NSW Health PhD Scholarship Program

NSW GOVERNMENT | Health

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A Message from Kerry Chant, CHO

Chief Health Officer and Deputy Secretary Population and Public Health

I would like to commend the successful candidates for the NSW Health PhD Scholarship Program. Candidates come from a variety of health and medical disciplines - from nursing and allied health to specialists in acute or emergency care. Many are employed in the NSW health system, or are based at universities or medical research institutes with close ties to the health system.

This program is designed to develop the capability and skill of PhD candidates by harnessing their research capacity.

The projects cover a broad range of areas including:

- gaining a better understanding of the patient experience;
- implementing evidence-based models of care;
- improving patient outcomes and quality of life, and
- cutting-edge research into the mechanism and treatment of disease and injury.

I would like to offer my thanks to Professor Garry Jennings who chaired the assessment panel, the Sax Institute who oversaw the scientific assessment process, and the Office for Health and Medical Research who managed the program.

To the many individuals who submitted applications, the host universities research offices, supervisors and partner organisations, I thank you for your support of this program and commitment to outstanding health and medical research in NSW.

I congratulate all the candidates, their universities and partner organisations for helping to embed high quality research into the NSW health system.

About the NSW Health PhD Scholarship Program (2017)

The NSW Health PhD Scholarship Program was open to PhD Candidates who work within, or closely with, NSW Local Health Districts (LHDs), Ambulance Service of NSW and Specialty Health Networks (SHNs). Candidates who were not NSW Health staff were also eligible to apply if they intended to work with one of these entities.

Funding for the NSW Health PhD Scholarships is matched by the university or partner organisation.

The purpose of the program is to:

- Develop the capability and skill of the PhD candidate.
- Build capacity in the NSW health system in areas of identified need, including: epidemiology, bioinformatics, health economics, biostatistics, implementation science, health workforce, health systems research and 'omics.
- Improve efficiencies in the delivery of population health, health services and clinical care in NSW.
- Provide support to projects that transfer and scale best practice processes in the health system.
- Enhance health and medical research capability within the NSW health system.

Douglas Bellamy

Managing the work of cancer for older people and their support networks in regional and rural NSW

The purpose of this study is to examine how older people with cancer and their families living in rural communities are affected by the burden of treatment. The objective is to identify how to enhance their capacity to manage this treatment through appropriate use of resources, including their local networks.

The project uses an interpretive description design combining semi-structured interviews and social network analysis to understand the complex and multidimensional nature of the social networks that patients and their caregivers use to help manage treatment burden.

1 in 2 men and 1 in 3 women are diagnosed with cancer during their lifetime, with older people most affected. Incidence have increased by 27% over the past 30 years. One-third of those affected by cancer live in regional and rural areas.

Treatment burden impacts negatively on the older person's ability to comply with treatment. It is experienced across functional, social, psychological and spiritual domains. It impacts on income and practical issues including transport, farm management, and family needs.

Rural people rely on formal and informal networks for support. Structure and effectiveness of these networks varies so standardised interventions cannot be effectively applied across all rural communities.

The work undertaken with this research will assist older people undergoing cancer treatment and their caregivers to improve their capacity to manage the work of cancer.

Candidate	Douglas Bellamy
Host University	University of New England
Partner Organisation	Hunter New England Local Health District
PhD Supervisor	Professor Vicki Parker
Health Practitioner/ Policy Supervisor	Roslyn Everingham, Hunter New England Local Health District
Priority Area	Health systems research

Ingrid Berling

QT prolongation in mental health patients: contributory factors and clinical significance

Patients with psychiatric disease have increased morbidity and mortality. It has been shown that psychiatric patients are at increased risk of sudden cardiac death.

The potential role of antipsychotic medication contributing to this via the development of a prolonged QT interval on the electrocardiogram (ECG) and consequently the potentially fatal arrhythmia Torsades de Pointes (TdP) will be explored.

This PhD aims to identify the most clinically useful method for measuring the QT interval on a patient's ECG which will ensure that an appropriate tool is used to assess QT prolongation in these patients.

The QT nomogram is a novel tool used in this research. This new tool will be used to find out how big the problem within the psychiatric community is, and to identify other factors that may be the cause of a prolonged QT in patients.

Candidate	Ingrid Berling
Host University	University of Newcastle
Partner Organisation	Hunter Medical Research Institute
PhD Supervisor	Professor Jennifer Martin
Health Practitioner/ Policy Supervisor	Roslyn Everingham, Hunter New England Local Health District
Priority Area	Epidemiology & Implementation science

Taylor Braund

Identifying biomarkers of anxious depression: an integrative neuroscience approach

Depression is the leading cause of disability worldwide. Identifying biomarkers of Major Depressive Disorder has the potential to enhance our understanding of its biological underpinnings, resulting in more accurate predictions of risk, prognosis, and treatment response.

One of the major roadblocks to identifying biomarkers of Major Depressive Disorder is the diversity of symptoms associated with the disorder. To reduce this diversity, biomarkers are investigated in Major Depressive Disorder's subtypes. Anxious Depression – a subtype of Major Depressive Disorder with symptoms of anxiety - occurs in roughly half of the Major Depressive Disorder population and is characterised by a weaker response to antidepressant treatments.

Given its high prevalence and poor treatment response, Anxious Depression offers a promising avenue for identifying biomarkers related to treatment prediction.

The aim of the PhD research project will be to identify biomarkers of Anxious Depression, with a specific focus on biomarkers related to treatment prediction.

It is anticipated that the translation and implementation of these research findings into health care practice will save time, effort, cost, and patient suffering.

Candidate	Taylor Braund
Host University	The University of Sydney
Partner Organisation	The Westmead Institute for Medical Research
PhD Supervisor	Associate Professor Anthony Harris Dr Donna Palmer
Priority Area	Implementation science

Kara Cappetta

Examining the impact of dementia on patterns of hospitalisation: a longitudinal analysis of hospital admissions in the Illawarra and Shoalhaven

The improved recognition and management of people with dementia in hospitals is a health care priority in Australia. Little is known about the patterns of hospital admissions over time for individuals with dementia, and what factors might be associated with the identification of dementia during hospitalisation.

This research utilises a new and sophisticated health records data linkage platform, the Illawarra Health Information Platform (IHIP), to investigate patterns of dementia identification during hospital admissions over a 10-year period, and to establish any relationships between dementia identification and patient outcomes. This will be accomplished through retrospective, longitudinal analysis of admissions for people with dementia and a matched cohort. Emergency Department and inpatient data sets from the Illawarra Shoalhaven Local Health District, linked with mortality data, will be utilised.

This evidence is critical to inform and monitor the impact of recognition and management-focused interventions, which aim to improve outcomes for people with dementia within the hospital system. It will help inform both the timing of these interventions, and the characteristics of admissions in which recognition is most critical to outcomes.

Candidate	Kara Cappetta
Host University	University of Wollongong
Partner Organisation	Australian Health Services Research Institute, University of Wollongong
PhD Supervisor	Dr Lyn Phillipson Dr Luise Lago Professor Kathy Eagar
Health Practitioner/ Policy Supervisor	Dr Jan Potter
Priority Area	Epidemiology

Samantha Carlson

Why do children get severe influenza and whooping cough?

In New South Wales (NSW) immunisation programs aim to protect the community from infectious diseases. Despite these programs, in 2016 there were 10,000 reports of children sick from influenza (the flu), and 6,500 reports of children sick from whooping cough in NSW. These two diseases send more children to hospital and cause more deaths in Australia than any other vaccine preventable disease, particularly in children aged less than 5 years.

This project seeks to understand parent's immunisation experiences with the NSW and Australian health systems.

To do so, a review of all of the research published about why children and pregnant women receive the flu and whooping cough vaccines in Australia will be done.

Interviews with 40 parents of children hospitalised from the flu or whooping cough will also occur. These interviews will explore the influences of the health system, policies, friends and family, the media and social norms on the decision parents made about vaccination.

Finally, surveys will be sent to hundreds of parents who have fully vaccinated or under-vaccinated children to widely explore all possible influences on vaccination behaviour in Australia.

This project will identify the key areas in the NSW and Australian health systems that can be improved. Recommendations will be made that are based on the results of feedback from clinicians, policy makers and immunisation advocates, with the aim of preventing children from acquiring the flu and whooping cough.

Candidate	Samantha Carlson
Host University	University of Sydney
Partner Organisation	Sydney Children's Hospitals Network
PhD Supervisor	Associate Professor Kristine Macartney Associate Professor Julie Leask
Priority Area	Health systems research

Cristyn Davies

HPV and HPV vaccination in the Australian school-based immunisation program: translating research findings into policy and practice

The National Human Papillomavirus (HPV) Vaccination Program in Australia is funded by the Commonwealth Government. Students (aged 11-14) are vaccinated at secondary school after parental/guardian consent is obtained.

In order to help eradicate HPV-related cancers in the future, it is important to find effective ways to ensure that all adolescents raise their HPV health literacy and receive all recommended vaccine doses.

This study is based on the findings of completed research about HPV vaccination in 40 Australian secondary schools (HPV.edu) funded by the National Health and Medical Research Council.

This study will work collaboratively with key stakeholders to implement evidence-based research findings into policy and practice within relevant health and education settings, and measure the effectiveness of these changes.

Key outcomes include:

1. Enhancing the communication of research findings to relevant health and education professionals and policy-makers about how to promote health literacy and health outcomes in cancer prevention, vaccination and sexual health in adolescents;
2. Identifying best practices on how to implement research findings in health and education settings.

Candidate	Cristyn Davies
Host University	University of Sydney
Partner Organisation	Sydney Children's Hospitals Network
PhD Supervisor	Professor Rachel Skinner Associate Professor Melissa Kang
Health Practitioner/ Policy Supervisor	Associate Professor Kristine Macartney
Priority Area	Implementation science

Carlos El-Haddad

Empowering patients to shape the doctors of tomorrow: an implementation study

In recent decades there has been an increasing focus on the importance of teaching doctors to be 'patient-centered'. This means doctors providing care that is respectful of individual patient preferences and values, and emphasising that the patient's priorities are at the centre of all clinical decisions.

In order to train 'patient-centered' doctors, it is crucial to include patient-feedback in the training process. Current hospital based medical training programs do not routinely facilitate patient feedback on the performance of training doctors. Instead, the feedback is almost exclusively provided by the supervising doctors. Therefore there is a need to develop an effective method of gathering patient feedback about training doctors, which can be used to improve their education and help them become more 'patient-centered'.

The aim of this research project is to develop an effective tool and method to gather patient feedback to train future doctors to be more 'patient-centered'. To develop the tool, several groups of people will be consulted including patients, doctors in training, and doctors who are supervisors. The tool will then be tested with junior doctors and actors in a simulated environment. Following this, the tool will be piloted and tested in a hospital.

The development and application of this tool has the potential to impact future generations of doctors by teaching them to be truly patient-centered in their daily practice. Ultimately, this can benefit the wider community by improving the quality of health-care in keeping with the principles of patient-centered care.

Candidate	Carlos El-Haddad
Host University	Western Sydney University
Partner Organisation	South Western Sydney Local Health District
PhD Supervisor	Professor Wendy Hu
Health Practitioner/ Policy Supervisor	Professor Kevin Pile
Priority Area	Implementation science

Elizabeth Highton-Williamson

Behavioural phenotype in neurodegeneration: insights into disease progression

Neurodegenerative diseases, such as Motor Neurone Disease (MND), Corticobasal Degeneration (CBD) and Progressive Supranuclear Palsy (PSP) have been shown to be multi-system disorders, having an impact on motor function, cognition and behaviour.

Patients can present with behavioural changes, similar to those seen in behavioural variant Frontotemporal Dementia (bvFTD). These symptoms can include apathy (loss of interest in things), disinhibition (becoming socially or sexually inappropriate), stereotypical behaviours (rigidity in their thoughts or routines) or mood disturbances (depression). These symptoms can be distressing and burdensome for patients, caregivers and families. It is not fully understood how frequently these behavioural symptoms occur, or whether they become worse over time.

This study aims to establish a clear understanding of the progression of behavioural symptoms in patients with Motor Neurone Disease (MND), Corticobasal Degeneration (CBD) & Progressive Supranuclear Palsy (PSP). These groups will be compared to a cohort of patients with behavioural variant Frontotemporal Dementia (bvFTD) where behavioural changes are well established.

The project will use validated techniques to measure behaviour and will develop novel ways to better measure behavioural changes over time.

The project will examine how these behaviours match with structural changes in the brain, using neuroimaging techniques like magnetic resonance imaging (MRI). This will help identify similarities and differences between the neurodegenerative diseases, allowing researchers to better distinguish between them.

If doctors and health professionals understand these symptoms better, they can become better at diagnosing disease and in a better position to trial new treatment options to modify the symptoms.

Improved understanding of the different manifestations of these diseases can lead to better patient education and hopefully alleviate burden and distress.

Candidate	Elizabeth Highton-Williamson
Host University	University of Sydney
Partner Organisation	Brain & Mind Centre, University of Sydney
PhD Supervisor	Professor Matthew Kiernan
Priority Area	Epidemiology

Malinda Itchins

Investigating resistance to tyrosine kinase inhibitor (TKI) therapy in ALK gene rearranged non-small cell lung cancer (NSCLC)

Lung cancer is one of the most common and lethal malignancies globally. About 3-7% of patients with non-small cell lung cancer (NSCLC) have a rearrangement in a gene called *EML4-ALK* (the ALK gene).

The *ALK* gene rearrangement produces an abnormal ALK protein that allows cancer cells to grow and spread in an unregulated fashion. New drugs that target this genetic alteration in *ALK* have been developed that can be effective in shrinking these tumours such as crizotinib. However, resistance to crizotinib treatment in these patients is inevitable and the cancer will begin to spread again.

Recently, it has been shown that treating these crizotinib-resistant *ALK* patients with a new anti-*ALK* drug, for example lorlatinib, may make the resistant tumours sensitive to treatment again and potentially delay the onset of resistance.

The research project will focus on why interchanging these drugs in a fixed alternating schedule may overcome drug resistance in these *ALK* patients.

The project will be looking at changes in lung cancer cells both in cell culture and in blood samples of *ALK* patients enrolled in a clinical trial.

Patients on the clinical trial will have progressed on crizotinib therapy and will receive treatment with lorlatinib at fixed intervals rotating with crizotinib.
While undergoing many tests, they will have regular blood tests which will be examined for circulating tumour DNA to test for new genes that may predict for drug resistance.

The project will also develop tools for doctors to inform patients about *ALK* lung cancer, to plan their treatment and help manage toxicity.

Candidate	Malinda Itchins
Host University	University of Sydney
Partner Organisation	Kolling Institute of Medical Research
PhD Supervisor	Associate Professor Nick Pavlakis Professor Stephen Clarke Dr Viive Howell Dr Sarah Hayes Dr Chee Lee
Priority Area	Implementation science

Melissa Ann Jackson

Targeted antenatal smoking cessation intervention in high-risk substance dependent pregnancy

Pregnant women who smoke tobacco and have other substance use problems are a highly vulnerable group at risk of poor health and developmental outcomes for their babies. Aboriginal women are a sub-group with particularly elevated risks of poor pregnancy outcomes. Smoking cessation rates are negligible in this population.

The study aims to measure the impact of the addition of a comprehensive evidence-based intervention to routine prenatal care in women referred to substance use in pregnancy services.

The project will assess:

1. The feasibility of addressing tobacco smoking amongst this group.
2. The effectiveness of the intervention at increasing smoking cessation rates at birth and 12-weeks post-partum.
3. The acceptability of addressing tobacco smoking and the intervention components amongst staff and clients of substance use in pregnancy services.
4. The cost effectiveness of the intervention when compared to usual care in improving smoking cessation in this population.

Candidate	Melissa Ann Jackson
Host University	University of Newcastle
Partner Organisation	Hunter New England Local Health District
PhD Supervisor	Professor Amanda Baker
Health Practitioner/ Policy Supervisor	Conjoint Professor Adrian Dunlop
Priority Area	Health systems research

Jessica Lee

Improving outcomes for people living with neuropathic cancer pain

The project will develop a cohesive strategy to enable people living with cancer, their carers and health providers to use proven methods to better manage cancer nerve pain. Cancer nerve pain stops people from participating in society by causing worse physical, cognitive and social function.

Even for those who see a doctor, cancer pain is inadequately controlled over half the time. Half of all people in NSW will be diagnosed with cancer by age 85. Over two-thirds of people with advanced cancer experience pain. This project will involve meeting with key people and organisations to effect health service change. Research will be conducted into the patient and carer experience of having poorly controlled cancer nerve pain and whether their care was evidence-based.

Use of drug and non-drug methods will be explored. A clinical trial will be conducted to explore a promising treatment of lignocaine, a local anaesthetic, used as an infusion for cancer nerve pain.

The project will use a national database with over 100,000 encounters to target interventions where greatest impact is expected.

Priority populations such as people from culturally and linguistically diverse backgrounds, Aboriginal and Torres Strait Islander communities, older Australians, carers, people experiencing socio-economic disadvantage, those living in rural locations and those living with a mental illness will be intentionally included. These populations have traditionally not been well captured within research due to additional logistical requirements.

The findings will be put into practice and shared through media, consumer organisations and government.

Candidate	Jessica Lee
Host University	University of Technology Sydney
Partner Organisation	Sydney Local Health District
PhD Supervisor	Professor Meera Agar Professor Jane Phillips Professor Melanie Lovell
Health Practitioner/ Policy Supervisor	Professor Martin Stockler
Priority Area	Implementation science

Julee McDonagh

The frailty measurement in heart failure (FRAME-HF) study

The frailty measurement in heart failure (FRAME-HF) project aims to improve the care of heart failure patients. It has been discovered in the last decade that a large proportion of heart failure patients are also frail. Frailty is defined as a syndrome of an increased vulnerability to acute stressors such as; infection, falls or hospitalisation. An individual who is frail is less able to overcome these stressors than an individual who is non-frail.

Frailty in heart failure patients is linked to a significantly higher rate of hospitalisation and death. If heart failure patients who are frail can be identified earlier, solutions can be put in place to try and improve their frailty.

The project will compare four different measurement tools used to assess frailty in the form of a clinical study currently taking place at St Vincent's Hospital Sydney. The aim is to find out which is the most accurate and reliable tool for use in patients with heart failure.

This study aims to provide a reliable and validated measurement tool to assess frailty in individuals with heart failure.

Candidate	Julee McDonagh
Host University	University of Technology Sydney
Partner Organisation	St Vincent's Health Network
PhD Supervisor	Professor Phillip Newton
Health Practitioner/ Policy Supervisor	Professor Peter Macdonald
Priority Area	Implementation science

Nicola Meagher

Unravelling mucinous tumours of the ovary and intestinal tract: diagnosis, classification and molecular profiling

Mucinous cancers are rare subtypes of cancer affecting different organs, most commonly colon, appendix and ovary. Making a diagnosis of mucinous ovarian cancer is especially challenging, particularly when the cancer has spread, with uncertainty about whether it started in the ovary or elsewhere in the gastrointestinal tract. This makes treatment recommendations difficult, and people with this cancer respond poorly to standard ovarian cancer chemotherapy.

Large studies to understand the cellular and genetic characteristics of mucinous cancers are needed to help guide diagnosis and treatment for these patients.

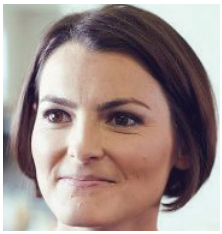
The project will analyse large datasets of histological and molecular information to better characterise these cancers. The key aims are to find markers that:

1. Improve diagnosis; and
2. Uncover treatment targets.

It is only through collaboration and bringing together samples and clinical data in large numbers that researchers can better understand rare cancers such as mucinous cancers.

The results of these studies will generate evidence to improve the way that mucinous cancers are diagnosed and reported, and the project will make recommendations that are communicated to diagnostic pathology organisations to ensure consistency across centres.

By developing a better understanding of the genetic make-up of these cancers, the project can also contribute evidence to help uncover new treatment targets, and design clinical trials that guide treatment options for these patients.



Candidate	Nicola Meagher
Host University	University of New South Wales
Partner Organisation	South Eastern Sydney Local Health District
PhD Supervisor	Professor Susan Ramus
Health Practitioner/ Policy Supervisor	Professor Michael Friedlander
Priority Area	Molecular epidemiology

Rakshit Panwar

Can individualised blood pressure (BP) targets reduce the incidence of new onset acute kidney injury among critically ill patients with shock?

Shock is a medical emergency in which the organs and tissues of the body are not receiving adequate blood flow. Each year about 11,000 Australians who are treated for shock develop acute kidney injury (AKI), and nearly half of them die in hospital.

Preventing low blood pressure (BP) during shock is an integral part of treatment, but it is unclear what level of BP is most effective for an individual patient.

The usual practice of targeting a standard BP for most ICU patients with shock implies that patients with higher-than-normal BP will have a degree of BP-deficit. Such untreated BP-deficit might be suboptimal for kidneys and other vital organs. Tailoring BP targets for patients according to their pre-illness resting BP may spare the use of BP-raising medication for those ICU patients who usually run a lower pre-illness BP or may restore baseline BP for those ICU patients who usually run a higher pre-illness BP.

In the pilot study, it was shown that in usual practice there is substantial degree of untreated BP-deficit, which was associated with an increase in incidence of new AKI among ICU patients with shock.

Accordingly, the aim of the research program is to compare standard care to implementation of a strategy, where patients' pre-illness resting BP is targeted during the management of shock in ICU.

The hypothesis is that this strategy of individualising BP targets during shock will improve clinical outcomes such as risk of AKI and hospital mortality. If proven, these findings will be novel and provide a more scientific basis for the adoption of individualised BP targets in ICU patients with shock syndromes.

Candidate	Rakshit Panwar
Host University	University of Newcastle
Partner Organisation	Hunter New England Local Health District
PhD Supervisor	Professor John Attia
Health Practitioner/ Policy Supervisor	Professor Anthony Quail
Priority Area	Implementation science

Saina Paul

A new taxon of antibiotic-producing enterobacteriaceae

Discovery of new classes of antibiotics is of great importance for developing therapies against drug-resistant bacteria, such as MRSA. A new taxon of a Gram negative bacterium, referred to here as GM1, has recently been discovered by researchers at Charles Sturt University, Orange Campus.

GM1 appears to secrete an antibiotic-like compound, as yet uncharacterised. DNA sequencing of the 16s rDNA and *rpob* genes at the Australian Genome Research Facility (AGRF), as well as biochemical analyses, revealed that this bacterium belongs to a new taxon of *Enterobacteriaceae*, close to but distinct from the genus *Serratia*.

The PhD project will:

1. Complete the genome sequence of GM1, which can then be published and so that genes encoding the antibiotic can be tentatively identified ("-omics expertise").
2. Complete the characterisation of the bacterium GM1, so the bacterium can be given a published scientific name.
3. Determine the chemical structure of the antibiotic, so that derivatives can be made and characteristics determined, and
4. Investigate the clinical usefulness of the antibiotic secreted by GM1. Including determining the different classes of bacteria that the antibiotic can act on, the mode-of-action of the antibiotic, the toxicity to animals and humans.

Candidate	Saina Paul
Host University	Charles Sturt University
Partner Organisation	NSW Health Pathology, Orange
PhD Supervisor	Dr Peter Anderson
Priority Area	Genomics

Aedan Roberts

Developing statistical models to improve inference from cancer gene expression data and guide clinical decisions

Recent scientific and technological advances mean that it is now possible to access vast amounts of human genetic information, which has the potential to provide clues to the causes of and possible treatments for human diseases.

In many cases, the genetic factors behind a disease are not clear, and it has not been possible to identify a single gene or a small number of genes that are responsible. In these cases, it is necessary to delve deeper into the vast and complex genetic data to find out why, for example, some children respond well to standard treatment for leukaemia, while others don't.

This approach provides 'actionable knowledge' to clinicians by making genomic data more accessible for individual patient diagnosis and case management. It goes beyond the current approaches of grouping patients into risk categories and treating them based on similar symptoms, to providing clinicians with the ability to see each patient as an individual within a group. This enables a more personalised approach to paediatric care, leading to effective clinical decisions. Our approach aims to increase the understanding of the biological factors that are both common to the disease types, but unique to individual patients.

The focus of this research strategy is rare childhood cancers and their management, but what is gained from the analyses of these disease paradigms is a better understanding for the treatment of cancer in the population as a whole. By increasing the understanding of the incidence of complex disease in our kids a better understanding will be gained of how to address the management of cancer in adults.

Candidate	Aedan Roberts
Host University	University of Technology, Sydney
Partner Organisation	The Sydney Children's Hospitals Network
PhD Supervisor	Associate Professor Paul Kennedy
Health Practitioner/ Policy Supervisor	Associate Professor Daniel Catchpoole
Priority Area	Bioinformatics

Emma Robson

Healthy lifestyle for patients with chronic non-specific low back pain

The purpose of the PhD is to test whether linking patients to existing clinical and healthy lifestyle services improves clinical outcomes and overall health risk, and reduces waitlists for specialist consultation.

Traditionally, back pain has been thought of as a completely separate problem to these other issues, but it is now known that there are complex interactions between lifestyle, behaviour and pain. This gives us good reason to believe that providing an integrated package of care that addresses lifestyle, habits and pain will give the best results, in terms of pain and disability outcomes but also for long term health and well-being.

The PhD will specifically involve conducting a randomised controlled trial targeting healthy lifestyle behaviours in overweight and obese patients with low back pain, a systematic review of the literature, and thesis by publication.

Not only does this research propose to provide better outcomes for people with chronic back pain, but it also aims to relieve some of the strain on the public hospital system in future.

The project is a collaboration between researchers with skills in evaluating the effectiveness of interventions, and Local Health District personnel involved in delivering services to people in the hospital system.

Researchers and health services staff will work together throughout the project to; identify and recruit patients to the study, to deliver the interventions, to collect information from patients, and to analyse the results.

Once complete, researchers, hospital administrators and clinicians will meet to discuss the implications of the findings for organising services and providing care.

Candidate	Emma Robson
Host University	University of Newcastle
Partner Organisation	Hunter New England Local Health District
PhD Supervisor	Dr Christopher Williams
Health Practitioner/ Policy Supervisor	Professor John Wiggers
Priority Area	Health Systems Research

Amanda Rush

Health economics analysis of cancer biobank investments and activity in NSW

Biobanking is a common activity that occurs at the nexus between biomedical research and clinical care. Biobanks store biospecimens from patients in order to support research, ranging from basic laboratory research through to clinical trials. Biospecimens from biobanks may be retrieved for additional clinical tests, and in this way biobanks also contribute to patient care.

Biobanking in Australia is supported by funding from project, programme, equipment and infrastructure grants from both state and federal sources, as well as by philanthropic funding, yet the full scope of this investment is unknown. The lack of co-ordination of biobanking likely leads to resource duplication, as well as a failure to fully capitalise on investments. In a similar fashion, there is a lack of evidence regarding the outputs from biobanks, in terms of research projects supported, student training, research publications, clinical tests, and contributions to clinical trials.

This project will provide a comprehensive description of how NSW cancer biobanks are supported, what they produce, and resulting cost-benefit and cost-consequence analyses. The project will examine gaps in productivity reporting, and identify how cancer biobanks could better support researchers by considering the under-investigated perspective of biobank users.

By examining cancer biobank operations prior to the introduction of biobank certification in 2016, this project will also produce unique baseline data that will allow the impact of biobank certification to be measured through follow-up studies. Improved organisation and support of cancer biobanking would extend to other forms of biobanking, and would allow NSW to lead any national framework for biobanking in Australia. The information from this project will also inform similar analyses of other major research infrastructure investments.

Candidate	Amanda Rush
Host University	The University of Sydney
Partner Organisation	Sydney Children's Hospitals Network
PhD Supervisor	Professor Jennifer Byrne
Priority Area	Health economics

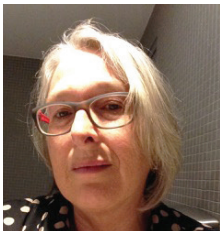
Christine Sanderson

Mixed methods investigation of doctors' moral distress in end-of-life decision-making: the case of patients dying with cognitive impairment in acute hospital settings

Doctors often care for dying patients who are cognitively impaired, and cannot make their own decisions. Impairment may be due to dementia, to delirium which is very common when people are extremely sick, or other medical conditions. This situation is common in hospitals, especially when dying older people are transferred from nursing homes. Hospital care processes are complex, involving many different teams, with intense emotions for families when their relative is dying. This results in competing pressures on individual doctors. Understanding how doctors deal with this, and how it affects their decision-making, may provide a better understanding of why particular treatment decisions are made for such patients, and why things sometimes seem to go wrong.

A national online survey of doctors will assess this problem from doctors' own perspectives. A longitudinal study will follow up a group of doctors from early in their careers, exploring their experiences with in-depth interviews. The same doctors will be reinterviewed 2 - 3 years later, to see how they have adapted and coped, what support they have wanted or used, and what they have learnt. Finally, a series of case studies will be done, where the researcher follows individual patients in real time as they go through the hospital system, observing decision-making processes and conversations as they unfold, in order to provide an accurate depiction of end of life decision-making for these very vulnerable patients.

Improving care for cognitively impaired dying patients in hospitals may require culture change. This study will help to inform that change, contributing to education and support for doctors, to support them in providing best care for their most vulnerable patients.



Candidate	Christine Sanderson
Host University	University of Technology Sydney
Partner Organisation	South East Sydney Local Health District
PhD Supervisor	Prof Meera Agar
Health Practitioner/ Policy Supervisor	Prof Elizabeth Lobb
Priority Area	Health workforce

Seth Tarrant

Preventable mortality and the immune system in geriatric hip fracture

Geriatric hip fracture is a serious injury with high morbidity and mortality. Despite global efforts in reducing mortality with shared geriatric care models and expedited operative intervention, mortality is still high.

The hypothesis is that there is a margin of preventable mortality that can be addressed by minimising management errors and better understanding the underlying immune function of frail patients, and how timing of surgery affects this.

The project is conducting ongoing epidemiological studies looking at management errors, cardioprotection, timing of surgery with anticoagulants and inpatient morbidity leading to mortality.

Furthermore, the project has prospectively recruited 105 consecutive hip fracture patients, collected serum at multiple peri-operative time points. Multiple described damage-associated molecular patterns (DAMPS) are currently being investigated. DAMPs are associated with musculoskeletal injury, influence the immune system, and have not been thoroughly described in hip fractures, only major trauma.

Matching immune-mediated physiological insults with surgery timing and patients' outcomes will shine light on how this fragile cohort is affected by interventions, and allow a better standard of care to be delivered.

Candidate	Seth Tarrant
Host University	University of Newcastle
Partner Organisation	Hunter New England Local Health District
PhD Supervisor	Professor Zsolt Balogh Professor John Attia
Priority Area	Epidemiology

Kelly Thompson

Sepsis and septic shock: health economic and long-term outcomes in Australia

Sepsis is life-threatening organ dysfunction due to infection. Septic shock is the most severe classification of sepsis and is a major cause of death worldwide. Survivors are at risk of major physical and psychological challenges when they return to the community.

For the past 50 years, intensive care doctors have used a steroid medication called hydrocortisone to treat patients with septic shock. Some doctors feel that steroids increase a patient's chance of recovering from septic shock, but even after 17 studies, whether steroids are beneficial or harmful remains unclear. The project is part of the largest ever study to determine whether giving steroids helps to reduce the mortality from septic shock.

Alongside this study a cost effective analysis will be conducted to determine long-term costs and consequences of using steroids to treat patients with septic shock. This will enable an assessment of this treatment in terms of value for money. To do this, quality of life will be measured, the amount of time patients spend in intensive care and hospital, and how much each episode costs within the public hospital system up to 2-years after the episode.

Given that many patients with sepsis die (up to 31% in Australia) and that studies have found that patients who survive have poor outcomes and are often unable to resume normal activities after discharge it is important to understand how long recovery takes and how costly it is. This project aims to facilitate change in health policy and improved patient outcomes.

Candidate	Kelly Thompson
Host University	University of New South Wales
Partner Organisation	The George Institute for Global Health
PhD Supervisor	Professor Simon Finfer
Health Practitioner/ Policy Supervisor	Professor Stephen Jan
Priority Area	Health economics

Jeannette Walsh

Access to universal child health services for new mothers experiencing intimate partner violence

Domestic violence is associated with poor health outcomes for women, and second-generation consequences for children and young people. It can remain a hidden cost to the health system given that women who are abused make extensive use of health care, but their experience of domestic violence is not always identified.

Screening for domestic violence is a public health intervention introduced in NSW Health to identify domestic violence early, promote awareness, ensure safety for women and children and provide appropriate referrals connecting women with services. It was implemented for key services including maternity, child and family health, drug and alcohol and mental health services.

This research aims to:

1. Identify if women who have disclosed domestic violence whilst pregnant are receiving universal child health services when they go home with their baby.
2. Identify any barriers to them receiving these services.
3. Develop a best practice model facilitating access to child health services for new mothers experiencing domestic violence.

The research initially examines how child and family health services are provided for two groups of women – those who disclosed domestic violence during pregnancy and those who did not – to see if there is equity in service provision between these groups. The research will then use an online survey and interviews with child and family health nurses to examine what facilitates and what are barriers for nurses in providing services to mothers experiencing domestic violence. The results of this research will be used to inform policy and practice.

Candidate	Jeannette Walsh
Host University	University of New South Wales
Partner Organisation	NSW Ministry of Health
PhD Supervisor	Dr Joanne Spangaro
Health Practitioner/ Policy Supervisor	Ms Lorna McNamara
Priority Area	Health systems research

Jackie Yim

Health economics of anxiety and depression in cancer patients

One in three Australians will experience cancer during their lifetime and it can be distressing for the patient and their families. Rates of anxiety and depression are significantly higher in cancer patients than those in the general population but, unfortunately, are often left undetected in busy cancer services.

This PhD will focus on anxiety and depression amongst cancer patients, from an economics perspective, by exploring 3 questions:

1. How does anxiety and depression affect cancer patients' use of health services?
2. What is the most cost effective approach to implement a clinical care pathway aimed to identify and manage anxiety and depression in cancer patients?
3. Do cancer patients have preferences for how anxiety and depression are identified and managed?

To answer the first question, the project will look at whether patients suffering from anxiety or depression will use more health resources than patients who do not.
The results will help to better identify those who may develop anxiety and depression, and how it can be managed.

To answer the second question, the project will compare the costs and benefits of different approaches in the implementation of a clinical care pathway. The results will improve and inform future cancer services implementation projects.

To answer the third question, a patient survey will be conducted to determine patient preferences for how anxiety and depression are identified and managed. The results will provide health care organisations and policy makers a patient's perspective on what they value through their cancer journey, so this can be considered when planning cancer services.

Candidate	Jackie Yim
Host University	CHERE, University of Technology
Partner Organisation	Psycho-oncology Co-Operative Research Group (PoCoG), University of Sydney
PhD Supervisor	Professor Rosalie Viney
Health Practitioner/ Policy Supervisor	Dr Joanne Shaw
Priority Area	Health Economics

Lili Yuen

Ethnic differences in women with gestational diabetes mellitus

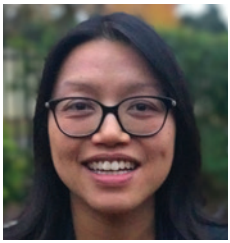
Gestational Diabetes Mellitus (GDM) is a condition that is affecting increasingly more women in pregnancy in Australia. It is estimated to affect between 5-10% of pregnancies, but certain ethnicities (such as South Asian, Indigenous, Polynesian, Middle Eastern, Asian) are at higher risk for the condition which can lead to poor foetal and maternal outcomes such as the birth of large babies, stillbirths and higher birth complication rates.

From preliminary data of the Greater Western Sydney population, it appears that overall the Gestational Diabetes Mellitus rates are higher due to a more culturally and ethnically diverse population.

The research will study the ethnic differences in women affected with Gestational Diabetes Mellitus, focusing on the differences between European women and those from two ethnicities highly represented in Greater Western Sydney: the Polynesian and South Asian populations.

The project aims to compare the prevalence of Gestational Diabetes Mellitus among the various ethnicities represented in Greater Western Sydney and to derive meaningful conclusions from epidemiological data collected in the region.

Furthermore, the project aims to examine how different insulin and leptin resistance changes over the course of pregnancy among different ethnicities and to describe the different biochemical and metabolic characteristics that cause or contribute to these differences. This can then translate into improving Gestational Diabetes Mellitus pregnancy outcomes across all ethnicities and drive policy development to focus on factors that can improve obstetric outcomes and prevent post pregnancy diabetes development in patients with Gestational Diabetes Mellitus.



Candidate	Lili Yuen
Host University	Western Sydney University
Partner Organisation	South Western Sydney Local Health District
PhD Supervisor	Professor David Simmons
Priority Area	Epidemiology

Patricia Zajaczkowski

Distribution of various protozoan parasites and Giardia genotypes, and the associated clinical symptoms and antimicrobial resistance patterns in hospitalised patients in NSW

The proposed project will aim to determine the number of infections that are caused by various protozoan parasites in NSW (including Giardiasis, Cryptosporidiosis, Blastocystis, Dientamoebiasis and Amebiasis) and will determine the pathogenicity of these illnesses.

The second stage of the PhD project will concentrate on the infectious protozoan parasite Giardia intestinalis as it is one of the most important non-viral causes of human diarrhoea in Australia.

Little is known about the relationship between different Giardia genotypes and the presence or absence of symptoms as well as the drug susceptibility profile of the genetic assemblages.

The project will investigate the distribution of Giardia genotypes, associated clinical symptoms and antimicrobial resistance patterns in hospitalised patients.

Candidate	Patricia Zajaczkowski
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Partner Organisation	South Western Sydney Local Health District
PhD Supervisor	Professor John Ellis Dr Joel Barratt
Health Practitioner/ Policy Supervisor	Dr Stephanie M. Fletcher-Lartey
Priority Area	Epidemiology

Shiying Zheng

Novel mechanisms of Immune Thrombocytopenia (ITP)

Immune thrombocytopenia (ITP) is a serious bleeding disorder caused by damage to blood cells called platelets. It is a diverse and common disease, affecting both children and adults. This can be primarily due to one's unregulated immune system, or, alternatively, to a variety of reasons such as medications, autoimmune diseases, infections and cancers.

Many of the currently available therapies, for example, steroids, immunosuppressive drugs and removal of the spleen, can cause serious adverse effects. Some patients do not respond to any of these treatments and there are no available options. ITP can lead to uncontrollable bleeding, which can be fatal. Both the disease and treatments can severely affect patients' quality of life.

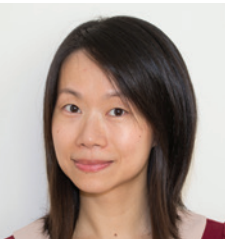
In ITP, platelet destruction is caused by antibodies produced in the body which attack the body's own platelets. Platelets are usually destroyed in the spleen, but this does not happen in all patients.

This project will elucidate other ways of how these antibodies destroy platelets and what can be done to stop it. Two mechanisms will be explored:

1. Decrease in platelet life span (called apoptosis); and
2. Removal of sugars from the platelet surface (called desialylation).

Analysis will be carried out in the laboratory and in a mouse model of ITP. New ITP medications to stop platelet destruction via these processes will also be studied.

The characterisation of these mechanisms has significant clinical implications. The disease will be better understood. It will guide the development of newer diagnostic tests and superior treatments for ITP. The clinical practice will be changed. The discovery of a new treatment will particularly benefit patients who do not respond to the currently available therapies.



Candidate	Shiying Zheng
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Priority Area	Translational research