuse is recognised as an international problem which may harmfully affect a child's future development. Many indicators of abuse manifest in the orofacial region including bite marks, lacerated soft tissues and untreated tooth decay.

Our research aims to understand whether Western Australian dental professionals can confidently identify and report incidences of child abuse. We were also interested in identifying the barriers towards reporting cases to appropriate authorities.

Our results demonstrated that dental professionals lack adequate training to confidently identify potential signs of abuse in the orofacial region. Further, many are unaware of the correct reporting protocols. Our findings aim to inform policy change and highlight the need for ongoing education for dental professionals surrounding child safeguarding.

Development and application of 3D organoid culture models for the investigation of oral carcinogenesis

Ravi Teja Chitturi Suryaprakash (PhD)

Organoids are the latest advancement in 3D cell culture technology and a useful tool to understand oncogenesis – the process through which healthy cells become transformed into cancerous cells.

Oral cancer is a significant burden to society and is usually preceded by precancer. Despite many advances in research, the natural progression of this disease from normal tissues to precancer to cancer is still largely unknown.

In this project, I intend to use this exciting new organoid technology to unravel some of the important molecular events associated with malignant transformation of precancerous cells. This would be the first of its kind *in vitro* model using 3D cell cultures to study oral oncogenesis and could potentially lead to the development of personalised treatment modalities for patients with precancerous lesions.

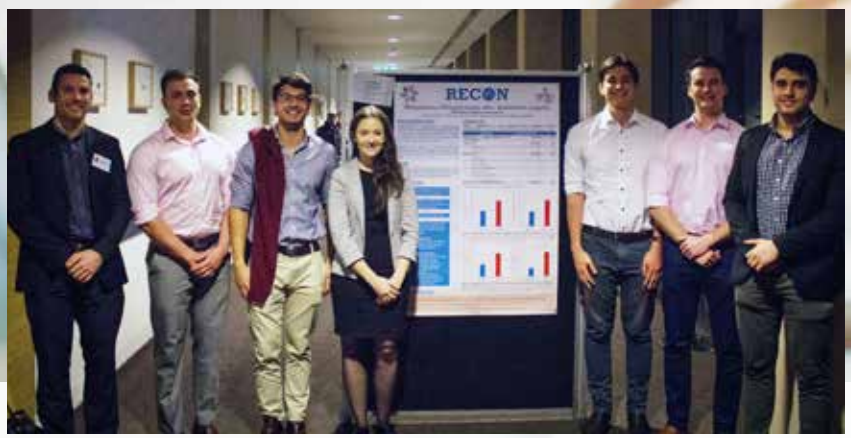
Chronic disease comorbidity in patients with oral leukoplakia

Lance Giudice, Yasmita Haripersad and Emrik Graff (DMD)

Oral leukoplakia (OL) is a predominantly white plaque of the oral mucosa, with questionable risk, having excluded other known diseases or disorders that carry no increased risk for cancer. It is considered to be the most common precancerous oral condition globally, and at present, little is known about the coexistence and impact of chronic diseases in patients with OL.

Our study aims to examine comorbidities in patients diagnosed with OL, with the hope of identifying associated diseases and enhancing our understanding of the impact of them on OL diagnosis and treatment decisions. Awareness amongst the healthcare profession of the associations between chronic diseases and OL may enable screening opportunities to help early diagnosis of this potentially cancerous condition.

Medical students improving audit and research opportunities for peers



Founded in January 2019, the Student Research Initiative of Western Australia (STRIVE WA) is a medical student run organisation focused on collaborative research and audit, both locally and beyond.

STRIVE WA is run as a steering committee consisting of medical students from The University of Western Australia, Curtin University and The University of Notre Dame, under the guidance of UWA Lawrence-Brown Professor of Vascular Surgery, Toby Richards.

The project was established following the observations of medical students who found themselves faced with the daunting task of undertaking research and audit during their studies with little prior experience.

"The purpose of STRIVE WA is to mitigate these challenges and help promote student participation in audit and research," said UWA medical student and STRIVE WA President, Andrei Sincari.

"Together as a steering committee we organise, facilitate and recruit students for a wide variety of audit and research opportunities depending on a person's skills, experience and interests. As a result, we can aid the development of an individual's research skills for their future," he said.

During the first half of 2019, STRIVE WA took part in a multinational audit assessing respiratory complications following major abdominal surgery (RECON). This audit was completed at Fiona Stanley Hospital, with the recruitment of 17 medical students from UWA, seven from Notre Dame and two from Curtin. Together the students took part in patient recruitment and follow-up, data processing, analysis, and presentations throughout several collection periods over three months.

In August 2019 three UWA medical students who took part in RECON were chosen to present a poster of the results at the International Surgical Students' Conference in Melbourne, where they won the prize for best poster. They also presented this poster at the Students in Health and Medical Research presentation night hosted by the Western Australian Medical Students' Society.

Marcel Nejatian, STRIVE WA committee member said, "The organisation has provided me with the opportunity to present a high-quality audit at a well-renowned international conference, which won best presentation. This has improved my confidence in presenting studies to the scientific community, which is a vital skill for any doctor to have."

Ultimately, STRIVE WA aims to continue its progress into 2020 and will endeavour to improve student participation, experience and skills in audit and research in many projects to come.

THE UNIVERSITY OF WESTERN AUSTRALIA

Cover image by Master of Pharmacy student Andrew Morrissy on placement in the Pilbara.

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