

RBWH

TWENTY

20

RESEARCH REPORT

Metro North  
Health



Queensland  
Government

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## Executive Director's Message



2020 was certainly a challenging year with the COVID-19 pandemic response requiring us to rethink and redesign almost every component of our services across Royal Brisbane and Women's Hospital.

Not only have we maintained our focus on our core research priorities (some would argue that they are our responsibilities), but we have rapidly shifted to accommodate the thirst for knowledge around the optimal pandemic response. It has been particularly impressive to see the growing confidence in qualitative research as we seek to understand the impact of the rapid changes on our patient experience and outcomes but also on ourselves.

A huge thank you to Merrilyn Banks for her exceptional work as RBWH Executive Director Research over the past three years. She leaves behind a legacy of streamlined governance that ensures we continue to entice enquiring minds to formalise and test their hypotheses.

World class organisations are defined by the ability to see challenges as opportunities, and this report certainly justifies our continued inclusion in the International Top 100 Hospitals list (Newsweek, 2020).

**David Rosengren**  
Executive Director  
Royal Brisbane and Women's Hospital

## RBWH Foundation

The year 2020 is one that will undoubtedly remain etched in global memories for generations to come. Facing an international pandemic has tested every level of our community in ways we could not imagine.

But the resounding theme, which became clearly apparent over the past year, is the trust and faith placed in medical and clinician-led research during major health crises.

Royal Brisbane and Women's Hospital (RBWH) Foundation's role, since it was established in 1985, has been to engage with donors, the corporate sector, Government and the general public to garner support and raise funds for ground-breaking medical and clinician research, education and patient care.

Research has always been one of RBWH Foundation's key priorities. We believe the outcomes of research can be far-reaching, benefiting not only the individual patient and their families, but potentially the health system and community at large.

It was with immense pride that RBWH Foundation was able to rapidly activate our donor and corporate relationships to establish the Coronavirus Action Fund in March 2020. This international campaign raised almost \$5.8 million and ensured RBWH's best and brightest minds were sufficiently resourced to participate in global COVID-19 research.

Through the Coronavirus Action Fund, RBWH plays a major role in the Australasian COVID-19 Trial (ASCOT ADAPT). RBWH Infectious Diseases experts are on the ASCOT ADAPT Trial Steering Committee and RBWH plays a vital role in enrolling patients in the trial and acting as the Australian-New Zealand medication distribution centre through the RBWH Pharmacy Department.

The Coronavirus Action Fund has also supported significant clinician-led research projects within RBWH assessing national and local changes to the delivery of patient care during COVID-19 restrictions including the development of a new low-cost rapid COVID-19 test and research into the mental health challenges faced by health care workers during the pandemic.

These investments were part of a record distribution for RBWH Foundation of \$9,312,091 in 2019-2020, despite major challenges faced by event cancellation due to COVID-19 restrictions and lockdowns.

The 2019-2020 financial year marked a major turning point for RBWH Foundation with a \$5 million contribution to the Herston Biofabrication Institute, the largest investment in Foundation history. Biofabrication is a new frontier in medical and clinician-led research and symbolises RBWH Foundation's mission to support healthcare innovation at all levels.

Clinician-led research remains a high priority for RBWH Foundation and this year we were delighted to support 31 Clinician Research Grants, 10 Medical and Allied Health Fellowships and 15 Funded Research Positions. Research can take years of commitment and dedication, and RBWH Foundation is proud to foster an environment that has enabled first-time grant recipients to become leaders in their areas of expertise.

RBWH Foundation funded research has not only changed health practice internationally, but also enables our patients to be involved in the latest therapies and diagnostics and provides access to the newest medicines and best models of care.

The past twelve months have also seen significant investment in new medical equipment including mammographic units and simulation mannequins for nurse training.

Our hospital and patient care programs are a point of pride and delivered a range of services including support for young people and Aboriginal and Torres Strait Islander patients facing mental health issues, patient lounge renovations, the Stairwell Project which provides live music to patients and visitors, and therapy dogs.

RBWH Foundation remains indebted to the incredible RBWH staff for support of our inaugural Royal Giving Day in November 2019, the generosity of donors, corporate sponsors and the individuals who honour the Foundation with Gifts in Wills.

With this incredible level of philanthropic support, RBWH Foundation can continue to provide the level of support which has assisted RBWH remain one of the Top 100 Hospitals in the World (Newsweek).

**Simone Garske**  
Chief Executive Officer  
RBWH Foundation

# Successful PHD Candidates in 2020

## Allied Health Professionals

Dr Michelle Cottrell	<p><b>PhD Title:</b> Evaluating the impact of a telerehabilitation model of care in an orthopaedic physiotherapy-led screening clinic &amp; multidisciplinary service</p> <p><b>Month Completed:</b> March 2020</p> <p><b>Affiliated University:</b> University of Queensland</p> <p><b>Summary:</b> Chronic musculoskeletal conditions are a leading cause of global morbidity and affect one-third of Australian adults. Access to evidence-based, first-line interventions can be difficult, particularly for those residing outside metropolitan regions. Telerehabilitation is a potential solution to many access barriers. This thesis involves a series of studies, embedded within an implementation science framework, investigating the development, implementation and evaluation of a multidisciplinary telerehabilitation service for individuals with chronic musculoskeletal conditions. Outcomes highlight the opportunity to re-design traditional models of care to adopt telerehabilitation as part of standard clinical practice in order to improve equitable access to clinical relevant treatment services.</p>
Dr Yvette Forbes	<p><b>PhD Title:</b> The effect of self-compassion on Internalised Weight-based stigma</p> <p><b>Month Completed:</b> July 2020</p> <p><b>Affiliated University:</b> Griffith University</p> <p><b>Summary:</b> The PhD conducted by Dr Yvette Forbes was conferred by Griffith University in 2020. It comprised a series of empirical studies merging fields of self-compassion and weight stigma research. Study 1 investigated self-compassion and internalised weight stigma as potential mediators in the relationship between external weight stigma and related outcomes. Findings indicated that self-compassion mediated the relationship between external weight stigma and psychological distress, loneliness and satisfaction with life, while internalised weight stigma mediated the relationship between external weight stigma and body shame. Study 2 involved the development of a 2-day Compassion-Focused Therapy based group program, designed to increase self-compassion and reduce internalised weight stigma. Study 3 involved a pilot study designed to examine the feasibility/acceptability of the program for a group of women with overweight and obesity. Statistically significant improvements were found from pre- to post-treatment for self-compassion and internalised weight stigma, with gains maintained at 3-months follow up. Significant improvements were also found at post-intervention for outcomes of psychological distress, life satisfaction, loneliness, eating self-efficacy, body dissatisfaction. Findings also indicated a non-significant trend of mean group weight loss from pre-treatment to 3-month follow-up. The program was rated as highly credible among group members. This compendium of three studies provided preliminary evidence for a CFT based group program as a promising strategy through which to alleviate the painful effects of weight stigma.</p>

## Successful PHD Candidates in 2020

### Allied Health Professionals (cont)

Dr Laura Moroney	<p><b>PhD Title:</b> “Dysphagia and related toxicity in patients with head and neck cancer receiving helical intensity modulated radiotherapy +/- chemotherapy: Implications for speech pathology management</p> <p><b>Month Completed:</b> January 2020</p> <p><b>Affiliated University:</b> The University of Queensland</p> <p><b>Summary:</b> New conformal radiotherapy techniques have the potential to reduce common symptoms such as dysphagia (swallowing disorder) experienced by patients with head and neck cancer (HNC). This thesis examined the incidence and severity of dysphagia and related toxicities of patients with HNC cancer undergoing (H-IMRT) +/- chemotherapy to inform speech pathology management practices. Four studies were conducted. Firstly, a prospective study examined a heterogenous group with mixed tumour sites and stages. From this, two subgroups of patients were then examined: those at ‘high-risk’ and ‘low risk’ of experiencing dysphagia. Results confirmed that despite treatment advances, patients in the ‘high risk’ group ‘should be prioritised for intensive speech pathology support. Outcomes from the ‘low risk’ group identified the opportunity to develop new model of care. A final study evaluated the implementation of a new interdisciplinary service for ‘low risk’ patients and confirmed its clinical safety, cost benefits, and service efficiency.</p>
Dr Leisa Turkington	<p><b>PhD Title:</b> “Carbonation as a sensory enhancement strategy: Evidence for clinical implementation</p> <p><b>Month Completed:</b> March 2020</p> <p><b>Affiliated University:</b> The University of Queensland</p> <p><b>Summary:</b> While sensory enhancement strategies (SES) are sometimes used as an option to help reduce severity and improve swallow safety for individuals with dysphagia (swallowing disorder), more systematic research is needed within the clinical setting to understand the impact of SES, particularly carbonation, on swallowing symptoms. This thesis involved four studies. Firstly, a narrative synthesis of existing evidence related to the use of carbonated liquid as an SES for dysphagia which highlighted the lack of clear direction for its clinical use. A subsequent qualitative study then informed a prospective cohort study with examined the efficacy of using carbonated liquids to reduce the symptoms of neurogenic dysphagia during videofluoroscopic swallow studies. A final study examined the taste intensity, palatability, effervescence, and sip volumes in a healthy cohort. Overall, this body of work provided further evidence and understanding in the use of carbonation as a SES for individuals with neurogenic dysphagia and implications for its use in clinical practice.</p>

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## Successful PHD Candidates in 2020

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### Cancer Care Services

Dr Elizabeth Ahern

**PhD Title:** Targeting RANK/RANKL in combination immunotherapy using murine and translational models of melanoma, prostate and other solid organ malignancies.

**Month Completed:** Dec 2020

**Affiliated University:** University of Queensland

**Summary:** Immunotherapy has transformed the treatment of various cancers but the benefits are currently limited to a minority of cancer patients owing mainly to primary immunotherapy resistance, therefore new treatments are needed. In this thesis I explored the repurposing of denosumab, an inhibitor of Receptor Activation of NF- $\kappa$ B (RANK) Ligand (RANKL), as a potential effective combinatorial partner in immunotherapy. I showed that combinations of RANKL blockade with various immune checkpoint inhibitors (ICI) result in superior anti-tumor outcomes in mouse models of cancer, and an immunological mechanism of action was elucidated. Real-world data on efficacy of concomitant denosumab and ICI was presented and a protocol for a novel trial in neoadjuvant immunotherapy of lung cancer with denosumab was developed. In summary, the findings presented in this thesis contribute to knowledge of the role of RANKL/RANK in tumor immunity and present a rationale and platform for the assessment of combination RANKL inhibition concurrently with ICI in patients with cancer.

Dr Rahul Ladwa

**PhD Title:** Predictors of dosimetry and response to peptide receptor radionuclide therapy

**Month Completed:** April 2020

**Affiliated University:** University of Queensland

**Summary:** Neuroendocrine tumours are rare tumours of the nerves and hormone system in the body affecting small bowel and pancreas predominantly. Their management involves radionuclide therapy which utilises intravenous injections of radiation particles called  $^{177}\text{Lu}$  that target the tumour cells to slow their growth. The aim is to evaluate the correlation between PET imaging and the dose-response relationship of targeted radionuclide therapy, a therapy administered to patients with advanced neuroendocrine tumours. From the knowledge received we will be better at selecting patients who respond to this targeted treatment.

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## Successful PHD Candidates in 2020

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### Internal Medicine

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Dr Karen Davies	<p><b>PhD Title:</b> Design, and validation and testing of a nursing administration assessment and evaluation tool</p> <p><b>Month Completed:</b> July 2020</p> <p><b>Affiliated University:</b> The University of Queensland</p> <p><b>Summary:</b> The purpose of this thesis was to design and test the reliability, utility, and acceptability of a medication administration evaluation and feedback tool (MAEFT). The development of the MAEFT included Phase One, the design using an expert multidisciplinary panel and Phase Two, testing in both simulated and clinical environments with longitudinal follow up. Results showed the designed MAEFT demonstrated reliability in a simulated and clinical environment. Nurses and observers found the process positive, useful and evaluated the nurse's usual medication administration practice. The thesis demonstrated the MAEFT is a useful assessment tool for nurses' compliance with medication administration practice standards.</p>
Dr Molly Milazi	<p><b>PhD Title:</b> A Bundled Phosphate Control Intervention (4Ds) for Adults with End Stage Kidney Disease Receiving Haemodialysis: A Cluster Randomised Controlled Trial</p> <p><b>Month Completed:</b> April 2020</p> <p><b>Affiliated University:</b> Queensland University of Technology</p> <p><b>Summary:</b> Hyperphosphataemia occurs in end-stage kidney disease and is managed by diet, drinks, drugs, and dialysis. Adherence to the 4Ds is challenging for patients. This thesis reports a pragmatic randomised controlled trial that evaluated the effectiveness of an innovative educational intervention "Taking control of your phosphate with the 4Ds" to improve adherence to phosphate control in adults receiving haemodialysis. The 4Ds, a bundled self-management intervention, was effective in improving patient's confidence about phosphate control methods. Importantly, the intervention was brief and feasible for nurses to deliver during haemodialysis treatment.</p>
Ms Pauline Nicholas	<p><b>PhD Title:</b> Impaired Cognition in End Stage Kidney Disease: Prevalence, Predictors and Differences Between Treatments</p> <p><b>Month Completed:</b> September 2020</p> <p><b>Affiliated University:</b> Queensland University of Technology</p> <p><b>Summary:</b> This thesis assessed cognitive impairment in people with end stage kidney disease. It found that over a third were cognitively impaired. More than half of those who had not yet started kidney replacement treatment and those already receiving haemodialysis were more likely than other groups to be cognitively impaired. The implications from these findings will influence people being able to make informed decisions about their healthcare, and that changes for patient education ought to occur due to altered levels of understanding.</p>



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## Successful PHD Candidates in 2020

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### Internal Medicine Services (cont)

A/Prof Sandhir Prasad

**PhD Title:** Diastolic dysfunction following myocardial infarction: pathophysiology and clinical consequences

**Month Completed:** August 2020

**Affiliated University:** University of Queensland

**Summary:** Left ventricular diastolic dysfunction is a powerful predictor of survival following myocardial infarction (MI) and forms an essential component of clinical echocardiography. This research program adopted a comprehensive 'bench to bedside' approach to a number of unresolved questions regarding diastolic dysfunction following MI. In a series of seven inter-related original studies, we examined basic pathophysiological inter-relationships (between infarct size and left ventricular diastolic dysfunction), haemodynamic correlations (between invasively measured left ventricular filling pressures and echocardiographic variables) and the prognostic implications of diastolic dysfunction in 472 consecutive patients following MI. The prognostic value of contemporary diastolic dysfunction guidelines was validated, prognostic data for a novel diastolic parameter (minimal left atrial volume) were presented, and a novel risk score for predicting all-cause mortality was developed and validated.

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### Critical Care and Clinical Support Services

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Gabrielle Simonova

**PhD Title:** Effect of storage conditions and duration on the clinical effect of platelet and red blood cell transfusion

**Month Completed:** November 2020

**Affiliated University:** The University of Queensland

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## Successful PHD Candidates in 2020

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### Critical Care and Clinical Support Services (cont)

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Professor Kevin Laupland	<p><b>PhD Title:</b> Distribution, determinants, and outcome of community onset bloodstream infections</p> <p><b>Month Completed:</b> October 2020</p> <p><b>Affiliated University:</b> Griffith University</p> <p><b>Summary:</b> Bloodstream infection (BSI) is a serious condition that causes major human suffering and death. Knowledge of the epidemiology of BSI, including its distribution, determinants, and outcomes is important to establish research and healthcare funding priorities and to design interventions to reduce its adverse impact. Overall, the thesis in context with the body of published literature argue that population-based surveillance methodologies are optimal means to define the epidemiology of an infectious disease. Despite this, several factors may threaten their validity and require appraisal. This work demonstrates the value of population-based surveillance in evaluating the distribution and determinants of community-onset BSI and highlights the need for rigorous critical appraisal in the establishment of the epidemiology of an infectious disease.</p>
Dr Martha Druery	<p><b>PhD Title:</b> Quality of life outcomes post-major burn injuries in adults – a longitudinal exploratory study</p> <p><b>Month Completed:</b> September 2020</p> <p><b>Affiliated University:</b> The University of Queensland</p>

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## Successful PHD Candidates in 2020

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### Mental Health Services

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Ji Hyun Julia Yang

**PhD Title:** Markers and mechanisms of mild cognitive impairment in Parkinson's disease

**Month Completed:** September 2020

**Affiliated University:** The University of Queensland

**Summary:** Parkinson's disease (PD) is widely recognised as a movement disorder, although non-motor symptoms such as cognitive dysfunction detrimentally impact PD patients' quality of life and contribute to a high disease burden. PD patients with mild cognitive impairment (MCI) are at greater risk of developing dementia than PD patients without MCI (PD-NC). The overall goal of this thesis was to understand the diverse characteristics of MCI in PD (PD-MCI) and identify markers for PD-MCI by undertaking resting state and cognitive task-based functional magnetic resonance imaging (fMRI). Overall, increased brain activation was observed during task-dependent and resting state fMRI in patients with PD-MCI compared to PD-NC and HC. This may reflect a compensatory mechanism in PD-MCI suggesting the brain is recruiting additional regions, possibly due to inefficient activation. Such compensatory mechanisms of brain activation outlined in this thesis can be used as possible markers to distinguish between patients with and without PD-MCI and may serve as early markers for PDD. This may extend our understanding of the neurobiology of pre-clinical PDD

### Surgical & Perioperative Services

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Dr Julie Lee

**PhD Title:** Rotational Thromboelastometry (ROTEM ®) in obstetrics: Baseline parameters in healthy women at term gestation.

**Month Completed:** December 2020

**Affiliated University:** UQ- Faculty of Health and Behavioural Sciences

**Summary:** ROTEM ® is a rapid and specific blood clotting test which has been recently introduced into RBWH. This is a rapid test in that results can be obtained within 10 minutes, compared with 30 to 60 minutes for the current standard clotting test. It is specific in that it further defines parameters to assist in deciding what blood products need to be given in the event of bleeding.

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## Successful PHD Candidates in 2020

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### Women's & Newborn Services

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Ms Abirami  
Ratnasingham

**PhD Title:** Long term consequences of altered neonatal adiposity

**Month Completed:** July 2020

**Affiliated University:** The University of Queensland

**Summary:** Early life factors such as birth weight are associated with childhood obesity but are more direct measures of metabolic status better predictors. This observational study in children aged 8-11 years old who had body composition analysis as infants found that increased risk of developing childhood obesity was associated with higher adiposity at 6 weeks old, higher maternal BMI, and earlier use of formula feeds. This allows identification of at-risk infants to enable timely intervention to prevent obesity before it develops. Interventions aimed at preconception maternal weight loss and continued exclusive breastfeeding after delivery may also reduce childhood obesity risk.

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