

Research Week 2019 Abstract Book and Report



Our Vision

Outstanding health care for our community

Our Mission

We are committed to the wellbeing of the people of Melbourne's north.

We draw upon the richness, knowledge and strength of northern communities as we partner with them in their care.

Our Values

- **Passionate** – we care
- **Dedicated** – we are focused
- **Progressive** – we look to improve
- **Collaborative** – we are a team and work in partnership

Our Strategic Goals

- **Patient First** – Our patients' expectations are exceeded because we partner with them to deliver innovative and accessible care.
- **Quality and Safety** – We pursue the highest quality outcomes of care.
- **Our People** – Passionate and capable people have great careers and provide outstanding health care.
- **Sustainability** – We eliminate unnecessary processes and costs.

Northern Health acknowledges Victoria's Aboriginal communities and their rich culture and pays respect to their Elders past, present and emerging. We acknowledge Aboriginal people as Australia's first peoples and as the Traditional Owners and custodians of the land (the Wurundjeri people) on which Northern Health's campuses are built.

We recognise and value the ongoing contribution of Aboriginal people and communities to our lives and we embrace the spirit of reconciliation, working towards the equality of outcomes and ensuring an equal voice.



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Research Lead Report: Professor Peter Brooks

What an exciting year it has been for research at Northern Health, reflected by the posters and presentations at our capstone event, Research Week 2019. These contributions highlight the quality of research activities occurring across the clinical spectrum being driven by an increasing number of staff at Northern Health. We know that a health service which commits to, and nurtures, a research culture has better patient outcomes and happier and more satisfied staff and patients. We should be very proud of the clinical care we deliver and we are underpinning it 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.



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, gives us 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 from the previous year:

- The creation of formalised Research Leads and establishment of Divisional Research Sub-committees who collaborate to drive the research message and provide structure, governance, mentoring and support for those undertaking research.
- Re-establishing Northern Health's own on-site Low Risk Human Research Ethics Committee. Chaired by Professor Bill van Gaal, this has significantly streamlined the governance review process for low-risk ethics applications and reduced the barrier for staff to initiate research.
- More than \$50,000 worth of Small Research Grants were awarded thanks to the generosity of the Northern Health Foundation and donors in our community.
- Northern Health's Annual Research Dinner was held in June with special guest Professor Kathryn North AC, Director of the Murdoch Children's Research Institute and the David Danks Professor of Child Health Research at the University of Melbourne. The event was sold out for the first time and supported by academic and industry partners, with all proceeds going towards funding future research activities via the Northern Health Foundation.
- Research Grand Rounds are now being conducted regularly and have been successful in stimulating research activities. High-profile guests have included Cheryl Jones, Harriet Hiscock, James Boyd, Greg Wadley, the late Allison Milner, Maarten J. IJzerman, Debra Nestel, Buzz Palmer, Don Campbell and Nancy Devlin. Keep an eye out for more events to come.
- Professor Debra Nestel hosted *A Healthcare Simulation Research Feast* with a workshop facilitated by one of Australia's leading researchers in simulation. This assisted in the establishment of the Simulation Research Interest Group. Led by Dr Nancy Sadka, this group drives exciting programs utilising our Simulation Laboratory and in-situ simulation in real-world locations within the hospital. Evaluation will explore how impactful and effective these are in changing practice.
- The investment into, and establishment of, the world-class Reproductive Health Biobank. Located within the Northern Centre of Health Education & Research, this is championed by one of our emerging researchers, Associate Professor Lisa Hui.

- Our *Stepping into Research* program was reintroduced and expanded to include all clinical disciplines. Led by Dr Rebecca Jessup, those new to or hoping to further enhance research practices undertake a 12-week intensive program to embark upon the journey from research proposal to publication.
- Success in securing grant funding through the Melbourne Academic Centre for Health in collaboration with research partners covering areas such as improving outcomes for indigenous patients with cardiac disease, investigating knowledge of disability services around NDIS providers and helping to better understand childhood respiratory diseases.
- Northern Health is the major partner in the recently announced *NHMRC Centre of Research Excellence in Interactive Digital Technology to Transform Australia's Chronic Disease Outcomes*. This grant, led by Professor Brian Oldenburg from the Melbourne School of Population and Global Health, provides a major opportunity for Melbourne's north to become the focus for digital health research. It will also significantly enhance our Staying Well program by utilising patient interactive digital technology to transform the way care is delivered for those living with chronic disease.
- We hosted the inaugural *Digital Health Futures Summit* bringing together expertise from around the globe focused on co-designing innovative ways of creating a sustainable future in healthcare.
- Our clinicians continue to publish high calibre research in leading journals. Examples include publications in the *New England Journal of Medicine* including Associate Professor Wei-Qi Fan's publication *Nasal High-Flow Therapy for Newborn Infants in Special Care Nurseries* and our Intensive Care team's collaborative efforts in the *SPICE, HEAT, ADRENAL* and *TRANSFUSE* trials led by Dr Angaj Ghosh and Dr David Crosbie.
- Partnering with *The Actuator – Australia's National Medtech Accelerator* to gain access to education programs on research commercialisation, entrepreneurship and technology development. This partnership creates opportunities for Northern Health researchers who are thinking about pursuing the journey of creating a start-up by unlocking funding for really innovative ideas.
- Northern Health partnered with Amazon and Swinburne University to launch the *Swinburne University Data for Social Good Cloud Innovation Centre powered by Amazon Web Services*. The centre is one of seven worldwide, and the first of its kind in the Southern Hemisphere. The first innovation challenge, aimed at improving outcomes for newly diagnosed type-2 diabetics, was held at Northern Health resulting in the development of digital solutions that were co-designed with Northern Health staff and patients from our Endocrinology team.

2019 has been a very busy year. Congratulations and thank you to all who have contributed to research. Research is on the move at Northern Health and we are looking forward to an even bigger and better 2020.



Professor Peter Brooks AM

Research Lead

Northern Health

Grand Opening: Professor Helena Teede

12.30 pm – 1.30 pm

Northern Centre for Health Education & Research (NCHER) Lecture Theatre

Creating a learning health system to meet clinical and community needs: it's everyone's job

The community are the funders and beneficiaries of health care and of research and our frontline workforce and health services are the powerhouse behind health care. Our community, health care providers and health services deserve a core role in priority setting, design and delivery of research and translation to deliver health impact in Australia. How do we deliver this together with the support of research, evidence and translation?



Professor Helena Teede

Professor Teede is Executive Director of the Monash Partners Academic Health Sciences Centre. She is passionate about research translation and driving better health through research. Helena is the Director of the Monash Centre for Health Research and Implementation, School of Public Health, Monash University. She is an Endocrinologist at Monash Health and an NHMRC Practitioner Fellow. Professor Teede has a leading role in research and translation including large scale randomised controlled trials and evidence synthesis, guidelines, the co-design of new models of care, implementation and scale-up.

She holds policy advisory roles, has been a member of the NHMRC Research Committee, Health Care committee and the Faculty for Research Translation. She has over 450 publications and focuses on women's reproductive health including infertility, polycystic ovarian syndrome, pregnancy health, gestational diabetes and menopause across clinical trials, epidemiology, health services research and public health. She is on the Cochrane editorial group, has over 60 systematic reviews, has worked on multiple guidelines including with the World Health Organisation and recently led international guidelines involving 37 organisations and 71 countries.

Workshop: Professor Helena Teede

2 pm – 4 pm

Northern Centre for Health Education & Research (NCHER) Level 3 Conference Room

Flipping the paradigm: how research can support community, clinical and health service needs and innovation to drive health impact

How can a health service drive and deliver a learning health system with evidence-based quality care and ongoing improvement?

Work through the steps in a learning health system from how to best engage our community and health professionals to generating and synthesising evidence to using evidence, and guidelines, to measurement of best practice, to feedback and benchmarking, implementation and quality improvement.

Tuesday 8 October 2019

Chief Executive Ideas Lab: Dr Greg Wadley

12.30 pm – 2.00 pm

Northern Centre for Health Education & Research (NCHER) Level 3 Ideas Lab

How do we ensure research and innovation underpins everything we do?

The Ideas Lab is an exciting innovation sponsored by our Chief Executive that gives our staff the opportunity to contribute towards developing solutions to challenges we face every day in our health system. We recognise that the best ideas and innovations are created by those who deal directly with these issues, our staff. The format of the Chief Executive Ideas Lab allows people to come together, collaborate and to articulate in an open forum.

The theme of the Ideas Lab during Research week is *'How do we ensure that research underpins everything we do at Northern'*. A health service which commits to, and nurtures, a research culture has better patient outcomes and happier and more satisfied staff and patients. We should be very proud of the clinical care we deliver but it must be underpinned by education and research. We must evaluate and question everything we do, leading to continuous improvement in the way we deliver care to our community and, importantly, educate our staff and our students, Northern Health's workforce of the future.

Dr Greg Wadley will facilitate a workshop in which participants will learn concepts user-centred design and lead the group through the processes of co-design of consumer and staff-oriented eHealth technologies.



Dr Greg Wadley second from left at the Chief Executive Ideas Lab

Dr Greg Wadley

Dr Greg Wadley is a Senior Lecturer in the School of Computing and Information Systems at the University of Melbourne. His research involves designing and evaluating consumer-facing eHealth technologies for a range of health conditions. He teaches a postgraduate subject on eHealth design. Details about his research and teaching can be found at <http://people.eng.unimelb.edu.au/gwadley/>

Oral Presentations

2.30 pm – 3.30 pm

Northern Hospital Epping Lecture Theatre

1. **Dr Belinda Lee:** Medical Oncologist
Use and outcomes from neoadjuvant chemotherapy in borderline resectable pancreatic ductal adenocarcinoma in an Australasian population
2. **Shannon Smith:** Clinical Nurse Specialist, Intensive Care
Key indicators of continuous renal replacement therapy in the Intensive Care Unit
3. **Kerry Hwang:** Research Assistant, National Ageing Research Institute
The use of mobile translation technology in the health care setting for everyday communication with patients with limited English proficiency
4. **Peter Brack:** Associate Director – Education, Allied Health and Interprofessional Programs
Is the Interprofessional Passport feasible at Northern Health? A pilot randomised controlled trial
5. **Dr Mandeep Kalsi:** Hospital Medical Officer
Hospital-wide audit of diabetes-related medication errors and health-professional responses to adverse glycaemia
6. **Dr Scott Reeves:** Registrar, Aged Care
Audit of osteoporosis investigation and management in patients presenting to an orthopaedic fracture clinic with minimal trauma fractures
7. **Dr Prahlad Ho:** Program Director, Diagnostic Services | Director, Clinical Haematology
Global coagulation assays in transgender individuals
8. **Kuan-Chou (Cradle) Liao:** Medical Student, University of Melbourne
Choosing Wisely in ordering computed tomography pulmonary angiograms in Northern Health Emergency
9. **Philip Harraka:** PhD Student, University of Melbourne
Retinal drusen in focal and segmental glomerulosclerosis



A presentation at Research Week 2019

Oral Presentations

10 am – 11 am

Northern Hospital Epping Lecture Theatre

1. **Rachel Ellis:** Clinical Leader, Physiotherapy
Effect of eccentric exercise on quality of life and function in people with heart failure.
2. **Elliot Gin:** Medical Student, University of Melbourne
Laparoscopic intra-abdominal pressure study: a double blinded randomised control trial.
3. **Dr Naomi Atkinson:** Registrar, Obstetrics and Gynaecology
Antenatal TORCH (toxoplasmosis, rubella, CMV, herpes simplex) screening – time to start choosing wisely?
4. **Mark Tacey:** Biostatistician
Development of a highly predictive risk-adjustment model in a clinical quality registry.
5. **Jane Jeong:** Medical Student, University of Melbourne
Impact of metabolic syndrome on the perioperative outcomes after emergency general surgery.
6. **Dr Brittany Green:** Hospital Medical Officer, Obstetrics and Gynaecology
Predicted clinical workload from early inductions of labour in South Asian women at Northern Health.
7. **Jamie Nicholls:** Medical Student, University of Melbourne
Birth trauma: how prevalent is it and how does it impact short-term neonatal outcomes?
8. **Dr Lisa Luo-Lan Ling:** Hospital Medical Officer, Surgery
Clinical predictors of pulmonary embolism for inpatients: are computed tomography pulmonary angiograms being requested appropriately?
9. **Amanda (Xiao Wei) Ma,** Medical Student University of Melbourne
Early Enteral Nutrition and Jaundice Outcomes in the Preterm Infant: A Retrospective Cohort Study.

Poster Presentations

12.30 pm – 1.30 pm

Northern Hospital Epping Foyer and Main Corridor

All authors are invited to showcase their work and research findings by networking with other researchers and health clinicians.

Top 10 posters

- Green B, Rozario S, Pratt A, Hui L. *Predicted clinical workload from early inductions of labour in South Asian women at Northern Health.*
- Reeves S, Papageorge M, Haywood C, Wong J. *Audit of osteoporosis investigation and management in patients presenting to an orthopaedic fracture clinic with minimal trauma fractures.*
- Bapat A, Lim HY, Ho P, Leung T. *Utility of Rockwood Clinical Frailty Score in elderly patients with diffuse large B-cell lymphoma.*
- Atkinson N, Hui L. *Antenatal TORCH (toxoplasmosis, rubella, CMV, herpes simplex) screening– time to start choosing wisely?*
- Gin E, Lowen D, Moar X, Hodgson R. *Laparoscopic intra-abdominal pressure study: a double blinded randomised control trial.*

- Nguyen N, Hui L, Hannan N. *Anti-thrombotic and anti-platelet therapy and their influence on placental cell-free DNA release.*
- de Mare K, Fan WQ. *What are the risk factors for 30-day neonatal readmission? A retrospective cohort study.*
- Smith S, Ghosh A, O'Sullivan P. *Key indicators of continuous renal replacement therapy in the Intensive Care Unit.*
- Ma XW, Fan WQ. *Early enteral nutrition and jaundice outcomes in the preterm infant: a retrospective cohort study.*
- Tacey M, Dinh DT, Andrianopoulos N, Brennan AL, Stub D, Liew D, Reid CM, Duffy SJ, Lefkovits J. *Development of a highly predictive risk-adjustment model in a clinical quality registry.*

Guest Speakers: Professors Jan Nicholson and Helen McLachlan

2 pm – 3 pm

Northern Hospital Epping Lecture Theatre

From evidence to implementation: promoting the health of women and children

This presentation provides an overview of collaborative research undertaken in Judith Lumley Centre (JLC) at La Trobe University, with a focus on two programs of work that have led to changes in service provision. JLC is multidisciplinary research centre committed to improving the health of women, children and families through research partnerships with health and community service providers. Cosmos is the award-winning trial of caseload midwifery, now being implemented with Aboriginal women as part of an NHMRC-funded evaluation. Smalltalk is a government-funded early life intervention that aims to provide vulnerable parents with skills and supports that will promote their child's development and reduce later inequalities. The presenters will provide an overview of these two programs of research and discuss their learnings on how to design research that has practical long-term benefits.



Professor Jan Nicholson

Professor Nicholson is the Inaugural Roberta Holmes Chair and Director of the Judith Lumley Centre at La Trobe University. With a background in psychology and public health, her research addresses the challenges facing contemporary parents. This includes cohort studies to identify the determinants and trajectories of parent and child health and wellbeing; and intervention studies that apply these learnings to develop effective, sustainable interventions.



Professor Helen McLachlan

Professor Helen McLachlan is Discipline Lead (Midwifery) for the School of Nursing and Midwifery, La Trobe University and Professor at the Judith Lumley Centre. She has a background as a nurse and midwife. Her research interests include Aboriginal maternal and infant health, models of care, breastfeeding and perinatal care. She is leading a major NHMRC partnership project exploring the implementation of caseload midwifery for Aboriginal women at four Victorian health services.



Research Week 2019 in pictures

Guest Speaker: Dr Adam Semciw

3.30 pm – 4.30 pm

Bundoora Centre, Percy Cleland Ward Conference Room

Factors associated with research interest, confidence and experience in allied health clinicians

Dr Semciw will provide an overview of his research journey on hip pain, from basic science research through to clinical trials. He will discuss factors associated with research interest, confidence and experience among Allied Health clinicians, and how this knowledge can be used to develop strategies to foster research engagement among clinician researchers.



Dr Adam Semciw

Dr Semciw has over 40 publications spanning his major research interests of muscle function, rehabilitation and exercise management of lower limb musculoskeletal conditions, including osteoarthritis. His research comprises basic science and laboratory studies, which has informed further work in clinical trials, systematic reviews and cohort studies. Adam is considered an international expert on the hip, and hip pain. He is ranked number twelve in the world and second in Australia for research on gluteals and ranked seventh in Australia for research on the hip joint. More recently Dr Semciw has gained qualifications in Epidemiology, and takes in interest in building research capacity among clinician researchers.



Audience participation at Research Week 2019

Grand Round: Professor Rachelle Buchbinder

8 am – 9 am

Northern Centre for Health Education & Research (NCHER) Lecture Theatre

The medicalisation of low back pain and how it contributes to low value care

While medical care brings benefits for many, there is accumulating evidence that unnecessary health care including overtesting, overdiagnosis and overtreatment is a growing problem. Not only may it harm people, it diverts scarce resources from those that need it most and may be the most important contributor to health care waste in Australia and the world.



Professor Rachelle Buchbinder

Rachelle Buchbinder is an Australian NHMRC Senior Principal Research Fellow, Rheumatologist and Clinical Epidemiologist. She is the Director, Monash Department of Clinical Epidemiology, Cabrini Institute and Professor, Department of Epidemiology and Preventive Medicine, Monash University. Her other roles include Coordinating Editor, Cochrane Musculoskeletal and current Chair, Australia & New Zealand Musculoskeletal (ANZMUSC) Clinical Trial Network. She combines clinical practice with research in a wide range of multidisciplinary projects relating to musculoskeletal conditions as well as improving communication with patients and health literacy. She has a longstanding

commitment to knowledge synthesis and implementation of clinical research evidence to guide clinical decision-making and improve patient outcomes. Her current program of work concerns reducing inappropriate or low value care and improving the sustainability of the health system. Most recently she contributed to The Lancet Low Back Pain Series www.thelancet.com/series/low-back-pain, a call to action to address the rising global burden of low back pain partly attributable to poor quality health care.

Great Debate and Awards Ceremony

12.30 pm – 1.30 pm

Northern Centre for Health Education & Research (NCHER) Lecture Theatre

Debate Topic: Is meat evil? – should everyone have a vegetarian diet?

It will be fierce. It will be funny. It will be factually questionable. Who will go the distance and who will throw in the towel?

Moderated by Professor Hamish Ewing, the Great Debate brings together two opposing teams for a light-hearted debate. The Great Debate – where critical thinking and comic timing collide.

The Awards ceremony for best poster and oral presentations will follow the debate.

Friday 11 October 2019

Masterclass: Ideation Session / Entrepreneur in Residence and Mentoring

1.00 pm – 5.00 pm

Northern Centre for Health Education & Research (NCHER) Level 3 Conference Room

The Actuator – Australia's National Medtech Accelerator

MedTech Actuator is an independent, not-for-profit entity who curates an entire ecosystem for MedTech and HealthTech innovation and investment.

A half day entrepreneurial education session to introduce commercialisation of new medical and health technologies for emerging and aspiring entrepreneurs from research, clinical, higher education, professional and other backgrounds. These programs are designed for aspiring entrepreneurs to explore opportunities in Medtech commercialisation and to receive the necessary skills and knowledge to kick-start their commercialisation journey.

MedTech Actuator activate ideas from clinicians, researchers, staff and students through industry-led specialised entrepreneurship education and training programs. Accelerate ventures, technologies and teams and invest and curate opportunities to co-invest for out ecosystem partners.

The logo banner features a dark grey background with magenta horizontal bars at the top and bottom. The text 'MEDTECH' is in white, uppercase, sans-serif font on the left. In the center is a cyan-colored logo consisting of three interlocking hexagons. To the right of the logo, the word 'ACTUATOR' is written in white, uppercase, sans-serif font.

MEDTECH

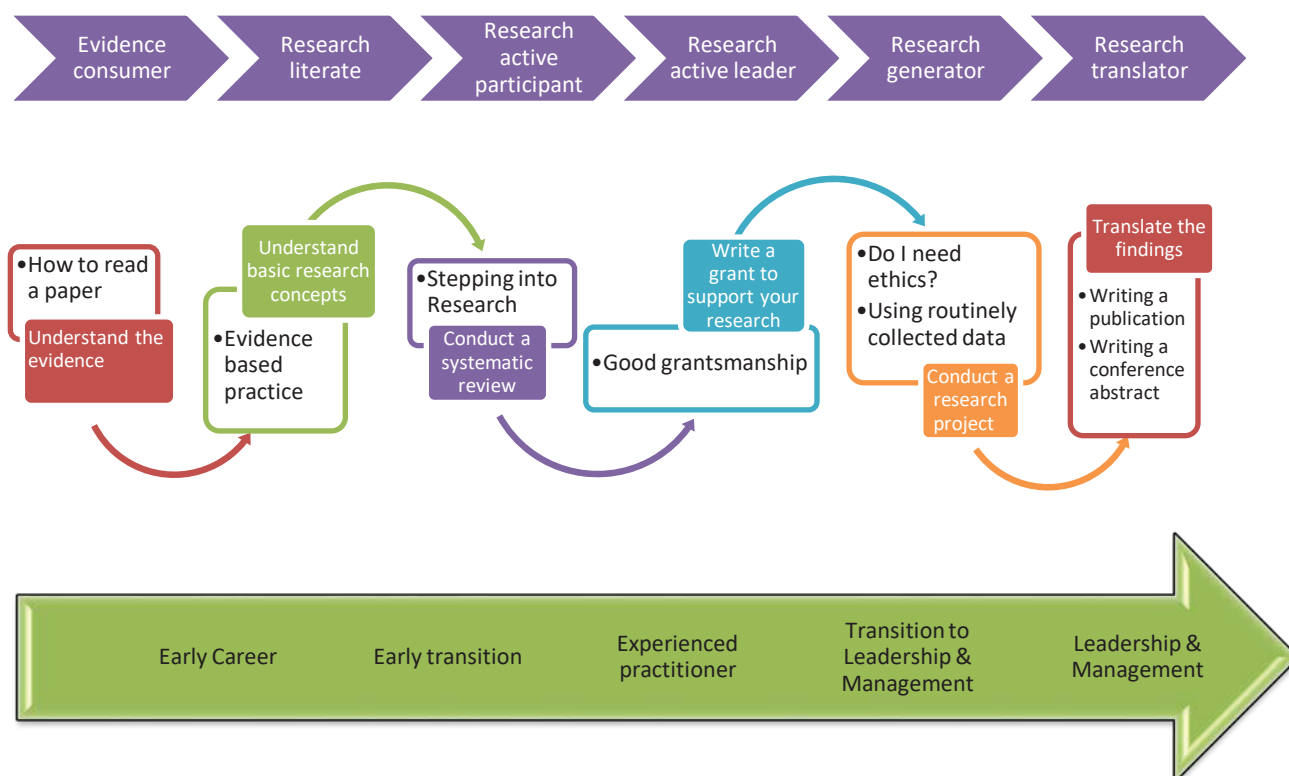


ACTUATOR

Research Reports

Allied Health and Pharmacy

The Department of Health and Human Services created the Victorian Allied Health Research Framework that calls for the development of a sustainable research culture within Allied Health across Victoria. This framework recommends the explicit recognition that research forms a core component of every Allied Health professional's role. This year, Allied Health has focused on educating people about research and how this should be translated into practice. In line with the Victorian Allied Health Research Framework, we mapped out a series of educational opportunities that supports Allied Health clinicians throughout all stages of research development.



This new research education program provides Northern Health's Allied Health with opportunities to identify research priorities, to conduct research into areas of clinical importance in the Northern region and to integrate findings into clinical practice. This ensures Northern Health continues to foster a research culture that values knowledge development, sharing and enquiry.

Pharmacy continues to enhance and evaluate methods of communications including providing information to our community in their native language. This aims to increase medical and medication knowledge and opportunities to receive advice for minor conditions that do not require admission in the emergency department. The surrounding suburbs of Northern Health are within the highest growth areas in Melbourne. People moving to these areas are ethnically diverse and younger than other regions. Working to minimise hospital presentations due to communication in regards to medication therapy or knowledge of their medical conditions will remain a focus. Future research ideas include evaluating the impacts of the implementation of new interventions designed to educate and upskill our pharmacists, reviewing clinical interventions that improve patient outcomes and evaluating processes behind medication management planning and others which partner with our community from admission through to discharge.

Stepping into Research

Relaunched this year, *Stepping into Research* introduces clinicians to the practices of undertaking a research project and partners with them throughout the journey of the process of writing a systematic review. The revamped program was opened up across Northern Health to include clinicians from all disciplines and including those from a non-clinical background. Following a rigorous selection process that included refinement of research questions, participants developed the skills and knowledge required to commence their pathway towards ensuring research becomes core to their future activities with the plan that these will evolve into future publications.

Research Projects

- Investigating the safety of a low-calorie diet using Optifast as a method of weight loss in obese patients receiving dialysis therapy.
- Pilot and evaluation of occupational based activity groups designed to improve overall wellbeing of older patients in a hospital setting.
- Pressure reducing characteristics of offloading devices commonly used to manage diabetes-related foot ulceration.
- Development of an optimal model of care for early supported discharge for people with lower extremity conditions: a co-design study.
- Exploring the barriers to patients completing therapist-prescribed, self-directed, homebased occupational therapy interventions post stroke: a patients' perspective.
- The NOURISH point prevalence study: Nutritional Outcomes of patients Undergoing Resection for upper gastrointestinal cancer in Australian Hospitals.
- Cultural adaptation of the Malnutrition Screening Tool and associated education resources.
- Implementation of a supervised exercise program for patients receiving cytotoxic and anti-cancer chemotherapy.
- Evaluation of the effectiveness of a comprehensive care plan to address national standards and reduce hospital acquired complications in an Australian hospital.
- Effect of metabolic syndrome on clinical and health service outcomes for people with osteoarthritis.

Research Grants

Funding Source	Project Name	Investigators and Affiliations	Amount
Hume Whittlesea Primary Care Partnership	Evaluation of iCope: perinatal screening digital platform for refugee and asylum seeker population group	Rebecca Jessup: Allied Heath Early Career Researcher	\$17,000
Northern Health Foundation Small Research Grant	Effect of metabolic syndrome on clinical and health service outcomes for people with osteoarthritis	Edmund Leahy: Physiotherapy	\$4,999
Northern Health Foundation Small Research Grant	Improving patient swallowing outcomes by credentialing of staff in Fibreoptic Endoscopic evaluation of swallowing	Marinda Brooks: Speech Pathology	\$4,862
Northern Health Foundation Small Research Grant	Meaningful Occupational based activity groups designed to improve the overall wellbeing for older patients in a hospital setting	Renee Catton: Occupational Therapy	\$4,999

Research Publications

- Simmance N, Cortinovis T, Green C, Lunardi K, McPhee M, Steer B & Porter, J. 2019. *Introducing novel advanced practice roles into the health workforce: Dietitians leading in gastrostomy management*. Nutrition & Dietetics, 76(1), 14-20

- Jessup, R. L, O'Connor, D. A, Putrik, P, Rischin, K, Nezon, J, Cyril, S & Buchbinder, R. 2019. *Alternative service models for delivery of healthcare services in high-income countries: a scoping review of systematic reviews*. BMJ open, 9(1), e024385
- Dillon, MP, Anderson, SP, Duke, EJ, Ozturk, HE & Stuckey, R. 2019. *The lived experience of sequential partial foot and transtibial amputation*. Disability and rehabilitation, 1-9
- Brooks, M, McLaughlin, E & Shields, N. 2019. *Expiratory muscle strength training improves swallowing and respiratory outcomes in people with dysphagia: A systematic review*. International journal of speech-language pathology, 21(1), 89-100
- Mayr HL, Tierney AC, Kucianski T, Thomas CJ & Itsiopoulos C. 2019. *Australian patients with coronary heart disease achieve high adherence to 6-month Mediterranean diet intervention: preliminary results of the AUSMED Heart Trial*. Nutrition, 61, 21-31

Research Presentations and Abstracts

- Yan C, Given A. *Combination therapy for massive dabigatran toxicity in severe renal impairment – are we giving enough?* SHPA National Conference: Medication Management, Sydney 2019
- Lal A, Lambros P, See K. *Increasing pharmacy hours increases patient flow: an evening pharmacist shift trial*. SHPA National Conference: Medication Management, Sydney 2019



Cancer Services

As a newly formed division in late 2018, Cancer Services is in the process of realising an effective structure and has been focussed on knitting together activities across our specialities of Haematology, Oncology, Palliative Care, Hospital-in-the-Home, Specialist Clinics and the various programs of Community Services. Research leads for Malignant Haematology, Oncology, Palliative Care and End of Life Care have been established that support the growth of Northern Health based research into the future.

Research Projects

- Understanding routine practice and lifting end results (PURPLE) registry: a prospective pancreatic cancer clinical registry.
- Establishing a biobank of pancreatic cancer models for the pursuit of personalised therapies.
- Circulating tumour DNA analysis informing adjuvant chemotherapy in early stage pancreatic cancer: a multicentre randomised clinical trial (DYNAMIC-Pancreas).
- Pancreatic cancer biomarker study.
- The prognostic role of baseline metabolic tumour volume and interim 18F-fluorodeoxyglucose positron emission tomography / computed tomography in patients with diffuse large B-cell lymphoma.

Research Grants

Funding Source	Project Name	Investigators and Affiliations	Amount
PanCare	PURPLE Translational Registry	Belinda Lee: Medical Oncologist, Northern Health and The Walter & Eliza Hall Institute of Medical Research	\$100,000 over 3 years
Hemstritch Foundation	Pancreatic Cancer Biomarker Project	Belinda Lee: Medical Oncologist, Northern Health and The Walter & Eliza Hall Institute of Medical Research	\$187,000 over 2 years

Research Publications

- Gerber K, Hayes B, Bryant C. 2019. *'It all depends': A qualitative study of preferences for place of care and place of death in terminally ill patients and their family caregivers*. *Palliative Medicine* 33(7): 802-811
- Gerber K, Hayes B, Bryant C. 2019. *Preferences for place of care and place of death: What, how, when and who to ask?* *Progress in Palliative Care* 27(2):64-68
- Martin R, Hayes B, Hutchinson A, Tacey M, Yates P, Lim WK. 2019. *Introducing Goals of Patient Care in Residential Aged Care Facilities to decrease hospitalization: A cluster randomized controlled trial*. *The Journal of Post-Acute and Long-Term Care Medicine* <https://doi.org/10.1016/j.jamda.2019.06.017>
- Lee B, Lipton L, Cohen J, Tie J, Javed AA, Li L, Goldstein D, Burge M, Cooray P, Nagrial A, Tebbutt N C, Thomson B, Nikfarjam M, Harris M, Haydon A, Lawrence B, Tai DWM, Simons K, Lennon AM, Wolfgang CL, Tomasetti C, Papadopoulos N, Kinzler KW, Vogelstein B, Gibbs P. *Circulating tumour DNA as a potential marker of adjuvant chemotherapy benefit following surgery for localized pancreatic cancer*. *Annals of Oncology*, mdz200, Published: 28 June 2019

Research Presentations and Abstracts

- Wong A, Harvey P, Yates P, Tacey M, Hayes. *Validating resuscitation decisions using the Good Outcome Following Attempted Resuscitation (GO-FAR) Score and the Supportive and Palliative Care Indicator Tool (SPICT)*. The Australian and New Zealand Society for Geriatric Medicine Annual Scientific Meeting. Adelaide, May 2019
- Brownstein H, Simadri A, Hayes B, Tacey M, Holbeach E. *Aged Care Facility to ED: an observational study of residents transferred to hospital in the last 24 hours of life*. The Australian and New Zealand Society for Geriatric Medicine Annual Scientific Meeting. Adelaide, May 2019
Speaker: Belinda Lee. *Pancreatic Cancer care in Victoria – Towards Optimal Care*. Victorian Integrated Cancer Services (VICS) Conference, Melbourne, May 2019
- Lee B, Thomson B, Ananda S, Lipton L, Shapiro J, Mclachlan S, Nikfarjam M, Tebbutt N, Wong R, Cooray P, Harris M, Croagh D, Goldstein D, Burge M, Clarke K, Pattison S, Nagrial A, Zielinski R, Yip D, Roy A, Ean Chee C, Poon D, Putoczki T, Grimmond S, Burgess T, Gibbs P. *The evolving role of data registries: An*

overview and application of the PURPLE Pancreatic cancer Translational registry. Australian GI Trials Group (AGITG) 2018 Annual Scientific Symposium: Brisbane Aug 2018

- Banks S, Kwok T, Chen R, Fox A, Banting S, Mclachlan S, Thomson B, Knowles B, Tagkalidis P, Ananda S, Lipton L, Usatoff V, Smith M, Gibbs P, Lee B. *Pancreatic Cancer: An Analysis of “Real World” Stent related morbidity in the palliative care setting.* Australian GI Trials Group (AGITG) 2018 Annual Scientific Symposium: Brisbane August 2018 (Awarded Best Poster Presentation)
- Jalali A, M Lee, C Semira, Banks S, H Wong, S Ananda, L Lipton, JD Shapiro, P Cooray, K Clarke, M Burge, R Wong, J Shapiro, P Gibbs, B Lee. *‘Use of FOLFIRINOX chemotherapy in an Australasian population of pancreatic cancer’* Australian GI Trials Group (AGITG) 2018 Annual Scientific Symposium: Brisbane August 2018 (Selected for Oral Fast Forward Presentation)
- Li J, Jalali A, Matoga K, Yau W, Barnett F, Chong F, Houli N, Yong T, Hodgson R, Ng M, Butt J, Lee B *Identifying Clinical Barriers to Optimal Pancreatic Cancer Treatment.* Australian GI Trials Group (AGITG) 2019 Annual Scientific Symposium: Adelaide August 2019
- Lee B, Lipton L, Cohen J, Tie J, Javed A A, Li L, Goldstein D, Burge M, Cooray P, Nagrial A, Tebbutt N C, Thomson B, Nikfarjam M, Harris M, Haydon A, Lawrence B, Tai D W M, Simons K, Lennon A M, Wolfgang C L, Tomasetti C, Papadopoulos N, Kinzler K W, Vogelstein B, Gibbs P. *Circulating tumor DNA as a potential marker of adjuvant chemotherapy benefit following surgery for localized pancreatic cancer.* Victorian Comprehensive Cancer Centre Scientific Symposium: Melbourne September 2019 (Selected for Oral Presentation)
- Lee B, Shapiro J, Thomson B, Ananda S, Lipton L, Shapiro J, Mclachlan S, Nikfarjam M, Tebbutt N, Wong R, Cooray P, Harris M, Croagh D, Goldstein D, Burge M, Clarke K, Pattison S, Nagrial A, Zielinski R, Yip D, Roy A, Ean Chee C, Poon D, Putoczki T, Grimmond S, Burgess T, Gibbs P *‘How can digital health be used to improve outcomes in pancreatic ductal adenocarcinoma (PDAC)? Examining the potential of the PURPLE Translational Pancreatic Cancer Platform (67010).* *Clinical Oncology Society Australia (COSA) Annual Scientific Meeting, Adelaide November 2019 (Selected for Best of Best Oral Session for COSA 2019)*
- Walpole I, Lee B, Shapiro J, Thomson B, Lipton L, Ananda S, Usatoff V, Mclachlan S, Knowles B, Fox A, Wong R, Cooray P, Burge M, Clarke K, Pattison S, Nikfarjam M, Tebbutt N, Harris M, Nagrial A, Zielinski R, Ean Chee C, Gibbs P *‘Use and Outcomes from Neoadjuvant chemotherapy in Borderline Resectable Pancreatic Ductal Adenocarcinoma in an Australasian Population’* *Clinical Oncology Society Australia (COSA) Annual Scientific Meeting, Adelaide November 2019 (Selected for Mini Oral and Poster Presentation Session COSA 2019)*

Future Research Goals

Our focus going forward will be to establish a Cancer Services Research Sub-Committee to oversee the sustainable offering of local clinical trials of new anti-cancer therapies. Success of this committee will ensure we provide support for both established and emerging researchers to localise, commence or consolidate their research at Northern Health.

Major research goals for Oncology are to continue to develop investigator lead research capabilities. We have two new clinical research projects in pancreatic cancer that are in development which will be undertaken in collaboration with North Eastern Melbourne Integrated Cancer Service. We will continue to build upon our current clinical trial portfolio and will actively seek out new potential clinical trials that will benefit patients at Northern Health.

The existing strength of research relating to patients who are moving towards end of life and improving the care of patients who are dying will ensure our community receives the best care in what otherwise is an extremely stressful time for patients and their families. Led by Dr Barbara Hayes, this research will be ongoing and translated into improvements in end of life care.



Diagnostic Services

2019 has been another successful year in terms of research for the Diagnostic Services. We have continued to expand our research projects alongside our internal (Renal, Endocrinology, General Medicine, Obstetrics, Vascular Surgery, Anaesthesia) and external collaborators (Professor Harshal Nandurkar – Australian Centre of Blood Diseases; Professor Geoffrey Donnan – The Florey Institute of Neurosciences and Mental Health; Professor Louise Burrell – Department of Medicine Austin Health; Dr Ada Chueng – Department of Endocrinology Austin Health). We have published in peer-reviewed international journals. Our division currently hosts two PhD students and two Scholarly Selective students.

Research Projects

- Global coagulation assays and biomarkers in high risk cardiovascular disease patients (key investigators: Hui Yin Lim, Prahlad Ho).
 - PhD candidate: Hui Yin Lim (recipient of joint NHMRC / Heart Foundation Postgraduate Scholarship).
 - In collaboration with both internal (Renal, Endocrinology, General Medicine) and external collaborators (Australian Centre of Blood Diseases, The Florey Institute of Neurosciences and Mental Health, Department of Medicine Austin).
- Establishment of normal control reference ranges for global coagulation assays and biomarkers of thrombosis (key investigators: Prahlad Ho, Hui Yin Lim).
- Prospective venous thromboembolism biomarker study (key investigators: Prahlad Ho, Hui Yin Lim, Julie Wang – PhD Student)
 - In collaboration with external collaborator (Australian Centre of Blood Diseases).
- Global coagulation assays in patients with plasma cell dyscrasia (key investigators: Hui Yin Lim, Prahlad Ho) – publication in preparation.
- Global coagulation assays in obstetrics population (key investigators: Prahlad Ho, Hui Yin Lim, Lisa Hui) – publication in preparation.

- Global coagulation assays in transgender population (key investigators: Hui Yin Lim, Prahlad Ho, Ada Cheung (Endocrinology, Austin)).
- Correlation of global coagulations assays to postpartum venous thromboembolism risk assessment score (key investigators: Hui Yin Lim, Prahlad Ho, Darren Lowen (Anaesthesia)).
- Evaluation of DOAC-Stop to resolve direct oral anticoagulant interference in laboratory and research coagulation testing (key investigators: Niki Lee, Hui Yin Lim, Prahlad Ho).
- Evaluation of direct oral anticoagulant anti-Xa level in patients of extremes of weight and in direct oral anticoagulant failure (key investigators: Khai Li Chai, Niki Lee, Hui Yin Lim, Prahlad Ho).
- Evaluation of use of direct oral anticoagulants at Northern Health and the role of low dose anticoagulation in high-risk populations (key investigators: Rowena Brook, Hui Yin Lim, Prahlad Ho) – publication in preparation.
- Management of superficial vein thrombosis at Northern Health (key investigators: Brandon Lui, Hui Yin Lim, Prahlad Ho) – publication in preparation.
- Validation of Genesii, a new global coagulation assay (key investigators: Uttam Punj, Joseph Rigano, Hui Yin Lim, Prahlad Ho).
- Evaluation of the role of D-dimer in predicting recurrence in venous thromboembolism patients (key investigators: Julie Wang, Prahlad Ho).
- Evaluation of the utility of CT pulmonary angiogram in diagnosing inpatient pulmonary embolism (key investigators: Lisa Ling, Hui Yin Lim, Prahlad Ho).

Research Publications

- Brook R, Aswapanyawongse N, Tacey M, Kitipornchai T, Ho P, Lim HY. *Real-world direct oral anticoagulants experience in atrial fibrillation: falls risk and low dose anticoagulation are predictive of both bleeding and stroke risk.* Int Med J (accepted for publication 11 Sept 2019)
- Lim HY, O'Malley Cindy, Donnan G, Nandurkar H, Ho P. *A review of global coagulation assays – Is there a role in thrombosis risk prediction?* Thromb Res 2019; 179:45-55
- Lim HY, Leung P, Manitta V, Nandurkar H, Ho P. *Evaluation of global coagulation assays in normal and thrombocytopenic populations.* Int J Lab Hematol 2019; 41:184-91
- Chua CC, Lim HY, A Testro, Hong FS. *Passenger lymphocyte syndrome due to anti-B and anti-Jk following combined intestinal and renal transplantation.* ISBT Science Series 2019; 14:183-6
- Lim HY, Ho P, Bayat I, Hong F. *Thrombophlebitis post varicose vein surgery: To treat or not to treat?* EC Clin Med Case Reports 2019;2:38-42
- Hong F, Fox C, Chai KL, Htun K, Clucas D, Morgan S, Cole-Sinclair MF, Juneja S. *Role of bone marrow biopsy for fever of unknown origin in the contemporary Australian context.* Intern Med J 2019; 49:850-4
- McBride L, Wang J, Ho P, Langsford D. *Dabigatran Toxicity in Acute Kidney Injury: Haemodialysis and Idarucizumab Required.* Kidney Int Report 2018;4(3):500-504
- Lim HY, Hong F. *Maximising yield of peripheral blood flow cytometry for chronic lymphoproliferative disorders.* Int J Lab Hematol 2018; 40:556-560
- Lim HY, Ng C, Tacey M, Donnan G, Nandurkar H, Ho P. *Global coagulation assays in myeloproliferative neoplasm.* Blood Coagulation and Fibrinolysis 2018; 28:300-6
- Lim HY, Nandurkar H, Ho P. *DOAC and the paradigm shift in VTE management.* Seminars in Thrombosis and Haemostasis 2018; 44:261-6
- Chua CC, Lim HY, Chai KL, Ong J, Sim S, Wood C, Dickinson M, Campbell P, Hempton J, King H, Dowsing C, Bergin K, Muir S, Gibbs S, Grigg A. *Peripheral blood stem cell mobilization with G-CSF alone versus G-CSF and cyclophosphamide after bortezomib, cyclophosphamide and dexamethasone induction in multiple myeloma.* Bone Marrow Transplant 2018; 53:1116-23

Research Presentations and Abstracts

Oral Presentations

- Lui B, Barit D, Nandurkar H, Ho P, Lim HY. *Evaluation of global coagulation assays in patients with chronic kidney disease*. Blood, Perth, October 2019
 - B Lui was awarded a travel grant for this abstract
- Lim HY, Nandurkar H, Donnan G, Ho P. *Is there a role for global coagulation assays in thrombosis risk prediction?* Asia Pacific Society of Thrombosis & Haemostasis – Japanese Society of Thrombosis Haemostasis Symposium, Tsu (Japan), June 2019
 - Abstract selected as one of five outstanding young scientists' abstract from the Asia Pacific Region with travel grant awarded
- Cheung A, Lim HY, Torkamani N, Rainier M, Grossmann M, Nandurkar H, Zajac GD, Ho P. *Global coagulation assays in transgender women*. Endocrine Society of Australia, Sydney, August 2019
- Aswapanyawongse O, Pham T, Lim HY, Ho P. *Thrombin generation via calibrated automated thrombogram: an alternative measurement of rivaroxaban effect?* Blood, Brisbane, October 2018
- Lim HY, Ho P. *Global coagulation assays in thrombosis*. THANZ Workshop, Brisbane, October 2018
- Wang J, Brook R, Hong L, Ho P. *Post-anticoagulation cessation D-dimer and VTE recurrence in the real-world practice*. Blood, Brisbane, October 2018
- Ho P, Lim HY. *Role of global coagulation in thrombosis risk prediction?* Vice-President's Symposium, International Union of Angiology, Beijing, October 2018

Poster Presentations (International)

- Langsford D, Lui B, Pianta T, Barit D, Nandurkar H, Ho P, Lim HY. *Assessing bleeding risk in chronic kidney disease using global coagulation assays*. American Society of Nephrology 2019, Washington DC, November 2019
- Lim HY, Torkamani N, Rainier M, Grossmann M, Nandurkar H, Zajac GD, Ho P, Cheung A. *Global coagulation assays in transgender women*. International Society of Thrombosis and Haemostasis 2019 Congress, Melbourne, July 2019
- Brook R, Krishnamoorthi B, Leung T, Nandurkar H, Ho P, Lim HY. *Global coagulation assays in multiple myeloma and monoclonal gammopathy of unknown significance*. International Society of Thrombosis and Haemostasis 2019 Congress, Melbourne, July 2019
- Ling L, Zhang V, Lim HY, Lim MJ, Ho P. *Clinical predictors of pulmonary embolism for inpatients: Are computed tomography pulmonary angiograms (CTPAs) being requested appropriately? – retrospective analysis*. International Society of Thrombosis and Haemostasis 2019 Congress, Melbourne, July 2019
- Brook R, Aswapanyawongse O, Lim HY, Ho P. *Real world experience of direct oral anticoagulants with comparison of safety outcomes to the warfarin era of venous thromboembolism treatment*. American Society of Haematology 2018, San Diego, December 2018
- Barit D, Lim HY, Munnings M, Nandurkar H, Ho P. *Global coagulation assays in haemodialysis patients*. American Society of Nephrology 2018, San Diego, November 2019

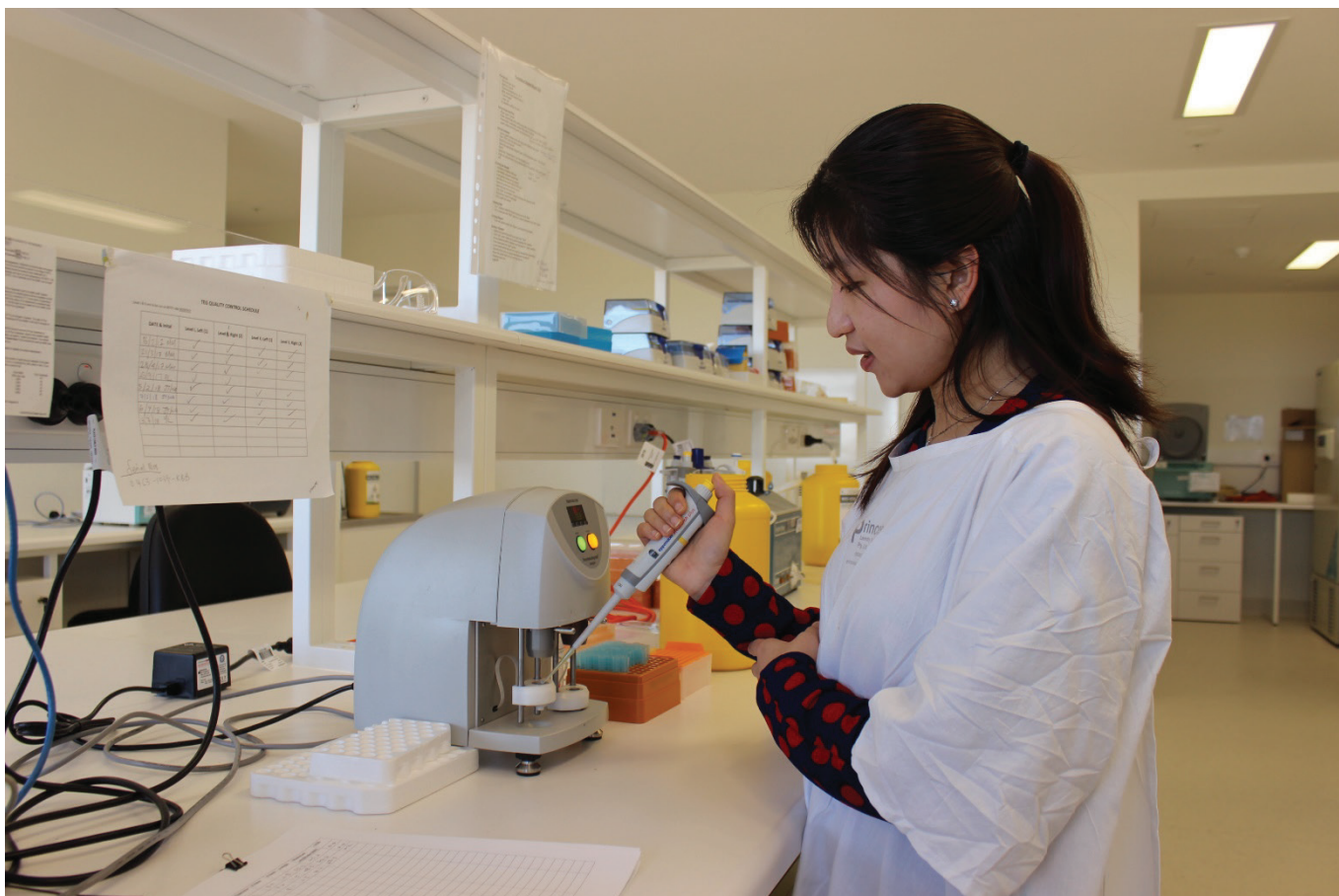
Poster Presentations (Local)

- Joshi S, Lim HY, Ho P. *Outcomes of intracranial bleed on direct oral anticoagulants and warfarin*. Blood, Perth, October 2019
 - S Joshi was awarded a travel grant for this abstract
- Krishnamoorthi B, Lim HY, Cooke R, Nandurkar H, Leung T, Ho P. *Global coagulation assays in multiple myeloma and monoclonal gammopathy of unknown significance*. Blood, Brisbane, October 2018
 - B Krishnamoorthi was awarded the Best Poster Award

An additional 6 abstracts were accepted for poster presentations at international conferences and 18 at local conferences in 2018-19.

Future Research Goals

We will continue to build our research team and pursue ground-breaking projects on our journey to become the major coagulation diagnostic laboratory and thrombosis research unit in Australia. We will further our collaborative efforts with both internal and external collaborators. Diagnostic Services will expand our repertoire of novel biomarkers of coagulation and thrombosis and continue to provide support and mentorship to emerging researchers.



Emergency Services

Clinical trials have been a major focus across Emergency Services with Cardiology running a cardiovascular clinical trials team that actively recruits patients for trials in lipid lowering, novel myocardial protectants and novel agents for the management of heart failure. The Intensive Care team has contributed to clinical research via collaborative efforts in the SPICE, HEAT, ADRENAL and TRANSFUSE trials resulting in publications in the New England Journal of Medicine.

Dr Nancy Sadka heads up the Emergency Department Research and has been driving success in simulation utilising our Simulation Laboratory and in-situ simulation in real-world locations within the hospital.

Research Projects

Professor William van Gaal is currently supervising PhD student Rifly Rafiudeen who is undertaking a randomised controlled trial of Ivabradine in patients undergoing surgery to reduce type II myocardial infarction. This is in conjunction with a trial of optical coherence tomography to look at the contribution of plaque rupture to type II myocardial infarction in patients with sepsis and / or tachyarrhythmias.

Research Grants

Dr Rifly Rafiudeen was successful in commencing his PhD supported by the Northern Health Foundation.

Research Publications

- Nandal S, Castles A, Asrar UI Haq M, van Gaal W. *Takotsubo cardiomyopathy triggered by status epilepticus: case report and literature review*. BMJ Case Rep. 2019 Jan 29;12(1)
- Dina A, Barlis P, van Gaal W. *Clozapine-Induced Myocarditis or Acute Coronary Syndrome? Optical Coherence Tomography to the Rescue*. Case Rep Cardiol. 2018 Jul 19;2018
- Itsiopoulos C, Kucianski T, Mayr HL, van Gaal WJ, Martinez-Gonzalez MA, Vally H, Kingsley M, Kouris-Blazos A, Radcliffe J, Segal L, Brazionis L, Salim A, Tierney AC, O'Dea K, Wilson A, Thomas CJ. *The Australian Mediterranean Diet Heart Trial (AUSMED Heart Trial): A randomized clinical trial in secondary prevention of coronary heart disease in a multiethnic Australian population: Study protocol*. Am Heart J. 2018 September; 203:4-11
- Obeyesekere MN. *Review: In adults with AF and HF, AF catheter ablation vs drug therapy reduces mortality and HF hospitalizations*. Ann Intern Med. 2019
- Obeyesekere MN, et al *Preventing Sudden Death in Asymptomatic Wolf-Parkinson-White Patients*. JACC Clin Electrophysiol. 2018
- Vlachadis Castles, A. and Segan, L. (co-first authors), *Women in cardiology in Australia- Are we making any progress?* Heart, Lung and Circulation, 2019, 28(5):690-696
- Burgess, S, Shaw, E, Ellenberger, K.A, Segan, L, Vlachadis Castles, A, Biswas, S, Thomas, L. and Zaman, S. *Gender Equity within Medical Specialties of Australia and New Zealand: Cardiology's Outlier Status*. Internal Medicine Journal, 2019, In print, DOI: 10.1111/imj.14406
- Han HC, Calafiore P, Teh AW, Farouque O, Lim HS. *Arrhythmic Mitral Annulus Disjunction and Mitral Valve Prolapse: Components of the Same Clinical Spectrum?* J Am Coll Cardiol. 2019 February 19;73(6):739
- Han HC, Ha FJ, Teh AW, Calafiore P, Jones EF, Johns J, Koshy AN, O'Donnell D, Hare DL, Farouque O, Lim HS. *Mitral Valve Prolapse and Sudden Cardiac Death: A Systematic Review*. J Am Heart Assoc. 2018 Dec 4;7(23)
- Ha FJ, Han HC, Sanders P, Teh AW, O'Donnell D, Farouque O, Lim HS. *Prevalence and prevention of oesophageal injury during atrial fibrillation ablation: a systematic review and meta-analysis*. Europace. 2019 Jan 1;21(1):80-90
- Ha FJ, Han HC, Sanders P, Teh AW, O'Donnell D, Farouque O, Lim HS. *Challenges and limitations in the diagnosis of atrioesophageal fistula*. J Cardiovasc Electrophysiol. 2018 Jun;29(6):861-871.
- Han HC, Ha FJ, Sanders P, Spencer R, Teh AW, O'Donnell D, Farouque O, Lim HS. *Atrioesophageal Fistula: Clinical Presentation, Procedural Characteristics, Diagnostic Investigations, and Treatment Outcomes*. Circ Arrhythm Electrophysiol. 2017 November;10(11).
- Gijzen F, Katagiri Y, Barlis P, Bourantas C, Collet, C, Coskun, U, Daemen, J, Dijkstra J, Edelman E, Evans P, Van Der Heiden K, Hose R., Koo B-K, Krams R, Marsden A, Migliavacca F, Onuma Y, Ooi A, Poon E, Samady H, Stone P, Takahash, K, Tang D, Thondapu V, Tenekecioglu E, Timmins L, Torii R, Wentzel J, Serruys P. 2019. *Expert Recommendation on The Assessment of Wall Shear Stress in Human Coronary Arteries: Existing Methodologies, Technical Considerations, And Clinical Applications*. European Heart Journal. DOI: 10.1093/eurheartj/ehz551
- Jiang B, Thondapu V, Poon E.K.W, Barlis P & Ooi A.S.H. 2019. *Numerical Study of Incomplete Stent Apposition Caused by Deploying Undersized Stent in Arteries with Elliptical Cross Sections*. Journal of Biomechanical Engineering-Transactions of the Asme, 141
- Poon, E. K. W., Thondapu, V., Hayat, U., Barlis, P., Yap, C. Y., Kuo, P. H., Wang, Q., Ma, J., Zhu, S. J., Moore, S. & Ooi, A. S. H. 2018. *Elevated Blood Viscosity and Microcirculation Resulting from Coronary Stent Malapposition*. J Biomech Eng, 140

- Tenekecioglu, E., Torii, R., Katagiri, Y., Asano, T., Modolo, R., Miyazaki, Y., Chichareon, P., Poon, E. K. W., Gijssen, F., Thondapu, V., Van Klaveren, D., Jonker, H., Ooi, A., Barlis, P., Collet, C., Onuma, Y., Bourantas, C. V. & Serruys, P. W. 2019. *Early strut protrusion and late neointima thickness in the Absorb bioresorbable scaffold: a serial wall shear stress analysis up to five years*. Eurointervention, 15, E370+
- Thondapu, V., Tenekecioglu, E., Poon, E. K. W., Collet, C., Torii, R., Bourantas, C. V., Chin, C., Sotomi, Y., Jonker, H., Dijkstra, J., Revalor, E., Gijssen, F., Onuma, Y., Ooi, A., Barlis, P. & Serruys, P. W. 2018. *Endothelial shear stress 5 years after implantation of a coronary bioresorbable scaffold*. Eur Heart J, 39, 1602-1609
- Yamamoto, E., Thondapu, V., Poon, E., Sugiyama, T., Fracassi, F., Dijkstra, J., Lee, H., Ooi, A., Barlis, P. & Jang, I. K. 2019. *Endothelial Shear Stress and Plaque Erosion: A Computational Fluid Dynamics and Optical Coherence Tomography Study*. JACC Cardiovasc Imaging, 12, 374-375
- Zhu, S. J., Thondapu, V., Poon, E. K. W., Serruys, P. W., Ooi, A. & Barlis, P. 2019. *Computational particle tracking to model platelet behaviour near malapposed coronary stent struts*. Eur Heart J, 40, 1890-1891
- Casamento A, Bailey M, Robbins R, Pilcher D, Warrillow S, Ghosh A, et al. *Patient characteristics, incidence, technique, outcomes and early prediction of tracheostomy in the state of Victoria, Australia*. Journal of critical care. 2018;44:278-84
- Venkatesh B, Finfer S, Cohen J, Rajbhandari D, Arabi Y, Bellomo R, et al. *Adjunctive Glucocorticoid Therapy in Patients with Septic Shock*. New England Journal of Medicine. 2018;378(9):797-808
- Shehabi Y, Howe BD, Bellomo R, Arabi YM, Bailey M, Bass FE, et al. *Early Sedation with Dexmedetomidine in Critically Ill Patients*. New England Journal of Medicine. 2019;380(26):2506-17
- Kamiya H, Panlaqui OM, Izumi S, Sozu T. *Systematic review and meta-analysis of prognostic factors for idiopathic inflammatory myopathy-associated interstitial lung disease*. BMJ Open. 2018;8(12):e023998
- Street M, Mohebbi M, Berry D, Cross A, Considine J. *Influences on emergency department length of stay for older people*. European Journal of Emergency Medicine. 2018;25(4):242-9
- Tsai D, Stewart PC, Hewagama S, Krishnaswamy S, Wallis SC, Lipman J, et al. *Optimised dosing of vancomycin in critically ill Indigenous Australian patients with severe sepsis*. Anaesthesia and intensive care. 2018;46(4):374-80
- Thien F, Beggs PJ, Csutoros D, Darvall J, Hew M, Davies JM, et al. *The Melbourne epidemic thunderstorm asthma event 2016: an investigation of environmental triggers, effect on health services, and patient risk factors*. The Lancet Planetary Health. 2018;2(6):e255-e63
- Hua-Gen Li M, Hutchinson A, Tacey M, Duke G. *Reliability of comorbidity scores derived from administrative data in the tertiary hospital intensive care setting: a cross-sectional study*. BMJ Health & Care Informatics. 2019;26(1):e000016

Research Presentations and Abstracts

- Vlachadis Castles A, Fendel K, Segan L, McFarlane L, Amerena J, Vaddadi G. *Troponin elevation in Takotsubo cardiomyopathy - a retrospective cohort study*. Cardiac Society of Australia and New Zealand (CSANZ), 2019 Adelaide
- Vlachadis Castles A, van Gaal W. *Women in Cardiology in Australia- Are we Making Any Progress?* CSANZ, Brisbane 2018
- Vlachadis Castles A, van Gaal W, Carr S, *Validation of Simulation for Assessing Competence of Medical Students and Junior Doctors in Managing Cardiac Emergencies*. CSANZ, Brisbane 2018
- Vlachadis Castles A, Sutherland N, van Gaal W. *Australian trends in the insertion of implantable loop recorders 2004 to 2016*. CSANZ, Brisbane 2018
- Vlachadis Castles A, Sutherland N, van Gaal W. *Prescription rates of sacubitril/valsartan with government subsidisation: the Australian experience*. CSANZ, Brisbane 2018

- Sutherland N, Vlachadis Castles A, Monk L, van Gaal W. *Is concern about falling preventing appropriate anticoagulation of elderly patients with atrial fibrillation? A retrospective cohort study.* CSANZ, Brisbane 2018
- Nandal S, Chow CL, Vlachadis Castles A, Ponnuthurai FA, van Gaal W. *Real-world evidence of improvement in quality of life score, NYHA class and tolerability of Valsartan/ Sacubitril in heart failure patients.* CSANZ, Brisbane 2018

Future Research Goals

We hope to build upon the foundations created in our PhD program to expand to include other areas including electrophysiology under the supervision of A/Prof. Uwais Mohamed.

Researching the outcomes and impacts of simulation utilising our Simulation Laboratory and in-situ simulation in real-world locations within the hospital will help us better understand future workforce models, and how to best equip staff with the skills and knowledge required to be exceptional clinicians.

The introduction of a new structure within our Emergency Department will continue to nurture the growing research culture required to evaluate the impacts as we evolve to meet the growing demands of our community.

Building upon the established culture of world-leading multi-centre clinical research collaborations that enables our community access to new and novel treatments.



Medicine and Sub-Acute Services

Key Achievements

- Expanding collaboration in large multicentre clinical trials – STOPPE and AMPLE-3 (Respiratory), AFTER-AKI, FUN-After-AKI, RESOLVE Trial (Nephrology), PIANO (Infectious Diseases), ATTUNE, AuSCR, MMSU (Neurology / Stroke)
- Papers accepted for publication in leading journals including the European Respiratory Journal (impact factor 12.2) and Nature Communications (impact factor 13.8)

Research Projects

Medicine

- Prospective rifampicin drug-drug interaction study.
- PIANO study: 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*) (Clinical Trial).
- 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* (Clinical Trial).
- *Dietetic intervention using multiple strategies to promote adherence in achieving long-term potassium restriction* (Clinical Trial).
- 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 Trial trial site, Multicentre clinical trial, AKTN).
- Global Coagulation Assays in Chronic Kidney Disease.
- Australasian Malignant Pleural Effusion Trial - 3.A Multicentre Randomised Study Comparing Combined Indwelling Pleural Catheter (IPC) and Talc Pleurodesis with Video-Assisted Thoracoscopic Surgery (VATS) for the Management of Patients with Malignant Pleural Effusion.
- Steroid Therapy and Outcome of Parapneumonic Pleural Effusions (STOPPE) - A Multicentre Randomized Control Trial.
- Retrospective audit of the Pleural Service.
- Molecular basis of Sudden Unexpected Death in Epilepsy (SUDEP).
- Timing of anticoagulation in 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.

Sub-Acute

- Involvement in trial of new medication for agitation in patients with dementia.
- Participation in ongoing Cochrane review – exercise for acutely hospitalised older patients.

Research Grants

Funding Source	Project Name	Investigators and Affiliations	Amount
Northern Health Foundation Small Research Grant	Prospective Clinical Drug-Drug Interaction study between Rifampicin and Fusidic Acid	Craig Aboltins: Infectious Diseases John Daffy: Infectious Diseases	\$5000
Northern Health Foundation Small Research Grant	Pleural effusion and symptom evaluation study-2: Ultrasound to quantify diaphragm function in patients with pleural effusion	Liam Hannan: Respiratory Sanjeevan Muruganandan: Respiratory	\$5,000
Northern Health Foundation Small Research Grant	Steroid Therapy and Outcome of Parapneumonic Pleural Effusions (STOPPE) - A Multicentre Randomized Control Trial	Sanjeevan Muruganandan: Respiratory Deirdre Fitzgerald, YC Gary Lee: Sir Charles Gairdner Hospital, Perth WA	\$5,000
Boston Scientific	Pleural effusion and symptom evaluation study-2: Ultrasound to quantify diaphragm function in patients with pleural effusion	Sanjeevan Muruganandan: Respiratory Liam Hannan: Respiratory	\$15,000

Research Publications

Medicine

- Wouthuyzen-Bakker M *et al.* *Timing of implant-removal in late acute periprosthetic joint infection: A multicenter observational study.* J Infect. 2019 Sep;79(3):199-205. doi: 10.1016/j.jinf.2019.07.003. Epub 2019 Jul 15
- Inthavong P *et al.* *Acute Q-fever infection in a dairy products maker without direct animal contact.* Intern Med J. 2019 Feb;49(2):272-273. doi: 10.1111/imj.14197
- Aboltins CA *et al.* *Hip and Knee Section, Prevention, Antimicrobials (Systemic): Proceedings of International Consensus on Orthopedic Infections.* J Arthroplasty. 2019 Feb;34(2S):S279-S288. doi: 10.1016/j.arth.2018.09.012. Epub 2018 Oct 19
- Aboltins CA *et al.* *Hip and Knee Section, Prevention, Prosthesis Factors: Proceedings of International Consensus on Orthopedic Infections.* J Arthroplasty. 2019 Feb;34(2S):S309-S320. doi: 10.1016/j.arth.2018.09.016. Epub 2018 Oct 19
- Wouthuyzen-Bakker M *et al.*; ESCMID Study Group for Implant-Associated Infections (ESGIAI). *Clinical outcome and risk factors for failure in late acute prosthetic joint infections treated with debridement and implant retention.* J Infect. 2019 Jan;78(1):40-47. doi: 10.1016/j.jinf.2018.07.014. Epub 2018 Aug 7.
- McBride L *et al.* *Dabigatran Toxicity in Acute Kidney Injury: Hemodialysis and Idarucizumab Required,* Kidney Int Rep (2019) 4, 500–504
- Arnold R *et al.* *Potassium control in chronic kidney disease: implications for neuromuscular function,* Intern Med J, 49 (2019) 817–825
- Jackson, M.L *et al.* *Cross-sectional examination of gender differences in depression and anxiety symptoms in patients with obstructive sleep apnea.* Sleep Biol. Rhythms (2019). <https://doi.org/10.1007/s41105-019-00225-0>
- Mu S *et al.* *Autocycling during noninvasive positive pressure ventilation producing a prolonged severe apnea and syncope.* J Clin Sleep Med. 2019;15(4):663–665
- Andrew, N.E. *et al.* *Prescription of Antihypertensive Medication at Discharge Influences Survival Following Stroke.* Neurology 2018. 90 (9). e745–e753

Sub-Acute

- Raymond MJ, Winter A, Jeffs KJ, Soh SE, Holland AE. 2018. *Acceptability of physical activity monitoring in older adults undergoing inpatient rehabilitation*. Aging clinical & experimental research Aug;30(8):1005-1010
- Haywood C, Sumithran P. 2019. *Treatment of obesity in older persons – A systematic review*. Obesity Reviews 20(4)
- Haywood C, Prendergast L et al. 2019. *Obesity in older adults: Effect of degree of weight loss on cardiovascular markers and medications*. Clinical Obesity 9(4)
- Yu JJ, Sunderland Y. 2019. *Outcomes of hospital in the home treatment of acute decompensated congestive cardiac failure compared to traditional in-hospital treatment in older patients*. Australasian Journal on Ageing. 2019 Jul 19 [Epub ahead of print]

Research Presentations and Abstracts

Medicine

- Atkinson N, Langsford D, *Severe Malarial sepsis in pregnancy – An Australian case report*. NASOM annual conference, 2019
- Lui B et al. *Assessing Bleeding Risk in Chronic Kidney Disease using Global Coagulation Assays*, American Society of Nephrology Kidney Week, 2019
- Aboltins C. *Diagnostic error*. Internal Medicine Society of Australia and New Zealand Conference. Melbourne, September 2019.
- Muruganandan S et al. *Pleural effusion and symptom evaluation study-2: Ultrasound to quantify diaphragm function in patients with pleural effusion*. Thoracic Society Australia New Zealand Annual Scientific Meeting, Gold Coast, March 2019.
- Fitzgerald DB et al. *Malignant pleural effusion management combining current best practice: Applying the EPITOME Algorithm*. Thoracic Society Australia New Zealand Annual Scientific Meeting, Gold Coast, March 2019.
- Muruganandan S. *Ultrasound in Pleural effusion and pleural masses*. World Federation for Ultrasound in Medicine and Biology Congress, Melbourne. September 2019
- Khorramania S et al. *Utilization of spirometry in patients with a clinical diagnosis of COPD*. Thoracic Society Australia New Zealand Annual Scientific Meeting, Gold Coast, March 2019.
- Tan JA et al. *Predicting Risk for Thunderstorm Asthma In Patients with Seasonal Allergic Rhinitis: The TAISAR Study*. European Academy of Allergy and Clinical Immunology Conference. Lisbon, Portugal 2019.

Sub-Acute

- Kalsi M, Pearson K, Ayoub S. *Are we Choosing Wisely at Northern Health: Coagulation Studies?* Northern Health Research week, Melbourne, October 2018
- Hayes L, Pearson K. *Communicating safely in hospitals with Medtasker*. International Forum on Quality & Safety in Healthcare Conference, Melbourne, September 2018
- Pearson K, Hayes, L. *Catching fish – Northern Health Test Results Sign-off*. International Forum on Quality & Safety in Healthcare Conference, Melbourne, September 2018
- Chmiel E, Pearson K. *Are we Choosing Wisely at Northern Health for inguinal hernia repair?* Choosing Wisely Australia conference, Canberra, May 2018
- Pearson K. *What shall we choose? Choosing Wisely at Northern Health*. Choosing Wisely Australia conference, Canberra, May 2018
- Liao K-C, Pearson K, Sadka N, Pritchard D, Channa K, Ayoub S. *Is Northern Health Choosing Wisely in ordering Computed Tomography Pulmonary Angiograms in the Emergency Department?* Choosing Wisely Australia conference, Melbourne May 2019

Future Research Goals

The Division of Medicine is committed to ongoing involvement in clinical, radiological and genetic studies of medical disorders, including clinical drug trials. We aim to actively encouraging allied health staff, nurses and clinical and basic scientists to participate in research.

We aim to expand collaborations with national and international experts to further diversify our portfolio of research opportunity in Medicine and are working towards a goal of all of our patients being eligible for local recruitment into clinical research studies.

The Division of Medicine is committed to delivering outstanding best practice clinical care, outcome driven professional education and community outreach as well as clinical research of international acclaim.



Nursing and Midwifery

Key Achievements

- Development of a Quality Program for Graduates who partnered with Quality to undertake projects at the local clinical areas. The Graduate Presentations were of a high standard and awards were presented for translation into research and followed up by Academic partners.
- Stepping into Research was extended to include Nursing and Midwifery who responded with an overwhelming number of high calibre applications for mentorship.
- Increased uptake and completion of Good Clinical Practice training and other research education opportunities for nurses and midwives leading to site investigator roles.
- Nurses and Midwives with research experience were identified as mentors for emerging researchers to ensure growth and sustainability into the future.
- Establishment of a monthly Journal club in Maternity that reviews and discusses midwifery focused papers.

- Building and strengthening academic partnerships and collaborations including establishing a Research Governance Committee with La Trobe University.
- Establishment and recruiting to an Associate Professor of Nursing and Midwifery Research.
- Increased grant applications, including application on behalf of Northern Health to the Victorian Nurses League proposal to look at Patient self-administration of medications, and collaboration to prepare a submission to Rosemary Bryant Foundation exploring patient perceptions of safety.
- The introduction of the Comprehensive C.A.R.E. Record is continuing to be evaluated and has been submitted for publication.
- Establishment of the Reproductive Health Biobank and recruiting to a Research Midwife role.
- An increasing number of nursing honorary positions for external collaborators on research to be undertaken at Northern Health.
- Midwife Carly Jowitt completed her Honors Thesis titled '*Outcomes of amniotomy on low-risk, post-date women. A retrospective observational study*'.
- Kate Dawson, Midwifery Educator is working toward completion of her PhD, anticipated by end of year.

Research Projects

- ECO – Exploring implementation, expansion and sustainability of caseload midwifery care throughout Australia – PhD candidate.
- An evaluation of the preceptorship model of supervision for third year nursing students in a teaching hospital. Asbury K, Hurren G, Sutton E, Hansen L, Jokwiro Y, McLeod C.
- Burnout in oncology nurses – PhD research (PhD candidate lead with Northern Health nurse co-investigators).
- Advanced Practice Nursing roles – EDON (Northern Health site investigator).
- TAP trial is testing the effectiveness of a purpose designed turning and positioning system (the Tortoise Turning Pad and the Fluidized Positioner) compared to usual care devices for prevention of pressure injuries in ICU – Suzanna Kapp lead.

Research Grants

Funding Source	Project Name	Investigators and Affiliations	Amount
Northern Health Foundation Small Research Grant	Evaluation of Registered Undergraduate Students of Nursing (RUSON) model of assisted patient care	Penny Ramsden: Nursing Education	\$3000
The Collier Charitable Fund	Build the evidence base for how health services are effectively implementing system change to reduce the burden of ill health associated with Family Violence	Northern Health and the Royal Women's Hospital	\$15,000

Research Publications

- Dawson K, Newton M, Forster D, McLachlan H. 2015. *Exploring midwifery students' views and experiences of caseload midwifery: A cross-sectional survey* conducted in Victoria, Australia. *Midwifery* 31(2): e7-e15
- Dawson K, McLachlan H, Newton M & Forster D. 2016. *Implementing caseload midwifery: exploring the views of maternity managers in Australia – a national cross-sectional survey*. *Women & Birth* 29(3): 214-222
- Dawson K, Forster D A, McLachlan HL, & Newton M. 2018. *Operationalising caseload midwifery in the Australian public maternity system: Findings from a national cross-sectional survey of maternity managers* *Women and Birth* 31(3) 194-201

- Dawson K, Newton M, Forster D, & McLachlan H. 2018. *Comparing caseload and non-caseload midwives' burnout levels and professional attitudes: A national, cross-sectional survey of Australian midwives working in the public maternity system* Midwifery 63, 60-67
- Downing, C. *A systematic review protocol of educational programs for nursing staff on management of resident-to-resident elder mistreatment in residential aged care homes.* Journal of Advanced Nursing 2018; 74(8): 1975-1983
- Edvardsson D. *Reconciling conceptualizations of relationships and person-centred care for older people with cognitive impairment in acute care settings* Nursing Philosophy 2018 Apr; Vol. 19 (2) PNG
- Irvine, S. *Near-peer teaching in undergraduate nurse education: An integrative review* Nurse Education Today 2018 Nov; Vol. 70, pp. 60-68
- Mohammed Iddrisu S. *Frequency, nature and timing of clinical deterioration in the early postoperative period.* Journal Of Clinical Nursing 2018 Vol. 27 (19-20), pp. 3544-3553
- Robins M. *Teaching patients with type 2 diabetes to self-administer insulin.* Australian Journal Of General Practice. 2019; Vol. 48 (5), pp. 251-254
- Sungkar Y & Mohammed Iddrisu, S. *Nurses role in recognising and responding to clinical deterioration.* Journal of Clinical Nursing 2018; Vol. 27 (9-10), pp. 1920-1930

Research Presentations and Abstracts

- Abraham S. *Do people with diabetes change their self-management behaviours whilst on extended overseas holidays?* Australian Diabetes Educator's Conference 2019 - best novice oral presentation award
- Quanchi A, Payne R. *Supporting Healthy Families.* ANMF conference 2018
- Robins, M. *When failure to attend reveals elder neglect and abuse.* Australian Diabetes Educator's Conference 2019 (awarded best poster)

Future Research Goals

- Implementation of midwifery research into practice, especially midwifery-led models of care.
- Co-design of care with community and workforce.
- Supporting nurses and midwives into research.

Surgery

The Division of Surgery is easily on track to have approximately 50 per cent more publications than last year, and is a just reward for a vast increase of projects commenced over the last few years. We have multiple randomised controlled trials up and running, signifying our commitment to high quality and cutting-edge research. We were again successful in one of our projects securing a Small Projects Grant from the Northern Foundation. We have had many of our members presenting their work at conferences, including seven poster or oral presentations at the RACS Annual Scientific Conference in Bangkok. We are also looking forward to continuing the trend with a high participation rate at this year's Research Week.

Research Projects

- Laparoscopic intra-abdominal pressure study (LIPS).
- Laparoscopic cholecystectomy video assessment study.
- Reduction of chronic postsurgical pain with Ketamine ROCKet trial.
- Pulsatile oxytocin study.
- Northern Health Orthopaedic outcome scores.
- Analgesic efficacy of local infiltration analgesia using cannulated stripper and adductor canal block versus adductor canal block alone after anterior cruciate ligament reconstruction – randomised control trial.
- Transperineal template biopsy is safer and more cost-effective than transrectal ultrasound-guided prostate biopsy in the Australian public hospital setting.

Research Grants

Funding Source	Project Name	Investigators and Affiliations	Amount
Robert C Bulley Surgical grant (Eastern Health Foundation Research and Innovation Grants 2018)	Evaluation of the isometry of different femoral and tibial points for anterior cruciate ligament reconstruction using four-dimensional computed tomography	Bronwyn Anderson: Orthopaedics Justin Wong: Orthopaedics	\$17,000
Ferring Pharmaceuticals	The CLOT study	Darren Lowen: Anaesthetics	\$17,600
Northern Health Foundation Small Research Grant	Laparoscopic Cholecystectomy Video Assessment Study	Ankur Sidhu: General Surgery	\$3,014
Northern Health Foundation Small Research Grant	Laparoscopic Intra-abdominal Pressure Study (LIPS)	Russell Hodgson: General Surgery	\$5,000
Northern Health Foundation Small Research Grant	Pravena Study	Neil Strugnell: General Surgery	\$4,300
Northern Health Foundation Small Research Grant	The Utility of Pre-Operative Optifast for Laparoscopic Resections in Colorectal Surgery – The PORC Study	Basil D’Souza: General Surgery	\$3,388

Research Publications

- Ravindra RK, Das A, Chew GL, Daniel E, *Small bowel obstruction with multiple perforations post chestnut ingestion*. BMJ Case Reports CP 2019;12:bcr-2018-227999
- Issa M, Bradshaw L, Loveluck M, Nickless D, Yong TL, *Laparoscopic distal pancreatectomy for intrapancreatic accessory spleen: a case report*. ANZ J Surg 2019; 89(6): 781-782
- Fuzzard SK, Teixeira R, Zinn R, *A Review of the Literature on the Management of Silicone Implant Incompatibility Syndrome*. Aesthetic Plast Surg 2019, doi: 10.1007/s00266-019-01407-4
- Luo YL, Makape M, Yim A, Tacey M, Bird D, Hodgson R, *An Acute General Surgical Unit (AGSU) Negates the Impact of the Tokyo Guidelines 2018 (TG18) Diagnostic Criteria for the Treatment of Acute Cholecystitis*, World J Surg 2019, doi: 10.1007/s00268-019-05104-w
- Ekegren CL, de Steiger R, Edwards ER, Page RS, Hau R, Liew S, Oppy A, Gabbe BJ. *Using Patient-Reported Outcomes to Predict Revision Arthroplasty Following Femoral Neck Fracture: Enhancing the Value of Clinical Registries through Data Linkage*. Int J Environ Res Public Health. 2019 Apr; 16(8): 1325

Research Presentations and Abstracts

- Lowen, D. Carbetocin - *The Northern Experience*. ANZCA Annual Scientific Meeting, Perth 2019
- Luo, Y. *Drain tube use in incisional hernia repair*. RACS Annual Scientific Congress, Bangkok 2019
- Seagar, R. *Outcomes for common bile duct (CBD) exploration for patients with unsuspected choledocholithiasis – a ten year study*. RACS Annual Scientific Congress, Bangkok 2019
- Seagar, R. *Common bile duct exploration for patients with unsuspected choledocholithiasis – a ten year study*. Asian-Pacific Hepato-Pancreato-Biliary Association, Seoul 2019

Future Research Goals

The Division of Surgery is keen on promoting research through all units within the division with a key goal to make research part of everyday life in operating theatres, clinics and on the wards. Our immediate goals are to increase our peer-reviewed journal publication rate by 50 per cent, and increase our number of Melbourne University MD Research Project students doing research within the Division of Surgery.

We are continuing to play to the strengths of Northern Health; our people. Future research includes improving outcomes for culturally and linguistically diverse patients and developing new tools to improve surgical education. We are striving to make Northern Health a place to be cared for, and to train at, as we work towards providing the most cutting-edge health care for everyone.



Women's and Children's

This has been a productive year for research in Women's and Children's. There have been eight publications plus 14 abstracts presented at international conferences. Several multicentre projects are ongoing this year. We are making a significant contribution to clinical research at Northern Health.

Research Projects

- Translational research into placental function to provide novel interventions for pregnancy complications impact of antiplatelet agents on trophoblast survival, relationship between maternal body mass index and hypercoagulability in pregnancy, developing in vitro model of placental cytomegalovirus infection.
- Quality assurance in clinical obstetrics at Northern Health - exploring current practice and obstetric outcomes in order to inform future clinical care indications for induction of labour, clinical utility of maternal TORCH serological screening, antenatal care of hepatitis B positive women, obstetric outcomes by maternal body mass index, and risk stratification for venous thromboembolism in pregnancy.
- Evaluation of group antenatal and postnatal care for refugee women.
- Does postnatal breast-feeding support improve rates of breast feeding (randomised control trial)?
- Impact of provision of pre-school wheeze plan on the quality of care in children less than 6 years old with wheezing (randomised control trial).

Research Grants

Funding Source	Project Name	Investigators and Affiliations	Amount
Melbourne Academic Centre for Health	Northern Centre for Health Education and Research Reproductive Health Biobank	Lisa Hui: Obstetrics University of Melbourne	\$50,000
Northern Health Foundation Small Research Grant	Anti-thrombotic therapy and trophoblast cell-free DNA: exploring mechanisms for failed cell-free DNA screening and therapeutic potential	Lisa Hui: Obstetrics University of Melbourne	\$5,000

Research Publications

- Pratt A, Howat P, Hui L. Maternal and perinatal outcomes for women with BMI 50kg/m² in a non-tertiary hospital setting. *Australian and New Zealand Journal of Obstetrics and Gynaecology* 2019. In press; DOI: 10.1111/ajo.13064
- Howard-Bath A, Poulton A, Halliday J, Hui L. Population-based trends in the prenatal diagnosis of sex chromosome aneuploidy before and after non-invasive prenatal testing. *Prenat Diagn.* 2018;38(13):1062-1068. doi: 10.1002/pd.5363
- Vora NL, Hui L. Next-generation sequencing and prenatal 'omics: advance diagnostics and new insights into human development. *Genet Med.* 2018;20(8):791-799. doi: 10.1038/s41436-018-0087-4
- Rieder W, White S, McGillivray G, Hui L. Contemporary prenatal aneuploidy screening practice in Australia: Frequently asked questions in the cell-free DNA era. *Aust N Z J Obstet Gynaecol.* 2018;58(4):397-403. doi: 10.1111/ajo.12834
- Hui L, Norton M. What is the real "price" of more prenatal screening and fewer diagnostic procedures? Costs and trade-offs in the genomic era. *Prenatal Diagnosis.* 2018;38(4):246-249. doi: 10.1002/pd.5228
- Hui L, Barclay J, Poulton A, Hutchinson B, Halliday JL. Prenatal diagnosis and socioeconomic status in the non-invasive prenatal testing era: A population-based study. *Aust N Z J Obstet Gynaecol.* 2018;58(4):404-410. doi: 10.1111/ajo.12778
- Brett J. Manley, Ph.D., Gaston R.B. Arnolda, Ph.D., Ian M.R. Wright, M.B., B.S., Louise S. Owen, M.D., Jann P. Foster, Ph.D., Li Huang, Ph.D., Calum T. Roberts, Ph.D., Tracey L. Clark, Grad.Cert.Nur.(N.I.C.U.), Wei-Qi Fan, Ph.D., Alice Y.W. Fang, M.B., B.S., Isaac R. Marshall, M.P.H., Rosalynn J. Pszczola, M.B., Ch.B., Peter G. Davis, M.D., and Adam G. Buckmaster, Ph.D. Nasal High-Flow Therapy for Newborn Infants in Special Care Nurseries. *N Engl J Med* 2019; 380:2031-40. DOI: 10.1056/NEJMoa1812077
- Fan WQ, Gan A, Crane OK. Commencing Nutrient Supplements before Full Enteral Feed Volume Achievement Is Beneficial for Moderately Preterm to Late Preterm Low Birth Weight Babies: A Prospective, Observational Study. *Nutrients* 2018, 10, 1340; doi:10.3390/nu10091340

Research Presentations and Abstracts

- Green E, Fan WQ, Tacey M, Corkery-Lavender T, Atkinson E, Russell T, Tran D. Diagnosing Anaphylaxis in the Emergency Department - Why is it so challenging? *ASCI*, Perth, Western Australia, Sept 2019.
- Atkinson E, Fan WQ. Meconium Stained Amniotic Fluid: What is the Risk? *Journal of paediatrics and child health.* Vol 55, Issue S1 March 2019 Pages 5-6
- Guan M, Manji J, Fan WQ. Does Antenatal Corticosteroid Therapy Improve Neonatal Outcomes in Late-preterm Birth? *Journal of paediatrics and child health.* Vol 55, Issue S1 March 2019 Pages 21
- Lee S, Fan WQ. Meconium Stained Amniotic Fluid: What Are the Neonatal Outcomes? Vol 55, Issue S1 March 2019 Pages 84

- Allen S, Fan WQ. Risk of Readmission Related to Early Postnatal Hospital Discharge of Healthy Term and Late Pre-term Neonates at The Northern Hospital. *Journal of paediatrics and child health*. Vol 54, Issue S1 March 2018 Pages 56
- Manley BJ, Arnolda G, Wright IM, Owen LS, Foster JP, Dalziel KM, Roberts CT, Clark TL, Fan WQ, Fang AYW, Marshall IR, Pszczola RJ, Davis PG, Buckmaster AG. Nasal High-Flow for Early Respiratory Support of Newborn Infants in Australian Non-Tertiary Special Care Nurseries (The Hunter Trial): A Multicentre, Randomised, Non-Inferiority Trial. *Journal of paediatrics and child health*. Vol 54, Issue S1 March 2018 Pages 4
- Ward B, Fan WQ. A cue based oral feeding clinical pathway strategy for preterm infants reduces length of nasogastric feeding. *Journal of paediatrics and child health*. Vol 54, Issue S1 March 2018 Pages 123
- BRYAN I, Fan WQ. The Incidence and Adverse Outcomes of Perinatal Substance Use at the Northern Hospital, Melbourne, Victoria, 2012–2016. *Journal of paediatrics and child health*. Vol 54, Issue S1 March 2018 Pages 62
- Tham J, Lim H, Ho P, Hui L. Evaluation of global coagulation assays in maternal blood. *Society of Obstetric Medicine of Australia and New Zealand Annual Scientific Meeting*, Cairns, July 2018
- Tham J, Lim H, Ho P, Hui L. Evaluation of global coagulation assays in maternal blood. *The Australian & New Zealand Society of Blood Transfusion BLOOD2018 conference*, Brisbane, July 2018
- Pratt A, Howat P, Hui L, Maternal BMI and obstetric outcomes at The Northern Hospital 2011-2016, *Royal Australian New Zealand College of Obstetricians and Gynaecologists Annual Scientific Meeting*, Adelaide, September 2018
- Brahim G, Khalid A. Use of Carbetocin instead of Oxytocin in emergency caesarean section in actively labouring women: is it as effective as Oxytocin? RCOG – Jan 2019 – London
- Quattrocelli A, Khalid A. Analysis of risk factors for the early and late diagnosis of gestational diabetes in women birthing at The Northern Hospital. RANZCOG ASM – Sept 2018 – Adelaide
- Quattrocelli A, Khalid A. Early glucose tolerance tests with recently modified ADIPS criteria: Is it doing more harm than good for women with gestational diabetes? RANZCOG ASM – Sept 2018 – Adelaide

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.

In paediatrics, we are concentrating on evidence-based research. Asking and researching regarding key areas of paediatric and neonatal disease to identify strategies to improve day to day management.

Abstracts

Utility of Rockwood Clinical Frailty Score in elderly patients with diffuse large B-cell lymphoma

Cancer Services

Bapat A¹, Lim HY¹, Ho P¹, Leung T¹

¹Department of Haematology, Northern Health

Background: Elderly patients with diffuse large B-cell lymphoma (DLBCL) have higher mortality than younger patients. Evidence suggests comprehensive geriatric assessment (CGA) is useful to assess frailty. We explored the utility of Rockwood Clinical Frailty Score (RFS) in predicting mortality and morbidity in this population.

Method: We conducted a retrospective audit of patients age >60 with DLBCL treated at Northern Health between 2013-2018. Functional assessment tools were reviewed to retrospectively determine RFS pre- and post-treatment.

Results: 35 patients (mean age 76, 60% female) with DLBCL were analysed. 20 (53%) had aggressive disease with Revised International Prognostic Index (R-IPI) ≥ 3 . Overall survival was 68%. Median follow-up was 718 days. 90% of mortality was disease or therapy related. Factors impacting survival included: low frailty score at diagnosis, both Eastern Cooperative Oncology Group (ECOG) status 0-1 (87% in survivors vs 36% in deceased, $p=0.001$) and RFS 1-4 (92% vs 54%, $p=0.01$), and completion of planned treatment without dose-reduction (100% vs 45%, $p=0.0001$). Those who died had poorer mobility (73% vs 21%, $p=0.003$) and required assistance in personal activities of daily living (pADLs) at diagnosis (45% vs 13%, $p=0.03$). Amongst survivors, functional decline – especially in mobility – was common. More such patients were identified using RFS than ECOG (33% vs 17%).

Conclusions: Frailty scores are important predictors of survival in elderly patients with DLBCL. Incorporating functional scores such as RFS in prognostic assessment prior to treatment should be considered. Larger prospective studies are needed to confirm these findings.

First year service evaluation of the inaugural Rapid Iron Access Clinic at Craigieburn Centre

Cancer Services

Kazi A^{1,2}, Ho P¹, Leung T¹

¹Department of Haematology, Northern Health,

²Austin Health

Background: Iron deficiency is the most common cause of anaemia in Australia, though access to appropriate investigations and management is often hindered by long wait times. To improve efficiency in managing these patients in the outpatient setting and to optimise emergency department access, a Haematology led Rapid Iron Access Clinic (RIAC) was established. Here we evaluate the utility of the clinic in its first year of service.

Method: Retrospective data collection and analysis was performed on all referrals accepted and treated between September 2018 and July 2019. Patient demographics, source of referrals, aetiology of iron deficiency and disposition outcomes were analysed.

Results: 168 patients were evaluated, with 11 excluded. Of the 157 included, 146 were female (93.0%). The median age was 40 years, with a range between 15 to 83 years. Of all referred patients, 125 were anaemic and 32 were not anaemic (79.6% vs 20.4%). Menorrhagia was the most common cause of iron deficiency in both anaemic and non-anaemic groups (49.2% and 59.4% respectively).

Malabsorptive state increased the likelihood of iron deficiency, but did not predict anaemia ($p=0.05$). 157 out of 168 patients attended their appointments (93.5%) and 66 patients (41.8%) required further follow up.

Conclusions: Over the past year, RIAC has successfully offered a streamlined iron infusion service to patients from a diverse ethnic background with a wide age range, including many females with menorrhagia. This pilot service establishes an effective model in managing outpatients with iron deficiency, and helps to relieve access burden of the emergency department.

Use and outcomes from neoadjuvant chemotherapy in borderline resectable pancreatic ductal adenocarcinoma in an Australasian population

Cancer Services

Walpole I³, Lee B^{1,2,3}, Gibbs P^{1,2,3} et al

¹Walter and Eliza Hall Institute, Melbourne,

²Department of Medical Oncology, Royal Melbourne Hospital, ³Department of Medical Oncology,

Northern Health

Background: International consensus guidelines recommend the use of neoadjuvant (NA) chemotherapy when pancreatic ductal

adenocarcinoma (PDAC) is borderline resectable. The Australian practice has not been well described.

Method: A retrospective analysis of consecutive patients with localized PDAC between January 2016 until March 2019 entered into the Australasian Pancreatic Cancer Registry (PURPLE: Pancreatic cancer: Understanding Routine Practice and Lifting end results) was performed. Clinicopathological characteristics, treatment administered, and outcome were analysed. Overall survival (OS) was compared using Log-rank and Kaplan-Meier analysis. **Results:** At initial presentation, 754 cases had localized PDAC, of which 350 (47%) were resectable, 148 (20%) borderline and 247 (33%) unresectable. The majority of resectable cases (91.4%) underwent immediate surgery. Of 148 borderline cases, 44 (29.7%) underwent immediate surgery, 80 (54.0%) received neoadjuvant chemotherapy and 22 (14.9%) opted for best supportive care. The most frequently used NA chemotherapy was FOLFIRINOX (46/87, 53%) versus Gemcitabine/Nab-paclitaxel (27/87, 31%). Surgery was performed in 63.8% (43/80) of borderline resectable patients receiving NA chemotherapy, with 34.9% (15/43) R0 resections compared to 20.5% (9/44) in those resected upfront. Median OS for immediate resection versus borderline resectable cases receiving NA chemotherapy was 29.5 versus 21.7 (HR 0.50, p=0.13) months.

Conclusions: The use of neoadjuvant chemotherapy in resectable pancreatic cancer remains infrequent in Australia. Two thirds of patients receiving NA chemotherapy proceed to curative resection, with 34.9% achieving R0 resections. Newer treatment strategies and high-quality evidence are needed. These are being explored in the MASTERPLAN and DYNAMIC-Pancreas clinical trials.

Clinical predictors of pulmonary embolism for inpatients: are computed tomography pulmonary angiograms being requested appropriately?

Diagnostic Services

Ling LLL¹, Zhang VJW¹, Lim MJ², Lim HY¹, Ho P¹

¹Department of Haematology, Northern Health,

²Department of Radiology, Northern Health

Background: The clinical presentation of pulmonary embolisms (PE) can be heterogeneous with significant practice variability and a potential for over-requesting Computed Tomography Pulmonary Angiograms (CTPAs). Current clinical predictors for PE have focused on outpatient and Emergency Department populations. We performed a

retrospective cohort study to determine the clinical indicators for ordering inpatient CTPAs and the predictors of positive scans for PE.

Method: 312 consecutive inpatient CTPAs (scans performed >24hours after admission) performed from Jan 2017 to Dec 2017 were reviewed. Variables including baseline characteristics, vital signs and risk factors for venous thromboembolism were extracted.

Results: Thirty-six CTPAs were positive for PE (11.5%) and the average time to CTPA request was 7 days. Clinical indicators associated with positive scans were hypoxia (OR 2.45; CI 1.18 – 5.1), tachypnoea (OR 2.6; CI 1.21 – 5.39), recent surgery or immobilisation (OR 2.68; CI 1.24 – 5.76), S1Q3T3 pattern on ECG (OR 7.31; CI 1.86 – 28.83), and right bundle branch block pattern on ECG (OR 5.22; CI 2.02 – 13.45). Tachycardia, hypotension, fever and malignancy were not significant. The average Wells' score was 4.7 for positive scans and 2.8 for negative scans with a negative predictive value (NPV) of 95.8%. Only 12 of 312 negative scans did not score any Pulmonary Embolism Rule-out Criteria (PERC) – NPV 100%.

Conclusions: Inpatient CTPAs appear to be over-requested and can potentially be rationalised based on a combination of clinical predictors as well as Wells criteria and/or PERC rule. Further prospective studies are needed to develop clinical decision tools for inpatient populations.

Low dose Apixaban for prevention of venous thromboembolism recurrence at Northern Health

Diagnostic Services

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Background: Apixaban 2.5mg BD was the first direct oral anticoagulant (DOAC) to be available in the low dose formulation for prevention of recurrent venous thromboembolism (VTE) in Australia. This has revolutionised long term VTE treatment given the ease of oral administration without the requirement of drug level monitoring. Selected high risk VTE patients are now being prescribed long term low dose apixaban. The rationale being to reduce bleeding complication rates compared to full dose anticoagulation while still preventing recurrent thrombosis. However there is limited real world data on the safety and efficacy of low dose apixaban for this indication.

Method: A retrospective analysis was performed of patients prescribed apixaban 2.5mg BD for

prevention of recurrent VTE at Northern Health between September 2013 and June 2016.

Results: 28 patients were identified, 46% were male with median age of 70 (range 33-90). Median duration of treatment was 11.79 months (range 1 week-21 months). There was one patient (3.57%) with potential VTE recurrence who was changed to full dose rivaroxaban at an overseas hospital, however diagnosis was not confirmed with imaging. There were no imaging proven VTE recurrences and no captured episodes of clinically significant bleeding (ISTH-SSC score 3/4).

Conclusions: In this study of our Northern Health population the use of low dose apixaban for prevention of recurrent VTE appears safe, though this is limited by small study numbers. Larger studies with prolonged follow up are required to assess the long term safety outcomes of low dose apixaban for prevention of recurrent VTE.

Evaluation of global coagulation assays in patients with chronic kidney disease

Diagnostic Services

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Background: Chronic kidney disease (CKD) confers changes to the coagulation profile of patients and is associated with both increased risk of thrombotic complications as well as bleeding problems. Currently available coagulation assays are limited in their capacity to predict these outcomes. We aim to evaluate the use of global coagulation assays (GCA) in patients with CKD.

Method: This is a prospective observational study in which patients with estimated glomerular filtration rate (eGFR) <30 mL/min/1.73m² were recruited (n=75) and compared to normal healthy controls (n=138). Blood samples were collected for baseline bloods and GCA, which included whole blood thromboelastography and platelet-poor calibrated automated thrombogram and overall haemostatic potential (OHP).

Results: Compared to normal controls (mean age 41.8 years, 67% female), CKD subjects (mean age 65.8 years, 39% female) had increased von Willebrand factor (vWF) antigen (178 vs 102, p<0.01), factor VIII levels (183 vs 108, p<0.01) and prothrombotic thromboelastography parameters with increased maximal amplitude (69.3 vs 60.3mm, p<0.01) and decreased clot lysis (0.0 vs 0.5%, p<0.01). Fibrin generation parameters were increased (OHP 39.0 vs 27.3, p<0.01) with impaired

fibrinolytic potential (40.8 vs 51.9%, p<0.01).

Thrombin generation was not significantly different between both groups. D-Dimer (930 vs 430, p<0.01) was increased in CKD although it did not correlate with OHP parameters.

Conclusions: CKD appears to confer a prothrombotic state characterised by increased vWF factor antigen, factor VIII levels, clot strength as well as both increased fibrin generation and hypofibrinolysis. The use of GCA to stratify thrombosis risk warrants further investigation.

Global coagulation assays in transgender individuals

Diagnostic Services

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Background: Transgender individuals seeking to develop the physical characteristics of the desired gender are prescribed endocrine therapy although the long-term effects are unclear. We aim to evaluate global coagulation assays (thromboelastography; thrombin generation using calibrated automated thrombogram (CAT); fibrin generation with overall haemostatic potential (OHP) assay) in transgender women on oestradiol therapy.

Methods: Blood samples were collected from transgender women for baseline investigations and experimental testing (i) thromboelastography using citrated whole blood (TEG[®] 5000), (ii) CAT and (iii) OHP using platelet-poor plasma.

Results: Samples from 19 transgender women (average age 37 years) were compared to 97 normal controls (68% female; average age 43 years). Eleven (57.9%) reported oral oestradiol use while the remaining used transdermal oestradiol. Twelve transgender women were on concurrent anti-androgen therapy. Overall, study patients demonstrated increased clot strength (maximum amplitude 65.1 vs 57.9 mm; p<0.01) and comparable clot lysis (p=0.20) on whole blood TEG[®]. CAT showed a trend towards higher endogenous thrombin potential (ETP) (1467.7 vs 1350.0 nM.min; p=0.08) in the transgender individuals. Interestingly, fibrin generation was reduced in the transgender women (overall coagulation potential 52.3 vs 59.6; p=0.04) with similar overall fibrinolytic potential (p=0.22). The method of oestrogen delivery did not appear to influence the global coagulation assays.

Conclusion: Transgender women on endocrine therapy demonstrated increased whole blood clot

strength and trended towards increased thrombin generation with reduced fibrin generation and comparable fibrinolysis to controls. The significance of these findings will be further elucidated with ongoing recruitment and longer-term follow up.

‘Choosing Wisely’ in ordering computed tomography pulmonary angiograms in the Northern Health Emergency Department Emergency Services

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Background: Choosing Wisely Australia aims to reduce unnecessary investigations and treatments. This study evaluated if Northern Health Emergency Department (ED) ordered computed tomography pulmonary angiograph (CTPA) appropriately.

Method: A clinical decision pathway that included Wells score, Pulmonary Embolism Rule-out Criteria and D-dimer was applied retrospectively to justify pre-implementation use of CTPA in 358 patients from 1st July to 31st October 2017. The pathway was implemented in February 2019 and 260 patients were included from 1st March to 31st May 2019. Implementation involved staff education, appropriateness monitoring and CTPA ordering changes. IBM SPSS Statistics 25 was used to conduct univariate as well as multivariate logistic regression analysis.

Results: CTPA imaging yield (percentage positive) increased from 7.26% to 11.54% ($p = 0.07$). CTPA imaging rate decreased from 1.10% to 0.94% ($p = 0.06$). CTPA appropriateness increased from 29.05% to 64.23% ($p < 0.01$). Appropriate CTPAs had a yield of 14.39% compared to 4.90% of inappropriate CTPAs ($p < 0.01$). An appropriate CTPA had a 3.20 Odds Ratio for positive CTPA ($p < 0.01$) on multivariable analysis.

Conclusions: This audit revealed 1 in 5 patients with diabetes-related. Although changes in imaging yield and rate were not statistically significant, however appropriately ordered CTPAs had a significant Odds Ratio for positive CTPA. Northern Health ED is one of the busiest in Australia with occasional access challenges and continued pathway use will further enhance clinically appropriate imaging requests to improve patient care and safety.

Key indicators of continuous renal replacement therapy in the Intensive Care Unit

Emergency Services

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Background: Continuous Renal Replacement Therapy (CRRT) is utilised to manage a number of complex conditions in the Intensive Care Unit (ICU). CRRT is used in 4.9% of Northern Health ICU patients with a mortality rate of 56%. Monitoring the key performance indicators (KPI) of filtration is the key to identifying procedures that can improve the performance of filtration in critically ill patients. These KPIs have indicated the need to start a new anticoagulation method of citrate.

Method: A retrospective data analysis of the 2018-2019 compiled from information sourced directly from the filter memory bank and passed through Baxter’s TrueVue Analytics to analyse data into themes. These themes are compared with the 2016-2017 data and compared with patient characteristics.

Results: Significant treatment downtime has increased across comparable time-frames; however downtime due to alarms has decreased from 4.7 to 3.9 per treatment day. Forty-one percent of filters are ceased due to elective cessation. The filters that become degraded account for 13% of retired filters; whilst capillary fibre clotting attributes to 16%. 18% of filters are interrupted due to clinical need and investigations.

Conclusions: An increase in filter life of 1 hour between comparison years is a 6% improvement, yet still at 50% of target rate indicates a need for clinical change. Alarm management has improved and may have contributed to filter life increases. Time management of filters should be considered to allow for optimum patient benefit. Citrate anticoagulation will be introduced in August 2019. Patient population and epidemiology will be continued to be monitored to guide further clinical treatment.

Audit of dysplasia screening and management in patients with inflammatory bowel disease at Northern Health Medicine

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Background: For patients with long-standing inflammatory bowel disease (IBD), dysplasia screening plays a substantial role in long-term management. Chromoendoscopy is currently regarded as the best methodology for dysplasia screening. The purpose of this study is to evaluate

dysplasia screening and management for Northern Health's IBD unit and its compliance with the Australian surveillance guidelines.

Method: This is a single-centre retrospective study using data collected from Northern Health's IBD database (733 patients) from April 2008 to April 2019. Medical, endoscopy and pathology records were reviewed with 81 meeting the inclusion criteria: current patient with colitis extending proximally to the sigmoid colon for ≥ 8 years or existing diagnosis of primary sclerosing cholangitis. Patients were grouped according to Australian guidelines: yearly for high risk patients (group 1), 3-yearly for those with inactive disease and no high-risk features (group 2) and 5-yearly for those with two normal surveillance colonoscopies (group 3).

Results: 85.2% of patients (n=69) were actively involved in the dysplasia screening program, with an overall compliance of 53.1% (n=43). When classified into groups, the compliance rate for group 1 was 43.3% (n=13), group 2 was 52.3% (n=23) and group 3 was 100% (n=7). Of the 189 total surveillance colonoscopies performed, 6.35% (n=12) were performed using chromoendoscopy and the dysplasia detection rate was 3.7%.

Conclusions: The dysplasia screening and management program at Northern Health revealed a moderate level of compliance with Australian surveillance guidelines. Opportunities exist to incorporate the use of chromoendoscopy to further enhance dysplasia screening processes.

Treatment of epidermal growth factor receptor mutant non-small cell lung cancer at Northern Health

Medicine

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Background: Knowledge of, and treatment for, the subpopulation of non-small cell lung cancer (NSCLC) with an activating epidermal growth factor receptor (EGFR) mutation has evolved rapidly in recent times, especially with the introduction of targeted therapies, such as EGFR - tyrosine kinase inhibitors (TKIs). This project aims to review the management of EGFR mutation positive patients at Northern Health, with a focus upon the first-line of therapy, efficacy duration, and reason for therapy cessation.

Method: Patients who received first-line therapy with erlotinib or gefitinib between January 2015 and December 2017 were identified from the electronic prescribing program 'CHARM'. Data was then manually collected from the Clinical Patients Folder

and entered into a secure Microsoft Excel database. Statistical analysis was conducted using Microsoft Excel.

Results: The overall median survival from date of diagnosis was 13.2 months (range 40.9 months); median of 2.6 months (range 28 months) for non-English speaking subjects. All subjects commenced on erlotinib as first-line treatment with a median progression-free survival (PFS) of 3.5 months (range 11.5 months). Of these, 5 out of 10 subjects had a PFS less than 3 months. Subjects who remained on Erlotinib for greater than 3 months had a 7.5-month PFS. The main reason for treatment cessation was progression.

Conclusions: Our 3.5-month PFS on first-line erlotinib is shorter compared to international trial findings of 9.7 and 13.1 months. A significant proportion of subjects had a PFS less than 3 months which invites additional investigation around the decision of treatment commencement.

Effect of eccentric exercise on quality of life and function in people with heart failure

Medicine

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Background: Current guidelines recommend regular physical activity for people with chronic heart failure however individuals are limited in their exercise tolerance. Eccentric exercise produces high forces with low metabolic demand. This trial aimed to determine if eccentric exercise, with its energy efficiencies, was effective, safe and feasible in increasing function and quality of life in people with heart failure compared to concentric exercise and a waitlist control group.

Method: A prospective, three-armed, parallel-design, assessor-blind randomised controlled trial with 1:1:1 allocation. Forty-seven participants (16 females; mean age 66 years) with mild to moderate heart failure of any aetiology. Participants were randomly allocated to either eccentric exercise, concentric exercise or a waitlist control group. Participants in the eccentric and concentric groups completed twice-weekly exercise for eight weeks. Participants were assessed at baseline, post intervention and three-month follow-up. The primary outcome was 6-minute walk distance. Secondary outcomes were quality of life, leg strength and fatigue. Attendance, adherence and adverse events were used to determine safety and feasibility.

Results: Intention-to-treat analysis showed no differences between eccentric exercise and either concentric exercise or waitlist for any outcome. Per-protocol analysis found improvements in quality of life were significantly greater post-intervention in the eccentric group compared to the concentric group (-17.99 (-35.96 to -0.01)). No major adverse events were reported. Twenty of the thirty-two exercise participants completed the program, attending on average, 75% of exercise sessions.

Conclusions: In this small trial, eccentric exercise did not demonstrate superior outcomes to either concentric exercise or a waitlist control group.

Retinal drusen in focal and segmental glomerulosclerosis

Medicine

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Background: Drusen are retinal deposits of cell debris, immunoglobulin and complement, characteristic of age-related macular degeneration but also observed in some types of glomerulonephritis. Focal and segmental glomerulosclerosis (FSGS) is a common glomerular disease characterised by proteinuria and renal failure. This study investigates whether drusen occur in FSGS.

Method: This was a single centre cross-sectional observational case-control study of individuals with biopsy-proven FSGS recruited from the Northern Health renal unit and matched hospital controls without kidney disease. Retinal images were taken with a non-mydratic retinal camera and examined for drusen by two trained graders. Central drusen ≥ 10 were considered abnormal.

Results: Fifty participants with FSGS were compared with 50 controls. Median age was 56 (IQR 45-65) and 30 (60%) were male. Ten (20%) had FSGS due to a secondary cause. Drusen numbers were higher in FSGS (9 ± 25) than controls (3 ± 8) ($p=0.02$) and in secondary FSGS (25 ± 46) than primary (5 ± 13) ($p=0.02$). Drusen were larger in FSGS ($p=0.049$) and with age over 60 ($p=0.04$). Drusen counts ≥ 10 were not more common in FSGS ($p=0.23$). However, a trend indicated more counts ≥ 10 in secondary FSGS (4, 40%) than primary FSGS (5, 13%) ($p=0.07$).

Conclusions: Drusen may occur more frequently and with larger size in FSGS. This is consistent with glomerular complement activation. Further studies are necessary to confirm these findings and determine if vision is affected.

Medical Emergency Team call outcomes in the Emergency Department

Medicine

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Background: Before 2016, medical emergency team (MET) calls within the Emergency Department (ED) of Northern Health were attended by the ED team. After 2016, MET calls within the ED were attended by the Intensive Care Unit (ICU). The study aims to identify if early ICU interventions of General Medical Patients in the ED have led to statistically significant improvements in patient outcomes.

Method: Compared outcomes associated with MET calls attended by the ED team and the ICU to examine the hypothesis that early ICU interventions lead to improved outcomes, in the ICU admission rates, mortality rates, risks of multiple MET calls and length of hospital stay. Retrospective study using prospectively collected data of the General Medicine Medical Emergency Team calls data base over 2015-16, and 2016-17 were conducted. Excel sheets and STATA were used for data analysis for pattern identification in the pre and post-intervention timeframe.

Results: There was no significant difference in mortality ($p=0.9$), mean length of stay ($p=0.33$), and ICU admission rate ($p=0.64$) between the two cohorts. The 'post MET cohort' had a significantly lower rate of multiple MET calls compared to the 'pre MET cohort' ($p=0.001$).

Conclusions: Early ICU interventions resulted in a statistically significant reduction in the rate of multiple MET calls for General Medical Patients. However ICU admission rate, length of hospital stay and mortality rate remain unchanged. Further prospective research to include all admitted cohorts needs to be undertaken to ascertain the impact of MET call attendance in ED by ICU.

Hospital-wide audit of diabetes-related medication errors and health-professional responses to adverse glycaemia

Medicine

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Background: Glucose lowering medication (GLM) management for inpatients can be challenging due to the increasing complexity of diabetes treatment, and the dynamic nature of hospital care. Errors in

prescribing and administration of GLMs, and sub-optimal adjustment of treatment can lead to adverse glycaemia.

Method: On November 30th 2017, a point-prevalence study at three Northern Health hospitals identified 36% of inpatients with pre-existing diabetes. A retrospective chart review (up to 7 days prior) was performed to identify the occurrence, type and glycaemic outcomes of GLM errors: similar to the assessment method employed by the annual UK National Inpatient Diabetes Audit (NaDIA).

Results: This cohort comprised 126 adult inpatients: 92% type 2 diabetes, 38% admitted under medical, 17% surgical, and 42% subacute units. Medication errors occurred in 27 (21%) patients. Most common error was the prescription of incorrect dose or incorrect timing of non-insulin GLMs in 12% of patients. Insulin errors were observed in 7%, mostly due to incorrect dose or time. The medication error rate is comparable to NaDIA 2017 where 19% had prescription errors. Of 35 patients with hyperglycaemia, 5 (14%) had no therapy adjustment, 25 (71%) had prescription of 'sliding-scale' insulin only, while 5 (14%) had adjustment of scheduled insulin or other GLM. In the 18 patients with hypoglycaemia, only 8 (44%) had an appropriate adjustment of insulin or non-insulin GLM.

Conclusions: This audit revealed 1 in 5 patients with diabetes-related medication errors over a 7-day period. Opportunities exist to further enhance processes regarding appropriate treatment adjustment in response to adverse glycaemia.

Are we 'Choosing Wisely' at Northern Health: coagulation studies?

Medicine

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Background: Northern Health Emergency Department (ED) is Victoria's busiest ED with quarterly presentations of approximately 24,000. Choosing Wisely Australia is a program to reduce unnecessary "low value" medical tests and treatments. This project is an audit of the rate of non-indicated investigations (coagulation studies) in Northern Health's ED as measured by adherence to Choosing Wisely Australia guidelines. Also, we noted the impact of two interventions to reduce the number of non-indicated testing. First intervention: provision of education and a matrix of approved tests for common presenting conditions; Second intervention: removal of coagulation tubes from trolleys creating a physical and psychological barrier

to accessing coagulation tubes and therefore ordering tests.

Method: Data was collected from patient's clinical notes and laboratory systems using a data collection tool. In total, 3 audits were conducted. A random sample of patients was selected for each Coagulation Studies audits.

Results: Audit 1 (July 2016) revealed that 74% of coagulation studies conducted was inappropriate. Audit 2 (May – June 2017) showed 78% of those tested were inappropriate. Audit 3 (January – March 2018) revealed both a reduction in proportion of patients undergoing coagulation studies testing and that only 52% of those tested were inappropriate, thus showing marked improvement after the second intervention.

Conclusion: Creating a physical barrier to accessing coagulation tubes has been effective in reducing frequency of testing and proportion of non-indicated investigations in the ED.

Audit of osteoporosis investigation and management in patients presenting to an orthopaedic fracture clinic with minimal trauma fractures

Medicine

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Background: According to Australian guidelines, all individuals over 50 who sustain a fracture following minimal trauma should be considered to have a presumptive diagnosis of osteoporosis. However, it is unclear how well this translates in a real-world environment.

The aim of this study was to retrospectively ascertain what proportion of people received investigation and management of their osteoporosis after review in the orthopaedic fracture clinic with a minimal trauma fracture.

Method: We identified patients aged over 50 who had suffered minimal trauma fractures treated at the Northern Health Fracture Clinic over a 3-month period. Patients' general practitioners were contacted and asked about the investigation and management of their patients' osteoporosis since their fracture.

Results: 32 patients were identified. For 20 patients, this was their first osteoporotic fracture. Of these 20, 5 (25%) had undergone DEXA and 3 (15%) had been newly commenced on antiresorptive therapy.

14 (70%) of these of patients had neither DEXA nor antiresorptive treatment.

Conclusions: Osteoporosis remains underdiagnosed and undertreated in our cohort. The majority of these patients are not being investigated with DEXA or treated with antiresorptives despite an osteoporosis defining injury. Reminders to clinicians regarding fracture investigation and treatment are required.

¹The Royal Australian College of General Practitioners and Osteoporosis Australia. 2nd edn. East Melbourne, Vic: RACGP, 2017

The use of mobile translation technology in the healthcare setting for everyday communication with patients with limited English proficiency

Sub-Acute

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Background: Communication is important for providing optimal healthcare. If communication barriers e.g. language discordance are present, quality care can be impacted. While interpreters are required for complex healthcare interactions, they are not always available or suitable in every situation, particularly for everyday conversations. Mobile translation technology such as translation apps may be useful in overcoming language barriers, however their suitability and acceptability for everyday care communication is unknown.

Method: We conducted a two-month trial of three translation apps (*Google Translate™*, *TalkToMe* and *CALD Assist™*) across four sub-acute aged care wards using iPads. Each site used iPads loaded with the translation apps to interact with patients with limited English proficiency when providing routine nursing care. We report staff attitudes and experiences of the translation apps on the wards.

Results: Nursing and allied health staff reported positive experiences of using translation apps including being able to understand patient needs quickly, assisting staff with providing good care, and building good rapport with patients. However, some barriers experienced by staff included: accuracy of translation and dialect issues, patients not understanding the purpose of translation apps, and patients responding in their language which nursing staff were unable to understand.

Conclusions: Mobile translation apps can improve communication between healthcare staff and older patients with limited English proficiency, however mobile translation apps are not suitable for use with in every situation.

How effective are Interventions to Increase physical activity levels among older inpatients receiving rehabilitation, without increasing the amount of therapy? A systematic review

Sub-Acute

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Background: We systematically reviewed the effectiveness of interventions to increase physical activity in older adults (aged ≥ 60 y), admitted for inpatient rehabilitation, without increasing the amount of therapy.

Method: Five electronic databases were systematically searched to identify English-language articles reporting controlled trials of interventions to increase the physical activity (through participation or behavioural change) of older adults receiving inpatient rehabilitation. Trials were excluded if an intervention increased the intensity of usual care, either during the week or on the weekend. Two reviewers independently completed trial selection, quality assessment, and data extraction. Data were synthesized descriptively, and effect sizes with 95% CIs were calculated.

Results: Of the 316 articles identified, 3 were included. Two were activity-based, and 1 was a behavioural change intervention. Physical activity was significantly improved in the behavioural change intervention trial that occurred during therapy ($d = 0.27$; 95% CI: 0.02, 0.52) and non-therapy time ($d = 0.43$; 95% CI: 0.19, 0.68). Participants in all trials were sedentary for the vast majority of the day.

Conclusions: Older adults in inpatient rehabilitation have a high level of inactivity. Evidence is lacking that interventions increase physical activity in older adults admitted to inpatient rehabilitation without increasing the amount of time in therapy. Evidence from one trial indicates that behaviour-based strategies are effective for increasing physical activity levels in the inpatient rehabilitation setting.

Development of a highly predictive risk-adjustment model in a clinical quality

registry

Surgery

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Background: Robust risk-adjustment models are a critical component of clinical quality registries, allowing outcomes to be reported in a fair and meaningful way. The Victorian Cardiac Outcomes Registry (VCOR) encompasses all 30 hospitals in the state of Victoria, Australia, that undertake percutaneous coronary intervention (PCI). In order to report risk-adjusted outcomes, we determined our most predictive risk-adjustment model for 30-day all-cause mortality. We also explored whether the exclusion of extreme high-risk conditions of cardiogenic shock, intubated out-of-hospital cardiac arrest (OHCA) and/or the need for mechanical ventricular support affected the model's predictive accuracy.

Method: Data were collected on 27,544 consecutive PCI procedures from 2014-2016. Twenty-eight patient risk factors and procedural variables were considered in the modelling process. The multivariable logistic regression analysis considered derivation and validation datasets, along with a temporal validation period utilising 2017 procedures.

Results: The model included risk-adjustment for cardiogenic shock, intubated OHCA, estimated glomerular filtration rate, left ventricular ejection fraction, angina type, mechanical ventricular support, age \geq 80 years, lesion complexity, percutaneous access site and peripheral vascular disease. The C-statistic for the derivation dataset was 0.92 (95%CI: 0.91-0.94), with C-statistics of 0.93 and 0.93 for two validation datasets reflecting the 2014-2016 and 2017 periods. Sub-group modelling excluding cardiogenic shock and intubated OHCA provided similar risk-adjusted outcomes ($p=0.32$).

Conclusions: Our study has developed a highly predictive risk adjustment model for 30-day mortality that included high-risk presentations. Therefore, there is no need to exclude high-risk cases from our model when determining and presenting risk-adjusted outcomes to participating VCOR sites.

Bleeding risk associated with low energy pubic rami fracture. How careful we should be?

Surgery

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Background: There have been a few case reports about the catastrophic haemorrhages from pelvic fragility fractures. However, there is limited evidence quantifying the bleeding risk associated with low-energy pelvic fractures. Our aim is to quantify the bleeding risk associated with osteoporotic pelvic fractures in elderly patients to streamline the care provided.

Method: A retrospective review of patients aged > 65 years old with pelvic fractures admitted between 2015 to 2018 was performed. Eighty-two patients were identified. There were 12 males and 70 females, with a median age of 86 years old (IQR, 80-90 years old). Eighty-one fractures were classified as lateral compression I or Tile A2 and one was classified as lateral compression II or Tile B2.

Results: The mean haemoglobin level on admission was 123.6 g/L. There was a significant drop in Hb on the 1st day of admission (Hb 112.2g/L +/- 18.6 g/L, $P<0.001$) and on the 4th day (Hb 109.7 g/L +/- 16, $p<0.001$). All patients were haemodynamically stable at admission and during the hospital stay. Nine per cent of patients required a blood transfusion. The mean baseline Hb pre-transfusion was 83.3 (+/- 11.5). Pre-existing anticoagulation treatment did not predispose the patients to a higher drop in their Hb level post-admission.

Conclusions: In patients with low-energy pelvic fractures who are haemodynamically stable, there is an average estimated decrease in Hb of 14 g/L (estimated 1.4 units of PRBC). This degree of Hb loss can be clinically significant in elderly patients with pre-existing chronic anaemia and cardiac comorbidities.

Do surgical drain tubes help reduce risks of post-operative wound infection and seroma formation? A 5-year (2013-2017) retrospective study of drain tube use in incisional hernia repair

Surgery

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Background: A recent legal case described in the ANZ Journal of Surgery has sparked significant topical interest in drain tube use in incisional hernia repairs in Australia. This study hypothesises that it is not mandatory to practice drain tube use in incisional hernia repairs as legal requirement.

Method: This retrospective audit was performed at a single centre, Northern Hospital Epping, Melbourne, Australia. Data from online clinical records was collected retrospectively from patients that underwent incisional hernia repair from the 1 January 2013 to the 31 December 2017.

Results: 410 incisional hernia repair cases were identified during the 5-year period. Median length of stay (IQR) of the non-drain placement group was significantly shorter at 2 days (2, 4) than that of the drain placement group being 6 days (4, 9) ($p < 0.001$). 10.8% of patients with drain suffered from post-op wound infection compared to 3.6% in patients without a drain tube in-situ ($p = 0.005$). By comparing cases involving a drain and without a drain, the proportions of these cases associated with post-operative seroma were approximately the same at 15.7% (16 out of 102) and 16.9% (51 out of 302).

Conclusions: Drain tubes were placed in only a small proportion of patients during incisional hernia repairs and were associated with a higher post-operative wound infection rate. Whether placing drain tubes or not, the chances of patients suffering from post-operative seroma are approximately the same.

An Acute General Surgical Unit (AGSU) negates the Impact of the Tokyo Guidelines 2018 (TG18) diagnostic criteria for the treatment of acute cholecystitis

Surgery

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Background: The Tokyo Guidelines 2018 (TG18) were developed to aid diagnosis and treatment for acute cholecystitis. The benefits of being treated in an acute general surgical unit (AGSU) include early diagnosis and treatment. This study aims to define the usefulness of TG18 before and after the introduction of AGSU.

Method: Patients who underwent cholecystectomy at Northern Health were audited retrospectively and assessed for TG18 diagnostic criteria and outcomes between 1 February 2012 and 1 February 2014 (one-year pre- and post-AGSU).

Results: 587 patients underwent emergency cholecystectomy with 203 (34.6%) patients having a suspected diagnosis, and 234 (39.9%) patients with a definitive diagnosis of acute cholecystitis using TG18 diagnostic criteria. After the introduction of AGSU, time from imaging to operation improved from 2.5 to 1.7 days ($p = 0.012$). There were more operations occurring during in-hours following AGSU implementation (75.8% vs 62.7%, $p < 0.001$).

Maximum pre-operative C-Reactive Protein (CRP) of > 26.6 mg/L had a higher likelihood of Clavien-Dindo complication grade 3 or 4 (OR 3.86, 95%CI 1.18-12.63, $p = 0.027$) compared with TG18 definitive diagnosis criteria (OR 1.50, 95%CI, 0.46-4.91, $p = 0.501$). Surprisingly, there was a trend towards higher complications and readmissions for patients operated within 24 hours, although this trend was not significant.

Conclusions: Patients with suspected acute cholecystitis should be stratified clinically and with CRP in an AGSU with TG18 adding little value in a busy metropolitan unit.

Hip arthroplasty following failed fixation of neck of femur fracture, single centre report and meta-analysis

Surgery

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Background: The conversion arthroplasty of femoral neck fractures is technically challenging. The purpose of the current study was to assess the results associated with hip arthroplasty after femoral neck fracture fixation. We also performed a meta-analysis to determine if there is a difference in the complication rate between hip arthroplasty after intramedullary nail (IMN) and dynamic hip screw (DHS) fixation.

Method: Between 2008 and 2018, 24 patients with a median age of 84 years were treated in our institution. The initial fracture types were intertrochanteric in 41% and subcapital in 59% of hips. The median time from the internal fixation to conversion arthroplasty was 14 months.

Results: The blood transfusion rate tended to be higher in the intertrochanteric group compared to the subcapital fractures. Intertrochanteric fractures

tended to be associated with a higher surgical complication. The length of inpatient stay and post-operative ICU admission was also significantly higher in the revised intertrochanteric fractures. A Preferred Reporting Items for Systematic Reviews and Meta-Analysis compliant systematic review was also undertaken. Four studies involving 284 patients were included in the meta-analysis. There was no difference in the rate of surgical and medical complications nor the intraoperative fracture rate between IMN and DHS fixation groups.

Conclusions: Conversion arthroplasty of intertrochanteric fractures can be associated with an increased requirement for blood transfusion, higher surgical complications and a greater need for ICU care compared to intra-capsular fractures. The meta-analysis suggests that there is no significant difference in the incidence of complications between the IMN and DHS fixation.

Garden I and II subcapital neck of femur fractures; what can plain radiographs miss?

Surgery

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Background: Internal fixation is regarded as the conventional treatment of choice for Garden I and II subcapital neck of femur fracture (SNOFs); however, an overall re-operation rate of up to 20% has been reported. The aim of this study is to further scrutinise the fracture pattern in what is believed to be an undisplaced SNOF on plain radiograph using pre-operative CT scan.

Method: We conducted a retrospective review of undisplaced SNOFs between 2012 and 2018. Sixty-six patients with a median age of 81 years were identified. Forty-six patients were female. Fifty-two patients underwent internal fixation, and 14 had hemiarthroplasty.

Results: Subgroup analysis of forty patients who also had a pre-operative CT scan was performed. In four patients the fracture was anteverted, in nine it was neutral and in 27 (67.5%) it was retroverted. Eleven patients had retroversion of > 20°. In nine patients (22.5%) there was a translation at the fracture site with a mean of 4.4mm. Thirteen of the 27 retroverted fractures had disrupted posterior hinge (p=0.006). Review of the lateral radiographs showed that posterior tilt and translation could not be judged in 40% and 30% of the patients respectively. After a median follow-up time of six months, two patients had re-operations.

Conclusions: Pre-operative CT scan of what may appear to be a benign undisplaced subcapital neck of femur fracture on anteroposterior x-ray, can be used to study radiologic indicators of instability in detail. This information can potentially be used in pre-operative planning and deciding between internal fixation versus primary arthroplasty.

Impact of metabolic syndrome on the perioperative outcomes after emergency general surgery

Surgery

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Background: There is burgeoning evidence to suggest that Metabolic Syndrome (MetS) is positively correlated with worse postoperative outcomes. However, most existing studies are retrospective or restricted to the elective surgical population. The aim of this prospective study is to contribute novel insight into the impact of MetS on postoperative outcomes after emergency general surgery.

Method: This study recruited 100 patients undergoing non-elective general surgery at Northern Health between March and May 2019. A peripheral blood sample and physical measurements were collected. Patients were assigned to MetS or non-MetS groups. History of co-morbidities, medications and perioperative data were obtained via Scanned Medical Records. Follow up period lasted 30 days.

Results: Patients with MetS were, on average, older, higher BMI, male and less likely to be current smokers. MetS patients had significantly increased risk of postoperative complications. MetS patients had increased risk of intraoperative conversion, increase in operating room time and length of hospital stay. Rates of postoperative intensive care admission, re-operation and re-admission were also increased in the MetS group. Following adjustment for major confounding factors, MetS continued to confer an increased risk of overall postoperative morbidity. All individual components of MetS were associated with worse postoperative outcomes with the exception of obesity.

Conclusions: MetS is shown to increase the risk of postoperative complications and usage of hospital resources. This study demonstrates the importance of screening for MetS pre-operatively in general surgery patients, particularly in the emergency setting. MetS patients should be identified as high risk and appropriately prioritized.

Do breast surgeons play an important role in a benign breast disease clinic?

Surgery

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Background: Benign breast disease accounts for >90% of breast presentations to primary care and breast clinics. This study examined the efficiency of the Northern Health Breast Clinic and asked the question, do breast surgeons play an important role in managing patients with benign breast disease?

Method: A retrospective audit was conducted of female non-cancer patients referred from General Practitioners to the Clinic from 1/1/2016 - 30/6/2016. Data included patient demographics, referral pathway and management in the outpatient setting.

Results: The most common reasons for referral were abnormal imaging findings (78%), breast lump (63%), and mastalgia (51%). Patients who were referred because of mastalgia were less likely to have an abnormal breast examination ($p < 0.014$) than those who were not referred because of mastalgia. 10% of patients were admitted for surgery. Patients who were referred because of mastalgia were 2.9 times (1.2 - 6.7) less likely to undergo surgery ($p < 0.016$). Patients who examined abnormally by the breast surgeon were 3.5 times (1.5 - 8.7) more likely to undergo surgery ($p < 0.005$).

Conclusions: Surgeons are needed for the management of some patients with benign breast disease, but the triage pathway could be optimised to reduce the burden of non-operative patients on the Clinic. Surgeons play an important role in examining patients for breast abnormalities. Patients presenting with pain and patients with a normal breast examination could instead be treated by breast care nurses or breast physicians.

Factors affecting renal preservation post radical nephrectomy

Surgery

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Background: Factors that lead to worsening estimated glomerular filtration rate (eGFR) reduction following radical nephrectomy (RN) remain unclear. We sought to identify clinical variables predicting worse post-operative renal function amongst

patients undergoing RN in an Australian tertiary hospital setting.

Method: We retrospectively reviewed 82 patients treated with RN at our institution from 2009 to 2019. eGFR preservation was defined as the percentage difference in eGFR measured 6 – 12 months postoperatively, compared with pre-operative eGFR. Median eGFR preservation was calculated and the patient cohort was categorised as below median eGFR preservation (BMEP) or above median eGFR preservation (AMEP). A larger, retrospectively collected, multi-institutional historical database was analysed to validate the results of our cohort analysis.

Results: Mean age was statistically significant in our cohort (65.12±10.23 in BMEP, 56.76±12.97 in AMEP, $p=0.002$) and in the historical cohort (63.81±12.49 in BMEP, 56.73±12.27 in AMEP, $p=0.000$).

Hypertension and Type 2 Diabetes Mellitus (T2DM) were both statistically significant in the historical cohort analyses ($p=0.01$ in hypertension, $p=0.00$ in T2DM), with higher rates of hypertension (56.8% vs 41.4%) and T2DM in BMEP (24.7% vs 7.1%). Tumour complexity was statistically significant ($p=0.03$) in our cohort. Median tumour size was smaller in BMEP vs AMEP and was statistically significant (50mm (40 – 75) vs 70mm (40 – 95), $p=0.03$).

Conclusions: We identified increased age and medical chronic kidney disease risk factors as predictors of poorer renal functional outcomes post-RN. Smaller tumour masses were associated with worse renal function deterioration following RN. Therefore, low and intermediate-complexity tumours should be considered for nephron-sparing surgery if feasible.

Tumour complexity does not affect trifecta outcomes in patients undergoing partial nephrectomy for kidney cancer

Surgery

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Background: Partial nephrectomy (PN) remains the treatment of choice for small renal mass, with the goal being to achieve the “trifecta” outcomes of oncological clearance, renal preservation and minimization of complications. We sought to determine the role of tumour complexity in our ability to achieve these outcomes at our Australian tertiary referral centre.

Method: We retrospectively reviewed 69 patients that had been treated with PN at our institution

from 2009 to 2019. “Trifecta” was defined as 90% eGFR preservation, negative surgical margins and Clavien-Dindo complications of Grade 2 or less. We classified tumour complexity using RENAL nephrometry scoring. We compared nephrometry score, demographic and perioperative variables to the achievement of Trifecta outcomes.

Results: Of the 69 patients reviewed, 58 patients had sufficient information to determine trifecta outcomes, of which 38 patients (65.52%) achieved trifecta whilst 20 patients (34.48%) did not. There was no significant difference in baseline characteristics of patients that did or did not achieve trifecta outcomes ($p > 0.05$). Operative time was shorter in patients that’s achieved trifecta outcomes (219.74 min \pm 49.96 min vs 249.50 min \pm 49.99 min, $p = 0.04$). There was no significant difference in RENAL nephrometry score ($p = 0.23$).

Conclusions: Our study suggests that tumour complexity does not affect the achievement of trifecta outcomes in patients treated with partial nephrectomy.

Pre-operative very low-calorie diet in overweight General Surgery patients – a pilot study

Surgery

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Background: Patients with a body mass index ≥ 30 awaiting elective general surgery are typically advised to lose weight but do not receive a specific diet plan. The focus of this pilot study is to assess whether providing advice to follow a two-week pre-operative very low-calorie diet (VLCD) using shakes will lead to greater pre-operative weight loss compared to general advice typically provided. The secondary outcomes of this study are patient-reported quality of life (QOL), length of hospital stay (LOS) and rates of post-operative complications (POC).

Method: Recruitment occurred in April-June 2019. This study was non-randomized; participants were given the option to participate in the VLCD or control groups. Height and weight measurements were obtained during recruitment and weight was re-measured on day of surgery. Participants in the VLCD group additionally completed pre- and post-VLCD questionnaires. LOS and POC data were obtained through hospital records. Statistical analysis was performed on IBM SPSS Statistics 25.

Results: A total of 12 patients were recruited (6 in each group). The mean (+/- SD) weight change for

the VLCD group was -3.75kg (+/- 5.04kg) compared to -0.07kg (+/-2.02kg) in the control group ($p=0.14$). There were no significant differences in LOS or POC between the groups. No significant change was observed in QOL measures before and after the VLCD program.

Conclusions: The greater weight loss observed in the VLCD group, although not statistically significant, is promising and additional studies with a larger sample size are required to further explore the effects of pre-operative VLCD.

Mechanical failure of the distal radius volar plate fixation

Surgery

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Background: Fixation failure following volar locking plate fixation of distal radius (DR) fracture is an uncommon but preventable complication. We sought to investigate the mechanical failure and complication rate of DR volar plate fixation.

Method: This is a retrospective review of patients with DR fracture who were admitted due to the implant failure after volar plate fixation between January 2008 and September 2018. During this period 1080 DR fractures were treated using volar locking fixation. We included all adult patients in whom the initial DR fracture fixation was complicated by fixation failure. The orthopaedic database search yielded 18 patients. Eight patients were excluded for a variety of reasons. The remaining ten patients met the inclusion criteria and are the focus of this study.

Results: There were five men and five women. The mean age was 59 years old. There were a variety of mechanisms of injury. The average time to the operation was 2.6 days. The mechanical failure occurred between 1 to 20 weeks post-operatively (mean: 8.6 weeks). The modes of were: inadequate lunate fossa fragment fixation (5); dorsal fragment collapse making the distal raw screws intra-articular (3); nonunion (1) and deep infection (1). All patients underwent re-operation. Three orthopaedic consultants independently analysed the pre-operative and post-operative x-rays and asked if the complications were preventable and how.

Conclusions: Implant failure post distal radius open reduction internal fixation is an uncommon complication that could potentially be avoided in the majority of cases.

A rare case report of large thenar lipoma causing carpal tunnel syndrome

Surgery

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Background: Carpal tunnel disease is one of the most common conditions treated in the world. Management of this condition varies from conservative to operative intervention. While there are several causes of carpal tunnel syndrome, lipomas causing carpal tunnel disease a very rare. We present a rare case of a large thenar lipoma extending into the carpal tunnel causing compression of the median nerve.

Method: A thorough literature review was performed using Pubmed, Ovid, Medline and Google scholar to identify any articles containing carpal tunnel disease and lipoma. The term “Carpal tunnel syndrome” and “Lipoma” or “Space occupying lesion”. Symptoms that the patients experienced we collated along with location of lipoma, information regarding velocities of median nerve were also gathered.

Results: We identified five published case reports of carpal tunnel disease caused by lipoma. A case report is presented along with literature review of the summary of cases in the current literature specifically reviewing symptoms experienced by the patient and location of lipoma.

Conclusion: We present a rare case report of a large thenar lipoma which lead to carpal tunnel symptoms. Given the lack of literature and rare variant of a common condition. Case reports are a pertinent way to gather data and still remain the best way to provide learning points in similar situations.

Laparoscopic intra-abdominal pressure study: a double blinded randomised control trial

Surgery

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Background: Laparoscopic surgery is regarded as the gold standard for the surgical management of cholelithiasis. To improve patient post-operative outcomes, low pressure laparoscopic cholecystectomies (LPLC) have been extensively trialled. A recent systematic review found that LPLC reduced post-operative pain (POP), however many of the randomised control trials were at a high risk of bias and the overall quality of evidence was low.

Methods: 64 patients undergoing elective laparoscopic cholecystectomy were randomised to a LPLC (8mmHg) or a standard pressure laparoscopic cholecystectomy (12mmHg) (SPLC) with 32 to each arm. Primary outcomes were POP and shoulder tip pain (STP) at 4-6 hours and 24 hours. Secondary outcomes included length of operation, intra-operative/post-operative complications and intra-operative visibility.

Results: At all time points, POP and STP were comparable across the two groups ($p = 0.07$, $p = 0.21$, $p = 0.29$, $p = 0.98$). Post-operative analgesic requirement was greater in SPLC; however, this did not reach statistical significance ($p = 0.06$). Intra-operative visibility was significantly compromised in LPLC ($p < 0.001$), however there were no differences in length of operation, and intra-operative/post-operative outcomes ($p = 0.95$, $p = 0.36/p = 0.76$). No mortality was reported.

Conclusion: LPLC did not significantly reduce POP or STP for the patient. Although LPLC compromised intra-operative visibility; length of operation, and intra-operative/post-operative complications were comparable across the two groups. LPLCs are a safe procedure; however, the results of this study contrast with the current literature, and further clinical trials are required to determine the efficacy of this intervention.

Diagnosing and characterising hernia of the inguinal canal with ultrasound in asymptomatic males

Surgery

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Background: Patients diagnosed with inguinal hernia on ultrasound but have no hernia presence on clinical examination do not need surgical fixation. Minor abnormalities seen on ultrasound in the absence of a clinically apparent hernia may represent normal anatomy. The study aims to reveal any age-related differences of the inguinal canal by diagnosing and characterising hernia with groin ultrasound in asymptomatic males.

Method: This study involves unrandomized male patients (20 to 40 and 60 to 80-year-old-cohorts) recruited from Northern Health. Selection criteria included no previous hernia or hernia repair, and no groin symptoms. Presence of clinical hernia results in study exclusion. An ultrasound scan of the left and right inguinal canal is performed for each patient by

one unblinded sonographer. SPSS was used for statistical analysis.

Results: Data collection is ongoing. The younger (n=10) and older (n=19) age groups were compared. The presence of hernia between the two age groups was significant with older group having multiple diagnosed hernias while the younger had no hernias detected (p<0.05). Ten indirect hernias and four direct were detected. All hernia were reducible with omentum involvement. The median hernia sizes for the right and left were 9.8mm and 11.5mm respectively.

Conclusions: Older men are much more likely to have radiologically diagnosed hernia. It may be argued that clinically inapparent indirect or direct hernias detected on ultrasound that are reducible as seen in this study, are normal age-related variations of the inguinal anatomy. Future research should focus on whether these hernias change over time.

How does obesity surgery affect calcium and vitamin D metabolism?

Surgery

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Background: Obesity is one of the biggest public health problems in many developing and developed countries. Long term nutritional outcomes following obesity surgery remain equivocal; particularly following Roux-en-Y Gastric bypass (RYBP) and Sleeve Gastrectomy (SG). This study aims to evaluate the variations in post-operative serum calcium, vitamin D and parathyroid hormone levels following RYBP and SG.

Method: Retrospective analysis of prospectively collected data of 390 patients who underwent bariatric surgery between the years 2015 and 2016 at a single-centre group practice in Melbourne, Australia. The data collected includes serum 25-OH vitamin D, corrected calcium and parathyroid hormone over three years. A variety of parametric and non-parametric tests were applied.

Results: Mean serum calcium levels increased post-operatively from a baseline of 2.31 (± SE 0.01) mmol/L following both surgeries – however remained within normal homeostatic range. Serum vitamin D levels increased following surgery, peaking at 6 months post-surgery; with 77 (IQR 65-90) nmol/L following SG and 74 (IQR 63-85) nmol/L following RYBP. Baseline parathyroid hormone levels were 5.7 (IQR 4.2-7.4) pmol/L following SG and 6.1

(IQR 4.7-8.7) pmol/L following RYBP. Post-operatively, these values dropped to 4.5 (IQR 3.4-5.7) pmol/L and 5.4 (IQR 4.2-7.2) pmol/L at 6 months which subsequently stabilised.

Conclusions: Serum parathyroid hormones levels are statistically different between the two surgical procedures across several time points. Higher parathyroid hormone levels following RYBP, may imply greater underlying nutritional deficiency compared to SG. These unique results may influence nutritional supplementation protocols within Australia and internationally.

Outcomes of positive faecal occult blood tests requested outside the Australian National Bowel Cancer Screening Programme

Surgery

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Background: The Australian National Bowel Cancer Screening Program (NBCSP) was introduced by the Australian government in 2006 and offers screening using faecal occult blood test (FOBT) kits. While the benefits of the NBCSP have been well established, the nature of screening outside the screening programme is not well understood. The aim of this project was to compare the characteristics of non-NBCSP and NBCSP participants and determine whether FOBT positive patients referred through the NBCSP pathway have more colorectal disease diagnosed than those referred outside the NBCSP.

Method: Data was collected retrospectively on all FOBT positive patients who have had colonoscopies performed at Northern Health from January 2017 to December 2018. Data was obtained from endoscopy reporting software and scanned medical records. The characteristics and outcomes of NBCSP and non-NBCSP participants were compared.

Results: Of the 733 participants who received colonoscopies, 316 (44%) were NBCSP participants and 417 (56%) were non-NBCSP participants. There was no significant association between referral pathway and advanced neoplasia (OR=1.04, 95% CI (0.98 to 1.10), p=0.18). Individuals participating in the NBCSP were less likely to be symptomatic than non-NBCSP participants (38.1% vs 69.9%, p<0.01).

Conclusions: There was no difference in the rates of advanced neoplasia between NBCSP and non-NBCSP participants.

Predicted clinical workload from early inductions of labour in South Asian women at Northern Health

Women's and Children's

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Background: Stillbirth increases steeply after 42 weeks gestation; hence induction of labour (IOL) at 41 week 3 days is recommended practice. Maternal country of birth is an independent risk factor for stillbirth, with South Asian (SA) women 1.27 times more likely to experience term stillbirth compared to women born in Australia¹. This study projected the impact on Northern Health if post-term IOL were routinely recommended one week earlier for women born in SA (including Bangladesh, India, Pakistan, Sri Lanka).

Method: Singleton births > 37 weeks during 2017-18 were extracted from the hospital Birthing Outcomes System. Elective caesarean section (n=2211) and IOL after prior caesarean section (n=5) births were excluded. Rates of spontaneous labour and IOL according to gestation and country of birth were analysed.

Results: There were 5413 included births, of which 24.9% were to South Asian women (n=1346). SA women had a significantly higher rate of IOL between 37 and 40+3 weeks compared with non-SA women (42.6% vs 35.0%, p< 0.0001). Among SA women > 40+3 weeks, there were 80 births following spontaneous labour and 94 following IOL. If all South Asian women were induced at 40+3, it would increase total term inductions by 4% per year, or less than one additional induction per week.

Conclusion: A policy of earlier IOL for South Asian women would only modestly increase demand on birthing services, due to pre-existing high rates of IOL in these women. These data should be applied with reference women's preferences for labour and birth.

¹ Davies-Tuck ML, Davey M-A, Wallace EM. Maternal region of birth and stillbirth in Victoria, Australia 2000–2011: A retrospective cohort study of Victorian perinatal data. PLoS ONE. 2017; 12: e0178727

What are the risk factors for 30-day neonatal readmission? A retrospective cohort study

Women's and Children's

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Background: Neonatal readmissions create a high burden to healthcare systems, patients and families. Readmission rates are used to gauge hospital care quality. This study's objectives were:

(1) calculate the 30-day neonatal readmission rates at Northern Health over 3 years; (2) provide a description of the readmitted cohort; (3) identify risk factors for neonatal readmission.

Method: A retrospective cohort study extracting data from the Birthing Outcomes System for all neonates born and discharged from Northern Health between 1-January-2016 and 31-December-2018. Risk factors were identified using multivariable logistic regression.

Results: Neonates totalled 10 956. The 30-day readmission rate dropped from 7.73% to 6.84%. The primary diagnoses for readmission were jaundice (48.9%), infection (22.9%) and feeding/growth concerns (20.1%). Multiple factors were found to increase readmission odds; 34-36 weeks' gestation (OR 5.26, 95% CI: 3.85- 7.19; p<0.001), 37-38 weeks' gestation (OR 2.40, 95% CI: 2.03-2.84; p<0.001), Aboriginal/Torres-Strait Islander (OR 2.62, 95% CI: 1.59-4.34; p<0.001), South East Asian/East Asian maternal birthplace (OR 1.49, 95% CI: 1.09-2.03; p=0.01 & OR 1.78, 95% CI: 1.06-2.96; p=0.030), marital status: separated (OR 2.85, 95% CI: 1.22-6.64; p=0.02), vacuum-assisted vaginal delivery (OR 1.33, 95% CI: 1.02-1.72; p=0.04) and length of hospital stay: same day discharge (OR 2.47, 95% CI: 1.36-4.47; p=0.01). Factors which decreased the odds of readmission; multiparity (OR 0.58, 95% CI: 0.49-0.69; p<0.001) and formula feeding (OR 0.70, 95% CI: 0.49-0.99; p=0.04).

Conclusions: Risk factors for readmission were multifactorial, thus policy development needs to be broadened to encompass the social, cultural and ethnicity needs of the community.

Birth trauma: how prevalent is it and how does it impact short-term neonatal outcomes?

Women's and Children's

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Background: The perceived "benign" nature of common forms of birth trauma (BT) has limited research assessing the impact of all-cause BT on short-term neonatal morbidity. This study aims to determine the prevalence of BT, investigate BT's effects on neonatal outcomes and assess the profile of BT risk factors (RF's).

Method: This retrospective case-control cohort study includes all coded BT cases at Northern Health between Jan 2017-Dec 2018. Cases were randomly matched to a single control (no BT) born within the

same obstetric registrar shift. Short-term neonatal outcomes included: infectious, metabolic, neurological and respiratory morbidity, treatments incurred, and length-of-stay data. Mode of delivery was assessed for BT risk profiling.

Results: Of 7,368 births, 201 cases of BT occurred (27/1000 births). BT associated delivery RF's included vacuum delivery (84 versus 22, $p<0.01$), forceps delivery (69 versus 5, $p<0.01$) and emergency caesarean delivery (36 versus 15, $p<0.01$). BT cases were more likely to be treated for presumed sepsis (33 versus 5, $p<0.01$), sepsis (18 versus 3, $p<0.01$) and to have an abnormal temperature (90 versus 50, $p<0.01$). Hypoglycaemia (32 versus 14, $p<0.01$) and jaundice necessitating phototherapy (53 versus 9, $p<0.01$) was higher in BT cases. Fetal resuscitation, blood transfusions, antibiotics >48 hours, were all significantly increased in BT cases. BT cases demonstrated significantly higher special care nursery admission rates (114 versus 20, $p<0.01$) and mean length-of-stay (median 3, IQR 3 vs median 2, IQR 2.5).

Conclusions: Birth trauma significantly worsens metabolic, neurological and respiratory neonatal outcomes, resulting in costly treatments and increased length-of-stay.

Evaluation of global coagulation assays for assessment of coagulability and venous thromboembolism risk in pregnancy

Women's and Children's

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Background: Women are at higher risk of venous thromboembolism (VTE) in pregnancy and postpartum. Global coagulation assays (GCA) including thromboelastography (TEG), thrombin generation using calibrated automated thrombography (CAT) and fibrin generation using the overall haemostatic potential assay (OHP) may be more representative of the coagulation process. We aimed to evaluate the ability of GCA to detect the hypercoagulability of pregnancy and differentiate coagulability amongst pregnant women of varying VTE risk profile.

Method: Women undergoing term elective Caesarean section at Northern Health provided a single pre-operative blood sample for routine baseline blood tests and experimental testing with TEG, CAT and OHP. Data from 47 healthy non-pregnant women aged 18-45 years from a

concurrent study database were used as the control group.

Results: Sixty women with term singleton pregnancies were included. 41.7% ($n=25$) were obese ($\geq 30\text{kg/m}^2$) at booking and 88.3% ($n=53$) were multiparous. Most GCA parameters were significantly more hypercoagulable in pregnant women compared to non-pregnant controls, particularly with increased maximum amplitude (clot strength) ($p<0.01$), endogenous thrombin potential ($p<0.01$) and fibrin generation ($p<0.01$). Pregnant women with booking BMI $\geq 30\text{kg/m}^2$ had significantly higher maximum amplitude compared to pregnant women of normal BMI (18.5-25 kg/m^2) ($p<0.01$). Statistical significance was maintained after controlling for age, parity, smoking status and diabetes.

Conclusions: GCA are able to detect the hypercoagulability of pregnancy and may potentially correlate with obesity in the pregnant population. GCA hold promise as adjuncts to risk factor-based criteria for VTE thromboprophylaxis during pregnancy and the puerperium.

Early enteral nutrition and jaundice outcomes in the preterm infant: a retrospective cohort study

Women's and Children's

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Background: The aim of this study is to compare clinical outcomes of low-birth weight (LBW), premature infants commenced on early (F80, 80 mL/kg/day total fluid intake) versus late (160 mL/kg/day total fluid intake) nutrient supplementation, with focus on jaundice outcomes.

Method: A retrospective analysis was conducted on premature LBW infants admitted to the Special Care Nursery (SCN) between January 2012 to December 2018 at Northern Health. Data on demographics, feeding regimens, and clinical outcomes were collected.

Results: Baseline characteristics for infants and mothers between F80 and F160 groups were similar. F80 infants experienced less maximum weight loss as % birth weight (5% vs 6%, $p = 0.03$) and regained birthweight significantly earlier than F160 infants (9.99 \pm 0.33 days vs 11.53 \pm 0.25 days, $p < 0.0001$). Change in Z-score from birth showed a significantly lower decrease in weight percentiles for F80 infants (-0.70 \pm 0.03 vs -0.79 \pm 0.03, $p=0.01$). Early nutrient

supplementation significantly reduced phototherapy requirements (39% vs 64%, $p < 0.0001$), and significantly reduced length of stay in the SCN (15.99 ± 0.64 vs 18.80 ± 0.74 days, $p = 0.03$). No differences were observed in adverse clinical outcomes as measured by presumed sepsis, respiratory distress syndrome and hypoglycaemia, and feeding intolerance.

Conclusion: Early enteral nutrition is safe and improves jaundice outcomes, weight gain and length of hospitalisation in LBW preterm infants.

Collaborating to deliver developmental care: A review of speech pathology practice in the Neonatal Unit

Women's and Children's

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Background: Infants admitted to Neonatal Units (NNU) have increased risk for adverse neurodevelopmental outcomes, which can prolong their hospital stay. Early input from a Developmental Care Team (DCT), including speech pathology, can positively influence outcomes. Despite the increasing presence of DCT's both nationally and internationally, descriptions of early speech pathology services are limited. Northern Health DCT provides multidisciplinary intervention to very preterm and complex term infants. Given the finite DCT resources service provision must be informed by evidence and organised collaboratively to optimise outcomes. This paper describes the speech pathology DCT activity on the NNU i.e. frequency, timing, and purpose of intervention for all referrals during a 12 month period with a view to drafting a developmental care pathway.

Method: A retrospective analysis of DCT referrals and activity across allied health between July 2017 and June 2018 was completed. Additionally, all admissions were audited to describe the frequency, timing and nature of speech pathology developmental services.

Results: Speech pathology had more encounters with very preterm infants but spent more time with complex term infants. Speech pathology provided a range of developmental services beyond feeding assessment.

Conclusions: This paper reviews how allied health services can be organised in a Level V NNU and considers the opportunities for further collaboration to improve care. The implications of speech pathology involvement in developmental care teams

will be considered particularly in terms of future training and research.

Anti-thrombotic and anti-platelet therapy and their influence on placental cell-free DNA release

Women's and Children's

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Background: Anti-thrombotic and anti-platelet therapy have been suggested to improve pregnancy outcomes by promoting cell survival in placenta and restoring normal placental function. This has been suggested to be a possible cause for the increased rates of failed non-invasive prenatal testing results due to a low fetal fraction. This study aims to measure cell-free DNA (cfDNA) release from placental tissue in vitro when treated with anti-thrombotic and anti-platelets drugs with the hypothesis that there will be a decrease in cfDNA release.

Method: Women with uncomplicated pregnancy presenting for term caesarean delivery at The Mercy Hospital for Women and Northern Health were recruited for this study. Five different placentas were collected and dissected into tissue explants, cultured and treated with increasing concentrations of enoxaparin, aspirin, clopidogrel, prasugrel and ticagrelor. After 24 hours of incubation, cfDNA was extracted from the culture media, quantified and normalized to placental explant tissue weight. Results were analysed using ANOVA and $p < 0.05$ was considered significant.

Results: Treatment of placental explants with 4.0IU/ml enoxaparin caused a significant increase in the relative amount of cfDNA released compared to untreated control ($p = 0.01$). There was no statistically significant difference in amount of placental cfDNA release in other drug treatments.

Conclusions: Enoxaparin caused a significant increase in amount of cfDNA released from placental explants contrary to our initial hypothesis, indicating a more complicated relationship between anti-thrombotic therapy and cfDNA release other than influencing cell survival. Further investigations are required to determine the underlying mechanisms in which anti-thrombotic therapy is involved in.

Antenatal TORCH (toxoplasmosis, rubella, CMV, herpes simplex) screening – time to start 'Choosing Wisely'?

Women's and Children's

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Background: Perinatal TORCH infections (toxoplasmosis, rubella, cytomegalovirus (CMV), herpes simplex (HSV)) may cause congenital abnormalities and intrauterine growth restriction (IUGR). Management of positive/indeterminate serology can be complex, requiring further investigations and specialist consultation. We aimed to evaluate the diagnostic yield and costs of antenatal TORCH testing in an Australian centre.

Method: Retrospective study to evaluate antenatal TORCH testing at Northern Health over a four-year period. Laboratory TORCH results and associated clinical records from January 2014 – December 2017 were analysed. TORCH serology performed for stillbirth/pregnancy losses were excluded. The laboratory cost for one TORCH test was \$184.

Results: 293 TORCH tests were performed for indications: IUGR (82.3%), abnormal ultrasound (14.7%), and clinical suspicion of maternal exposure (2%). 84% of women had prior documentation of rubella immunity. HSV results had no observable impact on clinical management. Positive/indeterminate results for CMV (n=16) and/or toxoplasmosis (n=4) infection were reported in 6.5% of total tests. Of these, 13 were subsequently classified as false positives. Twelve women underwent additional assessment, including serology, PCR, ultrasound, and/or subspecialist referral. Two cases were considered possible maternal primary CMV infection and monitored noninvasively. Six infants had neonatal TORCH testing; all were negative. \$53,912 was expended to identify 0 cases of congenital infection (0% 95%CI 0.0-1.2%).

Conclusions: Antenatal TORCH serology was of zero yield during the study period and was performed in the absence of a well-defined clinical pathway. Selective testing for specific infections based on clinical features should replace reflex TORCH serology, particularly for late-onset fetal growth restriction.

Diagnosing anaphylaxis in the Emergency Department – why is it so challenging?

Women's and Children's

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Background: The Victorian Department of Health and Human Services (DHHS) has mandated reporting of anaphylaxis by Emergency Department Clinicians. The primary aim of this study was to determine the accuracy of anaphylaxis diagnosis in presentations to a mixed adult/paediatric ED, and to look for factors that impacted on the accuracy of this diagnosis.

Method: Retrospective cohort study, reviewing presentations to NH ED between 2015-2018 that were ICD-coded as “anaphylaxis”, “allergic reaction” or “reaction (other)”. These cases were reviewed as either correct or incorrect based on the Vic DHHS anaphylaxis guidelines. Multivariate analysis based on age, allergen type and experience of ED clinician was included.

Results: Although anaphylaxis diagnosis was highly specific (97%), sensitivity was low (67%). Children under 5 years were most likely to have a missed anaphylaxis diagnosis (OR 3.26, 95%CI 1.6-6.6, p=0.001). Consultants had the highest sensitivity amongst the known clinicians (p=0.0015), suggesting the more senior the clinician, the more accurate the diagnosis.

Conclusions: The advent of mandatory reporting has raised concern of the accuracy of reporting. With overall sensitivity rates of only 67%, we are likely missing many cases of anaphylaxis. This study suggests the younger patient cohort and those managed by more junior staff are more likely to be missed. Further education and training is required to improve anaphylaxis recognition and diagnosis. Hence the category 1 prioritisation of both NBCSP and non-NBCSP participants with positive FOBTs is justified.

Is the Interprofessional Passport feasible at Northern Health? A pilot randomised controlled trial

Allied Health

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Background: Effective interprofessional education prepares students to practice collaboratively, however; challenges of sustainability in the clinical placement setting are significant. The Interprofessional Passport was developed at Northern Health to address these issues. A pilot RCT was undertaken to test the feasibility of this innovative model. The aim of this study was to test a program of short-duration, learner-led interprofessional education activities against five dimensions of feasibility: demand, implementation,

practicality, acceptability and limited efficacy testing (Bowen et al, 2009).

Method: Students on placement for ≥ 3 weeks during 2018 opted to participate. Control group participants completed their 'regular placement' whilst the experimental group also completed the Interprofessional Passport. This involved selecting and completing short duration, clinically-based IPE activities from the resource and submission of reflective worksheets to claim points towards a designated goal. Both groups completed pre and post evaluations (including ISVS-21 and IPLoS learning scales), daily activity records and opted in to complete semi-structured interviews.

Results: 93 students across nursing, medicine and allied health participated in the study. Outcomes from descriptive analysis of data related to demand, implementation, practicality and acceptability will be presented along with quantitative outcomes from the pre and post ISVS-21 and IPLoS and qualitative themes from semi-structured interviews.

Conclusions: With added flexibility this model of IPE may assist in embedding sustainable IPE into the clinical placement setting.



Research Week 2019 in pictures



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