

Northern Health

RESEARCH REPORT 2020



Our Vision

A healthier community, making a difference for every person, every day.

Our Values



safe

We provide safe, trusted care for our patients.
We are inclusive and culturally safe, celebrating the diversity of our staff and community.



kind

We treat everyone with kindness, respect and empathy.
We provide patient-centred and compassionate care.



together

We work together with our staff, patients, consumers and health system partners.

Our Priorities

- A safe, positive patient experience
- A healthier community
- An innovative and sustainable future
- Enabled staff, empowered teams
- Engaged learners, inspired researchers



*Together, with
our community,
#WeAreNorthern*

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RESEARCH LEAD'S YEAR IN REVIEW

This year has demonstrated, like no other, the importance of research for advancing our society. Who could have imagined that only six months ago that we would be hosting Research Week 2020 as a purely virtual event as we continue to transition a large proportion of our services towards digital health via telehealth, in-hospital monitoring and home-based healthcare solutions. This has been spurred on in response to a global pandemic and underpinned by research and evaluation. Research will lead the way on our journey to a 'new normal' – new treatments and a potential vaccine will likely dominate headlines but it is the new ways of doing many of the things we have taken for granted that is already advancing healthcare, delivery and consumer-led experience.

It is proven that a health service which commits to, and nurtures, a research culture has happier and more satisfied staff and better patient outcomes. We should all be proud of the clinical care we deliver and strive to underpin this with education and research. This will ensure we evaluate and question everything we do, leading to continuous improvement in the way we deliver trusted care to our community and, importantly, educate our staff and our students, Northern Health's workforce of the future.

Despite the challenges that COVID-19 presents, we continue to expand our research portfolio thanks to the extraordinarily dedicated staff in our research team. The response to fast-track ethics and governance approvals for COVID-19 related research has recognised the importance of not losing focus on non-COVID-19

research and helping facilitate opportunities that will shape the 'post COVID-19' world in which we will continue to meet our mission of a healthier community, making a difference for every person, every day.

The events during Research Week 2020 have been organised in a very different way with virtual presentations, posters, guest speakers and workshops. They will highlight the quality of research occurring across the spectrum that are being driven by an increasing number of our Northern Health staff. Highlighted is the increasing volume of projects being conducted with our academic partners; Melbourne, La Trobe, RMIT and Swinburne Universities.

We are privileged to have an exciting range of speakers at this year's Research Week. They will encourage us to reflect upon our current practices and challenge us to explore how we can rise above the increasing demands we will continue to face. Future service challenges are not to be underestimated, but by reviewing and evaluating what we do, and how we do it, we will have the opportunity to change things for the better and to deliver trusted care for our community, now and into the future.

Research at Northern Health is not just about Research Week, and here are just a few of the highlights during the year:

- Our Research Leads, Divisional Directors and Principle Investigators led a phenomenal response to keep our community safe in developing and enacting

contingency plans for all research projects and clinical trials throughout the pandemic. We are grateful to all staff who helped support these activities.

- Our Low Risk Human Research Ethics Committee celebrated its first-year anniversary back at Northern Health. Chaired by Professor Bill van Gaal, the adaptability, flexibility and support this team has provided to streamline applications during this dynamic period has been exceptional.
- RedCAP went live as a tool for our researchers to use greatly enhancing data capture and analysis.
- The 2nd annual *Digital Health Futures @ Northern* event brought together expertise from around the globe including Finland, India and the United States.
- Associate Professor Lisa Hui was awarded a \$1.28m Medical Research Future Fund (MRFF) investigator grant for her project 'closing the critical knowledge gaps in perinatal genomics'.
- The recruitment of Adam Semciw, Associate Professor of Allied Health Jointly appointed with La Trobe, Adam has in partnership with Dr Rebecca Jessup significantly increased support and provided leadership across the various disciplines. Together they have established the Allied Health Research Clinic to help enhance research across Allied Health.
- Research Grand Rounds are now running weekly and have been successful in stimulating research discussions. Guests to date include Tilman Ruff, Terry

Nolan, Malcolm Dobbin, Liam Caffery, Helen Haydon, Doug Crompton, Darren Lowen, Zoe Wainer and Marie Bismark. Keep an eye out for more events to come.

- Two new PhD scholarships were awarded to Natali Cvetanovska and Dr Julie Wang, and \$50,000 worth of Small Research Grants were awarded to researchers thanks to the generosity of the Northern Health Foundation and our community donors.
- The growth of clinical trials with a focus on good governance and rapid response. These included Oncology, Cardiology, Anaesthetics, Intensive Care, Paediatrics, Obstetrics and Surgery. Industry sponsored and investigator-led studies offer our community access to new and novel therapies they may not have otherwise been accessible.
- The expansion of Diagnostic Services which not only undertakes their own research but also underpins many other trials and research projects across the organisation. They continue develop strong research links with other laboratories across Melbourne.
- The ever increasing growth of opportunities for simulation research under the leadership of Dr Nancy Sadka and Mr Krinal Mori.

- Appointing our first research midwife, Eleanor Johnson, to support the newly created Reproductive Health Biobank led by Associate Professor Lisa Hui. Lisa is Chief Investigator on an important collaborative project monitoring outcomes of mother and babies during the pandemic.
- Participation in a number of COVID-19 research activities and clinical trials under the stewardship of Associate Professor Craig Aboltins and Dr Angaj Ghosh. These include ASCOT, CHARTER, SPRINT-SARI and participating in our first phase I study evaluating a protection device for our clinical staff caring for unwell patients in ICU.
- The *NHMRC Centre of Research Excellence in Interactive Digital Technology to Transform Chronic Disease Outcomes* launched officially in 2020. Directed by Professor Brian Oldenburg from the Melbourne School of Population and Global Health and co-directed by Professor Vas Kostakos from the School of Computing & Information Systems, this Centre aims to transform Australia's digital health ecosystem by undertaking research that will leverage the ubiquitous availability of smart devices and digital technology to improve the health and wellbeing of people with chronic conditions.

- Our close involvement with the Melbourne Academic Centre for Health (MACH) with various special interest groups and the financial support provided to seed a variety of projects.

We can only speculate on the future but what is clear is that research will always be key to getting us there. Funding for research is always competitive and we are grateful of the continuing support that is provided by the Northern Health Foundation.

Our staff and community should be proud of the research contributions in what has been an extraordinary year. Congratulations and thank you to all who have contributed to research at Northern Health.

Professor Peter Brooks AM

Research Lead – Northern Health





NORTHERN HEALTH'S RESEARCH TEAM

Major Achievements

2020 began with a series of workshops gathering feedback for the *Northern Health Research Strategy 2020 – 2025*. What wasn't expected was a requirement for some fast and flexible thinking to adapt research and clinical trials during a pandemic. Northern Health's vision of a *healthier community, making a difference for every person, every day* was put to the test for all areas of the health service. The research team provided leadership amongst Northern Health researchers to keep abreast with the quickly evolving regulatory guidance and provide a framework for researchers to implement changes to their protocols to ensure safe management of research participants and the staff who supervise them.

A new virus in our community means a requirement of knowledge to understand, manage and treat our patients. Northern Health's research team has been instrumental in the set up and running of the *ASCOT*, *SPRINT-SARI*, *CHARTER* and participating in our first phase I study which is evaluating a protection device for our clinical staff caring for unwell patients in ICU. Because of this, our community now has access to therapies that may support their recovery and has provided opportunities for unprecedented collaboration and support across the health service.

Our Low Risk Ethics Committee has experienced a successful first year operating in-house within Northern Health. It reviewed 46 projects across various departments leading to exceptional research at Northern Health.

The LREC has assisted researchers to adapt and continue undertaking research projects in light of the COVID-19 pandemic. The organisation has been actively involved in facilitating these research projects such as the org wide surveys conducted into the mental health of healthcare workers amidst the pandemic allowing us to provide better outcomes for staff and patients.

Mark Tacey our biostatistician has provided assistance to clinicians and researchers

for over 200 studies. His input and guidance includes advice on study design, sample size estimation, conduct of statistical analysis, development of results and content for journal articles. Mark provides training relating to clinical data collection, introductions to study design and sample size estimation, and introductions to statistical analysis using various software. A large focus was placed this year on transitioning these learning sessions into digital formats.

Just some of the projects that benefitted from biostatistical support included:

- Voluntary Assisted Dying survey exploring staff perspectives
- Health Independent Program evaluation
- End of Life Care Plan evaluation
- *Step On Sepsis* audit
- Evaluation of the mortality review process
- Comprehensive Assessment and Risk Evaluation (C.A.R.E.) Record evaluation
- Optical Coherence Tomography plaque progression analysis
- Eccentric randomised controlled trial assessing the effectiveness of an exercise program on quality of life and function in people with chronic heart failure
- Hip fracture study assessing longitudinal changes in physical activity levels and fear of falling after hip fracture
- Anaphylaxis in the Emergency Department analysis
- Laparoscopic inguinal hernia repair randomised controlled trial

The Team

- Simone Said
- Damian Cresp
- Elizabeth Buckley
- Abi Arulanandarajah
- Lynda Harrison
- Hala Mehdi
- Natali Cvetanovska
- Michael Kirk
- Brittany Szabo
- Anita Malik
- Mark Tacey
- Peter Brooks
- Jingfei Wu
- Amina Khayre
- Rebecca Jessup

Publications

Jessup R, Tacey M, Glynn M, Kirk M, McKeown L. *Evaluation of the effectiveness of a comprehensive care plan to reduce hospital acquired complications in an Australian hospital: protocol for a mixed-method pre-implementation and postimplementation study.* BMJ Open, July 2020, 10 (7):e034121.

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'Global coagulation assays in patients with multiple myeloma and monoclonal gammopathy of unknown significance.' Thrombosis research, November 2019, Vol.183, pp.45-48.

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Wightman A, Barlis P, Macbain M, Hodgson L, Cheng L, Gocuk S, Hayat U, Chow D, Tacey M, Hutchinson A, Colville D, Lamoureux E, Savige, J. *'Small vessel disease and intracoronary plaque composition: a single centre cross-sectional observational study.'* Scientific reports, 12 2019, Vol.9 (1), pp.4215.

Ali, F, Tacey M, Lykopandis N, Colville D, Lamoureux E, Wong TY, Vangaal W, Hutchinson A, Savige J. *'Microvascular narrowing and BP monitoring: A single centre observational study.'* PloS one, 2019, Vol.14 (3), pp.e0210625.



DR REBECCA JESSUP

“I am inspired by all the unanswered questions and the problems to be solved and by the possibility that by answering these, we may change the way we provide care and lead to better outcomes for our northern community”

#inspired
researcher

Northern Health

ALLIED HEALTH AND PHARMACY



Major Achievements

Northern Health Small Research Grant Success

Congratulations to Belinda Baines (Podiatry, \$3,550), Dr Matthew Cotchett (Podiatry, \$4,918), Angela McLoughlan (Occupational Therapy, \$2000) and Dr Rebecca Jessup (Allied Health Research, \$4,800) who secured four Northern Health Foundation Small Research Grants in 2020, totalling more than \$15,000 in funding. This is a fantastic achievement and demonstrates the positive contribution and direction of future research initiatives within Allied Health.

Appointment of Associate Professor Adam Semciw

In 2020, Dr Adam Semciw joined Northern Health as Associate Professor of Allied Health. This conjoint position between La Trobe University and Northern Health augments the role of the Allied Health Research Lead Dr Rebecca Jessup and cements the academic and research partnership between our organisations. Dr Semciw brings more than ten years of experience in research, over sixty peer reviewed journal publications (fourteen in 2020) and has supervised five higher degree (PhD, Masters & Professional Doctorate) clinician researchers through to completion. Adam and Rebecca are here to 'support, promote and do' allied health research.

Establishment of the Allied Health Research Clinic

The Allied Health Research Clinic was launched in March and received high interest. The clinic provides a dedicated time and place where allied health clinicians are supported through refining a research question, negotiating ethics applications, advice regarding data analysis and dissemination. The clinic is led by Dr Semciw and Dr Jessup, Biostatistician Mark Tacey and Research Governance Officer Jingfei Wu. To date we've hosted ten clinic consultations and will continue to officially evaluate the clinic over the next few years.

Key Research Areas

- Clinician researcher capacity
- Health literacy and health communication
- Evaluating new or alternative models of health care

The Team

- Dr Adam Semciw
- Dr Rebecca Jessup
- Cassandra Bramston

PhD Students

- Edmund Leahy (Western Sydney University): *'Best practice for physiotherapy professional development'*
- Hazel Heng (La Trobe University): *'Reducing falls in hospital: Enabling clinicians'*
- Caitlin Farmer (Monash University): *'Optimising the requesting and reporting of imaging of the lumbar spine in people with low back pain'*
- Natali Cvetanovska (Monash University): *'Patient initiated teach back to overcome low health literacy and improve recall and retention of health information'*

Masters Students

- Carrie McCallum (Newcastle University): *'Role in inpatient rehabilitation with moderate to severe acquired brain injury'*

Key Research Projects

Adam Semciw	Research Confidence, interest and experience among allied health professionals
Adam Semciw	An allied health research clinic evaluation
Anastasia Pourliakis	Investigating the Feasibility of Running A Group-Based Psycho-Oncology Program to Reduce Service Wait-Times and Relieve Psychological Distress Post-Diagnosis of Cancer.
Ange Mcloughlan	Staff attitudes to using technology to support evidence based medicine and virtual care delivery
Angela Menegazzo	Exploring the barriers to patients completing therapist-prescribed, self-directed, homebased occupational therapy interventions post stroke: A patients' perspective.

Anna Connolly	Factors associated with Assistive Technology prescription and acceptance in Motor Neurone Disease
Belinda Baines	The association between toe-brachial indices and haemodialysis in patients with End Stage Kidney Disease
Caitlin Farmer	What is the relationship between back pain beliefs, health literacy and presentation to the Emergency Department with low back pain?
Edmund Leahy	Effect of metabolic syndrome on clinical and health service outcomes for people with osteoarthritis
Hazel Heng	Preventing hospital falls: a qualitative analysis of the views of patients and clinicians on how to minimise risk
Justine Slattery	Multidisciplinary Feeding Clinic Pathways
Matthew Cotchett	STEP (Supported patient education for heel pain)
Matthew Cotchett	Management of plantar heel pain: a best practice guide synthesising systematic review with expert clinical reasoning and patient values
Matthew Cotchett	The experience of living with hallux valgus: a qualitative exploration of treatment beliefs, needs and expectations
Nadia Obeid	Malnutrition Point Prevalence Study 2020
Nadia Obeid	Investigating the safety of a Low Calorie Diet using Optifast as a method of weight loss in obese patients receiving dialysis therapy
Rachael Evans	Investigation of on-site food purchasing behaviour and attitudes at Northern Hospital
Rebecca Jessup	Development of an optimal model of care for early supported discharge for people with lower extremity conditions: a co-design study
Rebecca Jessup	Evaluation of the effectiveness of a comprehensive care plan to address national standards and reduce hospital acquired complications in an Australian hospital

Rebecca Jessup	Use of the iCOPE interactive digital perinatal screening platform to improve perinatal screening and referral: a pilot at Northern Health
Rebecca Jessup	How do health consumers interpret and apply health information during a pandemic? : a two-phase qualitative study
Rebecca Jessup	Teach back for consumers: online education module
Rebecca Jessup	Setting health service research priorities: a three step participatory process
Rebecca Lamont	"This could make life a lot easier!" - People with MND and Clinician perspectives of acceptance and use of assistive technology and life prolonging interventions
Rebecca Withers	Pressure reducing characteristics of offloading devices commonly used to manage diabetes-related foot ulceration
Renee Catton	Pilot and evaluation of occupational based activity groups designed to improve overall wellbeing of older patients in a hospital setting.
Tara Breheny	To investigate plate waste, barriers to adequate food and fluid intake and thickened fluid preferences of inpatients managed on texture modified fluid diet codes.
Tara Breheny	To investigate physical and organisational barriers to meal consumption and the degree of plate waste on a subacute ward at Northern Health
Tina Aboltins	Victorian ICUs' Nutrition Practices Survey
Vanessa Greenberg	Improving Speech Pathology Intervention for Culturally and Linguistically Diverse Persons with Aphasia

'Factors associated with Assistive Technology prescription and acceptance in Motor Neurone Disease': Anna Connolly

The needs of people with MND (pMND) evolve and change as the disease progresses, with a critical issue predicting when and what assistive technology (AT) is required to facilitate appropriate care, and early implementation of these interventions. Due to extensive wait times for AT in some funding streams, these applications need to be made much earlier in the disease progression than required. Considering the differing patterns of acceptance of AT and life prolonging interventions by pMND, clinicians would benefit from guidance around: when, how, how often and the terminology to use in discussions about these interventions for person-centred care. The multidisciplinary Northern Health Progressive Neurological Diseases team provide specialised services to the MND population in the Melbourne's Northern suburbs. To support clinicians in providing timely intervention and maximise outcomes for pMND; we aimed to evaluate when and how it is most appropriate to introduce different types of AT and life prolonging interventions, and perspectives on acceptance of these. We conducted qualitative interviews and theme analysis from pMND and Clinicians. Our research results will have direct implications on how, what and when AT and life prolonging intervention needs are discussed with pMND to reduce wait times. This will assist clinicians with applications, future planning and advocacy work. It will also guide clinicians to understand the perspectives of pMND toward these interventions and be mindful with their practice or approach to ensure optimal independence, access to community, dignity, safety and improve quality of life.

'Accessing, interpreting and applying health information during a pandemic': Dr Rebecca Jessup

The coronavirus pandemic (COVID-19) has required consumers to find and apply health and behaviour information rapidly, and to change the way they engage with health professionals. The internet is a primary source of information for many people. While offering benefits, information can also be hard to navigate, complex in nature, potentially untrustworthy and sometimes misleading. This is challenging for older people with multiple chronic conditions who have low levels of health literacy, and who now find themselves the most at risk of dying from COVID-19. The aim of this study is to understand how adults over 65 years with multiple co-morbidities access, interpret and use information to make healthcare and health behaviour decisions during COVID-19. Key findings will be used to co-design a series of interventions with patients and allied health clinicians, aimed at improving health literacy of vulnerable populations during pandemics.

Grants

Anastasia Pourliakis

Investigating the Feasibility of Running A Group-Based Psycho-Oncology Program to Reduce Service Wait-Times and Relieve Psychological Distress Post-Diagnosis of Cancer
NEMICS Service Improvement Grants - \$5,000

Dr Rebecca Jessup

Use of the iCOPE interactive digital perinatal screening platform to improve perinatal screening and referral: a pilot at Northern Health
Hume Whittlesea Primary Care Partnership - \$17,000

Caitlin Farmer

What is the relationship between back pain beliefs, health literacy and presentation to the Emergency Department with low back pain?
NH Small Research Grant - \$4,583

Belinda Baines

The association between toe brachial indices and haemodialysis in patients with chronic kidney disease
NH Small Research Grant - \$3,550

Angela McLaughlan

Embedding eHealth into routine practice: Investigating the technology readiness and ehealth literacy of the health professional workforce
NH Small Research Grant - \$2,000

Dr Rebecca Jessup

How do health consumers interpret and apply health information during a pandemic?
NH Small Research Grant - \$4,800

Dr Matthew Cotchett

The experience of living with hallux valgus: a qualitative exploration of treatment beliefs, needs and expectations
NH Small Research Grant - \$4,918

Dr Rebecca Jessup

How do health consumers interpret and apply health information during a pandemic?: a two-phase qualitative study
Hume Whittlesea - \$15,000

Dr Adam Semciw and Mr Anton Harms

Hip osteoarthritis and foot orthoses trial (HOOT): A randomised feasibility trial
La Trobe - \$20,000

Publications

Beagley J, Hlavac J, **Zucchi E**. Patient length of stay, patient readmission rates and the provision of professional interpreting services in healthcare in Australia. *Health and Social Care in the Community*. 2020;28 (5):1643-1650

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Ellis R, Holland AE, Dodd K, **Shields N**. Reliability of one-repetition maximum performance in people with chronic heart failure. *Disability and Rehabilitation*. 2019;41(14):1706-1710

Gilheany M, Edwards SR, **Cotchett M**. Capsular Interposition Arthroplasty With Percutaneous Suture Anchoring: A Pragmatic and Novel Surgical Technique for Hallux Rigidus. *Cureus*. 2020;12(6):e8556

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Heng H, Jazayeri D, Shaw L, Kiegaldie D, Hill AM, Morris ME. Hospital falls prevention with patient education: A scoping review. *BMC Geriatrics*. 2020;20(1)

Hislop AC, Collins NJ, Tucker K, Deasy M, **Semciw AI**. Does adding hip exercises to quadriceps exercises result in superior outcomes in pain, function and quality of life for people with knee osteoarthritis? A systematic review and meta-analysis. *Br J Sports Med*. 2020;54(5):263-271

Jessup, R.L., O'Connor, D.A., Putrik, P., Rischin, K., Nezon, J., Cyril, S., Shepperd, S., Buchbinder, R. Alternative service models for delivery of healthcare services in high-income countries: A scoping review of systematic reviews. *BMJ Open*. 2019;9(1)

Jessup RL, Tacey M, Glynn M, Kirk M, McKeown L. Evaluation of the effectiveness of a comprehensive care plan to reduce hospital acquired complications in an Australian hospital: Protocol for a mixed-method preimplementation and postimplementation study. *BMJ Open*. 2020;10(7)

Kemp, J.L., Mosler, A.B., Hart, H., Bizzini, M., Chang, S., Scholes, M.J., **Semciw, A.I.**, Crossley, K.M. Improving function in people with hip-related pain: a systematic review and meta-analysis of physiotherapist-led interventions for hip-related pain. *British Journal of Sports Medicine*. 2020;bjsports-2019-101690

Moore D, Pizzari T, McClelland J, **Semciw AI**. Rehabilitation Exercises for the Gluteus Medius Muscle Segments: An Electromyography Study. *J Sport Rehabil*. 2019:1-4

Moore D, **Semciw AI**, Wisbey-Roth T, Pizzari T. Adding hip rotation to therapeutic exercises can enhance gluteus medius and gluteus minimus segmental activity levels – An electromyography study. *Physical Therapy in Sport*. 2020;43:157-165

Morris, M.E., Ellis, T.D., Jazayeri, D., **Heng, H.**, Thomson, A., Balasundaram, A.P., Slade, S.C. Boxing for Parkinson's Disease: Has Implementation Accelerated Beyond Current Evidence? *Frontiers in Neurology*. 2019;10

Panayiotou, A., Hwang, K., Williams, S., Chong, T.W.H., LoGiudice, D., Haralambous, B., Lin, X., **Zucchi, E.**, Mascitti-Meuter, M., Goh, A.M.Y., You, E., Batchelor, F. The perceptions of translation apps for everyday health care in healthcare workers and older people: A multi-method study. *Journal of Clinical Nursing*. 2020;29(17-18):3516-3526

Shields N, van den Bos R, Buhler-Smith K, Prendergast L, Taylor N. A community-based exercise program to increase participation in physical activities among youth with disability: a feasibility study. *Disability and Rehabilitation*. 2019;41(10):1152-1159

Wilson M, Nickels M, Wadsworth B, Kruger P, **Semciw A**. Acute cervical spinal cord injury and extubation failure: A systematic review and meta-analysis. *Australian Critical Care*. 2020;33(1):97-105

Zacharias A, Pizzari T, **Semciw AI**, English DJ, Kapakoulakis T, Green RA. Gluteus medius and minimus activity during stepping tasks: Comparisons between people with hip osteoarthritis and matched control participants. *Gait and Posture*. 2020;80:339-346

Joyce K, Beauchamp A, **Jessup RL**, Staples M, Buchbinder R. (2020). The health literacy profile of clients attending a community rehabilitation program: A survey using the Health Literacy Questionnaire (HLQ). *Rehabilitation Research, Policy and Education* 2020 34(1), 31-45

Major DH, Røe Y, Grotle M, **Jessup RL, Farmer C**, Småstuen, MC, & Buchbinder R. Content reporting of exercise interventions in rotator cuff disease trials: results from application of the Consensus on Exercise Reporting Template (CERT). *BMJ Open Sport & Exercise Medicine*, 2019; 5(1)

Jessup RL, Oates MJ, Johnson R, Buchbinder R. (2019). Shockwave therapy for heel pain (plantar fasciitis) [Protocol] Cochrane Database of Systematic Reviews

Farmer CI, Bourne AM, O'Connor D, Jarvik JG, & Buchbinder R, Enhancing clinician and patient understanding of radiology reports: a scoping review of international guidelines. *Insights into Imaging*, 2020; 11, 1-10

Presentations & Abstracts

Barba S, Connolly A, Lamont R, Tu A. "This could make life a lot easier!" - People with MND and Clinician perspectives of acceptance and use of assistive technology and life prolonging interventions. International ALS/MND Symposium, Perth, Dec 2019

Connolly A, Barba S, Lamont R, Tu A. Factors associated with Assistive Technology prescription and acceptance in Motor Neurone Disease. Allied Professional Forum at ALS International Symposium, Perth, December 2019

HEALY, K. Referral and treatment of malnutrition in patients with inflammatory bowel disease (IBD) attending an IBD clinic in a metropolitan Australian hospital. Australian Gastroenterology Week, Adelaide, September 2019

Heng H. Patient education to prevent inpatient falls: A scoping review. 3rd GrassRoots Falls Festival Conference, Perth, September 2019

Leahy, E., Chipchase, L., Calo, M., Blackstock, F. Which learning activities enhance physiotherapy practice? Systematic review and meta-analysis. ANZAPHE, Canberra, July 2019 (Poster)

Leahy, E., Chipchase, L., Calo, M., Blackstock, F. Which learning activities enhance physiotherapy practice? Systematic review and meta-analysis. Victorian Allied Health Research Conference, Melbourne, March 2019

Mac Manus F, Yeung J, Hanna S, Francis A. Implementation of Orthotic Allied Health Assistant (AHA) Competency Package - Fit and Supply of Prefabricated Orthoses. AOPA Congress, October 2019

Future Research Goals

Support and cultivate clinician researcher capacity and promote translation and implementation of research in practice.

Northern Health

CANCER SERVICES



Major Achievements

The Haematology and Oncology trial team have combined to create the Cancer Services Clinical Trials Unit which focuses on increasing trial activity to increase our research profile and offer novel therapies to our patients. Our particular focus over the last five years has been on colorectal, gastric, breast, and haematological cancers including but not limited to Leukaemia (chronic and Acute), Lymphoma, Myelodysplasia and Multiple Myeloma. We are also going to further develop our trial focus on geriatric oncology/haematology, which is a key focus area of our service. We maintain a close referral network to other providers of cancer care in Melbourne, and Pharma companies in order to provide our patients with good access to experimental and emerging treatments for their cancer. We are in the process of developing comprehensive governance of Cancer Clinical Trials to set processes, Policies and procedures with the aim to promote Northern Health Cancer Clinical trials as a department that provides efficient and reliable clinical trial activity according to Good Clinical Practice.

Key Research Areas

- Haematological disorders and cancer
- Colorectal and gastric cancer
- Upper GI – pancreatic cancer
- Lung cancer

The Team

- Dr Prahlad Ho
- Dr Belinda Lee
- Dr Jennifer Mooi
- Dr Ainsley Campbell
- Dr Rachel Cooke
- Dr Hui Yin Lim
- Dr Julie Wang
- Lynda Harrison
- Dr Frances Barnett
- Dr Geoff Chong
- Dr Jaclyn Yoong
- Dr Josephine Stewart
- Dr Chong Chyn Chua
- Dr Paul Turner
- Dr Lachlan Hayes
- Louise Scolieri
- Dr Teresa Leung
- Dr Alysson Wann
- Dr Alison Giles
- Dr Jo-An Seah
- Dr Frank Hong
- Dr Vanessa Manitta
- Karen Matoga
- Kira Edwards

MD Research Program Students

- Vicky Yue Yin (University of Melbourne): 'Investigating the interplay between pancreatic cancer and diabetes' (Supervisor: Dr Belinda Lee)
- William Chiang (University of Melbourne): 'Exploring immune markers and the microenvironment in pancreatic cancer' (Supervisor: Dr Belinda Lee)

Key Research Projects

Dr Belinda Lee		Dynamic-III
Dr Belinda Lee		Dynamic-II
Dr Belinda Lee		Dynamic-rectal
Dr Belinda Lee		Dynamic-pancreas
Dr Belinda Lee		PURPLE data base
Dr Belinda Lee		TRACC data base
Dr Frances Barnett		TABITHA data base
Dr Belinda Lee		Organoid project
Dr Belinda Lee		Pancreatic biomarker study
Dr Frances Barnett		PALLAS
Dr Frances Barnett		NATALEE
Dr Geoff Chong		ISOFOL
Dr Prahlad Ho		CLL14
Dr Prahlad Ho		CRISTALLO
Dr Rachel Cooke		MRDR myeloma registry
Dr Chong Chyn Chua		ALLG NBCR acute myeloid leukaemia registry
Dr Chong Chyn Chua		PRAN 16-52 acute myeloid leukaemia
Dr Lachie Hayes		CLL6
Dr Lachie Hayes		CML 10

DYNAMIC clinical trials

Dynamic-II, Dynamic-III, Dynamic-Rectal and Dynamic-Pancreas are Walter and Eliza Hall Institute of Medical Research led studies. They are the first large scale randomised clinical trials in colorectal and pancreatic cancer that investigate the utility of ctDNA to detect the presence of residual cancer cells following curative intent surgery in order to guide adjuvant chemotherapy management. This trial will improve our understanding of how likely these cancers are to recur thus facilitating the best treatment options for our patients. These studies opened to recruitment in 2019 and are recruiting across multiple cancer centres in Australia. The primary endpoint of the DYNAMIC studies is recurrence free survival. Secondary endpoints include overall survival, and ctDNA turnaround time. Exploratory analysis into the health economic impact and fear of cancer recurrence are also being undertaken in conjunction with these DYNAMIC studies.

Investigator-led research

- 'Improving outcomes for patients with chronic haematological malignancies at Northern Health': Rachel Cooke
- 'The clinical significance of paraproteinaemia and serum/urine free light chains in asymptomatic patients': Rob Veljanovski supervised by Rachel Cooke
- 'Effect of Comprehensive Geriatric Assessment on Improving Clinical Outcomes and Quality of Life in Elderly Patients with Haematological Malignancies': Julie Wang, Akshay Bapat, & Teresa Leung

Grants

Anastasia Pourliakis

Investigating the Feasibility of Running A Group-Based Psycho-Oncology Program to Reduce Service Wait-Times and Relieve Psychological Distress Post-Diagnosis of Cancer
NEMICS Service Improvement Grants - \$5,000

Dr Belinda Lee

Supporting the use of circulating tumour DNA in clinical trials
Epworth Foundation Cork Grant - \$120,000

Dr Belinda Lee

Development of Pancreatic cancer organoids
Jreissati Foundation Grant - \$210,000

Dr Belinda Lee

Supporting a Pancreatic Cancer translational platform
Epworth Foundation Sanger Grant - \$85,000

Dr Belinda Lee

PURPLE translational registry
Pancare Foundation Research Grant - \$75,000

Dr Rachel Cooke

Quality improvement measures for myeloma patients
Celgene Northern Key Account - \$10,000

Dr Rachel Cooke

Service improvement in haematological malignancies
NEMICS Small Improvement Grant - \$10,000

Publications

Nguyen, M., Ng Ying Kin, S., Shum, E., **Wann A**, Sahu A, Torres J. Anticancer therapy within the last 30 days of life: results of an audit and re-audit cycle from an Australian regional cancer centre. *BMC Palliat Care* 19, 14 (2020).

Owen CN, Shoushtari AN, Chauhan D, Palmiere DJ, **Lee B**, Rohaan WN, Mangana J, Atkinson V, Zaman F, Young A, Hoeller C, Hersey P, Dummer R, Khattak MA, Millward, Patel SP, Haydon A, Johnson DB, Long GV. 2020. *Management of early melanoma recurrence despite adjuvant anti-PD-1 antibody therapy*. *Annals of Oncology*, <https://doi.org/10.1016/j.annonc.2020.04.471>

Pilgrim C, te Marvelde L, Stuart E, Croagh D, Deutscher D, Nikfarjam M, **Lee B**, Christophi C. 2020. *Population-based analysis of treatment patterns and outcomes for pancreas cancer in Victoria*. *ANZ Journal of Surgery*, <https://doi.org/10.1111/ans.15721>

Kumari S, Semira C, Lee M, **Lee B**, Wong R, Nott L, Shapiro J, Gibbs P. 2020. *Resection of Colorectal Cancer Liver Metastases in the Older Patient*. *ANZ J Surgery*

Lee B, Lipton L, Cohen J, Tie J, A A Javed, L Li, D Goldstein, M Burge, P Cooray, A Nagrial, N C Tebbutt, B Thomson, M Nikfarjam, M Harris, A Haydon, B Lawrence, D W M Tai, K Simons, A M Lennon, C L Wolfgang, C Tomasetti, N Papadopoulos, K W Kinzler, B Vogelstein, P Gibbs. *Circulating tumor DNA as a potential marker of adjuvant chemotherapy benefit following surgery for localized pancreatic cancer*. 2019 *Annals of Oncology*, 30(9);1472-1478 mdz200

Tie J, Cohen J, Wang J, Christie M, Simons K, Lee M, Wong R, Kosmider S, Ananda S, McKendrick J, **Lee B**, Cho JH, Faragher I, Jones I, Ptak, Schaeffer M, Silliman N, Li L, Tomasetti C, Papadoulos N, Kinzler K, Vogelstein B, Gibbs P. *Circulating Tumor DNA Analyses as Markers of Recurrence Risk and Benefit of Adjuvant Therapy for Stage III Colon Cancer*. 2019 *JAMA Oncol*. 5(12):1710-1717. doi:10.1001/jamaoncol.2019.3616

Guo C, Alexander M, Dib Y, Lau P, Weppler A, Au-Yeung G, **Lee B**, Khoo C, Mooney, Joshi S, Creati L, Sandhu S. 2019. *A Closer look at immune-mediated myocarditis in the ear of combined checkpoint blockade and targeted therapies*. *EJC* 124: 15-24. doi:10.1016/j.ejca.2019.09.009

Lee B, and Gibbs P. 2019. *Inflammation, Biomarkers and Immuno-Oncology Pathways in Pancreatic Cancer*. *J Personalised Medicine*. 2019, 9, 20; DOI10.3390/jpm9020020

Loft M, **Lee B**, Tie J, Gibbs P. 2019. *Clinical Applications of Circulating Tumour DNA in Pancreatic Adenocarcinoma*. *J Personalised Medicine* 9(3)piiE37 doi: 10.3390/jpm9030037

Mendis S, Beck S, **Lee B**, Lee M, Wong R, Kosmider S, Shapiro J, Yip D, Steel S, Nott L, Jennens R, Lipton L, Burge M, Field K, Ananda S, Wong HL, Gibbs P. 2019. *Right versus left sided metastatic colorectal cancer: Teasing out clinicopathologic drivers of disparity in survival*. *Asia-Pacific Journal of Clinical Oncology*. 15(3):136-143 DOI 10.1111/ajco.13135

Delahunty R, Lee M, Wong H, Johns J, McKendrick J, **Lee B**, Kosmider S, Cooray P, Ananda S, Desai J, Tran B, Tie J, Gibbs P, Wong R. 2019. *Utilisation of systemic therapy options in routine treatment of metastatic colorectal cancer in Australia*. *Intern Med J*. doi: 10.1111/imj.14288

Gately L, Wong HL, Tie J, Wong R, Lee M, **Lee B**, Jalali A, Gibbs P. 2019. *Emerging strategies in the initial management of locally advanced rectal cancer*. *Future Oncol*. 15(25):2955-2965. doi: 10.2217/fon-2018-0941.

Piercey O, Loh Z, Chan J, **Chong G**, Grigg A, Cheema S, Gill G, Whybird M, Cushion T, Hawkes E. *Routine blood tests in asymptomatic patients with indolent lymphoma have limited ability to detect clinically significant disease progression*. *JCO Oncol Pract*. 2020 Jun 25;JOP1900771. doi: 10.1200/JOP.19.00771

Lenz G, Hawkes E, Verhoef G, Haioun C, Lim ST, Heo DS, Ardesna K, **Chong G**, Haaber J, Shi W, Gorbachevsky I, Lippert S, Hiemeyer F, Piraino P, Beckmann G, Peña C, Buvaylo V, Childs BH, Salles G. *Single-agent activity of phosphatidylinositol 3-kinase inhibition with copanlisib in patients with molecularly defined relapsed or refractory diffuse large B-cell lymphoma*. *Leukaemia* doi.org/10.1038/s41375-020-0743-y

Garwood MJ, Hawkes EA, Churilov L, **Chong G**. *Patient Selection and Tolerability of High-Dose Methotrexate As Central Nervous System Prophylaxis in Diffuse Large B-Cell Lymphoma*. *Cancer Chemotherapy and Pharmacology* 2020, 85:133–140

Gunjur A, **Chong G**, Lim A, Lau E, Mitchell P, John T, Arulananda S. *Occult gastrointestinal perforation in a patient with EGFR mutant non-small-cell lung cancer receiving combination chemotherapy with atezolizumab and bevacizumab: a brief report*, *Clinical Lung Cancer* 2019 Nov 29. pii: S1525-7304(19)30331-6. doi.org/10.1016/j.clcc.2019.11.014

Ong DM, Ashby M, Grigg A, Gard G, Ng ZY, Huang HE, Chong YS, Cheah CY, Devitt B, **Chong G**, Loh Z, Mo A, Hawkes EA. *Comprehensive geriatric assessment is useful in an elderly Australian population with diffuse large B-cell lymphoma receiving rituximab-chemotherapy combinations*. *Br J Haematol*. 2019 Oct;187(1):73-81. doi: 10.1111/bjh.16049.

Martin K, Roberts V, **Chong G**, Goodman D, Hill P, Ierino F. *Ecucizumab therapy in gemcitabine-induced thrombotic microangiopathy in a renal transplant recipient*. *Oxf Med Case Reports*. 2019 Jun 14;2019(6)

Presentations & Abstracts

Lee B. *DYNAMIC-Pancreas Clinical trial update*, Australian GI Trials Group (AGITG) Annual Scientific Symposium, (Virtual Conference) August, 2020

Santucci J, Lee B, Shapiro K, et al. *Investigating the “real-world” clinical impact of treatment sequencing in advanced pancreatic cancer outcomes: a PURPLE translational registry analysis*. Australian GI Trials Group (AGITG) Annual Scientific Symposium, (Virtual Conference) August, 2020

Kosto L, Lee B, Tran B et al. *Cancer Clinical Trials versus Real-World Outcomes for Standard of Care First-line treatment in the Advanced disease setting*. Medical Oncology Group of Australia (MOGA) (Virtual Conference) Annual Conference, August 2020

Lee B, Witmond V, Pereira-Salgado A et al. *Real-world survival outcomes with Neoadjuvant chemotherapy in Pancreatic cancer patients*. American Society of Clinical Oncologist (ASCO) Annual Conference, (Virtual Conference) May 2020

Lee B & Gibbs P. *Understanding the treatment landscape in pancreatic cancer*, Victorian Comprehensive Cancer Centre Pancreatic cancer Workshop, Melbourne December 2019

Lee B, Shapiro J, Thomson B et al. *How can digital health be used to improve outcomes in pancreatic cancer? Examining the potential of the PURPLE Translational Pancreatic cancer platform*. Clinical Oncology Society of Australia (COSA) Annual Scientific Symposium, Brisbane November 2019

Walpole I, Lee B, Lipton L et al. *Use and outcomes from Neoadjuvant chemotherapy in Borderline resectable pancreatic ductal adenocarcinoma in an Australasian Population*. Clinical Oncology Society of Australia (COSA) Annual Scientific Symposium, Brisbane November 2019

Lee B. *Future and Challenges of immunotherapy in GI cancers*, Melbourne Immunology Network Symposium, Melbourne Sept 2019

Lee B. *The Next wave: Pioneering, personal, precise: the future of Oncology. Circulating tumour DNA as a potential marker of adjuvant chemotherapy benefit following surgery for pancreatic cancer*, Victorian Comprehensive Cancer Centre Research Conference, Melbourne Sept 2019

Lee B. *Introducing the DYNAMIC-Pancreas Clinical trial for Early Stage Pancreatic Cancer: A Multicentre Randomised Study*, Australian GI Trials Group (AGITG) Annual Scientific Symposium, Brisbane August 2019

Li J, Jalili A, Matoga K et al. *Identifying Clinical Barriers to Optimal Cancer Treatment*. Australian GI Trials Group (AGITG) Annual Scientific Symposium, Brisbane August 2019

Lee B. *Pancreatic Cancer Summit outcomes and future projects*, Victorian Integrated Cancer Services (VICS) Conference, Melbourne April 2019

Wight J, Wai SH, Shen E, Lee ST, Berlangieri S, Fancourt T, Hannah A, Leung T, Hawkes E, Chong G. *FDG PET Delta SUVmax Following 4 Cycles Rather Than 2 Cycles Of R-CHOP Predicts Strongly For Refractory Disease in Aggressive B Cell Non-Hodgkin Lymphoma*. European Hematology Association June 2020

Bapat A, Leung T. *Elderly Patients with Diffuse Large B Cell Lymphoma – Utility of Rockwood Clinical Frailty Score in Predicting Clinical Outcomes and Change in Functional Status*. Blood October 2019

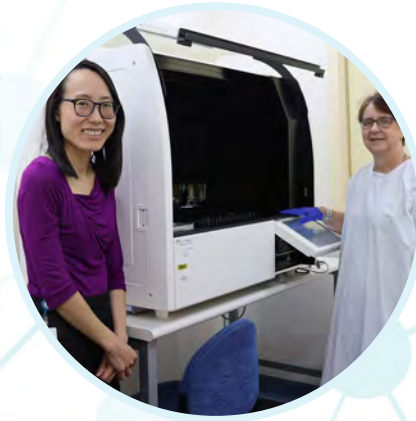
For thrombosis and non-malignant haematology studies, please see Diagnostic Services Research Report.

Future Research Goals

Cancer clinical trials will continue to develop, with the goal to be able to offer every patient diagnosed with cancer the opportunity to enter a clinical trial. Cancer Services will also commence development of investigator-led studies in conjunction with our partners.

Northern Health

DIAGNOSTIC SERVICES



Major Achievements

2020 has been a successful year in terms of research for the Diagnostic Services. We have continued to collaborate with our internal (renal, endocrinology, general medicine, obstetrics, vascular surgery and anaesthesia) and external (Australian Centre of Blood Diseases, Melbourne Health, Austin Health and the Royal Children's Hospital) collaborators. We had publications in several peer-reviewed international journals currently hosts two PhD candidates.

Key Research Areas

Thrombosis is a major research interest for Diagnostic Services, in particular the role of global coagulation assays. Traditional coagulation tests do not provide sufficient information for thrombotic risk assessment. Global coagulation assays provide a more holistic assessment of the haemostatic profile and through our studies we aim to investigate the utility of these assays in the risk stratification of individuals at risk of thrombosis. Other key areas of research include epidemiology and laboratory-based studies in biochemistry and blood bank.

The Team

- Dr Prahlad Ho
- Dr Hui Yin Lim
- Dr Julie Wang
- Mr Uttam Punj
- Dr Rowena Brook
- Dr Frank Hong
- Dr Kay Weng Choy
- Mr Niki Lee
- Dr Rachel Cooke
- Dr Brandon Lui

PhD Students

- Dr Hui Yin Lim (University of Melbourne): '*Global coagulation assays and biomarkers in high risk cardiovascular disease patients*' (Supervisors: Dr Prahlad Ho, Prof Harshal Nandurkar, Prof Geoff Donnan and Prof Louise Burrell)
 - Recipient of joint NHMRC / Heart Foundation Postgraduate Scholarship
- Dr Julie Wang (University of Melbourne) '*Prospective serial evaluation of new biomarkers of thrombosis in patients with newly diagnosed venous thromboembolism*' (Supervisors: Dr Prahlad Ho and Prof Harshal Nandurkar)
 - Recipient of Northern Health Foundation PhD Scholarship

MD Research Program Students

- Anna Kwok (University of Melbourne)
- Nicholas Wu (University of Melbourne)

External Collaborators

- Prof Harshal Nandurkar: Australian Centre for Blood Diseases & Alfred Health
- Prof Beverley Hunt: St Thomas' Hospital, UK
- Prof Louise Burrell: Austin Health & University of Melbourne
- Prof Geoff Donnan: Melbourne Health
- Dr Ada Cheung: Austin Health & University of Melbourne
- Prof Paul Monagle: Royal Children's Hospital

Key Research Projects

- Global coagulation assays and biomarkers in:
 - Normal controls: Dr Prahlad Ho and Dr Hui Yin Lim
 - High risk cardiovascular disease patients including renal and diabetic patients: Dr Hui Yin Lim
 - Prospective VTE biomarker study: Dr Julie Wang
 - Postpartum VTE risk assessment score: Dr Darren Lowen
 - Validation of Genesiia, a new global coagulation assay: Mr Niki Lee and Dr Rowena Brook
- Evaluation of DOAC-Stop to resolve DOAC interference in laboratory and research coagulation testing: Mr Niki Lee, Mr Uttam Punj and Dr Julie Wang
- Biomarkers of COVID-19: Dr Prahlad Ho, Dr Hui Yin Lim, Dr Kay Weng Choy, Mr Niki Lee, Prof Louise Burrell and Prof Paul Monagle
- Epidemiological studies / retrospective audit
 - VTE Audit from 2012 – 2019: Dr Brandon Lui and Dr Hui Yin Lim)
 - Haematological and biochemistry changes in COVID-19: Dr Hui Yin Lim, Dr Kay Weng Choy and Dr Rowena Brook
- Ferritin assay biases and decision limits for iron deficiency: Dr Kay Weng Choy and Miss Rachelle Liwayan

- Reflex testing for protein electrophoresis: Dr Kay Weng Choy
- Diagnostic algorithm for TSH and troponin assay interferences: Dr Kay Weng Choy and Miss Rachel Liwayan
- Transfusion medicine department quality improvement audits
 - Patient ABO Blood Group Frequency in Northern Metropolitan Melbourne: Mr. Niki Lee, Dr Hui Yin Lim and Dr Frank Hong
 - Platelet usage audit: Dr Khai Li Chai, Mr Niki Lee and Dr Frank Hong
- Transfusion medicine department technical / scientific projects
 - NEO Iris plate exposure validation study: Mr Vincent Lu and Mr Niki Lee
 - Investigation into a novel anti-D quantitation method on the NEO Iris solid phase automation platform: Ms Meg Ginete and Mr Niki Lee
 - Correlation between patient diagnosis and non-specific reactions on the NEO Iris solid phase automation platform: Ms Leila Fulane and Mr Niki Lee

Grants

Dr Julie Wang

Prospective serial evaluation of new biomarkers of thrombosis in patients with newly diagnosed venous thromboembolism

Northern Health Foundation PhD Scholarship - \$75,000

Publications

Lim HY, Brook R, Leemaqz SY, Torkamani N, Grossmann M Zajac JD, Nandurkar H, Ho P, Cheung A. *Global coagulation assays in transgender women on oral and transdermal estradiol therapy*. J Clin Endo Metab 2020 (accepted for publication 8 May 2020)

Choy KW. *An Urgent Call to Clinicians and Researchers: 2020 Acuity Required When Assessing and Reporting Laboratory Abnormalities in COVID-19*. Intern Med J 2020 (accepted for publication 8 May 2020)

Choy KW. *Diagnostic Testing for Gestational Diabetes Mellitus during The COVID-19 Pandemic – An Opportunity to Revisit Glucose-Based Testing*. Intern Med J 2020 (accepted for publication 30 April 2020)

Lim HY, Lambros P, Krishnamoorthi B, Chellaram V, Ho P. *Outpatient management of deep vein thrombosis using direct oral anticoagulants is safe and efficient*. J Pharm Pract Res (accepted for publication 4 March 2020)

Lui B, Ho P, Lim HY. *Superficial venous thrombosis: is it as benign as we think?* J Thromb Thrombolysis 2020 (accepted for publication 13 February 2020)

Wang J, Tacey M, Ho P. *Retrospective review of D-dimer testing for venous thrombosis recurrence risk stratification – is this a useful test in the real world?* J Thromb Thrombolysis 2020;49:562-571.

Lim HY, Brook R, Krishnamoorthi B, Tacey M, Leung T, Donnan G, Nandurkar H, Ho P. *Global coagulation assays in patients with multiple myeloma and monoclonal gammopathy of unknown significance*. Thromb Res 2019;183:45-48.

Mirzaee S, Choy KW, Doery JCG, Zaman S, Cameron JD, Nasir A. *The tertiary hospital laboratory; a novel avenue of opportunistic screening of familial hypercholesterolaemia*. IJC Heart & Vasculature 2019;23:100354.

Wijeratne N, Tate JR, Du Toit S, Smith JD, Soepnel A, Choy KW, Martin H, Henry R, Glegg K, Byrnes E, Wienholt L, Mollee P. *Paraprotein sample exchange in Australian and New Zealand* 2018. Clin Biochem Rev 2019;40:43-54.

Pope JD, Choy KW, Drummer OH, Schneider HS. *Harmala alkaloids identify ayahuasca intoxication in a urine drug screen*. J Anal Toxicol 2019;143:e23-27.

Tan RZ, Markus C, Choy KW, Doery JCG, Loh TP. *Optimized delta check rules for detecting misidentified specimens in children*. Am J Clin Pathol 2020;154:605-612.

Chee NYN, Abdul-Wahab A, Libianto R, Gwini SM, Doery JCG, Choy KW, Chong W, Lau KK, Lam Q, MacIsaac RJ, Chiang C, Shen J, Young MJ, Fuller PJ, Yang J. *Utility of adrenocorticotrophic hormone in adrenal vein sampling despite the occurrence of discordant lateralization*. Clin Endocrinol (Oxf) 2020.

Wong A, Homer N, Dear JW, Choy KW, Doery J, Graudins A. *Paracetamol metabolites concentrations following low risk overdose treated with an abbreviated 12-h versus 20-h acetylcysteine infusion*. Clin Toxicol (Phila) 2019;57:312-317.

Solanki P, Gwini SM, Doery JCG, Doery KW, Shen J, Young MJ, Fuller PJ, Yang J. *Age- and sex-specific reference ranges are needed for the aldosterone/renin ratio*. Clin Endocrinol (Oxf) 2020.

Wheeler E, Choy KW, Chin LK, Wijeratne N, McNeil A, Yen T, Matthews S, Deam D, Lu Zhong, Loh TP, Doery J, Bergman P. *Routine free thyroxine reference intervals are suboptimal for monitoring children on thyroxine replacement therapy and target intervals need to be assay-specific*. Sci Reports 2019;9:19080.

Presentations & Abstracts

Evaluation of global coagulation assays in patients with chronic kidney disease. Lui B, Barit D, Nandurkar H, Ho P, Lim HY. *Blood*, Perth, October 2019

- Mr Brandon Lui was awarded a travel grant for this abstract

Global coagulation assays in transgender women. Cheung A, Lim HY, Torkamani N, Rainier M, Grossmann M, Nandurkar H, Zajac GD, Ho P. *Endocrine Society of Australia*, Sydney, August 2019

Evaluation of thrombin and fibrin generation in venous thromboembolism (VTE) patients receiving anticoagulation. Wang J, Lim HY, Brook R, Aswapanyawongse O, Ho P. *International Society of Thrombosis and Haemostasis 2020 Congress (Virtual presentation)*, July 2020.

Evaluation of global coagulation assays in pregnancy. O'Keefe, Hui L, Nandurkar H, Ho P, Lim HY. *International Society of Thrombosis and Haemostasis 2020 Congress (Virtual presentation)*, July 2020.

Assessing bleeding risk in chronic kidney disease using global coagulation assays. Langsford D, Lui B, Pianta T, Barit D, Nandurkar H, Ho P, Lim HY. *American Society of Nephrology 2019*, Washington DC, November 2019

Global coagulation assays in transgender women. Lim HY, Torkamani N, Rainier M, Grossmann M, Nandurkar H, Zajac GD, Ho P, Cheung A. *International Society of Thrombosis and Haemostasis 2019 Congress*, Melbourne, July 2019

Global coagulation assays in multiple myeloma and monoclonal gammopathy of unknown significance. Brook R, Krishnamoorthi B, Leung T, Nandurkar H, Ho P, Lim HY. *International Society of Thrombosis and Haemostasis 2019 Congress*, Melbourne, July 2019

Clinical predictors of pulmonary embolism for inpatients: Are Computed Tomography Pulmonary Angiograms (CTPAs) being requested appropriately? – Retrospective analysis. Ling L, Zhang V, Lim HY, Lim MJ, Ho P. *International Society of Thrombosis and Haemostasis 2019 Congress*, Melbourne, July 2019

Outcomes of intracranial bleed on direct oral anticoagulants and warfarin. Joshi S, Lim HY, Ho P. *Blood*, Perth, October 2019

- Dr Shubhum Joshi was awarded a travel grant for this abstract

Fibrinogen Austin (A²17Gly²Cys and A²381Ser²Phe); Identification of a Novel Fibrinogen Mutation Causing Dysfibrinogenaemia. Rigano J, Lee N, *International Society of Laboratory Haematology (Virtual Meeting)*, June-September 2020

Inherited protection against Malaria; A Case of Co-Existing Sickle Cell Disease, Alpha Thalassaemia, Glucose-6-Phosphate Dehydrogenase Deficiency and Duffy Null Phenotype. Rigano J, Lee N, *International Society of Laboratory Haematology (Virtual Meeting)*, June-September 2020

Future Research Goals

We aim to continue to build our research team and pursue ground-breaking projects to become a major coagulation diagnostic laboratory and thrombosis research unit in Australia as well as further our collaborative efforts with both internal and external collaborators. We also aim to further expand our repertoire of novel biomarkers of coagulation and thrombosis and continue to build relationships with both international and local partners, as well as mentor junior research across Northern Health.



ASSOCIATE PROFESSOR UWAIS MOHAMED

“There are many things that are unique about research at Northern Health. They include a large patient population, they come from diverse backgrounds and they tend to be willing participants. This is certainly something that inspires us.”

#inspired
researcher

Northern Health

EMERGENCY SERVICES



Major Achievements

Emergency Services comprises the Intensive Care Unit, Cardiology Department and Emergency Department. Over the last year, the Emergency Department has recruited a Clinical Toxicologist and a Paediatric Emergency Physician Research Lead to grow and develop research leadership capacity across the department. The Cardiology Department have commenced two new PhD candidates in imaging and electrophysiology. Together, Emergency Services have had significant research output including papers in the *New England Journal of Medicine*, *Circulation* and *JACC Cardiovascular Imaging*.

Key Research Areas

- Simulation and education in emergency medicine
- Clinical toxicology, addiction medicine and opioid prescribing
- Mental health
- Dyslipidaemia
- Coronary artery disease and intravascular imaging
- Physiologic cardiac pacing
- Cardiac strain imaging in diabetes
- Therapy for lung injury and anoxic brain injury
- Pressure injuries
- Analgesia in mechanical ventilation
- COVID-19
- Septic shock

The Team

- Prof William van Gaal
- A/Prof Uwais Mohamed
- A/Prof Gautam Vaddadi
- Dr Asrar ul Haq
- Dr Chris Lim
- Dr Nancy Sadka
- Dr Anthony Cross
- Ms Mary Park
- Prof Peter Barlis
- A/Prof Chiew Wong
- A/Prof Nagesh Anavekar
- Dr Han Lim
- Dr Joe-Anthony Rotella
- Dr Angaj Ghosh
- Dr Andrew Casamento
- Ms Simone Said

PhD Students

- Dr Rifly Rafudeen: '*Ivabradine and high sensitivity troponin in type II myocardial infarction: insights from a randomized controlled study of Ivabradine in preventing peri-operative infarction, and in a cohort of patients with type II MI and acute coronary syndromes*' (Supervisors: Prof William van Gaal and Professor Peter Barlis)
- Dr Savvy Nandal: '*Role of SGLT2 inhibitors and sacubitril / valsartan on myocardial performance*' (Supervisors: A/Prof Chiew Wong and Dr Asrar ul Haq)
- Dr Dominic Chow: '*A Randomised Controlled Trial Comparing His-bundle pacing with Conventional Right Ventricular Pacing*' (Supervisors: A/Professor Uwais Mohamed, A/Prof Chiew Wong and A/Prof Han Lim)

MD Research Program Students

- Helen Pho (University of Melbourne)
- Jessica Yun (University of Melbourne)

Key Research Projects

Colchicine vs. placebo

The Cardiology team collaborated with David Tong and colleagues to evaluate colchicine versus placebo in 795 patients who presented with acute coronary syndrome (ACS) and had evidence of CAD (mean age, 60; 21% women). Colchicine dosing was 0.5 mg twice daily for the first month and then 0.5 mg once daily. At 12 months, the two groups did not differ significantly on the primary endpoint (composite of all-cause mortality, ACS, ischemia-driven [unplanned] urgent revascularization, and non-embolic ischemic stroke) – 6.1% in the colchicine group and 9.5% in the placebo group. However, significantly more colchicine patients died (8 vs. 1), driven largely by non-cardiovascular deaths (5 vs. 0). Of the 8 patients who died, 5 had continued colchicine treatment until the time of death. The paper was recently presented at the *European Society of Cardiology and published in Circulation*.

Toxicology Presentations in 2019: Dr Joe-Anthony Rotella

An audit of all presentations related to Clinical Toxicology was undertaken and found that in 2019, there were 969 presentations. Of those, 390 patients represented with a similar toxicology presentation. Most were young (mean age 33.3) and often required referral to Mental Health (43.1%) or Drug and Alcohol (3.1%). The three most common substances were ethanol, paracetamol, and diazepam. GHB, methamphetamine and heroin were most commonly seen from an illicit substance perspective. Patients often presented by ambulance and attracted high triage categories and required significant time in the Emergency Department (average LOS 6.5 hours with 50% having a LOS >4 hours). Most patients were admitted to CDU (15.5%), AMT (9.8%) or EOU (9.2%) and there were 8 deaths in the cohort examined. This highlighted the ongoing presentation of young patients with significant medical problems that should remain centre in the view of the organisation.

Investigator-led research

- 'Urine drug screen audit': Dr Joe-Anthony Rotella
- 'Heavy metal concentrations Audit': Dr Joe-Anthony Rotella
- 'Take home naloxone survey of ED clinicians': Dr Joe-Anthony Rotella
- 'Elevated carboxyhaemoglobin level audit': Dr Joe-Anthony Rotella
- 'Promethazine and Droperidol in the acutely agitated (PRADAA)'
- 'Health literacy study of patient presenting with lower back pain to ED'
- 'ApoA-I Event reducInG in Ischemic Syndromes II (AEGIS-II)' – phase III clinical trial of CSL112 to reduce early recurrent cardiovascular events after an acute myocardial

infarction (MI). A study of CSL112, a reconstituted, infusible, human plasma-derived apolipoprotein A-I in patient with myocardial infarction: Prof William van Gaal

- 'Dal-GenE, a pharmacogenetic trial targeting reduction of cardiovascular events with dalcetrapib' – a precision medicine trial evaluating CETP inhibition in patients with specific genetic profiles: Prof William van Gaal
- 'Ivabradine in the prevention of peri-operative myocardial injury' – a multi-centre, double-blinded, randomised controlled study of ivabradine in the prevention of peri-operative myocardial injury, in patients undergoing emergent orthopaedic surgery: Prof William van Gaal
- 'Optical coherence tomography assessment for acute coronary events in type II myocardial infarction and myocardial injury': Prof William van Gaal
- 'AUS COVID – a prospective Australian cardiovascular COVID-19 database': Prof William van Gaal
- 'CHARTER – nebulised heparin in COVID respiratory failure'
- 'TTM2 – hypothermia vs fever prevention in post out of hospital cardiac arrest'
- 'TAME – CO2 management in in post out of hospital cardiac arrest'
- 'SPRINT-SARI – prospective observational study of COVID-19 in ICU'
- 'ANALGESIC – Morphine vs Fentanyl for analgesia in mechanical ventilation'
- 'TAP: ICU – use of fluidised turning device in ICU'
- 'I-Hood – use of ventilation hoods for isolation in ICU'
- 'Flow dynamics in coronary bifurcation lesions before and after provisional stenting': Dr Asrar ul Haq
- 'Optical coherence tomography assessment of ostial side branch stenosis': Dr Asrar ul Haq
- 'Association of balloon inflation time and pressure with stent apposition': Dr Asrar ul Haq
- 'Clinical Utility of Pathology Results in Patients presenting to the Emergency Department with 1st presentation seizure': Dr Kate Ferguson
- 'Clinical Utility of Urine Drug Screens in Mental Health patients': Stefano Prisco Penna
- 'Clinical features of patients presenting to hospital with chronic nitrous oxide abuse': Aakriti Sharma
- 'Clinical efficacy of parenteral promethazine in the management of acute behavioural disturbance': Matt Bricknell
- 'An audit tool for measuring performance and quality in acute coronary syndromes, heart failure and atrial fibrillation': Dr Sheran Vasanthakumar

Publications

Rotella JA, Greene SL, Koutsogiannis Z, Graudins A, Leang YH, Kuan K, Baxter H, Bourke E, Wong, A. *Treatment for beta-blocker poisoning: a systematic review*. Clinical Toxicology Doi: 10.1080/15563650.2020.1752918

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Presentations & Abstracts

Sadka, Nancy. Simulation – Improving Systems and Transforming Culture, A Hospital Quality Improvement Simulation Project. Laerdal Sun Simulation Conference 2020 – presented as a Webinar, July 2020

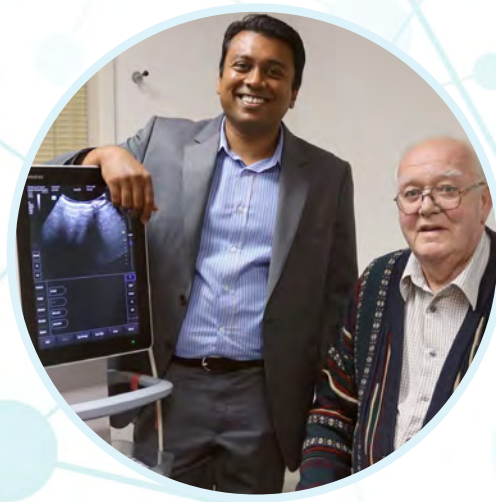
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Future Research Goals

- Further research investigating clinical toxicology, addiction medicine, opioid prescribing and mental health
- Progress in all current project and expanding collaboration in research with other hospital units and health services
- Continue to expand the Cardiovascular Trials Unit and support PhD candidates in cardiovascular research

Northern Health

MEDICINE AND SUB-ACUTE



Major Achievements

Research is thriving in the busy, collegial clinical corridors of medicine and sub-acute care. The Respiratory and Gastroenterology teams have made outstanding progress, and the challenges of understanding and treating COVID19 have been embraced through ongoing participation in key multi-centre research studies. We are proud that the list of research active staff and students has grown to include most members of many units, and the number of peer-reviewed papers co-authored by medicine and sub-acute care staff and students has double within a year.

Highlights include:

- Collaborative research projects with University and Industry partners including Swinburne University of Technology, La Trobe University, University of Melbourne, Rocket Medical and Philips Healthcare
- Collaboration on large multicentre grants including successful MRFF and MNDRAI grants
- High profile publications in multiple leading journals including the New England Journal of Medicine (impact factor 74.7)
- COVID-19 research including large multicentre trials including ASCOT and SETREP-ID plus a number of investigator-led observational studies
- The development of a consumer reference group who provides direct consumer feedback and input into research project design and conduct
- The supervision of multiple University of Melbourne MD Research Program students

Key Research Areas

- A multicentre national study of COVID-19 infection in cancer patients
- ASCOT clinical trial investigating antiviral therapies including nebulised heparin and therapeutic antibody treatment in COVID-19
- SETREP-ID observational trial and CHARTER ICU nebulised heparin trials in COVID-19
- Australasian Malignant Pleural Effusion Trial 3 – a multicentre randomised study comparing combined indwelling pleural catheter and talc pleurodesis with video-assisted thoracoscopic surgery for the management of patients with malignant pleural effusion

- Indwelling pleural catheter and talc pleurodesis with video-assisted thoracoscopic surgery for the management of patients with malignant pleural effusion
- Steroid therapy and outcome of parapneumonic pleural effusions (STOPPE) - a multicentre randomised control trial
- AIR – a pilot study to assess feasibility, safety and efficacy of artificially introducing an air-pleura interface for detection of pleural nodules by computed tomography
- Multicentre randomised controlled trial of polysomnographic titration of non-invasive ventilation in motor neurone disease
- NIV@home study evaluating methods of implementing non-invasive ventilation
- Prospective rifampicin drug-drug interaction study
- PIANO study – a prospective multi-centre prosthetic joint infection cohort
- Improving vaccination rates of hospitalised patients
- Determinants of antibiotic delays in patients with sepsis
- Improving the management of patients with peripheral intravenous catheters
- Enterococcal endocarditis treatment with amino-penicillin and ceftriaxone
- Rifampicin resistant staphylococci in patients treated with rifampicin for latent tuberculosis
- Australasian follow-up tracking and enhancing recovery after acute kidney injury (AFTER-AKI)
- Follow up by a Nephrologist after acute kidney injury (FUN-After-AKI)
- Care bundles in acute kidney injury – analysis of provision of routine AKI care at an Australian metropolitan hospital (AKI Care Bundles)
- Investigating the safety of a low-calorie diet using Optifast as a method of weight loss in obese patients receiving dialysis therapy
- Dietetic intervention using multiple strategies to promote adherence in achieving long-term potassium restriction
- Erythropoietin stimulating agents usage patterns and patient experience among a population of ambulatory patients with chronic kidney disease (ESA Use)
- Randomised evaluation of sodium dialysate levels on vascular events (RESOLVE & AKTN)

- Global coagulation assays in chronic kidney disease
- Exercise for acutely hospitalised older patients
- Genetic basis of sudden unexpected death in epilepsy (SUDEP)
- Optimal timing of anticoagulation in ischaemic stroke with new atrial fibrillation (ATTUNE study)
- Predictive value of signs and symptoms in Code Strokes for diagnosis of ischemic stroke
- CT perfusion in code strokes due to seizures
- Clinical and imaging features of transient global amnesia
- Australian Stroke Clinical Registry
- Melbourne Mobile Stroke Unit and reperfusion therapy
- Improving early recognition of posterior circulation stroke with video nystagmography
- Optimising diagnosis of convulsive epileptic seizures
- Improving epilepsy care by recognising and managing cyclical seizure predisposition

Grants

Maureen Goodwin, Dr Katharine See, Dr Sanjeevan Muruganandan & Dr Liam Hannan

Point prevalence of oxygen usage (O2PP)

Northern Health Foundation Small Research Grant - \$5,000

Dr Liam Hannan (Associate Investigator)

A multi-centre randomised controlled trial of polysomnographic titration of non-invasive ventilation in motor neurone disease

Medical Research Future Fund - \$3,500,000

Dr Liam Hannan (Associate Investigator)

NIV@home study evaluating methods of implementing non-invasive ventilation

Motor Neuron Disease Research Institute of Australia - \$100,000

Dr Liam Hannan (Associate Investigator)

NIV@home study evaluating methods of implementing non-invasive ventilation

Melbourne Disability Institute - \$20,000

Publications

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Therapy: Greater Clinical Impact of Thrombectomy Than Thrombolysis." *Stroke* 51, no. 3 (March 2020): 922–30. <https://doi.org/10.1161/STROKEAHA.119.027843>.

Presentations & Abstracts

Southwell K et al. Aeroallergen SPT patterns in Northern Melbourne. Thoracic Society Australia New Zealand Annual Scientific Meeting, Melbourne, March 2020

- Shortlisted for Young Investigator Award

Duong V et al. Improving important patient related outcomes with specialized pleural disease service Thoracic Society Australia New Zealand Annual Scientific Meeting, Melbourne, March 2020

Romeo N et al. Frequency of bronchodilator response in those with normal baseline spirometry. Thoracic Society Australia New Zealand Annual Scientific Meeting, Melbourne, March 2020.

Chiang E et al. Clinical attributes of individuals diagnosed with culture-negative and culture-positive tuberculosis. Thoracic Society Australia New Zealand Annual Scientific Meeting, Melbourne, March 2020.

Future Research Goals

Further expansion of research across medicine and sub-acute. Gastroenterology will establish clinical and translational research programs in inflammatory bowel disease, iron deficiency, endoscopy and hepatology. Inflammatory bowel diseases research will focus on the development of novel therapeutics to target intestinal inflammation and fibrosis, a randomised controlled trial to investigate new techniques for detecting dysplasia in patients, development of quality indicators for endoscopy in patients and novel approaches to provide community-based care to patients with gastroenterological illnesses. The presence of industry supported clinical trials will open up further opportunities for our community to access new and novel treatments.

We are excited that Northern Health will be the lead site for three planned investigator-led multicentre studies in Respiratory Medicine. Research grant applications are being actively pursued and aim to attract scientific and clinical staff wishing to undertake a research higher degree.

Medicine and sub-acute recognises that high performing clinical services benefit enormously from participation in research. Our efforts in research will continue to drive a culture of quality improvement and scientific endeavour for staff and our community.

Northern Health

SURGERY



Major Achievements

It is remarkable that our teams have found a way to continue pursuing research in amongst COVID-19 waves and lockdowns. There has been a mad rush on COVID-19 studies approvals with Surgery contributing to large state-wide and international collaborations such as COVIDSurg.

Research across Surgery continues to be diverse and directly translational as evidenced by two showcase projects; one looking at the biomechanical and technical aspects of anterior cruciate ligament repair and another the physiology and hormone control in obstetric anaesthesia. Three of our busiest research units, Orthopaedics, General Surgery and Anaesthetics, have helped set a new record for number of journal publications this calendar year. We are increasing our participation in multicentre studies and continue to have a strong research influence with regular Northern Health Foundation Small Grant success.

Key Research Areas

- Orthopaedics
 - ACL reconstruction
 - Knee prostheses
 - Fracture registries and outcomes
- General Surgery
 - Surgical education
 - Gallstone / gallbladder pathology and CBD stones
 - Management and prevention of nausea and vomiting
- Anaesthetics
 - Obstetric anaesthesia
 - Perioperative medicine
 - VTE prevention
- Urology
- Plastic Surgery
- Vascular Surgery
- ENT

The Team

- Russell Hodgson
- Justin Wong
- Prassannah Satasivam
- Krinal Mori
- Wanda Stelmach
- Sarah Burns
- Catherine Ryder
- Darren Lowen
- Rodrigo Teixeira
- Leonard Shan
- Saeed Asadollahi
- Vicky Kartsogiannis
- Amanda Baric

PhD Students

- Zahra Nasr (RMIT University): *'Engaging patients in the management and prevention of postoperative nausea and vomiting'*
- Sarah Hassan (RMIT University): *'Current prescribing practice for antimicrobial surgical prophylaxis in Orthopaedic Surgery'*

Masters Students

- Rebecca Law (RMIT University): *'Level of engagement among surgical patients: a cross-sectional survey'*

Key Research Projects

'Evaluation of the isometry of different femoral and tibial points for anterior cruciate ligament reconstruction using four-dimensional computed tomography': Bronwyn Anderson and Justin Wong

Anterior cruciate ligament (ACL) injuries are a common knee injury particularly in younger patients engaging in high risk sports activities. If a patient has an ACL rupture, their knee often becomes unstable which increases their risk of further injury and may prevent them from engaging in other physical activities and sport. ACL reconstructive surgery aims to restore stability to the knee, allow patients to return to activities and prevent further injury. To reconstruct the ACL, a tunnel is drilled in the femur and the tibia and a graft is passed between these points. The position of the tunnels is critically important in determining the success of surgery. If the tunnels are placed in

the incorrect position the knee may be stiff, unstable or at higher risk of re-rupture. Our research team has conducted a cadaveric study applying 4D CT technology to record an accurate series of three-dimensional images of a human cadaveric knee as it moves through a range of movement. The benefit of using the 4D CT technology is that unlike previous studies we can use significantly more potential graft attachment points and measurements can be made at any degrees of knee flexion. In previous studies static measurements have been made, not whilst the knee is in motion. Through this technique we expect to define the safe zone of ACL graft placement during ACL reconstructive surgery. Optimal graft placement is vital for restoring knee stability and reducing the risk of re-rupture, allowing patients to successfully return to sport and activities. This technique and the data obtained in this study will also be able to be extrapolated for use in assessing other structures in the knee whilst the knee moves.

'Pulsatile Oxytocin Study': Darren Lowen

We have initiated a single blinded randomised controlled trial to determine if an alternative protocol for the induction of pregnant women leads to an improved outcome in the sense of a reduced need for an emergency caesarean section, as well as the amount of blood loss associated with the various birthing techniques, such as normal vaginal delivery, instrumental delivery with either forceps or ventouse, or surgical delivery. We are comparing the traditional induction of labour with a continuous infusion of oxytocin to an infusion of the same concentration and same amount of oxytocin given in a pulsatile fashion. In other words, a 12 ml/hr continuous oxytocin infusion will be compared to a 3 ml bolus of oxytocin given every 15 minutes, so that at the completion of one hour, the same amount of oxytocin has been given. As the rate of continuous oxytocin is increased, the corresponding rate in four boluses that are given at 15 minutely intervals are also increased. As the pulsatile arm of this study more closely mimics the endogenous secretion of oxytocin from the posterior pituitary, it is hypothesised that this arm will result in an improvement in the outcomes of interest, namely the caesarean section rate and the incidence of post-partum haemorrhage. This study has been powered to show a 50% reduction in the caesarean rate, which is based upon data that was obtained for all of the births recorded at Northern Health in 2017. The power analysis revealed that we need to recruit 412 trial participants.

Investigator-led research

- Controlled ACL graft shuttling reduces intraoperative complications in ACL reconstruction: Nathan Myhill and Justin Wong
- Implementation of osteoporosis reminder into Fracture Clinic documentation to improve osteoporosis investigation and management: Scott Reeves and Justin Wong
- Medial pivot versus posterior stabilising total knee prosthesis – a comparison of early clinical and functional outcomes and patient satisfaction: Raphael Hau
- Analgesic efficacy of local infiltration analgesia using cannulated stripper and adductor canal block versus adductor canal block alone after anterior cruciate ligament reconstruction: Jaye Yick and Justin Wong
- Wound closure techniques in total hip arthroplasty: Raphael Hau and Samuel Bewsher
- Management of preoperative anaemia in elective surgical patients: Juliette Gentle
- Negative pressure wound therapy to reduce incisional wound infections – a randomised control trial: Neil Strugnell
- Laparoscopic intra-abdominal pressure study: a double blinded randomised controlled trial: Russell Hodgson
- Laparoscopic cholecystectomy video assessment study: Russell Hodgson

Grants

Nathan Myhill and Justin Wong

Controlled ACL graft shuttling reduces intraoperative complications in ACL reconstruction

Northern Health Foundation Small Research Grant - \$2,406.86

Austin Lang, Adam Wertheimer, David Dyer, Indra Danny, Vicky Kartsogiannis, Lori McLeod Mills and Raphael Hau

Medial pivot versus posterior stabilising total knee prosthesis: a comparison of early clinical and functional outcomes and patient satisfaction

Surgical Specialties - \$38,692.50

David Liu, Betty Lai and Krinal Mori

Establishment and validation of a dedicated thromboprophylaxis review team for the Northern Hospital Acute General Surgical Unit

Northern Health Foundation Small Research Grant - \$5000

Jenny Huynh, Grace Chew, Jocelyn Lippy, Michael Issac and Wanda Stelmach

Can a 'one-stop' benign breast disease clinic further improve outcomes for women in the north?

Northern Health Foundation Small Research Grant - \$5000

Ms Jocelyn Lippey

*The **Breast** Cancer **AI** Project (BRAIx)*

Medical Research Future Fund - \$2.26 million

Publications

Lambers A, Talia A. Spaced repetition learning as a tool for Orthopedic Surgical Education: A prospective cohort study on a training examination. *Journal of Surgical Education*, 2020. 000: 1-6.

Sng M, Gentle J, Asadollahi S. Bleeding risk associated with hemodynamically stable low-energy pelvic fracture. *Geriatric Orthopaedic Surgery & Rehabilitation*, 2020. 11: 1-5.

Issa M, Sidhu A, Lam D, Mori K. Peritoneal pocket hernia after laparoscopic femoral hernia repair: a rare cause of bowel obstruction. *ANZ J Surg*, 2020. DOI: 10.1111/ans.15665

Taplin C, Romano L, Tacey M, Hodgson R. Everyone has their role to play during the world health organisation surgical safety checklist in Australia: A prospective observational study. *World J Surg*, 2020. DOI: 10.1007/s00268-020-05397-2

Luo Y, Mohammed Jinnaah S, Masood D, Hodgson R. Drain tube use in incisional hernia repair: a national survey. *Hernia*, 2020. DOI: 10.1007/s10029-019-02115-3

Zheng Z, Layton J, Stelmach W, Crabbe J, Ma J, Briedis J, Atme J, Bourne D, Hau R, Cleary S, Xue CC. Using patient self-checklist to improve the documentation of risk of postoperative nausea and vomiting: an implementation project. *Int J Evid Based Healthc*, 2020. DOI: 10.1097/XEB.0000000000000213

Bayat I, Wang J, Ho P, Bird D. Intravascular ultrasound-guided laparoscopic division of the median arcuate ligament. *J Vasc Surg Cases Innov Tech*, 2020. DOI: 10.1016/j.jvscit.2020.01.011

Luo Y, Masood DE, Mohammed Jinnaah S, Tacey M, Hodgson R. Do drain tubes help reduce risks of post-operative complications in complex incisional hernia repair (as defined by a recent court ruling)? *ANZ J Surg*, 2020. DOI: 10.1111/ans.15875

Future Research Goals

The future of research in Australia has to be collaborative, with limited funding available for single institution projects. Anaesthetics, Orthopaedics and General Surgery are all strongly working towards collaborative multi-centre projects in 2021, including establishing closer ties with industry and clinical trials networks. We are looking forward to seeing some future multicentre studies with Northern Health as the leading investigative centre!



ASSOCIATE PROFESSOR WEI QI FAN

“One of the key reasons I became a doctor is to help others. To do this I need to apply best practice, which of course is based on research.

My medical training and my nature have taught me to be observant, curious and use reasoning to solve clinical problems, all of which are fundamental to good research.

By involving myself in research, I add to best practice and help more patients - especially as at Northern we serve a multicultural, lower socioeconomic community with many health concerns.”

**#inspired
researcher**

Northern Health

WOMEN'S AND CHILDREN'S



Major Achievements

The Reproductive Health Biobank based within NCHER was established by A/Prof Lisa Hui and A/Prof Natalie Hannan with the support of Northern Health. During 2019-20, more than \$100,000 was raised for major equipment purchases from the Melbourne Academic Centre for Health (MACH), private donors, the Northern Health Foundation and the University of Melbourne's Department of Obstetrics and Gynaecology. The biobank is a joint Northern Health and University of Melbourne facility that supports translational research in the northeast corridor of Melbourne and facilitate collaborations across the MACH network.

A/Prof Lisa Hui was awarded a Medical Research Future Fund EL2 Investigator Grant worth \$1.28 million over five years.

A/Prof Natalie Hannan was appointed as Associate Dean, Diversity and Inclusion in the Faculty of Medicine, Dentistry and Health Sciences at University of Melbourne.

Our first research midwife at Northern Health, Ms Eleanor Johnson, commenced in 2020 and has successfully commenced recruitment of research participants for the Reproductive Health Biobank. Eleanor is embarking on midwifery-lead research with the Family Planning Clinic at Broadmeadows Health Service.

Northern Health is a key player in understanding the maternal and newborn outcomes related to the COVID-19 pandemic. A/Prof Lisa Hui is the chief investigator of the Collaborative Maternity and Newborn Dashboard (CoMaND) which monitors monthly outcomes for mothers and babies across the five major maternity services in Melbourne which supports data-informed health policy during the pandemic. Northern Health is a collaborator in the Australian Coronavirus Health Outcomes in Pregnancy and Newborns Registry (CHOPAN) which analyses health outcomes for women who are infected with SARS-CoV2 during pregnancy.

The Children's Service has completed two randomised controlled trials with excellent results. These projects are being written up for publication:

- *'Impact on the provision of pre-school wheeze action plan on the quality of care in children less than 6 years old with wheezing'*
- A randomized controlled trial to compare the efficacy of weekly lactation consultant led telephone calls in the first month postpartum versus standard care on breastfeeding rates

Our paediatric teams actively promote collaborative research with other health institutions:

- *'Asthma re-admission study'* – multicentre study throughout Victoria

- *'MRFF Telerehabilitation for early intervention to improve neurodevelopmental outcomes in infants born preterm and their parent's well-being: a randomised controlled trial'* – funding secured from the Medical Research Future Fund of \$1.8 million
- *'Children's Inpatient Research Collaboration of Australia and New Zealand (CIRCAN)'* is a community of inpatient paediatric clinicians with an interest in research. We aim to improve general paediatric hospital care and outcomes through robust clinical research. Research projects include *'PAEDS-FluCan-CIRCAN COVID-19 Surveillance Study'* and *'ISQ – The PROMPT bolus study ISQ'*
- *'PrePosition study'* – a study of transmitted airway pressure and catheter position during surfactant instillation via the Hobart method
- A prospective multicentre observational study of COVID-19 transmission and disease course

With supervision from Dr David Tran and A/Prof Wei Qi Fan's, four advanced paediatric trainees have successfully completed their FRACP projects.

Key Research Areas

- Translational research in maternal and perinatal health at the Reproductive Health Biobank
- Clinical research in obstetrics and gynaecology including COVID19-related projects
- Obstetric haematology
- Breast feeding promotion
- Preterm baby's nutrition and growth
- Clinical research in paediatrics including COVID19-related projects

The Team

- A/Prof Lisa Hui
- Eleanor Johnson
- Natasha DeAlwis
- Dr David Tran
- Barbara Rischitelli
- Susan Peterson
- A/Prof Natalie Hannan
- Sally Beard
- Tejas Doctor
- A/Prof Wei Qi Fan
- Kelvin Chapalwenda
- Kathy Foster

MD Research Program Students

- Benjamin Pearce
- Daniel Ng
- Malith Ranatunga
- Christine Lee
- Nathan Nadansabesan
- Inushi Ilangamage
- Danielle Fitzpatrick
- Chiara Marshall
- Janis Wong
- Mina Mikhael
- Sarah Lim

Key Research Projects

Collaborative Maternity and Newborn Dashboard (CoMaND) for the COVID-19 pandemic

The COVID-19 pandemic has resulted in a range of unprecedented changes to maternity care delivery in all Australian public hospitals. The impact of these changes on health outcomes for pregnant women and their babies is currently unknown. This study aims to combine the routinely collected performance indicators of the five largest maternity services to create a timely, powerful, adaptive monitoring system for use during the COVID19 pandemic. This multi-centre study will gather routinely collected data on births at each of the participating sites from January 1 2018 to December 31 2022. The first half of the study period (from Jan 1 2018 to mid-2020) will be retrospectively collected in order to provide baseline rates of all outcomes. Data will then be prospectively collected each calendar month from each of the sites, and this will be continuously updated to provide timely reports on maternity services.

The following health services are members of the CoMaND collaboration lead by A/Prof Lisa Hui:

- Northern Health
- Mercy Health
- The Royal Women's Hospital and The Women's at Sandringham
- Monash Health
- Western Health

Reproductive Health Biobank

We will continue to facilitate collaborations with other researchers at Northern Health and across the MACH network. Projects planned include:

- Epigenetic and transcriptional reprogramming of maternal immune cells during pregnancy – a collaboration with Dr Boris Novakovic from the Murdoch Children's Research Institute
- Anti-thrombotic therapy and trophoblast cell-free DNA – exploring mechanisms for failed cell-free DNA screening and therapeutic potential

Grants

NA/Prof Lisa Hui and A/Prof Natalie Hannan

Reproductive Health Biobank

Northern Health Foundation - \$51,200

A/Prof Lisa Hui and A/Prof Natalie Hannan

Prevention of fetal cytomegalovirus infection after maternal infection: developing novel therapeutic approaches using primary trophoblast and placental explant cultures

University of Melbourne Department of Obstetrics and Gynaecology Innovation Grant - \$20,000

A/Prof Lisa Hui

Anti-thrombotic therapy and trophoblast cell-free DNA: exploring mechanisms for failed cell-free DNA screening and therapeutic potential

Northern Health SRG - \$5000

A/Prof Lisa Hui

Collaborative Maternity and Newborn Dashboard (CoMaND) for the COVID pandemic

Norman Beischer Medical Research Foundation - \$50,000

A/Prof Lisa Hui

Collaborative Maternity and Newborn Dashboard (CoMaND) for the COVID pandemic

University of Melbourne Department of Obstetrics and Gynaecology Innovation Grant - \$20,000

A/Prof Lisa Hui

Coronavirus health outcomes in pregnancy and newborns (CHOPAN registry)

Ferring COVID-19 Investigational Grants in Reproductive Medicine and Maternal Health - \$15,000

Publications

Lindquist A*, Hui L*, Poulton A, Kluckow E, Hutchinson B, Pertile MD, Bonacquisto L, Gugasyan L, Kulkarni A, Harraway J, Howden A, McCoy R, da Silva Costa F, Menezes M, Palma-Dias R, Nisbet D, Martin N, Bethune M, Poulakis Z, Halliday J. State-wide utilization and performance of traditional and cell-free DNA-based prenatal testing pathways: the Victorian Perinatal Record Linkage (PeRL) study. *Ultrasound Obstet Gynecol.* 2020. doi: 10.1002/uog.21899.* Joint first authors.

Kluckow E, Halliday J, Poulton A, Lindquist A, Hutchinson B, Bethune M, Bonacquisto L, Da Silva Costa F, Gugasyan L, Harraway J, Howden A, Kulkarni A, Martin N, McCoy R, Menezes M, Nisbet D, Palma-Dias R, Pertile MD, Poulakis Z, Hui L. Association between timing of diagnosis of trisomy 21, 18, and 13 and maternal socio-economic status in Victoria, Australia: A population-based cohort study from 2015 to 2016. *Prenat Diagn.* 2019. doi: 10.1002/pd.5577.

Lostchuck E, Hui L. Should second trimester hypoplastic nasal bone be sole indication for diagnostic testing with chromosomal microarray analysis? *Ultrasound Obstet Gynecol.* 2019;53(6):848-850. doi: 10.1002/uog.20141.

Hui L, Bianchi DW. Fetal fraction and noninvasive prenatal testing: What clinicians need to know. *Prenat Diagn.* 2020. doi: 10.1002/pd.5620.

Hui L, Szepe E, Halliday J, Lewis C. Maternity health care professionals' views and experiences of fetal genomic uncertainty: a review. *Prenat Diagn* 2020. DOI: 10.1002/pd.5673

Fan WQ, Molinaro A. Maternal obesity adversely affects early breastfeeding in a multicultural, multi-socioeconomic Melbourne community. *Aust N Z J Obstet Gynaecol* 2020; 1-8 DOI: 10.1111/ajo.13232

Ma XW & Fan WQ Earlier Nutrient Fortification of Breastmilk Fed LBW Infants Improves Jaundice Related Outcomes. *Nutrients* 2020, 12(7), 2116;

Fan WQ, Archer J. Sudden-onset fever and rash in a 9-year-old girl. *Pediatr Infect Dis J.* PIDJ-219-464. Vol 39, 88-89 January 2020. ISSN: 0891-3668/16/00-00; DOI 10.1097/INF.0000000000002477

Presentations & Abstracts

Hui L, Lindquist, et al. State-wide performance of traditional and cell-free DNA based prenatal testing pathways: the Victorian Perinatal Record Linkage (PeRL) study. 29th World Congress on Ultrasound in Obstetrics and Gynaecology, Berlin October 2019. Top plenary abstract session, (ranked 3rd of 1466 submitted abstracts)

O'Keefe D, Hui YL, Tham J, Ho P, Hui L.. Evaluation of global coagulation assays for assessment of clotting function and risk of venous thromboembolism in pregnancy and postpartum. Poster presentation. Society of Obstetric Medicine of Australia and New Zealand ASM 2019, Melbourne Oct 2019. Award for best poster.

de Mare K and Fan WQ What are the risk factors for 30-day neonatal readmission? a retrospective cohort study. *Journal of Paediatrics and Child Health*, Volume 56, Issue S1, 5-8 April 2020 Page 55-135 Ma, XW and Fan, WQ Early enteral nutrition and jaundice outcomes in the preterm infant: a retrospective cohort study. *Journal of Paediatrics and Child Health*, Volume 56, Issue S1, 5-8 April 2020 Page 55-135

Nicholls J and Fan WQ Birth trauma: how prevalent is it and how does it impact short-term neonatal outcomes? *Journal of Paediatrics and Child Health*, Volume 56, Issue S1, 5-8 April 2020 Page 55-135

Future Research Goals

- To build translational and clinical research capacity in obstetrics at Northern Health with a focus on the specific features of our antenatal population
- Concentrate on evidence-based research by asking and researching key areas of paediatric and neonatal disease to identify strategies to improve day to day management.

Northern Health

UNIVERSITY PARTNERS



Northern Health hosts students from a number of Universities and has developed an increasing number of academic appointments both in Education and Research over the past two years. This is increasing our ability to provide our staff with the opportunity to be involved in research activities at all levels. These partnerships and the research ethos they engender enables Northern Health to offer access to our patients' innovative therapies through their participation in clinical research. The Northern Health Foundation continues to provide great support for the research effort by funding the Small Grants Scheme for young researchers and the very important PhD Scholarship Program which helps grow research leaders of the future.

University of Melbourne

The Melbourne Academic Centre for Health has funded a number of projects at Northern Health. These include:

- Clinical and community service provision for people with disabilities: partnership with the Melbourne Disability Institute's School of Population and Global Health
- Closing the gap on indigenous cardiovascular health: partnership with University of Melbourne and Melbourne Health
- Improving the care of children with frequent asthma admissions: partnership with Murdoch Children's Research Institute and University of Melbourne.
- Reproductive Health Biobank: led by Associate Prof Lisa Hui in partnership with University of Melbourne

NHMRC Centre of Research Excellence (CRE) in Digital Technology to Transform Chronic Disease Outcomes

The NHMRC Centre of Research Excellence in Digital Technology to Transform Chronic Disease Outcomes formally launched in 2020 at Digital Health Future @ Northern. Administered by the University of Melbourne, the CRE is directed by Professor Brian Oldenburg from the Melbourne School of Population and Global Health and co-directed by Professor Vas Kostakos from the School of Computing & Information Systems. The CRE aims to transform Australia's digital health ecosystem by undertaking research that will leverage the ubiquitous availability of smart devices and digital technology to improve the health and wellbeing of people with chronic conditions. The CRE's senior researchers come from the University of Melbourne, Deakin University, Griffith University and Macquarie University in Australia and Palo Alto and Stanford Universities in the United States. There are also research collaborators from around the world.

Northern Health is one of the CRE's major health service partners and a formal agreement has been endorsed for the work program with Northern Health as a testbed for research studies. The CRE's Advisory Board is co-chaired by Professor Peter Brooks and Ms Leanne Wells (Chief Executive, Consumers Health Forum). As Australia further embraces new virtual care delivery models that digitally enabled healthcare affords, the opportunities for the CRE to partner with Northern Health in testing these new models of care are promising. Ensuring that these new ideas are evaluated appropriately in the real world environment that Northern Health provides, much due to its extraordinarily diverse multicultural community, will place both partners at the leading edge for digital health innovation and implementation in Australia for the future.

The CRE's work program aims to optimise the use of existing interactive digital technologies by working out new ways to integrate them into current health care delivery in order to significantly improve current approaches to chronic disease prevention and management. The CRE is developing new ways of collaborating and communicating with health consumers and health practitioners in order to create more digitally enabled health consumers, practitioners and researchers. The CRE is growing the digital health and medical research workforce by providing training opportunities for collaborative research between health services like Northern Health and universities. A number of the CRE's researchers and trainees have obtained honorary appointments with Northern Health.

Activities in the first year of formal collaboration between the CRE and Northern Health include:

- Establishing a website for the CRE: <https://mspgh.unimelb.edu.au/digitalhealth-cre>
- Co-hosted the 2nd Digital Health Futures @ Northern in March 2020 which was a tremendous success with more than 100 attendees from around Australia and internationally. Many of the digital health solutions presented and discussed have since been further developed and implemented in response to COVID-19
- Dr Michael Kirk and Anthony Gust have been appointed as affiliates to the CRE. Professor Peter Brooks is one of the CRE's co-investigators
- Professor Vas Kostakos has been supervising a number of early career research projects at Northern Health including:
 - 'Proactive voice assistants for chronic disease management at home': Jing Wei
 - 'Indoor localisation in healthcare settings': Gabriele Marini
 - 'Wearable sensors for hand hygiene quality monitoring': Chaofan Wang

- Professor Brian Oldenburg, Dr Tilahun Haregu and Dr Tina Cao are collaborating on a project led by Dr Rebecca Jessup *'How do health consumers interpret and apply health information during a pandemic?: A two-phase qualitative study using in-depth interviews and the think aloud method'*
- Professors Ron Borland and Brian Oldenburg are collaborating on a project led by Dr Rebecca Jessup *'Staff attitudes to using technology to support evidence-based medicine and virtual care delivery'*
- Professors Peter Brooks and Brian Oldenburg are collaborating with the Staying Well team, Max Lee and others to develop new ways of helping patients navigate health care delivery and other community services throughout the northern region of Melbourne during pandemic times. This approach will help develop a new workforce of Health Care Navigators who will assist patients with Chronic Diseases to navigate to their dedicated health providers and other social and community supports. The model is being currently developed for implementation in Denmark
- The CRE has developed a monthly webinar program that will focus on issues such as digitally enabled mental health solutions and smart device application development and evaluation

La Trobe University

The Academic Research Collaborative in Health (ARCH) is transforming the clinical research capability and evidence based-practice in allied health and nursing: <https://www.latrobe.edu.au/she/arch>

ARCH is building a scientific base for evidence-based care and education which brings together academics, clinicians, consumers, healthcare professionals, health leaders and policy makers skilled in the translation of interdisciplinary research. Future leaders and ARCH clinicians have access to education and training and specialist mentoring pathways. Entry-to-practice and post-graduate clinical placements offer students valuable experience at the clinical interface. ARCH is all about partnerships that deliver better care to Australians. The ARCH model promotes close ties between research, education, training, clinical practice and consumer engagement. The end result is high quality, evidence-based and science-led care for consumers.

Research translation is fundamental to changing practice. ARCH adopts an implementation science framework to co-produce research with partners and consumers. The translational research pipeline starts with co-production of the research questions, research design, methodology and then implementation of projects with our

ARCH partners. Together we interpret and disseminate the results, ensuring that the findings reach intended end-users and are adopted widely.

Swinburne University of Technology

NH has been collaborating with Swinburne's Iverson Health Innovation Institute and the Digital Health group.

We participated in a project with Amazon Web Services developing smartphone application to support patients living with type-II diabetes. This project led to an NHMRC Ideas Grant application. Students and senior academics from Swinburne are assisting development of digital solutions with our Orthopaedic team aiming to improve experience and outcomes of patients waiting surgery.

RMIT University

Academics from RMIT have developed links with Northern Health clinicians in a number of areas and the Northern Health Foundation is supporting two PhD scholarships for in the areas of exercise science and peri operative medicine.



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