Northern Celebrates

Research Abstract Book 2018

Northern Health

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.

Guest Speakers

Professor Sandra Eades

Professor Sandra Eades is Domain Head of the Aboriginal Health program at Baker Heart and Diabetes Institute. Sandra is a Noongar woman from Mount Barker, Western Australia and is Australia's first Aboriginal medical doctor to be awarded a Doctorate of Philosophy (2003). Sandra was appointed an Initiating Fellow of the Australian Academy of Health and Medical Sciences. Sandra's research career has focussed on the epidemiology of Indigenous child health in Australia. Over the past decade she has made substantial contributions to the area of Aboriginal health and has provided leadership at a national level in Aboriginal research. Sandra is strongly committed to capacity building. Sandra leads a current NHMRC CRE focused on Aboriginal child and adolescent health. She has previously led a National Health and Medical Research Council (NHMRC) Population Health Capacity Building grant that funded a research training program for five Indigenous researchers and six non-Indigenous researchers many of whom now hold leadership positions in Universities, Medical Research Institutes and Government. She continues to supervise and mentor Aboriginal and non-Aboriginal researchers making a contribution to the Aboriginal health.

Dr Stephen Duckett

Stephen Duckett is Director of the Health Program at Grattan Institute. He has a reputation for creativity, evidence-based innovation and reform in areas ranging from the introduction of activity-based funding for hospitals, to new systems of accountability for the safety of hospital care. An economist, he is a Fellow of the Academy of the Social Sciences in Australia and of the Australian Academy of Health and Medical Sciences.

Professor Bernhard Riedel

MB.ChB, FCA, FANZCA, FAHA, FASE, MMed, MBA, PhD

Bernhard is the Director of the Department of Anesthesia, Perioperative and Pain Medicine at the Peter MacCallum Cancer Centre, honorary Professorial Fellow at the University of Melbourne, and Clinical Associate Researcher at the Cancer & Neural-Immune Research Laboratory, Monash Institute of Pharmaceutical Sciences. His academic interests are in the field of onco-anaesthesia, with collaborative research efforts investigating the role of prehabilitation prior to major surgery and the impact of the perioperative adrenergic-inflammatory response and anaesthetic technique on tumor-progression signaling to improve cancer outcomes.

Dr Denise O'Connor

Dr O'Connor is Senior Research Fellow at Monash Department of Clinical Epidemiology, Cabrini Institute, School of Public Health and Preventive Medicine, Monash University. She is also Director of the Australasian Satellite of the Cochrane Collaboration Effective Practice and Organisation of Care (AusEPOC) Group, the group responsible for publishing Cochrane reviews of interventions to improve health care delivery and systems. Dr O'Connor's research is in health services, focusing on the design, delivery, uptake and impact of behaviour change interventions to translate knowledge from research into clinical practice.

Alfred Deakin Professor Mari Botti

Alfred Deakin Professor Mari Botti of Deakin's School of Nursing and Midwifery holds the Chair in Nursing in a joint appointment between Deakin University and Epworth Healthcare. Her specific research and clinical interests are in postoperative pain management, models of care delivery that encourage patient and family engagement in their care, safety and wellbeing and, the use of clinical data to improve quality and safety in healthcare. In 2012, the Deakin University Council conferred the title of 'Alfred Deakin Professor' to Professor Botti in recognition of her high-level contribution to furthering the aims of Deakin University in relation to research. In 2016, she was recognised as a Member of the Order of Australia for significant service to nursing, and to medical education, as an academic and author, and to pain management research.

Penelope Casey

RN, Grad Dip Nurs (Infectious Diseases), B. Ed, BNurs (Hons), PhD Student- Monash University.

Penelope's nursing career has spanned 30 years, during which she has specialised in infectious diseases, neuroscience nursing, and nursing education. In 2015, in addition to her role as Clinical Nurse Educator for Eastern Health, Penelope commenced a PhD with the Eastern Health Clinical School - Monash University. Her research is focussed on nurses' detection and documentation of delirium, supervised by Professors- Peteris Darzins, Wendy Cross and Claire Johnson. Her passion for improving delirium detection is motivated by her personal experiences with an elderly relative who suffers repeatedly with misdiagnosed delirium. Recently Penelope was awarded "Best 12- minute Oration-2017" for her research presentation at the Eastern Health Research Forum, and awarded the prize for the 'Deakin University Chair of Nursing Research - 2017'.

Abstracts

1 Identifying Barriers to Pancreatic Cancer treatment at the Northern Hospital

Li J[1,2], Jalali A[1,3,4], Matoga K[1,3,4], Yau W[1], Barnett F[1], Chong G[1], Handolias D[1], Houli N[1], Yong T[1], Hodgson R[1], Ng M[1], Dhir A[1], Heng TC[1], Bird D[1], Butt J[1], Lee B[1,2,3,4,5]

[1]Northern Health; [2]Faculty of Medicine and Dentistry, University of Melbourne; [3]Walter and Eliza Hall Institute; [4]Royal Melbourne Hospital; [5]Peter MacCallum Cancer Centre

Cancer Services

Background: Delays in diagnosis of pancreatic cancer (PC) contributes to high mortality rates. We sought to investigate possible barriers to diagnosis at the Northern Hospital.

Method: The Northern Hospital PC patients were identified from the PURPLE Registry, a prospective, multi-centre database which collates standardised data on demographics, diagnosis, treatments and outcomes in PC patients across Australasia.

Results: Between January 2016 and May 2018, data from 55 patients with PC were analysed. The median age was 69.5(33-85). It took a median of 45 days from presentation to a definitive diagnostic biopsy and 66 days for non-English speaking patients (13/55). A biopsy was attempted in 81% of patients, of which 91% were successful. Of the positive biopsies, 44% were done in <4 weeks from presentation, 32% between 4-12 weeks and 24% took >3 months. 58% of patients had 1-2 comorbidities, whilst 15% scored a Charlson Comorbidity Index of 0, and 27% scored 3 or more. Similar proportions were seen for ECOG performance. In terms of Socio-economic (IRSAD) scores, 58% were low, 28% were mid, 14% were high in comparison to 27%, 29%, 44% respectively across the PURPLE cohort (n=904). The median overall survival in locally advanced disease treated with chemotherapy versus metastatic disease and supportive care only was 19.3, 9.3 and 3.4 months. These findings were comparable to the PURPLE cohort, 14.0, 7.6 and 3.4 months respectively.

Conclusions: Despite challenges, such as a high proportion of non-English speaking patients and low socio-economic scores, Northern Health PC patient outcomes compare well to published outcomes. Steps to reduce time to diagnosis should be further investigated.

2 Transition, Threshold Concepts and Troublesome Knowledge in Medical Education: Hurdles in Becoming an Intern Doctor

Gray A[1], Mori K[2]

Education

[1]University of Melbourne; [2]Northern Health

Background: Transitioning from a medical student to an intern doctor is a stressful experience. Factors that contribute to a stressful internship include long hours, sleep deprivation, increased levels of responsibility, and inadequate support. The focus of this study will be to explore the factors that affect the transition from medical student to intern doctor at the Northern Hospital.

Method: This is a qualitative study that involved recruiting interns at the Northern Hospital during 2017 and 2018 who had been Northern Clinical School students. Participants then completed an online questionnaire eliciting: i) demographic information, ii) experience of the transition to internship, iii) preparedness for internship, iv) opinion of the University of Melbourne's Transition To Practice (TTP) subject. Open response sections of the questionnaire have been thematically analysed.

Results: The study participants reported that the most challenging parts of internship were time management, prioritisation, increase in responsibility and burnout. Transition To Practice was rated by all study participants as either very helpful or extremely helpful in preparing medical students for internship. The intern shadowing component was considered to be the most useful part of TTP; and the majority of participants suggested increasing intern shadowing during medical school as a way to ease the transition to internship.

Conclusions: The University of Melbourne's TTP subject is valued by former students as it eases the transition to internship. To further decrease the stress of transitioning consideration must be given to increasing the amount of time medical students spend shadowing interns before internship.

3 An evaluation of the preceptorship model of supervision for third year nursing students in a teaching hospital

Ramsden P[1], Asbury K[1], Varghese S[1], Hurren G[1], Sutton E[1], Skec C[1], Malamatinas V[1], Leung S[1], Hansen L[1], Jokwiro Y[2], McLeod C[2]

[1]Northern Health; [2]La Trobe University

Education

Background: The model of supervision on clinical placements has an impact on the clinical development of nursing students. Limited evidence suggests that the preceptorship model of supervision is associated with better skill acquisition and professional preparation for transition to graduate programs. The aim of this project was to evaluate the preceptorship model of supervision for third year nursing students at a teaching hospital.

Method: A cross sectional study was conducted with third year nursing students (n=42). The Student Preceptorship Model Evaluation Questionnaire was used post the acute placement (Cronbach alpha 0.91). A higher score indicates a more readily prepared student for the industry.

Results: The total mean score was 114 (SD 9.24), a scale ranging from 0-125. The mean scores of the subscales were Supervision 24 (SD 1.8) on a scale of 0-25; Receiving Feedback 19 (SD0.8) on a scale of 0-20; Preparedness 19 (SD 1.2) on a scale 0-20 and Skill Acquisition 19 (SD 1.4) on a scale 0-20. Correlation analysis indicated that preparedness was strongly influenced by supervision (0.587) and skill acquisition (0.674). There was little relationship (-0.081) between receiving feedback and preparedness. Skill acquisition correlated (0.735) with supervision, however less with feedback (0.337).

Conclusions: The preceptorship model of supervision positively influenced the perception of preparedness for third year nursing students for industry. There is need to understand the process of receiving and giving feedback between the preceptors and students. Further research could be conducted to evaluate the effect of programs aimed at improving feedback processes.

4 Continuous Renal Replacement Therapy in the Intensive Care Unit: An Audit of Filter Life

[1]Ghosh A, [1]Bolzon R, [1]Smith S

[1]Intensive Care Unit, Northern Health

Emergency Services

Background: While the clinical role of Continuous Renal Replacement Therapy (CRRT) has become well-established, there exists tremendous variability in how CRRT is prescribed and delivered, impacting clinical outcomes. The Kidney Disease: Improving Global Outcomes (KDIGO) acute kidney disease guidelines provide some recommendations; however there is large variability in following these guidelines. Our goal was to evaluate CRRT utilisation in critically ill patients admitted to our Intensive Care Unit (ICU) to inform the delivery of evidence-based best care.

Method: A single centre retrospective study in Melbourne, Victoria, Australia. All CRRT filters used on patients admitted to Intensive Care Unit in 2017-18 were identified. 392 filters were audited to evaluate their performance at the Intensive Care Unit at the Northern Hospital. Simple descriptive statistical and graphical analysis was performed. This then allowed us to determine our mean filter life in hours and identify causes for filter cessation, guiding future education and training to improve filter life hours.

Results: The overall filter life at the Northern Hospital ICU is 17.5 hours. This does not vary if outliers (>48 hours) or cessation due to access issues are excluded, nor does it vary after excluding elective cessation of filters. There is not much variation in filter life throughout the year.

Conclusions: Filter life hours at the Northern Hospital ICU is below the current KDIGO AKI guidelines, with clotting of the filter identified as the main factor for cessation of the filter. Future education and training should focus on management that reduces the risk of filter clotting to improve filter life hours.

5 Are we Choosing Wisely at Northern Health: Coagulation Studies?

Kalsi M[1], Pearson K[1]

[1]Northern Health

Emergency Services

Background: The Northern Hospital Emergency Department (ED) is Victoria's busiest ED with quarterly presentations of approximately 24000. 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 the Northern Hospital 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 patients' 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.

Conclusions: 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.

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

Kalsi M[1], Robins M[1], Wallace M[1], Loughran J[1], Wallace J[1], Fourlanos S[2], Varadarajan S[1], Kyi M[1,2]

[1]Northern Health; [2]Royal Melbourne Hospital

Medicine

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 30 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. There was also significant clinical inertia with lack of appropriate treatment adjustment in response to adverse glycaemia.

7 Importance of appropriate antimicrobial therapy in community-acquired sepsis and septic shock

Tumali R[1,2], Ghosh A[1,2], Crosbie D[1], Cross A[1,2]

[1]Intensive Care Unit, Northern Health; [2]University of Melbourne

Emergency Services

Background: The Surviving Sepsis Campaign 2016 recommends initiation of antimicrobial therapy (AT) within 1-hour of the diagnosis of sepsis or septic shock, along with expeditious source control. This project aimed to describe the association between time to initial AT or source control, appropriateness of initial AT and in-hospital mortality of Intensive Care Unit patients with community-acquired sepsis or septic shock.

Method: A single centre retrospective cohort study was performed including all cases of community-acquired sepsis and septic shock, directly admitted to the Intensive Care Unit from the Emergency Department in 2016. All data were collected from patients' medical records. Time zero was defined as Emergency Department triage time, and appropriate AT was defined as adherence to Therapeutic Guidelines or local guidelines. Univariate analysis was performed to determine predictors of in-hospital mortality.

Results: Out of 119 cases, 43.7% of patients were diagnosed with septic shock, and overall in-hospital mortality rate was found to be 21%. No significant correlation between in-hospital mortality and time to AT or source control was found. Appropriate AT was associated with a greater survival rate (p-value=0.02). Pneumonia, urinary tract and intra-abdominal infections were associated with a lower overall mortality rate compared to infection in other sites (13.8% vs 35.9%) (p-value<0.01).

Conclusions: There was no correlation between in-hospital mortality and time to AT or source control, and it may be attributable to the small study size. This study highlights the importance of appropriate AT and the continuous review of antimicrobial guidelines to ensure effective therapy.

8 Medical Emergency Team reviews in colorectal surgical patients: A descriptive study

Chan R[1], Crosbie D[2], Barclay K[1]

[1]University of Melbourne; [2]Northern Health

Emergency Services, Surgical Services

Background: Although differences in characteristics of Medical Emergency Team (MET) reviews between medical and surgical patients have been reported, there is a paucity of literature evaluating these cohorts separately. It is also common knowledge that major abdominal surgery has high risks of postoperative complications. Our primary aim was to describe patient and MET review characteristics of colorectal surgical patients receiving MET reviews at a tertiary teaching hospital.

Method: This was a retrospective observational study of 148 colorectal surgical patients who received a total of 218 MET reviews over a 5-year period between 1 April 2013 and 28 February 2018. MET review details were derived from a MET-specific database while the hospital's electronic patient records were used to extract all other information. Data analysis was performed using IBM SPSS Software.

Results: We found that the median time to index MET review after surgery was 3 days (IQR 2-6) and that the mortality rate of our cohort was almost ten times that of all colorectal surgical patients admitted during the study period. The median length of hospital stay of our cohort was double that of all colorectal patients with 12 days compared to 6 days.

Conclusions: Our findings may have implications in the postoperative care of colorectal patients in the first 4 days after surgery. Prevention of clinical deterioration may improve mortality rate and hospital length of stay for these patients.

9 Characteristics of episodes of escalation of care for clinical deterioration in the ED

Leonard-Roberts V[1,4], Considine J[1,2,3], Currey J[1,2]

[1]School of Nursing and Midwifery, Deakin University; [2]Centre for Quality and Patient Safety, Deakin University; [3]Centre for Quality and Patient Safety, Eastern Health Partnership; [4]Northern Health

Emergency Services

Background: Recognising and responding to clinical deterioration is a national patient safety priority. Safety systems such as Medical Emergency Teams (METs) have been developed to ensure a prompt response to clinical deterioration and a reduction in associated adverse events.

Method: The aim of this study was to describe the characteristics of episodes of escalation of care for clinical deterioration in the Emergency Department (ED). The study was conducted in an urban district ED in Melbourne, Australia. The ED had three levels of clinical deterioration, PreMET, MET and cardiac arrest, each with specific escalation of care criteria. There were 65 breaches of PreMET, MET and cardiac arrest criteria in 37 patients. Study data were collected between October and December 2015 across a variety of shifts. Data were analysed using Statistical Package for Social Sciences (SPSS) Version 23.0. Descriptive statistics were used to summarise the study findings.

Results: Analysis of the escalations of care for clinical deterioration revealed three findings. First, of the escalations of care that came from within the ED 72.4% (n=21) were from registered nurses with postgraduate qualifications in emergency nursing. Only 6.9% (n=2) escalations came from graduate (novice) nurses. Second, escalation of care originated from all areas of the ED and not just the resuscitation area. Finally, nurse concern was a common cause for MET escalation.

Conclusions: This study provided an opportunity to increase understanding of the characteristics of escalation of care for clinical deterioration. An increased understanding of escalation of care for clinical deterioration is crucial to reduce associated adverse events and improve patient outcomes.

10 Preventing Avoidable Hospitalisation for People with Dementia – patterns and practices

Panayiotou A[1], Mackell P[1], Haralambous B[1], Yates P[2], Tropea J[3,4], Aras D[5], Lautenschlager N[3,6], Catrice A[6], O'Toole G[7], Hunt M[8], Batchelor F[1]

[1]National Ageing Research Institute; [2]Austin Health; [3]Royal Melbourne Hospital; [4]Melbourne EpiCentre, University of Melbourne; [5]Northern Health; [5]Academic Unit for the Psychiatry of Old Age, University of Melbourne; [6]Department of Health and Human Services; [7]Dementia Australia; [8]North Western Melbourne Primary Health Network; ([1-8]On behalf of the Melbourne Ageing Research Collaboration)

Emergency Services

Background: In Australia, 6.5% of hospitalisations are potentially avoidable if conditions, known as ambulatory care sensitive conditions (ACSCs), were managed earlier. Compared to age-matched peers, people living with dementia (PLWD) are at greater risk of ACSCs, have 2 times hospitalization rate, have more long-term health conditions, and are 2-3 times likely to have poor outcomes from hospitalisation. This study aimed to understand the prevalence of avoidable hospitalisations for PLWD.

Method: A retrospective audit of 150 ED records of PLWD across 3 hospitals; survey of 24 staff from 2 hospitals regarding practices and attitudes towards PLWD and their carers who attend the ED.

Results: Audit showed PLWD had an average of 5.5 comorbidities, 58% arrived after hours, 41% were potentially avoidable, and 53% were admitted to hospital. Common reasons for presentation were pain, falls, functional decline, infection, and behavioural and psychological symptoms of dementia. While most (96%) staff agreed that hospital was a risk to PLWD, 87% reported that PLWD are a major problem for the health service and could be treated elsewhere.

Conclusion: Although most presentations were not immediately avoidable at the time of presentation, preventative practices in the weeks/months leading to presentation may have been indicated and efforts should still be made to avoid harms associated with hospitalisation. Further exploration of staff attitudes towards PLWD and carers' decision-making processes around hospitalisation is warranted.

11 Reducing outpatient referrals through collaboration with primary care

Farmer C[1], Dickman G[2], Jordan P[1], Gentle, J[3]

[1]Emergency Department, Northern Health; [2]Outpatients Department, Northern Health; [3]Orthopaedic Department, Northern Health

Emergency Services

Background: The Northern Hospital Emergency Department (ED) is the busiest in Victoria and sees over 8,000 patients per month. Around 5% of these are limb broken bones (fractures), most of which can be managed by appropriately skilled general practitioners (GPs) rather than be referred to outpatients. In a joint project funded by the Eastern Melbourne Primary Health Network (EMPHN) alongside Eastern and Austin Health services, a GP fracture diversion pathway was established in 2017.

Method: Appropriate fractures to be diverted to GP care were agreed upon by all stakeholders. GPs selected by the EMPHN were trained by the orthopaedic team with education, practical fracture clinic sessions and upskilling in plastering techniques. ED and orthopaedic processes were adapted for fracture patients and diversion of simple fractures commenced in November 2017.

Results: Stakeholder engagement has remained high throughout the project. The average diversion rate for simple fractures at Northern Health has increased from 32% to 80%. Prior to the project, an average of 203 patients were seen per month in ED with simple fractures, and 139 of them reviewed in fracture clinic. Since the introduction of the fracture diversion project, the average number of patients with simple fractures seen in ED per month is 234, but the number seen in fracture clinic is 45, a reduction of 95 appointments per month or 68%.

Conclusions: Upskilling local GPs to provide services normally provided by outpatients has been successful in significantly

reducing the burden on one of Northern Health's busiest outpatient clinics.

12 The validity of NaURSE to predict in-hospital mortality in the oldest-old in an Australian population

Chin KS[1,2], Lim WK[1]

[1]Department of Aged Care, The Royal Melbourne Hospital; [2]Northern Health

Medicine

Background: Age-specific death rate increases as the population ages. Previous studies have shown that age, co-morbidities and poor mobility are not strong predictors of in-hospital mortality in the oldest-old patients i.e. over the age of 90, compared to older patients in general. This project aims to assess the validity of a simple 5-point scoring system, NaURSE (sodium, urea, respiratory rate and shock index), in predicting in-hospital mortality in the oldest-old in an Australian population.

Method: A retrospective cohort study was performed at The Northern Hospital, Victoria. Data including initial clinical observations and initial blood test results were obtained from medical records. Using sodium>145mmol/l, urea>/=14mml/l, respiratory rate>20/min and shock index>1.0, a total score (0-4) is calculated for every patient. Statistical analysis was performed using univariate and multivariate logistic regression analyses.

Results: 205 patients (mean age 93.5 +/- 2.9) were included. Mortality rate was 12.2%. Using univariate analysis, admission sodium, admission urea, respiratory rate and shock index were all found to be significant predictors of in-hospital mortality (OR 3.2, 4.2, 2.4 and 4.8, respectively; p<0.05). The total NaURSE score alone was also a significant predictor (OR 2.5; 95% CI 1.6-4.0; p<0.001). The odds ratio of mortality rose as the total NaURSE score increased.

Conclusions: NaURSE scoring system is significantly predictive of in-hospital mortality in the oldest-old. It might help to guide clinicians in more accurately identifying acutely unwell oldest-old patients and in making management decisions, whether active or palliative.

13 Diagnosis and Referral Rates to Nephrology in Inpatients with Acute Kidney Injury

Barakat Z[1], Langsford D[1,2], Pianta T[1,2]

[1]Northern Clinical School, University of Melbourne; [2]Northern Health

Medicine

Background: AKI is common and serious but variably detected. Limited Australian data exists regarding variability in diagnosis, documentation, and involvement by nephrology units in acute and long-term management.

Method: Scanned and electronic medical records, funding codes, and clinic records were manually examined in 377 adults with a multi-day admission in July 2016. Diagnosis of AKI and stage was determined by KDIGO 2012 sCr criteria. Clinic appointments, readmission, and death were examined to 12 months.

Results: Chart review identified 102 (27%) patients with AKI, (73% stage 1, 13% stage 2, 14% stage 3). AKI was recorded in 49% (95%CI: 40-59%) of notes and 30% (95%CI: 22-40%) of discharge summaries. AKI was diagnosed in 12 patients not meeting KDIGO sCr criteria and no sCr was available in 19 patients. Factors associated with non-diagnosis were stage 1 AKI, no CKD, and admission to a surgical unit. Nephrology referral occurred in 11% (95%CI: 6-18%) of all AKI cases. Prior outpatient nephrology care was identified in 17 patients with AKI with 7 further referrals generated after AKI diagnosis. After 12 months patients with AKI had higher odds of death (OR 2.4, 95% CI: 1.3-4.3).

Conclusions: Non-diagnosis and non-recording of AKI was common. Policies to improve AKI outcomes should address improving diagnosis and recognise that nephrologists are currently involved in a minority of cases.

14 Outcomes in patients with acute upper gastrointestinal bleeding following management protocols changes at Northern Health

Papadinas A[1], Butt J[2]

University of Melbourne[1]; Northern Health[2]

Medicine

Background: Upper gastrointestinal bleeding (UGIB) has a high mortality rate and requires efficient and directed acute management. This project aimed to identify changes in patient outcomes following the latest upgrade to UGIB management protocols at Northern Health. The new protocols focussed on earlier endoscopy, blood transfusion thresholds and risk stratification.

Method: This was a cohort study of 400 patients aged ≥18 years admitted to Northern Hospital who underwent endoscopy for acute UGIB. Both retrospective and prospective data was collected from Group 1 and 2, categorised as pre and post-protocol changes, respectively. Primary outcomes were inpatient mortality, rebleeding, radiologic or surgical intervention, and endoscopic reintervention. Secondary outcomes included length of stay (LOS) ≥3 days and units of blood transfused. Univariate analysis was conducted comparing groups and identifying associations between variables and outcomes, followed by multivariate analyses for each outcome.

Results: There was no difference in mortality between groups (p=0.76). Rebleeding reduced by 4% (adjusted odds ratio [AOR]

0.50; P=0.04), LOS ≥3 days reduced by 12% (AOR 0.41; P<0.00) and median blood units transfused decreased from 2 to 1 (adjusted incidence rate ratio 0.82; P=0.01). Early endoscopy (i.e. ≤12 hours) increased by 15% overall (p<0.00) and there were 12% more higher risk patients (i.e. Glasgow-Blatchford risk score ≥12) in Group 2 (p=0.01).

Conclusions: Following protocol changes for UGIB management at Northern Health endoscopic times decreased with improvements in rebleeding, LOS ≥3 days and blood transfusion rates. This was not associated with decreased mortality though these findings should encourage further adherence to protocols.

15 Point-prevalence study utilising capillary blood glucose measurement detects a high prevalence of diabetes, pre-diabetes and stress hyperglycaemia in hospital

Kyi M[1,2], Robins M[1], Loughran J[1], Wallace M[1], Wallace J[1], Douglas A[1], Kalsi M[1], Ulrich E[1], Fourlanos S[2], Varadarajan S[1]

[1]Northern Health; [2]Royal Melbourne Hospital

Medicine

Background: Some individuals are discovered to be hyperglycaemic during hospitalisation in the absence of pre-existing diabetes. This may occur due to physiological stress; treatments in hospital; or undiagnosed diabetes prior to hospitalisation. Despite international recommendation for random blood glucose (BG) screening of all inpatients, this is not routinely done and hence the prevalence of new hyperglycaemia is unclear.

Method: We conducted a single-day point-prevalence study at the three Northern Health affiliated hospital sites, to determine the prevalence of pre-existing diabetes and new hyperglycaemia. We audited all multi-day inpatients (excluding maternity, paediatric, psychiatry and palliative care admissions) for the presence of pre-existing diabetes. Patients without pre-existing diabetes had a random capillary BG (cBG) measurement performed, and if resulting BG >7.8mmol/L, HbA1c was performed.

Results: On 30 November 2017, 351 patients (98% of occupied beds) were surveyed. The prevalence of pre-existing diabetes was 36%. Of 216 patients without pre-existing diabetes, 61(28%) had new hyperglycaemia (random cBG >7.8mmol/L). Increasing age and Charlson comorbidity index were associated with higher random cBG. Of patients with new hyperglycaemia, 6% had undiagnosed diabetes (HbA1c >6.5%), 52% had pre-diabetes (HbA1c 5.7-6.4%), and 42% had stress hyperglycaemia (HbA1c ≤5.6%). In the entire cohort, 51% inpatients had either pre-existing diabetes or new hyperglycaemia.

Conclusions: Random cBG measurement identified hyperglycaemia in 1 in 4 patients without pre-existing diabetes, of whom 60% had pre-diabetes or undiagnosed diabetes. Prevalence of diabetes was also highest reported to date in an Australian hospital. This study supports random cBG measurement to identify inpatients with new hyperglycaemia.

16 Acute Q-fever infection in a dairy products maker without direct animal contact: A case report

Inthavong P[1,2], Turner D[1], Stanley P[1], Aboltins C[1,2]

[1]Department of Infectious Diseases, Northern Health; [2]University of Melbourne

Medicine

Background: Q-fever is a zoonotic infection caused by the bacteria Coxiella burnetii with manifestations from asymptomatic to endovascular infection. Transmission from raw milk exposure is controversial and recommendations don't include precautions or education for these individuals. We present the first reported case of Q-fever in a dairy products maker without animal contact.

Case description: A 38-year-old male dairy products maker from suburban Melbourne with no recent history of contact with farm animals, farms or abattoirs presented with 6 days of fever (38.6°C at presentation) and malaise without a focus. His initial work-up was unremarkable but his occupation and prolonged febrile illness prompted investigation for zoonoses. Following suggestive Coxiella burnetii serology he was given doxycycline 100mg/BD for 14 days and recovered well. Direct questioning revealed exposure to aerosolised raw milk when unhooking pressurised milk pipes 3 weeks prior to presentation. Repeat testing of paired serum in parallel revealed Phase II IgG seroconversion, diagnostic of acute Q-fever.

Discussion: Our case demonstrates likely acquisition of Q-fever from a novel exposure mechanism in an industry which currently does not have any recommendation for pre-employment education or vaccination. The risk in this group may be higher than other raw milk exposures due to aerolsolisation of organisms which is a more infectious route.

Conclusion: The risk of Q-fever exposure for this occupation needs further examination so that appropriate education and vaccination recommendations can be made to prevent unnecessary morbidity.

17 Outcomes for acute haematogenous prosthetic joint infection: A retrospective cohort study

Inthavong P[1,2], Aboltins C[1,2]

[1]Department of Infectious Diseases, Northern Health; [2]University of Melbourne

Medicine

Background: Current guidelines suggest acute prosthetic joint infection (PJI) should be managed with debridement, antibiotics and implant retention (DAIR). Some evidence suggests outcomes for patients with acute, presumed, haematogenous PJI may be worse than acute early PJI. This project aims to describe the

severity, microbiology, management and outcomes for patients with acute haematogenous PJI.

Method: A retrospective, single centre, cohort study was performed including all consecutive cases of acute PJI treated between 2005 and 2015. Potential predictors of failure and outcomes were described. Failure was defined as implant revision or removal, relapsed infection, or PJI related mortality. Univariate and multivariate analysis were performed to determine predictors of failure.

Results: Out of 23 cases (median 65 years) 14 cases were acute haematogenous and 9 cases acute early PJI. 10 cases were polymicrobial, microorganisms cultured were *S.aureus* (*n*=14), *Streptococci* (*n*=10), Gram negatives (*n*=5), and coagulase-negative *staphylococci* (*n*=4). Primary surgical approach was DAIR in 91% of cases. The majority of IV treatment (median=34) was with βlactams (96%). Oral-therapy of choice was rifampicin-based combinations (70%). Overall failure was 39% (Median follow-up 748 days), failure was 36% for haematogenous PJI and 44% for early PJI. 5 acute haematogenous PJI cases were treated with chronic antimicrobial suppression. This subset experienced no failures (median follow-up 975 days).

Conclusions: The numbers for this study were small, unexpectedly outcomes for haematogenous PJI were not worse than acute early PJI. The treatment of some patients with chronic antimicrobial suppression was successful and its role in acute haematogenous PJI may require further exploration.

18 Thrombophlebitis post varicose vein surgery: is anticoagulation necessary?

Lim HY[1], Bayat I[2], Hong F[1], Ho P[1]

[1]Department of Haematology, Northern Health; [2]Department of Vascular Surgery, Northern Health

Medicine

Background: Patients may report limb oedema, lump and/or pain following varicose vein surgery and present to their local general practitioners (GPs) or emergency departments (ED). We aim to determine the management approach of clinicians in these patients.

Method: A case study of a patient presenting with left leg oedema and pain 6 days following varicose vein surgery (left saphenofemoral junction ligation, great saphenous vein (GSV) stripping and stab avulsions) with extensive superficial thrombophlebitis throughout the course of GSV reported on Doppler ultrasound was sent as a survey to GPs, ED physicians and haematologists (including registrars). The clinicians were requested to choose from 5 possible management options.

Results: A total of 115 responses from 52 GPs (45%), 31 ED physicians (27%) and 32 haematologists (28%) were received. There is marked heterogeneity in the responses: 26 (23%) chose prophylactic anticoagulation, 30 (26%) full anticoagulation, 8 (7%) aspirin while 32 (28%) chose no anticoagulation. The remaining 19 (17%) were unsure.

Conclusions: Limited superficial thrombophlebitis in the operated vein or its tributary soon after varicose vein surgery is a common (and often expected) post-operative occurrence due to associated surgical bleeding into the space previously occupied by the vein. There is usually no role for anticoagulation unless if there is evidence of deep venous thrombosis. Our survey showed that this is not well known in the medical community, which leads to unnecessary treatment with anticoagulation (49% in our survey). Further education to raise awareness amongst clinicians is required for patient safety.

19 Global coagulation assays in anticoagulated venous thromboembolism patients: increased fibrin generation with reduced fibrinolysis

Aswapanyawongse O[1,2], Brook R[2], Nandurkar H[3], Ho P[2,3], Lim HY[1,2,3]

[1]University of Melbourne; [2]Department of Haematology, Northern Health; [3]Australian Centre for Blood Diseases

Medicine

Background: Conventional coagulation testing is not sensitive enough to detect the anticoagulant effect of direct oral anticoagulants (DOAC). Global coagulation biomarkers such as calibrated automated thrombogram (CAT) and overall haemostatic potential (OHP) may provide a better assessment of the haemostatic state in anticoagulated venous thromboembolism (VTE) patients.

Method: Citrated whole blood samples were collected from patients on therapeutic anticoagulation for VTE and double spun to obtain platelet-poor plasma for evaluation of thrombin generation using CAT and fibrin generation using OHP and compared to previously collected normal controls.

Results: Fifty anticoagulated VTE patients were evaluated including 11 patients (22%) on warfarin, 37 (74%) on DOAC and 2 (4%) on enoxaparin. Compared to normal controls, anticoagulated VTE patients exhibited hypocoagulable CAT parameters characterised by prolonged lag time (5.7 vs 3.1minutes), reduced endogenous thrombin potential (688.8 vs 1310.6 nM.min), reduced thrombin peak (57.6 vs 222.0 nM) and reduced velocity index (9.7 vs 65.3 nM/min; $p<0.01$ for all). Only 14/39 (36%) of non-warfarin patients had prolonged prothrombin time (PT) and/or activated partial thromboplastin time (APTT). Fibrin generation parameters including overall coagulation potential and overall haemostatic potential, were significantly higher in VTE patients (66.1 vs 59.6U, 33.5 vs 27.5U; $p<0.01$) with reduced overall fibrinolytic potential (48.2 vs 52.1%; $p=0.01$) despite anticoagulation.

Conclusions: Global coagulation assays, particularly CAT, appear useful in the assessment of an individual's in-vivo anticoagulated status despite normal conventional coagulation studies. Paradoxically, fibrin generation is increased in these patients despite anticoagulation suggesting that OHP assay is independent of the anticoagulant effect.

20 Thrombin generation via calibrated automated thrombogram: an alternative measurement of Rivaroxaban anticoagulant effect?

Aswapanyawongse O[1,2], Pham T[3], Lim HY[1,2], Ho P[1,3]

[1]University of Melbourne; [2]Department of Haematology, Northern Health; [3]Northern Pathology Victoria

Medicine

Background: Routine coagulation monitoring is not required for Rivaroxaban due to its predictable pharmacokinetic and pharmacodynamic profile. However, there are circumstances in which quantification of Rivaroxaban can be helpful and commercially available assays may not be widely available. Measurement of thrombin generation using calibrated automated thrombogram (CAT) may provide a readily available and convenient alternative.

Method: Citrated whole blood samples from patients on therapeutic dose Rivaroxaban were double spun to obtain platelet-poor plasma for the evaluation of thrombin generation using CAT.

Results: Thirty-one patients on Rivaroxaban were evaluated. The median duration from last dose of Rivaroxaban was 7.3 hours (range 1.0-50.7). Lag time showed positive linear correlation to anti-Xa level (r_s= 0.91; p<0.01). Increasing levels of thrombin peak corresponded well to longer duration from the last dose (r_s= 0.58, p<0.001) and decreasing Rivaroxaban plasma anti-Xa level (r_s= -0.74; p<0.01) while endogenous thrombin potential showed a weaker but significant correlation to time from last dose (r_s= 0.43; p=0.02). Of note, variation in thrombin peak was observed even at low levels of anti-Xa. Velocity index also correlated to the timing of dose (r_s=0.60, p<0.01) and anti-Xa levels (r_s= -0.74, p<0.01).

Conclusions: Thrombin generation parameters using CAT, particularly lag time and thrombin peak, show significant correlation to the anticoagulant effect of Rivaroxaban and appears to be useful in the assessment of an individual's in-vivo anticoagulated status. Variation in thrombin peak despite low anti-Xa levels may indicate clinically significant anticoagulant effect. The study is ongoing to further validate these findings.

21 Evaluation of global coagulation assays in patients with haematological malignancies

Krishnamoorthi B[1,2], Leung T[2], Nandurkar H[3], Ho P[2,3], Lim HY[1,2,3]

[1]University of Melbourne; [2]Department of Haematology, Northern Health; [3]Australian Centre for Blood Diseases

Medicine

Background: Patients with haematological malignancies are at increased risk of venous thromboembolism. Current coagulation tests are poor indicators of in-vivo clot formation. Global coagulation assays (GCA) may provide a more holistic assessment of an individual's coagulation profile.

Method: Blood samples from patients were sent for routine laboratory tests and GCA testing, which included (i) thromboelastography using TEG®, (ii) thrombin generation via calibrated automated thrombogram (CAT) and (iii) fibrin generation via the overall haemostatic potential (OHP) assay. Results from these studies were then compared to previously collected normal controls (n=96).

Results: Thirty-two patients (median age 69.5 years) were recruited and included patients with multiple myeloma (n=15), acute myeloid leukaemia (n=3), chronic myelomonocytic leukaemia (n=1), myelodysplasia (n=3), chronic lymphocytic leukaemia (n=1), Hodgkin's lymphoma (n=1) and non-Hodgkin's lymphoma (n=8). Twenty (64.5%) patients were undergoing chemotherapy. Patients with haematological malignancies demonstrated higher factor VIII, von Willebrand factor antigen, von Willebrand factor activity and D-Dimer levels (p<0.01). Study patients showed hypercoagulable TEG® with increased maximum amplitude (65.3mm vs 57.9mm, p<0.01) and reduced clot lysis (0.0% vs 0.6%, p<0.01). Thrombin generation parameters including peak thrombin and velocity index were significantly increased despite comparable endogenous thrombin potential. Fibrin generation parameters were also increased (p<0.05) with preserved overall fibrinolytic potential.

Conclusions: GCA appear to be useful in profiling the haemostatic picture of patients with haematological malignancies. Thromboelastography, in particular, demonstrated a hypercoagulable state in these patients alongside increased peak thrombin and fibrin generation. Future studies will be required to correlate these findings with the clinical risk of thrombosis.

22 Global coagulation assays in multiple myeloma and monoclonal gammopathy of unknown significance

Krishnamoorthi B[1,2], Lim HY[1,2,3], Cooke R[1], Nandurkar H[3], Ho P[1,3], Leung T[1]

[1]Department of Haematology, Northern Health; [2]University of Melbourne; [3]Australian Centre for Blood Diseases

Medicine

Background: Patients with multiple myeloma (MM) have a higher risk of developing venous thromboembolism. Given the inadequacy of routine coagulation tests in characterising an individual's haemostatic profile, global coagulation assays (GCA) may be a promising alternative.

Method: Blood samples from patients with MM and monoclonal gammopathy of unknown significance (MGUS) were sent for routine laboratory tests and GCA testing, which included (i) thromboelastography using TEG®, (ii) thrombin generation via calibrated automated thrombogram (CAT) and (iii) fibrin generation via the overall haemostatic potential (OHP) assay.

Study results were compared to previously collected normal controls (n=96).

Results: Thirty-two patients (MM (n=14), MGUS (n=18)) were recruited. Study patients showed significantly higher factor VIII, von Willebrand's antigen, von Willebrand's activity and D-Dimer levels (p<0.01). TEG® was hypercoagulable with significantly increased maximum amplitude (68.9mm vs 57.9mm, p<0.01) and reduced clot lysis (0.0% vs 0.6%, p<0.01). Thrombin generation parameters including endogenous thrombin potential (1449.2nM.min vs 1347.6nM.min, p=0.04), velocity index (88.5 nM/min vs 65.0 nM/min) and thrombin peak (263.8nM vs 222.6nM, p<0.01) were also elevated. The overall coagulation potential and overall haemostatic potential parameters were increased in our study patients (p<0.01) with preserved overall fibrinolytic potential. There were no significant differences across assays when comparing MM to MGUS patients. Paraprotein levels and subtypes did not correlate with differences in GCA parameters.

Conclusions: MM and MGUS patients demonstrated more hypercoagulable GCA parameters as evident by thromboelastography and increased thrombin as well as fibrin generation. Future studies are required to correlate these findings with the clinical risk of thrombosis.

23 Overview of real-world direct oral anticoagulant experience at Northern Health- patients on low-dose anticoagulants have higher rates of bleeding and thrombotic stroke

Brook R[1], Aswapanyawongse N[1], Ho P[1], Lim HY[1]

[1]Department of Haematology, Northern Health

Medicine

Background: Direct oral anticoagulants (DOAC) are increasingly prescribed due to the convenience of oral administration without requiring drug level monitoring. We aim to evaluate the local real-world DOAC use.

Method: Retrospective evaluation of patients prescribed DOAC between September 2013 and September 2016 through Northern Health.

Results: 1079 patients were identified with median age 70 years (range 17-96). The indications for DOAC were atrial fibrillation (AF) 61.4% (n=663), venous thromboembolism (VTE) treatment 30.5% (n=329) and VTE maintenance/prophylaxis 8.1% (n=87). The most commonly prescribed DOAC was Rivaroxaban 60.8% (n=656) followed by Apixaban 28.7% (n=310) and Dabigatran 10.5% (n=113). Forty episodes of clinically significant bleeding (ISTH-SCC score 3-4) (3.7%) were captured. Significant risk factors for bleeding included low dose anticoagulation (p=0.04), AF patients (p=0.01), concurrent antiplatelet use (p=<0.01), prior bleeding (p=<0.01) and high falls risk (p=<0.01). In terms of thrombotic complications, there were 12 episodes of thrombotic stroke (1.8%) despite DOAC use with risk factors including low dose anticoagulation (p=0.03), prior stroke (p=0.04) and high falls risk (p=0.03). Nine patients on DOACs for VTE (2.2%) reported recurrence.

Conclusions: Our local safety data appears comparable to clinical trials although interestingly, low dose anticoagulation was a significant risk factor for both clinically significant bleeding (p=0.04) and thrombotic stroke (p=0.03). This may be due to a frailer population and shared risk factors for bleeding and stroke leading to initial prescription of low dose anticoagulation. This data suggest that low dose anticoagulation does not negate complications risk and careful prescribing and ongoing review remains vital.

24 Warfarin vs direct oral anticoagulants in venous thromboembolism – real world experience at Northern Health

Brook R[1], Aswapanyawongse N[1], Lim HY[1], Ho P[1]

[1]Department of Haematology, Northern Health

Medicine

Background: The introduction of direct oral anticoagulants (DOAC) has revolutionised the treatment of venous thromboembolism (VTE). However, there is limited data on the real world experience of DOAC and we aim to further evaluate this, including the safety outcomes in comparison to the warfarin era.

Method: Two retrospective local audits of VTE patients treated with warfarin (July 2011 to December 2012, n= 617) and DOAC (September 2013 and September 2016, n = 374) respectively were compared.

Results: 991 patients were reviewed: 62.2% (n=617) were on warfarin, 28.8% (n=286) were on DOAC for acute VTE treatment and 8.9% (n=88) were on DOAC for maintenance or prophylaxis. 88.0% (n=329) of DOAC patients were on rivaroxaban and 13.4% (n=50) on apixaban. There were 28 clinically significant bleeding (ISTH-SCC score 3-4) events in the warfarin group and 8 in the DOAC group (4.5% vs 2.1%, 1.71 per 100-person-years vs 1.08 per 100-person years; p-value=0.05). Forty-eight recurrent VTE events were captured – 39 on warfarin and 9 on DOAC (6.3% vs 2.4%, 2.40 per 100-person-years vs 1.21 per 100-person years; p-value<0.01).

Conclusions: This retrospective study found that patients on warfarin had a significantly higher rate of VTE recurrence and clinically significant bleeding compared to patients on DOAC. This may be due to selection bias as high-risk patients with co-morbidities or those not meeting criteria for DOAC prescription continue to be prescribed warfarin over DOAC. Further studies are required to evaluate the comparative safety data of warfarin vs DOAC in VTE.

25 Aged Care Facility to ED: an observational study of residents transferred to hospital in the last 24 hours of life

Brownstein H[1], Hayes B[1,2], Simadri A[1], Tacey M[1,2], Holbeach E[1]

[1]Northern Health; [2]The University of Melbourne

Medicine

Background: Whilst transfer of Aged Care Facility (ACF) residents to an acute hospital is sometimes necessary, for those at end-of-life this can cause fragmented care and disruption. This study explores the characteristics of ACF residents transferred to hospital in the last 24 hours of life and factors that may influence this decision, including access to medical review, advance care planning and pre-emptive symptom management prescribing; an area not previously researched.

Method: A retrospective observational audit of ACF residents transferred to a metropolitan hospital between 2012 to 2017 who died within 24 hours of transfer.

Results: 149 patients met the criteria. The median age was 87, 63(42%) were male. 83(56%) were transferred 'out-of-hours', the majority (71%) having no medical review in the 24 hours prior. 43(29%) died within 4 hours of arrival. The commonest reasons for transfer were dyspnoea (46%) and altered conscious state (32%), and commonest cause of death was pneumonia (37%). Some form of advance care planning documentation was available in 41%. Of the 86(58%) patients who required injectable opioid for symptom management in hospital, only 7 (8%) had this pre-emptively prescribed on their ACF medication chart.

Conclusions: Appropriate decision making around hospital transfers and end-of-life care for ACF residents may be influenced by access to professionals able to diagnose dying and access to appropriate symptom management medications. Advance care planning is important, but often requires the aforementioned to be enacted. Further research is needed to better inform how we can identify and meet the end-of-life care needs of this cohort.

26 Effectiveness of Multimodal Interventions in Improving Arteriovenous Fistula (AVF) Use for New Planned Haemodialysis Patients

Tan PG[1], Langsford D[1], Pianta T[1], Barit D[1]

[1]Renal Department, Northern Health

Medicine

Background: In 2015, a multidisciplinary approach to improve fistula use at haemodialysis initiation was commenced: one-on-one chronic kidney disease education, use of vascular led arteriovenous ultrasound mapping and a combined nephrologist-vascular surgical AVF planning and triage clinic. Retrospective study is conducted to evaluate if multidisciplinary interventions increase AVF use at time of planned haemodialysis initiation.

Method: Patients commencing planned haemodialysis, AVF creation and prevalent use of permacath between 1 January 2015 and 31 December 2017 were retrospectively analysed. Quarterly Key Performance Indicator (KPI) data from June 2015 to December 2017 was compared to state average. Prevalent permacath data was also collected. Patients underwent pre-dialysis AVF creation were retrospectively stratified into low- or high-risk of dialysis need based on calculated 8-Variable Kidney Failure Risk Equation (KFRE) from demographic and renal specific data at time of vascular referral.

Results: Across study period, 68 patients commenced haemodialysis whilst 85 underwent AVF creation. AVF use upon haemodialysis commencement consistently improved from 57% to 91%, compared to state-wide average of 56-66%. Prevalent permacath rate fell from 18.3% to 10%. Pre-dialysis AVF creation had increased from 74% to 85%. Amongst those started dialysis with catheters, 50% had poor engagement with the unit and 20% had late decision change with preferred dialysis modalities. High-risk patients with KFRE score ≥20% had shorter waiting time for AVF creation (median 45 days vs 142 days) but no difference in time from access creation to dialysis commencement. No significant changes in patient characteristics over this period.

Conclusions: Multimodal interventions including joint assessment by nephrologists and vascular surgeons may improve triaging of patients and AVF use at haemodialysis commencement.

27 Purtscher-like Retinopathy in Systemic Vasculitis and Lupus Nephritis: Two Case Reports

Tan PG[1], Langsford D[1], Pianta T[1], Savige J[1]

[1]Renal Department, Northern Health

Medicine

Background: Purtscher-like retinopathy (PLR) is a rare and severe angiopathy mediated by retinal microembolisation and complement activation. We report two cases of PLR in context of systemic vasculitis and lupus nephritis.

Case Report: A 68-year-old male presented with hypertension and acute kidney injury requiring dialysis. Lower limb palpable purpuric rash was noted. Renal biopsy demonstrated cortical infarction, which was proven to be bilateral despite patent renal arteries on angiogram. Autoimmune, vasculitis and pro-thrombotic screens found no abnormalities. Skin biopsy demonstrated leucocytoclastic vasculitis. Severe lower limb ischemia developed despite patent lower limb arteries on angiogram. He then developed increasing confusion, cardiac instability and painless visual loss. Retinal imaging found PLR. He was treated with prednisolone, cyclophosphamide and plasma exchange. At 9 months, whilst dialysis dependent, he has made

an otherwise good recovery including now normal retinal findings with restored vision.

A 47-year-old female presented with nephrotic syndrome, hypertension and a malar rash. She was diagnosed with class IV/V lupus nephritis associated with low complement factors. Antiphospholipid antibodies were negative. She was treated with prednisolone, hydroxychloroquine and mycophenolate sodium. At 3 months she achieved partial remission but reported blurred vision. Retinal imaging demonstrated PLR.

Conclusions: PLR is a rare microvascular occlusive retinal disease that can cause painless visual loss. It is associated with complement-mediated disorders including lupus and atypical haemolytic uremic syndrome. The pathogenesis is believed to be a microembolic or thrombotic phenomenon resulted from underlying systemic disease. It may improve with successful treatment of the systemic disease.

28 Ironing out the optic nerves: A world first in the treatment of superficial siderosis of the central nervous system

Crompton DE[1,2], Ross L[1] , Edmonds M[3]

[1]Neurology Department, Northern Health; [2]University of Melbourne; [3]Neurosciences Department, Austin Health

Medicine

Background: Superficial siderosis of the central nervous system is characterised by iron deposition on nervous system structures causing chronic, progressive neurological disability. Recent studies have shown that the iron-binding drug deferiprone is safe and in some cases may enable radiological stabilisation, though evidence of functional recovery has been lacking.

Method: We report a 45 year-old woman with superficial siderosis, treated with deferiprone. Pre-treatment assessments included validated measures of ataxia (incoordination), hearing, optic nerve and spinal cord function and overall disability, in addition to brain and spinal cord MRI. These measures were repeated after six months of deferiprone treatment (1000mg twice daily).

Results: Deferiprone was well tolerated. During treatment there was no deterioration of ataxia, hearing or spinal cord function. Visual evoked potentials showed bilateral optic nerve impairment prior to treatment but became normal with deferiprone treatment.

Conclusions: We report recovery of optic nerve function and stabilisation of other neurological parameters in a patient with superficial siderosis treated with deferiprone. Although radiological improvement has previously been reported in some treated individuals, this is the first ever demonstration of objective normalisation of neurological function attributable to deferiprone treatment. Deferiprone shows promise for treatment of this rare but debilitating neurological disorder.

29 Comparison of predicted and actual mortality in the Respiratory Care Unit

Mu S[1], Fahey G[1], Goodwin M[1], See K[1], Hannan L[1]

[1]Northern Health

Medicine

Background: The Respiratory Care Unit (RCU) was created to allow ward-based management of patients with respiratory failure who do not require Intensive Care Unit (ICU) admission. The RCU can accept patients directly from the Emergency Department (ED) requiring high flow oxygen therapy or non-invasive ventilation. Previously these patients required admission to ICU. The Acute Physiology and Chronic Health Evaluation (APACHEII) is a validated clinical tool that can predict overall inpatient mortality during acute ICU admissions. We aimed to compare the mortality rate of patients admitted to the RCU from ED with the predicted mortality rate using the APACHEII score.

Method: A retrospective analysis of the routine clinical data collected on patients admitted to RCU was performed. Patients admitted to the RCU from ED between March and July (inclusive) 2018 were included. APACHEII scores were calculated using measurements within the first 24 hours of admission to RCU.

Results: Overall, 44 patients were directly admitted from ED to RCU. Data was incomplete in 10 patients, primarily due to the lack of arterial blood gas measurements. The remaining 34 patients were included in the analysis. Three deaths occurred in this group (mortality rate 8.82%). The median APACHEII score was 19 (range 7-26) which predicts an inpatient mortality rate of 24% (range 8-55%).

Conclusions: Inpatient mortality rates within RCU for patients directly admitted from ED were low compared to the predicted mortality using their APACHEII scores. The omission of arterial blood gas measurement is an area for future quality improvement efforts within the RCU.

30 Utility of an evidence-based influenza like illness algorithm for respiratory viral polymerase chain reaction testing

Mu S[1], See K[1]

[1]Northern Health

Medicine

Background: Influenza is an easily transmissible respiratory infection that can have serious health effects and public health implications. At Northern Health, respiratory viral polymerase chain reaction (PCR) is used to detect influenza. Currently there is no evidence based assessment tool for emergency physicians to discriminate which patients require a PCR. Inappropriately performed viral PCRs have implications for potential missed cases and subsequent infective risk whilst PCRs performed

unnecessarily place a burden on hospital utilization of isolation rooms and associated waste of personal protective equipment. In 2018, Northern Health implemented a structured influenza like illness (ILI) algorithm based on the World Health Organisation (WHO) definition of influenza.

Method: A retrospective audit of patients who received a respiratory viral PCR over a 3 month period (May- July) in 2017 was conducted. Paediatric, pregnant and immunosuppressed populations were excluded. Data were used to determine sensitivity, specificity, positive and negative predictive values of the algorithm.

Results: Of 310 PCRs performed, 77 (24.84%) were positive for influenza. When the ILI algorithm was applied, 176 individuals met the criteria for performing a PCR. Data demonstrated a sensitivity of 92.21%, specificity of 54.94%, positive predictive value 40.34% and negative predictive value 95.52% for the ILI algorithm. Only 6 (4.48%) of the individuals who did not meet the criteria for PCR returned a positive result.

Conclusions: Given the high sensitivity and negative predictive value of the ILI algorithm, it is a useful guide in the Emergency Department to prevent unnecessary viral PCR being performed in ILI presentations.

31 The diagnostic utility of supine spirometry in patients with diaphragmatic paralysis

Tampaline LJ[1], See KA[1], Hannan L[1], Romeo N[1]

[1]Northern Health

Medicine

Background: Unilateral phrenic nerve dysfunction, manifesting as hemi-diaphragmatic paralysis is commonly suspected on the basis of plain (static) chest x-ray imaging. Confirmation of the diagnosis typically requires the use of either fluoroscopy or ultrasound in order to demonstrate paradoxical diaphragm movement on the affected side. Supine spirometry has been recognised as a useful measure to identify both unilateral and bilateral diaphragm dysfunction however it is infrequently requested or performed. This technique provides functional information on diaphragm strength, is non-invasive, easy to perform and is both cost and time efficient.

Method: A literature review was performed in order to establish guidelines to report normal parameters as well as unilateral and bilateral diaphragm weakness for supine spirometry within the Respiratory Function Laboratory at Northern Health.

Results: Analysis of the available literature demonstrated that a normal decrease in forced vital capacity in the supine position is less than 10% from that obtained in the sitting position. Unilateral diaphragm paralysis is suggested when the decrease is greater than 15%. Bilateral diaphragm dysfunction is suggested when the decrease is greater than 25%.

Conclusions: Supine spirometry testing can be performed in patients with suspected phrenic nerve dysfunction and may also be useful in patients with complaints of orthopnoea or with unexplained restrictive spirometry. A fall in forced vital capacity >15% in the supine position suggests unilateral phrenic nerve dysfunction and may be diagnostic when combined with consistent imaging findings.

32 Implementation of the Assessment for Rehabilitation Tool for Northern Health Acute Stroke interdisciplinary discharge planning

Meredith C[1], Brooks M[1], Rodda A[1], Southby A[1], Selvarajah M[1], Gauci T[1], Lee-Archer M[1], Ligtermoet M[1], Crompton D[1]

[1]Northern Health

Medicine

Background: The Northern Hospital Stroke team meet weekly to discuss patient care; however the decisions regarding rehabilitation and discharge planning are not consistently documented. Anecdotally the stroke team identified the opportunity to increase interdisciplinary collaboration in discharge planning decisions. The implementation of the Assessment for Rehabilitation Tool (ART), based on the National Stroke Guidelines (2017), during stroke case conferences, provides a framework to facilitate consistent, collaborative discharge planning.

Method: A retrospective audit of medical progress notes provided baseline data regarding the consistency of Northern Health stroke interdisciplinary case conference documentation, recommendations for rehabilitation, and patient length of stay. A post implementation audit of progress notes was conducted to measure changes in discharge documentation and length of stay. Qualitative data regarding the impact of the ART on interdisciplinary collaboration in discharge decisions was captured via staff surveys.

Results: Preliminary findings from pre-post ART implementation audit and staff survey indicate 1) an increase in the consistency of documentation of interdisciplinary case conferences and the decision making for discharge planning 2) increased staff satisfaction due to improved collaboration and problem-solving between interdisciplinary team members.

Conclusions: Implementation of the ART tool brings Northern Health's Acute Stroke team discharge planning practice into line with recent National Stroke Clinical Guidelines (2017) and preliminary findings indicate an improvement in stroke patient care through interdisciplinary collaboration decision-making regarding rehabilitation and discharge planning.

33 Botulinum toxin treatment for chronic migraine at Northern Health

Ruthnam L[1], Crompton D[1], Lee-Archer M[1]

[1]Northern Health

Medicine

Background: Chronic migraine is one of the world's most disabling diseases and affects approximately 2% of the Australian population. Chronic migraine is often refractory to oral prophylactic preparations and is associated with medication overuse. Onabotulinumtoxin A (BOTOX®) was proven to be effective for managing chronic migraine in the PREEMPT study in 2010. It has been subsidised by the Pharmaceutical Benefits Scheme (PBS) in Australia since 2011 making it more accessible to patients. A clinic was established at the Northern Hospital in December 2016 to provide Onabotulinumtoxin A for eligible patients with chronic migraine.

Method: A retrospective audit assessing the effectiveness of onabotulinumtoxin A was completed. The primary end point was to establish the percentage of patients who responded to treatment. A response is defined as a 50% reduction in headache days from baseline, within 6 months of the first treatment. Data was collected from electronic patient medical records. The cohort consisted of all patients treated from December 2016 to April 2018. All patients fulfilled PBS criteria to be treated with Onabotulinumtoxin A and had received at least one cycle. Other data points collected included basic demographics, headache days per month, medication days per month, as well as previous and concomitant medication use.

Results: Thirty patients have been treated and 70% of these have responded. There was an associated 37% decrease in acute medication use from baseline to last follow up.

Conclusions: These results support Onabotulinumtoxin A as an effective treatment for chronic migraine in our population.

34 Current Nutrition Practices in ICU at the Northern Hospital

Aboltins T[1], Cross A[1], Ghosh A[1], Arucino A[2], Inban M[2], Sanders M[2], Suaalii Ausagi M[2], Evans R[1], Kouris A[2], Bonello K[2]

[1]Northern Health; [2]La Trobe University

Medicine

Background: Early feeding (within 24 hours of admission) in critically ill patients can decrease mortality by 8-13%. Achieving ≥ 80% of nutritional requirements by day 3 of Intensive Care Unit (ICU) stay is considered adequate for critically ill patients. Current practice of initiating nutrition and achieving nutritional requirements in ICU patients at the Northern Hospital is not known. An audit examining nutrition support provision in Northern Health ICU patients will highlight whether current practice aligns with clinical practice guidelines for nutrition support in critical illness.

Method: A retrospective audit was conducted on patients admitted to Northern Health's ICU, who received Enteral Nutrition (EN) and or Parenteral Nutrition (PN) between November 2016 and July 2017. Data collected included nutrition support provision and total volumes received of EN or PN from the patient's medical record. Inclusion criteria: ≥18 years of age, mechanically ventilated within 48 hours of ICU admission and assessment completed by a dietitian in ICU.

Results: Fifty-three patients met inclusion criteria. 98% of patients were exclusively on EN, 2% received PN only and 6% received EN and PN. In patients receiving EN, 30% had EN initiated on day 0, 40% by day 1 and 17% by day 2. 11% of patients fed EN received ≥80% of target feeding regime. The average volume received was 47%.

Conclusions: This audit highlights the need to look at the enablers and barriers to achieve early enteral feeding and meet target volumes of ≥ 80% by day 3 for patients in ICU.

35 Inhalers prescription in patients with chronic obstructive airways disease over 18 months

Khorramnia S[1], Nguyen J[2] See K[1], Hannan L[1]

[1]Department of Respiratory Medicine, Northern Health; [2]Pharmacy Department, Northern Health

Medicine, Emergency Services

Background: Historically inhalers for chronic obstructive pulmonary disease (COPD) were limited to a few options. Recently, several new inhalers have become available. Although this provides prescribers alternatives to choose from, their knowledge of the best practice guidelines is essential for appropriate prescribing. Inhaled corticosteroid/long-acting beta-agonists (ICS/LABA) are indicated for patients with at least moderate obstruction. Long-acting muscarinic antagonists (LAMA) and LAMA/LABA inhalers are used in any severity if other prescribing criteria are met.

Method: We conducted an audit of the prescribed inhalers for Northern Hospital discharges between October 2016 and March 2018 using pharmacy database. We cross-referenced these data with patients with COPD diagnosis on discharge summary. Prescription rate for each class of inhalers was used to identify any change in the prescribing pattern.

Results: There were 1800 prescriptions, 982 in patients with COPD. 48.47% of prescriptions were for LAMA, 45.11% ICS/LABA and 41.04% both. Newer LAMA/LABA combinations comprised 4.99% of all inhalers however; their prescription increased over time (10.30% of total prescribed inhalers in the third 6 months versus 2.99% in the second and 3.36% in the first 6 months of the audit period). Similarly, combined use of ICS/LABA and LAMA inhalers dropped from 43.09% of prescriptions in the first 6 months to 40.82% in the second and 39.47% in the third 6 months.

Conclusions: Although new inhalers are being more frequently utilised, traditional combinations are remain the mainstay of pharmacotherapy. An audit of the severity of COPD would be helpful to further evaluate compliance with the guidelines.

36 Timeliness of care following the Lung Cancer Re-design Project at Northern Health

See K[1], Khorramnia S[1]

[1]Department of Respiratory Medicine, Northern Health

Medicine

Background: The Lung Optimal Care Pathway (OCP) specifies that patients with suspected lung cancer should be seen by a specialist within 14 days and be treated within 42 days of referral. The lung cancer re-design project was conducted in Northern Health to ensure timely specialist review followed by appropriate diagnostic investigation and treatment.

Method: We conducted an audit of patients referred with a suspected diagnosis of lung cancer between March 2018 and June 2018. The findings were compared to the available historical data from 2016 which predates the establishment of the respiratory department within Northern Health.

Results: Overall, 58 patients were reviewed in 3 months, a 450% increase compared to 50 patients a year in 2016. Average time to first review was 12 days. 92% met OCP timeline compared to 68% in 2016. Re-direction of referral from other disciplines to respiratory was the main reason for longer wait in the remaining 8%. Average time to diagnosis was 24 days with 60% within the recommended 28 days. The primary cause of delay in diagnosis was lack of on-site Endobronchial Ultrasound (EBUS) which required referral to other hospitals. 92% of lung cancer cases were discussed in the multidisciplinary meeting. Average time to treatment was 62 days. 29% started treatment within the 42 days from referral. In 10%, treatment was initiated within 14 days from diagnosis.

Conclusions: Lung cancer re-design project has improved patients' care however time-limiting factors need to be further addressed to facilitate optimum care of lung cancer patients.

37 Complement and drusen in IgA glomerulonephritis

Harraka P[1,2], Barit D[1], Pianta T[1], Langsford D[1], Colville D[1], Mack H[2], Savige J[1]

[1]Northern Health; [2]Melbourne Health

Medicine

Background: IgA glomerulonephritis (IgAN) is the commonest form of glomerulonephritis worldwide, with 25% developing end-stage renal failure. Complement is implicated in IgAN pathogenesis, with C3 and C1q deposits in the mesangial matrix, and GWAS linkage studies. We have previously noted drusen in occasional patients with IgAN. Drusen have the same composition as glomerular immune deposits including complement. This study examined patients with IgAN for retinal drusen, and any clinical associations.

Method: Retinal images from 98 individuals with biopsy-proven IgAN were examined for drusen in the central and peripheral retina by two trained graders. Drusen number, location and size were identified. A retina with ≥10 drusen was considered abnormal. Results were compared with those from 98 age and gender matched controls using student's t test and Fischer's exact test (SPSS).

Results: Individuals with IgAN had more drusen (8 ± 21) than controls (2 ± 6) ($p<0.01$). Eighteen with IgAN (18%) had ≥10 drusen compared with 4 controls (4%, $p<0.01$). Drusen count and size were not associated with the development of end-stage renal failure ($p=0.53$, $p=1.00$).

Conclusions: Drusen are common in IgAN and are further evidence for complement involvement. The presence of drusen in the retina suggests future treatments for IgAN could target the complement pathway.

38 Hospital-wide glucometric analyses of inpatients with diabetes reveals high incidence of adverse glycaemia

Douglas A[1], Varadarajan S[1], Fourlanos S[2], Kyi M[1,2]

[1]Northern Health; [2]Royal Melbourne Hospital

Medicine

Background: Following a point-prevalence study of diabetes at Northern Health, we analysed capillary blood glucose (cBG) measurements of all inpatients with pre-existing diabetes, to describe glycaemic control and compare to published international data.

Method: On 30 November 2017, a point-prevalence study at Northern Health identified 126 inpatients with pre-existing diabetes. We then retrospectively collected cBG measurements from medical records for up to 14 days surrounding the audit date per-patient. Patient-day and per-patient glucometrics analyses were performed to determine the incidence of various severities of hypoglycaemia, hyperglycaemia, and adverse glycaemia (BG<4 or >15mmol/L).

Results: We analysed 4252 cBG measurements comprising 1300 patient-days from 126 individuals with diabetes. Mean age was 74 years and included 117(93%) patients with Type 2 and 5 (4%) with Type 1 diabetes, divided among medical, surgical and subacute admissions: 48(38%), 22(17%) and 53(42%), respectively. Patient-day analysis revealed mean BG 9.3mmol/L, with 233(18%) and 72(5.5%) of patient-days with BG>15 and BG>20mmol/L, respectively. Hypoglycaemia <4 and <3mmol/L occurred in 4.6% and 1.6% of patient-days respectively. On per-patient analysis, 52(42%) and 26(21%) of patients had hyperglycaemia >15 and >20mmol/L, respective ly.

Hypoglycaemia <4 and <3mmol/L occurred in 23(18%) and 14(11%) of patients, respectively. Overall, 59(47%) of patients had at least one episode of adverse glycaemia. Compared to US and UK hospitals, this cohort had higher incidence of hyperglycaemia but lower incidence of hypoglycaemia.

Conclusions: Almost half of all inpatients with diabetes had adverse glycaemia during their admission. Ongoing auditing of glycaemic control is required to improve our understanding and approach to inpatient diabetes care.

39 Prothrombin time as measured with STA® NeoPTimal is sensitive to Rivaroxaban effect

Pham T[1], Aswapanyawongse O[2], Wallis A[3], Lim HY[4], Ho P[1,4]

[1]Northern Pathology Victoria; [2]University of Melbourne; [3]Alfred Pathology Service; [4]Department of Haematology, Northern Health

Pathology

Background: Routine monitoring for Rivaroxaban is not required due to its predictable pharmacokinetic. However, there are situations when urgent assessment is required. Prothrombin time (PT), if performed with a sensitive reagent, has been shown to be useful. We aim to investigate the effect of rivaroxaban on a new PT reagent, STA® NeoPTimal.

Method: We analysed the PT using STA® NeoPTimal reagent on 30 patients receiving rivaroxaban 20mg daily for VTE treatment. The results were compared to the PT obtained using STA® Neoplastine® CI Plus and Dade® Innovin® reagents. Twenty-nine patients (97%) have eGFR >60ml/min/1.73m^2 and median time of last dose of Rivaroxaban is 7.7 hours (range 1–50.4).

Results: The PT measured using STA® NeoPTimal (R^2=0.79) and Neoplastine® CI Plus (R^2=0.78) closely correlated with the anti-factor Xa levels, compared to Dade® Innovin® (R^2=0.58). STA® NeoPTimal had similar sensitivity to STA® Neoplastine® CI Plus (p=0.67) and both were more sensitive compared to Dade® Innovin® (p<0.001). Seven patients (23%) who reported taking their rivaroxaban within 2-5 hours before sampling (mean anti-factor Xa 119ng/mL) demonstrated a mean PT of 20 seconds (range 13.7-26.5) using STA® Neoptimal and 19 seconds (range 13.6-23.3) using STA® Neoplastine®. All but one patient with PT within the normal range (n=12; range 11.6-15.3) as measured using STA® NeoPTimal, had an anti-factor Xa <50ng/mL.

Conclusions: The PT measured using the new STA® NeoPTimal reagent is comparable to STA® Neoplastine® and may be useful to assess the anticoagulation effect of rivaroxaban in urgent situations, particularly when anti-factor Xa assay is unavailable.

40 Focus Rigidity Casting for offloading heel pressure injury in a subacute inpatient setting: Case Study

Bramston C[1], Tragarz A[1], Grollo A[1]

[1]Northern Health

Sub Acute

Background: Heel pressure injuries (HPI) are the second highest acquired pressure injury in sub-acute setting. HPIs can take three times longer to heal than other areas, are costly, can increase hospital length of stay whilst impacting patient health and recovery. At Northern Health HPI offloading device options include heel suspension boots, bed wedge, foam bootie, pressure relief ankle foot orthoses. Focus Rigidity Casting (FRC) are bespoke casts made from semi-flexible polymer and rigid fibreglass material pressure with research indicating it can be an effective alternative method for offloading HPI.

Method: A case study was undertaken trialling a FRC on an eligible 89 year old male admitted with a Stage 2 left HPI, following a left femoral fracture. A custom made FRC was used to offload the left foot with an aperture at the site of the PI designed to reduce forces. Peak pressure measurements (kPa) on the foot were determined using a pressure mapping technology (Pressure Guardian) on bony prominences of the left foot and at the ulcer site, whilst supine and sitting in a chair.

Results: Peak Pedal pressure measurements confirmed a decrease in plantar pressures up to 89%. Complete wound healing was achieved in seven weeks.

Conclusions: The FRC used in the case study was as an alternative device to offload a heel PI. Heel Plantar pressures decreased by 89%. The ulcer healed within seven weeks and remained healed at a two month review.

41 The association between a secure GEM ward's aggressive behaviour (RAGE) score and unplanned nursing staff leave: A pilot study

Yu JJ[1], Holbeach E[1]

[1]Northern Health

Sub Acute

Background: Older patients with aggressive behaviours, often complicating delirium and/or dementia, frequently require management in specialised secure geriatric wards. Working with particularly aggressive patients anecdotally increases unplanned staff leave. This study attempts to determine if a secure geriatric ward's (KAW-Aged) aggressive behaviour (RAGE) score, traditionally used to guide patient management, can also be used to predict unplanned nursing staff leave (UNSL).

Method: RAGE scores for every inpatient, number of code greys, patients' diagnoses and other demographics were recorded

weekly on KAW-Aged for 26 weeks and correlated with the UNSL for the same week and the following week (to allow for any "lag effect" the aggression may have on leave).

Results: There was low correlation between the ward's mean RAGE score and UNSL for the same week (r = -0.34) and for the following week (r=0.08). The correlation between UNSL and the number of code greys (r=-0.06), diagnosis "case mix" (Alzheimer's dementia r=0.24, vascular dementia r=-0.11, Lewy Body dementia r=0.02) and non-English speaking proportion of the ward (r=-0.14) was similarly low.

Conclusions: This pilot study has not demonstrated that the RAGE score can be used to predict UNSL, however it was limited by its small sample size and short study period. It has demonstrated that UNSL is likely influenced by complex factors. It has proven feasibility of this type of study and will be used to inform the design of an adequately powered prospective study in the future.

42 How effective are interventions to increase physical activity levels among older inpatients receiving rehabilitation?

Quick S[1], Cleary S[2], Shields N[2]

[1]Department of Allied Health, Northern Health; [2]School of Allied Health, La Trobe University

Sub Acute

Background: Increasing the intensity and frequency of therapy during inpatient rehabilitation improves patients' functional independence and reduces length of stay but in many workplaces offering is not possible due to resourcing issues. Our aim was to systematically review the effectiveness of interventions to increase physical activity in older adults (aged 60 and over), 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 physical activity (through participation or behavioural change) for older adults receiving inpatient rehabilitation. Trials were excluded if the intervention increased the intensity of usual-care, either during the week, or at the weekend. Two reviewers independently completed trial selection, quality assessment and data extraction. Data were synthesized descriptively, and effect sizes with 95% confidence intervals were calculated.

Results: Of 316 articles identified, 3 trials were included. There were two activity-based, and one behavioural change intervention. Physical activity was significantly improved in the behaviour change intervention trial, during therapy (*d*=0.27; 95% confidence interval [CI] 0.02 to 0.52), and non-therapy time (*d*=0.43; 95% CI 0.19 to 0.68). There were no differences between groups in the other two trials for any physical activity measure. Participants in all trials had very low levels of physical activity.

Conclusions: There is a lack of evidence for interventions to increase physical activity in older adults admitted to inpatient rehabilitation, without increasing the amount of therapy. Older adults in inpatient rehabilitation have extremely high levels of inactivity.

43 Minimally Invasive Glaucoma Surgery: Comparison of iStent with iStent *inject* in Primary Open Angle Glaucoma

Hooshmand J[1], Rothschild P[2,3], Allen P[2], Kerr NM[4], Vote BJ[2], Toh T[2]

[1]Northern Health; [2]Tasmanian Eye Institute; [3]University of Tasmania; [4]The Royal Victorian Eye and Ear Hospital

Surgical Services

Background: Minimally Invasive Glaucoma Surgery has gained significant traction in recent years. This study evaluates the effects of trabecular micro-bypass stents 'iStent' and 'iStent *inject*' in Primary Open Angle Glaucoma (POAG).

Method: POAG patients undergoing cataract surgery combined with trabecular micro-bypass stent insertion were prospectively recruited. Baseline demographic information, pre-operative, intra-operative and post-operative outcomes including intraocular pressure (IOP), visual acuity, reliance on glaucoma medication and complications were collected and analysed. Primary, secondary and tertiary outcome measures were consecutively defined as an IOP of ≤ 18mmHg with zero medications, an IOP of ≤ 18mmHg with reduced medications or a 20% reduction in IOP with or without medication.

Results: The study comprised 145 eyes in the iStent and 100 eyes in the iStent *inject* group. At 12 months 55 and 52% of the iStent and 48 and 54% of the iStent *inject* patients had achieved primary and secondary outcomes. The mean post-operative IOP was 16.6 in iStent and 16.9mmHg in iStent *inject.* Survival analysis demonstrated a greater incidence of failure in the iStent *inject* beyond 6 months.

Conclusions: Both trabecular micro-bypass stents in this study were effective in reducing IOP and the burden of medication when combined with cataract surgery. There was no statistically significant difference between the two groups across our outcome measures although the iStent *inject* required earlier recommencement of medications for optimal IOP control.

44 Are we Choosing Wisely at Northern Health for inguinal hernia repair?

Chmiel E[1,2], Pearson K[2], Mori K[2], Geraghty J[2]

[1]University of Melbourne; [2]Northern Health

Surgical Services

Background: Choosing Wisely Australia is an initiative aimed at reducing the incidence of unnecessary investigations. This project is an audit of Northern Health's adherence to two Choosing Wisely recommendations in the context of inguinal hernia repair. Recommendation 1: "Avoid routinely performing preoperative blood investigations, chest X-ray or spirometry prior to surgery, but instead order in response to patient factors, symptoms and signs, disease or planned surgery." Recommendation 2: "Do not use ultrasound for further investigation of clinically apparent groin hernias. Ultrasound should not be used as a justification for repair of hernias that are not clinically apparent."

Method: Records of 264 patients who underwent elective inguinal hernia repair at Northern Health in 2016 were reviewed.

Results: Recommendation 1: 34% of patients received coagulation studies, 86% of which were unindicated. There was better adherence to Choosing Wisely guidelines for other investigations: 38% of patients received a FBE (42% unindicated), 38% received a UEC (14% unindicated), 7% received a HbA1c (0% unindicated) and 38% received an ECG (11% unindicated). Recommendation 2: 70% (n=186) of patients received an ultrasound of which 25% (n=46) had a documented indication.

Conclusions: Recommendation 1: Most preoperative coagulation studies were unindicated, while adherence to Choosing Wisely guidelines was better for preoperative FBE, UEC, HbA1c and ECG. Recommendation 2: The majority patients received an inguinal hernia ultrasound, most of which had no documented indication. Referring clinicians are not "Choosing Wisely" with respect to ultrasound.

45 Argon Electrosurgery for Transanal Minimally Invasive Surgery

Lam D[1], Strugnell N[1]

[1]Northern Health

Surgical Services

Background: Transanal minimally invasive surgery (TAMIS) is an organ-sparing technique used to excise benign and early malignant tumours of the rectum. However, dissection within the confined space of the rectum can be limited by tissue charring and excessive smoke. We sought to use argon electrosurgery as an alternative to standard electrosurgery in dissection for TAMIS.

Method: A retrospective analysis of patients who underwent TAMIS using argon electrosurgery dissection from the period January 2017 to July 2018 was undertaken. Details regarding patient demographics, operative and pathological characteristics were obtained from Northern Health Clinical Patient Folder (CPF).

Results: Five patients underwent TAMIS using argon electrosurgery. The mean age and BMI were 64 years and 25 respectively. Mean operating time for the procedure was 133 minutes. There were no post-operative complications recorded and mean length of stay was three days. From a histological perspective, three patients had neuroendocrine tumours (NETs), one patient had an adenoma and one patient had an adenocarcinoma of the rectum. There were no involved margins in any of the specimens. There have been no cases of tumour recurrence thus far.

Conclusions: This is the first case series of argon electrosurgery for TAMIS. Argon electrosurgery is a safe and valid alternative to traditional diathermy, as it offers equivalent haemostasis with reduced charring and surgical plume production. Its potential to improve quality of dissection due to improved visualisation of tissue planes makes it an attractive option for other transanal procedures including taTME (transanal total mesorectal excision) for rectal cancer.

46 Is laparoscopic surgery safe in pregnancy? An evaluation of perioperative and obstetric outcomes

Seetharaman D[1,2], Mori K [1,2], Poon P[1]

[1]Northern Health; [2]The University of Melbourne

Surgical Services

Background: Approximately 1 in 635 pregnant women will require some form of surgical intervention during their pregnancy. However, there remains conflicting views on the safety of laparoscopic surgery during pregnancy, particularly with regard to poor foetal outcomes. The aim of this study is to identify the perioperative and obstetric outcomes of laparoscopic surgeries performed during pregnancy.

Method: We retrospectively reviewed the hospital records of all pregnant women across all trimesters who underwent a laparoscopic non-obstetric abdominal procedure at The Northern Hospital from January 2013 to January 2018. Clinical data, such as operative reports, inpatient records, pathology reports and birth records of the patients were analysed.

Results: Forty-five subjects were identified. Common laparoscopic procedures performed included appendicectomy (n=24), cholecystectomy (n=10) and cystectomy (n=5). Procedures were mainly done in the second trimester with a mean gestational age (GA) of 15.7 ± 6.2 weeks. Intraoperative and postoperative complications were observed in 4% and 9% of the study population. There was a 4% conversion rate to open surgery. Follow up for foetal outcomes was achieved in 87% of patients. No maternal or foetal deaths occurred in this series. Preterm delivery rate was 5.1% with the average GA at delivery being 39.3 ± 1.0 weeks.

Conclusions: Laparoscopic surgery can be safely performed in all trimesters of pregnancy for a wide range of non-obstetric indications with good maternal and foetal outcomes. These findings support other hospital-based reviews that reveal low rates of foetal loss and perioperative complications associated with laparoscopic surgery in pregnant patients.

47 A Review of Trauma Presentations, Admissions and Tertiary Surveys at the Northern Hospital

Fong JY[1], Lai JM[1], Hodgson R[1,2]

[1]Division of Surgery, Northern Health; [2]Department of Surgery, University of Melbourne

Surgical Services

Background: Trauma is a large component of emergency general surgery. The Northern Hospital admits a high proportion of non-operative patients that have an impact on the health system when possible injuries are not realised. We present a retrospective study of the trauma workload through the Northern Hospital to examine opportunities to improve patient safety.

Method: Trauma patients admitted at Northern Health under the Acute General Surgical Unit from July 2016 to June 2017 were examined to identify pre-hospital factors, mechanisms, hospital admission characteristics, injuries identified on secondary and tertiary surveys and length of stay.

Results: 595 patients were identified. A high velocity mechanism was involved in 43% of patients. 219 (36.8%) had a major injury identified on secondary survey. Only 11 patients (2.9%) had a major injury identified at tertiary survey if the patient was only identified with a minor or no injury at secondary survey. There were no missed injuries following tertiary survey. Mean times from presentation to emergency review, surgical admission, and tertiary survey were 95.09, 293.86, and 971.63 minutes respectively. CT panscan was the most used imaging modality. The biggest factor in performing the tertiary survey was time of day, with 478/543 (88.0%) of patients having their tertiary survey after the morning ward round. The majority of low risk mechanism patients were discharged within 24 hours.

Conclusions: Patients diagnosed with no or minor injuries were unlikely to have major injuries detected on tertiary survey. Inefficiencies in delaying tertiary surveys until the next day were identified.

48 Drain tube use in incisional hernia repair

Luo Y[1], Mohammed Jinnah S[1], Hinton J[1], Hodgson R[1]

[1]Northern Health

Surgical Services

Background: There has been significant topical interest in the method of incisional hernia repair. Recent literature has discussed an unprecedented legal judgement following complications relating to an incisional hernia repair, and in particular the non-placement of a drain tube causing post-operative infection. Expert witnesses testified that drain tube use should be mandatory and would have reduced the risk of infection. The aim of this study is to examine the perception of surgeons regarding the use of drains and reasons behind their use in incisional hernia repair.

Method: 735 general surgeon members of the General Surgeons Australia (GSA) were surveyed regarding their experience and regular technique of performing incisional hernia repair.

Results: The survey response rate was 26.7%. Only 12% of general surgeons placed drains all of the time whereas 67% of surgeons “sometimes” or “rarely” placed a drain tube and 11% of surgeons “never” placed a drain tube. Surgeons elected to place drains for “reduced risk of seroma” (85%). Interestingly 47% of surgeons thought that drains “increased risk of infection”, whereas 24% of them thought they “reduced risk of infection”.

Conclusions: Surgeons of the GSA have mixed opinions regarding the use of drains in incisional hernia repair. Placement of drain tubes is not universally practiced and the majority of general surgeons who participated in the survey believe that drain tube placement causes increased potential for surgical site infection, rather than reduction of infection risk. The expert witness testimony does not reflect current practice in our cohort.

49 Incisional Negative Pressure Wound Therapy for Laparotomy Wounds

Islam R[1], Lam D[1], Strugnell N[1]

[1]Northern Health

Surgical Services

Background: Post-operative surgical site infections (SSI) are a major cause of patient morbidity and increased hospital stay, adding a significant cost to the health system. Population studies have demonstrated SSI rates of 3-11% for class II (clean/contaminated), 10-17% for class III (contaminated) and >27% for class IV (dirty) wounds. A recent body of evidence suggests incisional negative pressure wound therapy (INPWT) is effective in reducing SSI rates; however, minimal literature exists regarding laparotomy incisions. Our aim was to assess the efficacy of the Prevena™ Incision Management System (KCI, San Antonio, USA) in reducing SSI in this subgroup.

Method: A retrospective review of General Surgery patients who underwent elective or emergency laparotomy with application of Prevena™ INPWT between January and July 2018 was conducted. Details regarding patient demographics, operative details, post-operative complications and SSI were retrieved. The study's primary end point was SSI rate at 30 days post surgery. Secondary endpoints included time to wound epithelialisation and other wound complications.

Results: A total of 23 patients were included; their operations comprised 8 elective colorectal resections and 15 emergency midline laparotomies. 13 were classified as clean/contaminated, 7 contaminated and 3 dirty wounds. INPWT was used for a median of 6 days. The overall SSI rate was 8.7%. By subgroup, SSI rates were 0%, 14% and 33% for Class II, III and IV groups respectively.

Conclusions: INPWT with Prevena™ is an effective method of laparotomy wound closure with favourable overall SSI rates compared to evidence from existing literature.

50 Tokyo Guidelines 2018 (TG 18) diagnostic criteria review in a tertiary surgical centre in Melbourne Australia

Luo Y[1], Makepe M[1], Yim A[1], Bird D[1], Hodgson R[1]

[1]Northern Health

Surgical Services

Background: The Tokyo Guidelines have been developed to assist with the diagnosis and treatment of acute cholecystitis. The latest guidelines (TG18) demonstrate a sensitivity (91.2%) and specificity (96.9%) for diagnostic purposes and severity grading. This study assesses their application to Northern Health patients.

Method: 1222 patients who underwent cholecystectomy from 1 January 2012 to 1 February 2014 were audited for the indication of acute cholecystitis and retrospectively assessed for TG18 diagnostic criteria and outcomes.

Results: Using TG18 criteria, a suspected diagnosis of acute cholecystitis was made in 217 (79.5%) and a definitive diagnosis 56 (20.5%) patients. 56.1% of patients with suspected acute cholecystitis had a histological diagnosis of acute cholecystitis compared to 77.8% in the group with definitive diagnosis. 99.3% of patients meeting criteria for both suspected and definitive diagnosis had a raised C-Reactive Protein (CRP), and 67.0% had raised White Cell Count. 7.4% of patients with suspected diagnosis had unexpected 90 day readmission compared to 20.0% (p=0.017) in the definitive group. Patients with definitive diagnosis had a major and minor post-operative complication rate of 17.9% and 21.8%, compared to 6.0% (p=0.021) and 8.9% (p=0.016) in patients with suspected diagnosis.

Conclusions: Using TG18 criteria, Northern Health patients demonstrate a close correlation with histological diagnosis. A definitive diagnosis of acute cholecystitis is associated with higher chances of unexpected 90 day readmission and increased major and minor complication rates. CRP was the most common positive TG18 criterion indicating suspected or definite acute cholecystitis. Using TG18 criteria at Northern Health can predict patients at higher risk of post-operative complications.

51 Comparing Northern Health's approach to Gallbladder Pathology before and after the introduction of the AGSU model

Makepe M[1], Luo F[1], Yim A[1], Bird D[1], Hodgson R[1]

[1]Northern Health

Surgical Services

Background: Gallbladder pathology represents a significant proportion of Northern Health's general surgical workload. The pressures of theatre access, bed availability, and an increasingly elderly and co-morbid population has increased the pressure on surgical units and led to the introduction of the Acute General Surgical Unit (AGSU) model in February 2013. We hypothesise that there will be outcome improvements including morbidity, mortality following the introduction of the AGSU model.

Method: A retrospective audit was performed between February 2012 and June 2013 of all patients undergoing cholecystectomy at Northern Health. Demographic data and outcomes including morbidity, mortality were analysed in the 12 months before and after the introduction of the AGSU model.

Results: 1223 patients were identified who underwent cholecystectomy. There were no significant differences in number of patients, age, or gender between the 2 time periods. Following the introduction of AGSU, there was a significant increase in patients undergoing laparoscopic cholecystectomy for presumed acute cholecystitis as an emergency, an increase in complex cases, and increase in histologically confirmed acute pathology. The complication rate trended towards an increase in the post-AGSU period (18.4% vs 13.4%, p=.17).

Conclusions: Since the introduction on AGSU, more acute and complex operations were performed which was associated with a trend towards higher complications. Further study of non-operative cases in this period needs to be performed to gauge accurate benefits of the AGSU model.

52 Accidental Inoculation of the Right Forearm with *Gudair* Sheep Vaccine: A Case Report

Fuzzard S[1], Richardson J[1], Liew J[1], Wiseman J[1], Teixeira R[1]

[1]Department of Plastic and Reconstructive Surgery, Northern Health

Surgical Services

Background: Workplace hazards in the agricultural sector are extensive and can have significant repercussions. This case report discusses a twenty-one-year-old male with accidental inoculation of the right volar wrist with *Gudair* ovine Johne's disease (OJD) sheep vaccine. The vaccine contains heat inactivated Mycobacterium paratuberculosis as well as immune stimulating mineral oil. There is a paucity of reports of this type of injury in Australia, with less than ten cases in the literature.

Method: The presentation, progress and outcome were all noted, as well as interventions that underpinned his recovery. Data was collected during the clinical course of treatment, with informed patient consent.

Results: Initial management was conservative, with limb elevation and broad-spectrum antibiotics, a lack of resolution of symptoms and consultation with a surgeon with previous experience with this presentation prompted surgical intervention. Radical surgical debridement was required to

excise sterile granulomatous tissue produced as a result of the immunological response to the vaccination. Subsequent negative pressure dressing and full thickness skin grafting, in conjunction with steroid and ongoing antibiotic therapy, allowed for definitive closure. Long term follow up will be required to ensure no recurrence that functional deficits do not develop.

Conclusions: Accidental *Gudair* inoculation can lead to significant morbidity secondary to immune mediated inflammatory reaction in tissues. The definitive management requires early surgical debridement and multidisciplinary input. Due to the potential severe consequences of this injury despite benign initial presentation, imaging and biochemical findings, education is necessary to ensure this condition is not overlooked.

53 A Review of the Literature on Treatment of Silicone Implant Incompatibility Syndrome

Fuzzard S[1], Zinn R[1], Wiseman J[1], Teixeira R[1]

[1]Department of Plastic and Reconstructive Surgery, Northern Health

Surgical Services

Background: Silicone implant breast augmentation has been routinely performed since the 1960s. Emerging literature suggests the existence of a clinical syndrome, silicone implant incompatibility syndrome (SIIS) resulting from silicone implants, and sequelae of this include autoimmune reactivity, with subsequent symptoms including myalgias, athralgias, chronic fatigue, sleep disturbance and cognitive impairment. While the existence of a clinical entity is currently being established in the literature, there are currently no guidelines on the diagnostic criteria or the approach to management.

Method: A literature review was conducted using Medline, CINAHL and PubMed databases with key terms searched for. The relevant literature was then analysed to determine if a consensus exists on the most appropriate treatment plan.

Results: Twenty-two relevant studies were located, as well as 15 review articles. The majority of research available was in the form of case reports or small case series with only eight papers providing data with larger cohorts. From these studies improvement in symptoms was obtained by both medical management of their immune response, explantation of their implants as well as by counselling on the condition itself.

Conclusions: Silicone implant use appears to be linked to symptoms in a cohort of patients. The subsequent treatment of this silicone implant incompatibility syndrome is yet to be agreed upon. Further research is required to establish guidelines for diagnosis and ensure that this condition can be treated in an evidence-based way, and that patients and clinicians have a more refined understanding of the potential risks of silicone breast implant use.

54 Defining patient engagement: A review of the dimensions and context of the concept in literature

Nasr Z[1,2], Cleary S[1], Stelmach W[2], Zheng Z[1]

[1]RMIT University; [2]Northern Health

Surgical Services

Background: The role of patients in managing their own healthcare is a focus for policy makers, healthcare organisations and researchers. A growing body of research indicates that patient engagement is associated with patient satisfaction, patient safety, reduced healthcare costs, and economic sustainability. Patient engagement has been poorly defined and applied inconsistently, presenting a challenge to research. This paper aims to examine commonalities and differences in the way patient engagement has been defined in healthcare research; and to understand the dimensions and context used in the definitions.

Method: Pubmed/Medline and Google Scholar were searched using "patient engagement" for publications between 2004 and 2018. Peer-reviewed or government documents published in English that provided an explicit definition for the term were selected.

Results: 19 peer-reviewed papers and five government reports were selected. Four themes, including actions, collaboration, autonomy and education, were identified. Seven papers focused on action, seven papers on collaboration, five papers on patient autonomy, and three papers on education. The term 'patient engagement' is associated with 5 other terms - including patient participation, patients as partners, patient involvement, patient empowerment, and patient activation - with overlapping definitions. Patient engagement's definition also depends on the context such primary care, hospitals, and mental health institutions.

Conclusions: Patient engagement is multi-dimensional and context related, and it is difficult to develop a clear definition. Limiting its definition to one dimension or context could however significantly narrow its clinical application. This research contributes to ongoing debate about the dominant conceptualisations of patient engagement in the literature.

55 Caffeine: An unnecessary outcast?

Overland J[1], Condon B[1], Wiseman J[1], Teixeira R[1]

[1]Plastic and Reconstructive Surgical Unit, Northern Health

Surgical Services

Background: Caffeine is a widely-consumed stimulant with known vasoactive properties. Awareness of this physiologic side-effect of caffeine amongst microsurgeons has encouraged a fear in micro-surgical units that provision of caffeine in the peri-operative setting to microsurgical patients may lead to adverse outcomes. As a result, some units have adopted the policy of

caffeine restriction in the perioperative period, however the evidence base for this practice remains largely unquestioned.

Method: We conducted an independent review of the literature using MEDLINE and EMBASE databases to identify the evidence base for caffeine restriction perioperatively for microsurgical patients. A total of 164 articles were identified, and a search of the bibliographies yielded another 14 articles. Of these 178 articles, 5 were included in our systematic review.

Results: The 5 relevant articles looked at caffeine's effect on free tissue transfers and/or digital replants. There were 2 animal and 3 human studies. 1 animal study found a decrease in blood flow to axial flaps post caffeine use, and the other found no statistically significant change in blood flow after caffeine consumption. Of human model studies, 1 looked at non-habitual caffeine consumers, whilst the other 2 used habitual consumers. Only the study looking at non-habitual consumers suggested that caffeine impairs blood supply to flaps.

Conclusions: There is little evidence within the literature to support the restriction of caffeine in habitual drinkers post microsurgical revascularisation procedures. On the contrary, experimental models suggest a potential beneficial effect on blood supply. Further work is needed in this area.

56 Implementing a self-checklist to improve identification of the risk of post-operative nausea and vomiting among surgical patients

Zheng Z[1], Layton J[1], Stelmach WS[2], Crabbe J[2], Briedis J[2], Ma J[2], Atme J[2], Bourne D[2], Reynolds D[2], Cleary S[1], Xue CCL[1]

[1]School of Health and Biomedical Sciences, RMIT University; [2]Northern Health

Surgical Services

Background: The guidelines recommend that prevention and management of post-operative nausea and vomiting (PONV) needs to be tailored to the risk of individual patients. Assessing PONV risks is the first recommendation. At the Northern Hospital, PONV risk could have been assessed but was not documented. We implemented a patient self-checklist in May 2017. This study aimed to assess the implementation outcomes; and enablers and barriers to the implementation.

Method: A four-item PONV risk checklist based on the validated Apfel score was developed. Surgical patients completed it pre-operatively on the day of surgery at the Day Procedure Unit. Between June to Oct 2017, 1306 patients underwent general anaesthesia and their files were audited. Enabler and barriers were identified through interviewing staff and patients.

Results: 60.2% (n=787) files had recorded PONV risk assessment. The compliance improved from 57% in June 2017 to 74% in Oct 2017. 16.8% patients were identified as high risk. Prior to implementation, only 5.3% of patients were identified as high risk. The two main initial concerns from staff were the increased time and paper work required. Engaging patients to self-check their own PONV risk assessments might have bypassed those barriers. However nurses and clerks did not trust patients' capacity to complete the self-checklist.

Conclusions: The PONV risk self-checklist is simple and useful tool in identifying high risk patients. Future studies need to explore how to address nurses and clerk's trust in patient capacity and if the checklist can be a useful tool to engage surgical patients.

57 Common Bile Duct Exploration for Management of Choledocholithiasis: A Northern Health 10-year Audit

Heathcock D[1], Hodgson R[1]

[1]Department of Surgery, Northern Health

Surgical Services

Background: The best treatment for choledocholithiasis continues to be debated. The treatment of Common Bile Duct (CBD) stones may include cholecystectomy with pre-operative, intra-operative or post-operative endoscopic retrograde cholangiopancreatography, or cholecystectomy with simultaneous duct clearance via CBD Exploration (CBDE). The CBDE approach is strongly advocated for at Northern Health, which we believe is the only health system worldwide with an on-call roster of surgeons who specialise in the management of choledocholithiasis.

Method: We performed a retrospective audit of patients who underwent CBDE for the management of choledocholithiasis from 2008 to 2017 at Northern Health.

Results: Interim results analysed the outcome of 334 patients; 35% male and 65% female. The majority (79%) of CBDE were performed by a CBDE-specialist surgeon, with a significantly higher rate of success when compared to a non-CBDE-specialist surgeon (92.7% vs 80.0%, p=.002). CBDE performed by CBDE-specialist surgeons tended to be of higher complexity, yet had a significantly higher rate of being performed laparoscopically (95.4% vs 86.1%, p=.002) and similar length of stay (5.32 vs 5.35 days, p=ns). Failure of CBDE was associated with higher preoperative white cell count and C-reactive protein levels, and led to significantly more complications (27.3% vs 9.5%, p=.009) and a longer length of stay (7.0 vs 5.1 days, p=.047).

Conclusions: Single-stage cholecystectomy with CBDE is a successful approach for the management of choledocholithiasis, with higher rates of success when patients are managed by a specialist surgeon. Its application and success relies on the availability of hospital resources and surgical expertise.

58 A Systematic Review on the use of anticoagulation in Digital Replantation

Low Y[1], Wiseman J[1], Easton J[1], Teixeira R[1]

[1]Plastic and Reconstructive Surgery Unit, Northern Health

Surgical Services

Background: Digital replantation following an amputation has been successfully performed since 1965 with various surgical techniques well described. However there has been a lack of consensus in terms of the choice of anticoagulation post-operatively to reduce the incidence of arterial of venous thrombosis. The aim of this study is to conduct a systematic review on the use of various types of anticoagulation and survival rates of the digital replantation.

Method: A MEDLINE and EMBASE search using "anticoagulation", "leeching" and "digital replantation" as keywords and limited to English-language articles since 1965 identified 1670 articles. Articles meeting the inclusion criteria of digital replantation in adults and the use anticoagulation along with the survival outcomes of the digital replantation were analysed.

Results: 52 articles met the inclusion criteria. Various anticoagulation therapy including systemic thromboprophylaxis, local heparinization and leeching therapy have been described to reduce risk of arterial and venous thrombosis. However there is a lack of comparative data between different types of anticoagulation to help guide post-operative use anticoagulation.

Conclusions: The choice of post-operative anticoagulation therapy should be based on the zone of injury of the amputation and surgical technique used. Patient risk factor and comorbidities also determine to the choice of anticoagulation therapy used.

59 Patterns of uptake of acupressure for reducing postoperative nausea and vomiting

Layton J[1], Stelmach WS[2], Crabbe J[2], Briedis J[2], Ma J[2], Atme J[2], Bourne D[2], Cleary S[1], Xue CCL[1], Zheng Z[1]

[1]School of Health and Biomedical Sciences, RMIT University; [2]Northern Health

Surgical Services

Background: Acupuncture is recommended in guidelines for the reduction of postoperative nausea and vomiting (PONV), but trained providers are lacking in the Australian hospital system. Acupressure provides non-invasive stimulus to acupuncture points, and could be integrated into standard peri-surgical care. In May 2017, acupressure was implemented as part of the PONV management plan at the Northern Hospital. This study assessed patient and staff uptake of acupressure for PONV.

Method: Surgical patients at moderate to high PONV risk were eligible to receive acupressure. A unilateral elasticised wristband was applied to the PC6 acupoint prior to surgery in cases deemed appropriate by staff. Patients were given the choice to use or not use acupressure, or to follow clinicians' advice. Documentation for surgeries between May and October 2017 was audited to assess patterns of acupressure use.

Results: Records of 1306 surgeries were examined. Of cases where PONV risk assessment was documented, 51% (400/789) were eligible for acupressure. Acupressure was administered to 49% (197/400) of eligible patients. 32% of patients (100/311) preferred to use acupressure, 13% (40/311) preferred not to, and 24% (75/311) chose to follow clinicians' advice, with 31% (96/311) not expressing a preference. Those who indicated a preference for acupressure, and patients at higher PONV risk, or with previous PONV history, were more likely to receive acupressure.

Conclusions: Initial acupressure uptake was higher for patients for whom the intervention was more clinically or personally relevant; that is, those at higher PONV risk, or those who expressed a preference to utilise the intervention.

60 Collagenase at Northern Health

Wiseman J[1,2], Teixeira R[1,2]

[1]Northern Health; [2]University of Melbourne

Surgical Services

Background: Dupuytren's is a progressive hereditary fibromatosis affecting the hand. Left untreated it causes debilitating flexion contractures of the digits. Until recently operative surgical management was the only successful treatment option. Currently TGA has approved *Clostridium Histoliticum collagenase*, as a non-surgical option for the management of Dupuytrens' disease in Australia. It has emerged as an attractive alternative to surgery for patients in the in the Australian public health care system. Currently we are auditing its suitability for use at Northern Health.

Method: An initial cohort of 8 patients (7 males and 1 female) with a mean age 68.5 years have now been treated at the Northern Hospital, under an institutional protocol for xiaflex injection using local anaesthetic in the outpatients clinic, followed by manipulation under intravenous sedation in the operating theatre on day 5 post injection. Joint goniometry and quick dash scores were recorded.

Results: 8 patients were treated with 12 doses (.58mcg/dose) Xiaflex. A total of 11 cords affecting were treated in 8 hands. There was a single minor skin tear and no major complications. Mean joint contracture of 24.6 degrees for 9 metacarpophalangeal joints and 45 degrees for 2 proximal interphalangeal joints was completely corrected at 3 months. The mean Quick dash score improved from 36 to 15 after 3 months.

Conclusions: At Northern Health, our outcomes with collagenase are comparable to registration trials with high patient

satisfaction. Further cohorts and long term follow up will be included in further audits.

61 Patient access barriers to plastic surgery care between Northern Catchment General Practices and Northern Health

Shah Y[1,2], Kirk M[1], Teixeira R[1,2]

[1]Northern Health; [2]University of Melbourne

Surgical Services

Background: Approximately 1 million patients with cutaneous malignancies present to Australian General Practitioners (GPs) annually. There are opportunities to research the primary and secondary care interface to improve patient access to healthcare. The purpose of this study is to identify barriers and improvement areas in community management, referrals, and follow-up of skin and soft tissue lesions.

Method: A prospective 6 week cross-sectional study was conducted utilising a quantitative and qualitative survey (online and posted) for the 605 Northern Catchment GPs who referred to Northern Health.

Results: 57% of GPs had five or more patients presenting weekly with benign or malignant lesions. More than 60% of GPs reported personally treating all lesions except for melanoma. The majority reported 'poor' public hospital outpatients waiting times for all lesions except melanoma. Common limitations in post-specialist management included: unclear documentation (69%); cost of equipment (46%); and low billing revenue (43%). Only 17% had educational training opportunities for lesion diagnosis. Future educational interventions were regarded as 'very helpful' (51%). GPs were 'not at all' confident in curettage (40%), dermoscopy (34%) or biopsy (17%), or comfortable in managing melanoma (23%). Almost 50% regarded follow-up improvements as 'very urgent'. GP's Northern Health satisfaction rates were: 'very satisfied' (3%), 'satisfied' (17%), 'neutral' (47%), 'dissatisfied' (26%) and 'very dissatisfied' (6%).

Conclusions: Northern Catchment GPs provided critical information in skin and soft tissue lesions management. Long outpatients' waiting lists suggest opportunities for improvement in all three areas investigated: management in the community, referral process, and community follow-up, particularly in procedural skills and effective communication.

62 Medial Pivot vs Posterior Stabilising Total Knee Prostheses: A Comparison of Clinical and Functional Outcomes

Wertheimer A[1], Danny I[1], Dyer D[1], McLeod-Mills L[1], Kartsogiannis V[1], Tacey M[3], Wong J[1,2], Hau RC[1,2]

[1]Department of Orthopaedic Surgery, Northern Health; [2]Department of Orthopaedic Surgery, Eastern Health; [3]Office of Research, Northern Health

Surgical Services

Background: 15-20% of Total Knee Replacement (TKR) patients are unsatisfied with their outcome. The design of the Evolution Medial Pivot (MP) Total Knee Replacement is based on a relatively new concept of a physiological medial pivot in the normal knee, and is hypothesised to improve patient outcomes compared to other prosthesis designs, such as the Zimmer Nexgen Posterior Stabilising (PS) TKR. We aim to compare these two prostheses.

Method: This is a single blinded randomised control trial of patients aged 50 to 85 years undergoing TKR for osteoarthritis at The Northern Hospital. Patients are randomised to receive MP or PS TKR prostheses. A power calculation requires 46 patients in each arm to detect a 20% difference between the 2 groups. Patient reported outcome measures (PROMS) were filled out pre-operatively and post-operatively at 3, 6, 12 and 24 months. A longitudinal mixed-effects model was utilised to evaluate change over time and differences between groups.

Results: To date, 43 patients have been randomised to each group. Both TKR prostheses show statistically significant improvement in all PROMS at all post-operative time points. At 3 months, PS patients experience less pain during sport and recreation (Coefficient -17.72, 95%CI -34.76 to –0.70, p=0.04) while MP patients experience less pain at 12 months during activities of daily living (ADLs) (Coefficient -1.00, 95%CI -1.75 - 0.25, p=<0.05).

Conclusions: Both TKR prostheses improve PROMS post-operatively. MP patients have less pain during ADLs than PS knees at 12 months although the estimated sample size has not yet been reached.

63 Cyanoacrylate Glue vs. Tacks in Fixation for Laparoscopic Inguinal Hernia Repair – Randomised Control Trial Update

Issa M[1], Geraghty J[1], Mori K[1], Dhir A[1], To H[1]

[1]Northern Health

Surgical Services

Background: Variations in operative methods for total extraperitoneal laparoscopic inguinal hernia repair (TEP-IHR) have led to a review of safety and benefit for fixation methods. Cyanoacrylate glue (Glubran-2) is a biologically safe fixation adhesive, previously proved to be useful in open and transabdominal preperitoneal (TAPP) laparoscopic IHR. We report updated data on a multi-centre randomised controlled trial (RCT) comparing Glubran-2 vs. tacks in TEP-IHR.

Method: Adult patients undergoing TEP-IHR were audited from 2016 to inform study design. Consented patients from 2017-2018 were randomly assigned to tack or Glubran-2 fixation. All other aspects of surgery and aftercare remained the same. Surgeons documented operative and fixation time, and the placement of fixation on standardised diagrams. Complications and pain scores using both Visual Analogue Scale (VAS) and a

qualitative questionnaire were obtained pre-operative, Day 1, 14, 90, and 180 for univariate analysis.

Results: 59 TEP IHR all had tack fixation in 2016 with significant complications (10.2%) and pain at 3 months (16.9%). Randomised data from 81 operative sides show a trend towards equivocal operative time (52 minutes vs. 50 minutes) and similar post-operative pain in glue vs tacks, seen at post-operative Day 0 (Pain score 3.2 vs. 3.2), Day 1 (Pain score 3.8 vs. 4.4) and Day 14 (Pain score 2.7 vs. 1.3). There have been no re-operations or recurrences.

Conclusions: Gluebran-2 is safe and has equivalent outcomes to tacks, as seen in similar operative time and post-operative pain, with minimal recurrence or complications. Further recruitment is continuing.

64 A novel approach to Endovascular Repair of Traumatic Popliteal Artery Occlusion

Birch B[1], Chan A[1], Bayat I[1]

[1]Northern Health

Surgical Services

Background: Traumatic injury to the popliteal artery is rare but significant, occurring from blunt or direct penetrating injury. Early recognition of arterial injury is critical to prevent ischaemic complications. Traditional treatment approaches include open thrombectomy, direct reconstruction and bypass. These procedures can be challenging especially with concomitant unstable knee injuries and the increased incidence of obesity. Endovascular approaches offer similar long-term results with less short-term complications.

Method: A 44-year-old morbidly obese female with COPD, OSA with orthopnoea, presented after a mechanical fall. The patient arrived with an obvious fracture-dislocation of the left knee with a pulse-less, dusky left foot. Posterior tibial (PT) pulse returned after anatomical reduction and remained after definitive external fixation of her knee. CT angiogram and catheter angiogram confirmed a popliteal artery (P2) occlusion and filling of tibial vessels, ABI was 1.0.

Results: The patient had a planned endovascular repair with antegrade/retrograde approach. Arterial access was established via direct PT and SFA puncture. An 0.014 wire was passed retrograde through the occlusion to prevent intimal dissection, antegrade JETi mechanical thrombectomy was performed with successful distal embolization protection. The reconstruction was completed with balloon angioplasty and stent. Completion angiogram demonstrated a patent popliteal artery and 2 vessel run-off. The patient had no limb ischaemia and continued on to orthopaedic rehabilitation.

Conclusions: This case highlighted some of the challenges of surgical access in co-morbid patients. Endovascular approaches offer several attractive benefits when treating traumatic arterial occlusion.

65 Maternal body mass index and obstetric outcomes at the Northern Hospital 2011-2016

Pratt A[1], Howat P[2], Hui L[1,2]

[1]University of Melbourne; [2]Northern Health

Women's and Children's

Background: Obesity is prevalent in the Australian population. This study analysed maternal and neonatal outcomes by maternal body mass index (BMI), with a focus on women with BMI≥50kg/m^2.

Method: Retrospective cohort study of women delivering a singleton pregnancy at The Northern Hospital between 2011-2016. Women were categorized according to the first recorded BMI (≤18kg/m^2=underweight, 19-24kg/m^2=normal weight, 24-29kg/m^2=overweight, 30-49kg/m^2=obese, and BMI≥50kg/m^2). Women weighing >180kg were transferred to a tertiary unit and were excluded. Outcomes were analysed by BMI group. Statistical analysis utilised chi-square, one-way ANOVA and logistic regression, with a significance level of 0.05.

Results: Of the 18,518 births during 2011-2016, 18,402(99.4%) had a maternal BMI recorded. Overall, 92(0.5%) women had BMI≥50kg/m^2, 5120(27.8%) had BMI 30-49kg/m^2, 5806(31.6%) were overweight, 6926(37.6%) were normal weight and 459(2.5%) were underweight.

Maternal BMI was significantly associated with pregnancy complications/interventions in a dose-dependent manner, including gestational diabetes, hypertensive disorders of pregnancy, induction of labour, caesarean section, preterm birth, birth-weight ≥4.0kg and neonatal admission for special or intensive care. Among women with BMI≥50kg/m^2, 29% developed gestational diabetes, 20% developed a hypertensive disorder of pregnancy, 38% required induction of labour and 48% required cesarean section. Of infants born to women with BMI≥50kg/m^2, 12% were late preterm, 23% required admission for special or intensive care and 20% were had a birth-weight ≥4.0kg.

Conclusions: Increasing maternal BMI is associated with increased adverse outcomes for both mother and infant. Health services need to anticipate future needs of our antenatal population to provide optimal care.

66 Early glucose tolerance tests with recently modified ADIPS criteria: Is it doing more harm than good for women with gestational diabetes?

Quattrocelli A[1], Khalid A[1]

[1]Northern Health

Women's and Children's

Background: Preceding the modified Australasian Diabetes in Pregnancy Society (ADIPS) criteria for diagnosis, the incidence of gestational diabetes (GDM) was approximately 17%. ADIPS currently recommends that women with no known risk factors have a 75g glucose tolerance test (GTT) performed between 26-28 weeks gestation whilst those at risk have an early GTT at less than 24 weeks gestation for prompt diagnosis and management.

Method: Women with GDM who gave birth at the Northern Hospital between 1 July 2017 and 31 October 2017 were studied retrospectively. Antenatal and birthing history was obtained through Birthing Outcome System (BOS) whilst maternal and fetal outcomes were ascertained through medical records. Chi squared analysis was used to compare birthing outcomes between women who had an early GTT to those who had a regular GTT.

Results: Of 1298 births, 243 women (18.7%) were diagnosed with GDM. 104 had early GTT, 82 had normal GTT and 57 had both early and normal GTT. Women with early GTT were more likely to be treated with insulin ($p<0.01$) and those with normal GTT were more likely to be diet controlled at the time of delivery (<0.01) with an increased spontaneous labour rate ($p<0.05$). There was no difference between the groups for mode of delivery, gestation and birth weight, birthing complications or negative fetal outcomes.

Conclusions: The modified ADIPS criteria lead to an increased early diagnosis of GDM with little difference observed in obstetric and fetal outcomes of pregnancy when compared to women diagnosed with GDM after 24 weeks.

67 Analysis of risk factors for the early and late diagnosis of gestational diabetes in women birthing at The Northern Hospital

Quattrocelli A[1], Khalid A[1]

[1]Northern Health

Women's and Children's

Background: We aim to determine which risk factors are the strongest predictors of earlier diagnosis of gestational diabetes (GDM) and how they compare to those recommended by the Australasian Diabetes in Pregnancy Society (ADIPS) for early glucose tolerance testing.

Method: Women with GDM who gave birth at the Northern Hospital between 1 July 2017 and 31 October 2017 were studied retrospectively. Each patients' risk factors for GDM as outlined by ADIPS were recorded and compared according to the timing of glucose tolerance test, either before 24 weeks or later.

Results: Of 1298 births, 243 women (18.7%) were diagnosed with GDM. Multiparous women with previous GDM and women with a familial history of diabetes were 2.4 and 2.25 times more likely to have an early GDM diagnosis compared to women without previous or familial diabetes respectively ($p < 0.01$). When analysing risk factors recommended by ADIPS including previous macrosomia, high pre-pregnancy BMI, ethnicity, advanced maternal age, polycystic ovarian syndrome or the use of antipsychotic medications in pregnancy it has not shown a difference between early and late GDM diagnosis. The mean number of risk factors for women with an early verses late diagnosis of GDM were 3.61 and 2.0 respectively.

Conclusions: A history of previous GDM or familial history of diabetes is the strongest predictor for an early diagnosis of diabetes in pregnancy. There is a cumulative effect of risk factors when assessing the overall GDM risk of pregnant women. There was no difference between early and late diagnosis of GDM for women with other risk factors outlined by ADIPS in this patient population.

68 Diabetes in Pregnancy and fasting for Ramadan: What are the maternal and foetal outcomes?

Ulrich E[1], McCann S[1], Evans R[1], Cortinovis T[1], Shields N[1,2]

[1]Northern Health; [2]La Trobe University

Women's and Children's

Background: Pregnant women with diabetes are at higher risk of maternal and foetal adverse outcomes. Women identifying as Muslim and who fast for Ramadan may be at an even higher risk. This systematic review aimed to investigate whether pregnant Muslim women with diabetes who fast for Ramadan experience adverse maternal or foetal outcomes.

Method: Six electronic databases were searched from inception until October 2017. Included studies measured maternal or foetal outcomes in pregnant Muslim women with diabetes who fasted for any period during Ramadan, and were published in full text, in English. The quality of included studies was assessed using the Downs and Black Checklist and was applied independently by two reviewers.

Results: The search strategy yielded 1,711 articles, 19 of which were reviewed in full text. Four studies met the full inclusion criteria. Three were prospective cohort studies and one was a retrospective cohort study. Participants in these studies were taking insulin during their pregnancy however, no participants were on high doses of insulin or had diabetes complications. Data from these studies showed no significant differences in blood glucose control and no severe maternal or foetal adverse outcomes. Three studies were assessed to have a high risk of bias.

Conclusions: Due to the small number of studies at high risk of bias, strong conclusions cannot be drawn. The review highlights the need for further research of foetal and maternal outcomes in this population group.

69 Evaluation of haemostasis in pregnancy using global coagulation assays

Tham J[1,2,3], Ho P[2,4], Nadurkar H[4], Lim HY[2,4], Hui L[1]

[1]Department of Obstetrics and Gynaecology, Northern Health; [2]Department of Haematology, Northern Health; [3]University of Melbourne; [4]Australian Centre for Blood Diseases

Women's and Children's

Background: Pregnant women are at increased risk of venous thromboembolism (VTE). Routine laboratory tests are inadequate in evaluating haemostasis. We aimed to evaluate the use of global coagulation assays (GCA) including thromboelastography (TEG), calibrated automated thrombogram (CAT), and overall haemostatic potential (OHP) assay, in the assessment of term pregnancy.

Method: Non-labouring pregnant patients at 37 weeks' gestation was recruited prior to elective Caesarean section. Bloods were collected at a single preoperative time point for baseline tests and research samples, which included citrated kaolin whole blood for TEG and platelet poor plasma for thrombin and fibrin generation assays. The results were compared to previously collected non-pregnant healthy female controls aged 18 to 45 years (n=31).

Results: Nineteen women (median age 31 years) were recruited. Four patients (21%) had gestational diabetes and fifteen patients had a body mass index (BMI) > 30 kg/m2 at the time of delivery. All patients demonstrated positive D-dimer (median=1830 ng/mL) and had median fibrinogen of 4.5 g/L. Pregnant patients were hypercoagulable on TEG with significantly increased maximum amplitude (MA) (72.5mm vs 57.8mm, p<0.01) and reduced clot lysis (LY30 0.0% vs 1.4%, p<0.01). CAT also demonstrated elevated endogenous thrombin potential (2047.1nM.min vs 1417.0nM.min, p<0.01). The fibrin generation parameters were also significantly increased (p<0.01) and positively correlated to fibrinogen level (r=0.869; p<0.01) and MA (p<0.01), despite preserved overall fibrinolytic potential.

Conclusions: GCA are more sensitive than conventional coagulation testing to delineate the hypercoagulable state in pregnant women. The study is still recruiting to further validate these results.

70 Does antenatal corticosteroid therapy improve neonatal outcomes in late-preterm birth? Evidence from a cohort study

Guan M[1], Manji J[1], Fan WQ[1,2]

[1]University of Melbourne; [2]Northern Health

Women's and Children's

Background: The World Health Organisation endorses the administration of antenatal corticosteroids (ACS) in pregnant women at risk of preterm birth from 24 weeks to 34 weeks of gestation because it improves neonatal outcomes. However, this recommendation does not extend to women at risk of preterm delivery beyond 34 weeks, "the late preterm period", due to a paucity of safety literature for this cohort. Our aim was to study the risks and benefits of using ACS in the late preterm gestation.

Method: A retrospective cohort study was conducted on all singleton preterm deliveries from 34 0/7 to 36 6/7 weeks of gestation at the Northern Hospital from 2012 to 2017. Data were collected on ACS administration and neonatal outcomes. Univariate, multivariate and stratified analysis were carried out to compare the neonatal outcomes between mothers who received ACS and those who did not.

Results: 838 subjects were included in this study, comprising 228 subjects that received ACS and 610 that did not. Administration of ACS significantly reduced both the incidence of transient tachypnoea of the newborn (aOR=0.276, 95% CI 0.122–0.624) and the use of intermittent positive-pressure ventilation (aOR=0.617, 95% CI 0.387–0.987). We found no significant between-group differences in the incidence of respiratory distress syndrome, hypoglycaemia, jaundice requiring phototherapy, and admission to special care nursery.

Conclusions: Administration of ACS in late preterm birth was associated with a significant decrease in transient tachypnoea of the newborn and reduced requirement for intermittent positive-pressure ventilation. There were no immediate adverse outcomes associated with ACS.

71 Australian midwives' views of caseload midwifery

Dawson K[1,3], Forster D[2,3], Newton M[3,4], McLachlan H[3,4]

[1]Northern Health' [2]The Royal Women's Hospital' [3]Judith Lumley Centre, La Trobe University; [4]School of Nursing and Midwifery, La Trobe University

Women's and Children's

Background: In Australia, continuity of care is recommended for women having a baby. Caseload midwifery is considered the 'gold standard' of care; women receive care from a known midwife during pregnancy, birth and the postnatal period. Caseload is associated with fewer childbirth interventions and increased maternal satisfaction. Some data suggests there is lower burnout and higher role satisfaction midwives providing caseload care, but it is unknown if this is consistent across Australia.

Method: A national cross-sectional study explored the views and experiences of midwives in public maternity services regarding caseload midwifery. Midwives were asked their views on the positive and negative aspects of caseload midwifery.

Results: Midwives from 111 hospitals were asked to participate in a survey and 546/3800 (14%) responded. There was a high level of support for caseload midwifery, especially in regard to the benefits it brings to women. While the on-call aspect of the model was a concern, flexibility and working to the full scope of practice were identified as positive aspects. While many

respondents wanted to work in caseload, we also found that working in this model is not for all midwives all the time.

Conclusions: Caseload midwifery care is increasing as an option in public maternity services across Australia. There is strong support for the model from midwives, positive and negative impacts need to continue to be considered in relation to model sustainability. Further research should explore the factors that can contribute to maternity services' capacity to grow and sustain a caseload model of care.

72 Meconium stained amniotic fluid: How great a risk is it?

Atkinson E[1], Fan WQ[1,2]

[1]University of Melbourne; [2]Northern Health

Women's and Children's

Background: Meconium stained amniotic fluid (MSAF) occurs when a foetus passes gastrointestinal contents in utero. MSAF has been associated with increased caesarean rates, birth asphyxia, and neonatal unit admissions. The literature is conflicting regarding predictors of MSAF. The aim of this study was to assess the incidence and predictors of MSAF at Northern Health.

Method: Routine antenatal data from Northern Health's Birthing Outcomes System was used for a single-centre retrospective case control study. Live singleton births from 2012-2017 (N=19,542) were used to determine the incidence of MSAF. A random sample (N= 1,733 cases and N= 1,783 controls) was used for risk factor analysis. Univariate analysis identified potential risk factors, and multiple logistic regression accounted for interactions and confounders.

Results: The incidence of MSAF was 16.9% for the period. MSAF increased with each week of gestational age (adjusted Odds Ratio [aOR] 1.39, 95% Confidence Interval [CI] 1.31-1.48). The incidence in pre-term, term and post-term births was 5.9%, 17.6%, and 31% respectively. Significant ($p < 0.05$) predictors of MSAF included: being of African (aOR 1.82, 95% CI 1.16-2.86), Oceanian (aOR 2.25, 95% CI 1.06-4.78) or South/Western Asian (aOR1.2, 95% CI 1.02-1.42) descent, and maternal pyrexia in labour (aOR 3.62, 95% CI 1.08-14.8). Factors associated with decreased odds of MSAF included: maternal diabetes on insulin (aOR 0.6, 95% CI 0.43-0.84) and multiparity (aOR 0.75, 95% CI 0.62-0.91).

Conclusions: The incidence of MSAF varies across ethnicity and gestational age. Multiple antenatal and intrapartum factors were found to be significant predictors of the odds of MSAF.

73 Meconium-stained amniotic fluid – what are the neonatal outcomes?

Lee S[1], Fan WQ[1,2]

[1]University of Melbourne; [2]Neonatal Unit, Northern Health

Women's and Children's

Background: Meconium-stained amniotic fluid (MSAF) is a common occurrence and often considered an indicator of poor foetal wellbeing. Contemporary research comparing the neonatal outcomes of those with MSAF compared to clear amniotic fluid remains equivocal. Additionally, research has predominantly been conducted in countries that differ to Australia on demographic characteristics, antenatal, intrapartum and neonatal management. Therefore, the aim of this study is to identify important associations between MSAF and adverse neonatal outcomes at Northern Health over a five-year period.

Method: We conducted a retrospective cross-sectional study of all deliveries at Northern Health between 1 January 2013 to 31 December 2017. Exclusion criteria included: twin pregnancy, prematurity, non-cephalic presentation, known foetal chromosomal or structural abnormalities, pre-eclampsia and suspected chorioamnionitis. Data on participant demographic characteristics, obstetric measures and neonatal outcomes were obtained from electronic health records.

Results: There was a total of 17,076 deliveries at Northern Health. 3,925 participants were excluded. The overall incidence of MSAF was 16.4% (n=2,157). Using multivariate logistic regression, MSAF was independently associated with a 5-minute Apgar score <7 (OR 2.26, 95% CI: 1.59-3.21), neonatal sepsis (OR 1.56, 95% CI: 1.28-1.89) and respiratory distress (OR 2.18, 95% CI: 1.58-3.02).

Conclusions: MSAF is independently associated with adverse neonatal outcomes, including a 5 minute Apgar score <7, neonatal sepsis and respiratory distress, even with the modern advancements in obstetric and neonatal care. Consequently, closer surveillance during labour, delivery and the immediate neonatal period are necessary.

74 A feasibility study to determine if ROTEM may be used to correlate a postpartum venous thromboembolism risk score

Lowen D[1]

[1]Northern Health

Women's and Children's

Background: There is a major discrepancy (approximately 100 fold), between the number of parturients identified as being at high risk for venous thromboembolism (VTE), using screening guidelines and the actual incidence of VTE. We wished to determine if we could improve upon this.

Method: Blood was taken from two groups of postpartum women. Those who were screened to be at low risk of VTE and those who were screened to be at high risk. The blood samples were analysed in a point of care coagulation machine (ROTEM) to determine if any correlation existed between screening scores and hypercoagulablilty of the postpartum women's' blood samples.

Results: Sixty parturients were recruited into this study in just over 3 months. As expected, with an increase in the VTE risk assessment score, there is a corresponding increase in age, parity and BMI, with an increased tendency towards emergency caesarean section in the higher score categories. We were unable to show any correlation between postpartum VTE screening scores and corresponding coagulability of blood, as determined by ROTEM.

Conclusions: Although postpartum VTE screening guidelines are in widespread use throughout the world and are easily applied, there is no consistency between the various guidelines as to which parturients need to receive thromboprophylaxis. Furthermore, with regards to the postpartum VTE screening guidelines in use at The Northern Hospital, we could not show a correlation between the score obtained and the parturient's coagulability of her corresponding venous blood samples. This remains an active area of interest and further research in this area is warranted.

75 Multidisciplinary management of people with Motor Neurone Disease under the National Disability Insurance Scheme

Connolly A[1], Lamont R[1], Mouy C[1], Barba S[1]

[1]Northern Health

Background: The researchers work as part of a multidisciplinary Motor Neurone Disease (MND) clinic at Northern Health including neurology, nursing and respiratory specialists providing coordinated, multidisciplinary care to people living with MND and have been working with the National Disability Insurance Scheme (NDIS) across the North East Metropolitan areas (NEMA). Our aim is to present our findings on MND management pre and post NDIS roll out in NEMA (24 months) and inform and guide other health organisations working with this population regarding the management of NDIS participants to assist with future planning and advocacy work.

Method: Data was pulled from client data management programs comparing phenotype, length of stay, time spent on joint sessions, home visits, face-to-face contact, total activity (direct and indirect) and funded vs unfunded NDIS activity. Staff working with this population completed a survey looking at the differences in practice between funding models. The sample population of 70 people included clients who had a diagnosis of MND and were seen by the community allied health team at Northern Health Bundoora.

Results: Despite the challenges we have encountered with reduced joint sessions and increased administration time, the new funding model has improved care coordination, increased individual therapy and empowered the client cohort.

Conclusions: The data showed increased activity time post NDIS with clinicians reporting a sense of limitations to provide holistic and collaborative care within this model. The NDIS and the complexities working within a consumer driven marketplace have proven to present with some challenges when working with our MND population.

76 Prevalence and characteristics of Charcot Neuroarthropathy Recurrence within Northern Health: Observational pilot study

Kaur J[1], Jessup R[2]

[1]Northern Health; [2]Monash Health

Background: Charcot Neuroarthropathy (CN) is a non-infective destructive condition that can result in severe foot deformity and if mismanaged lead to potential limb loss and mortality. There is a paucity of studies on the prevalence of recurrence and pathogenesis of CN. The primary aim of the present study was to evaluate rate of recurrence of CN in this population. The secondary aim of the study was to determine if there were any associations between recurrence and patient characteristics.

Method: Retrospective data was retrieved for patients with CN attending any of the four hospital sites from 1 January 2013 until 30 November 2017. Prevalence of recurrence is reported as percentage of total CN presentations. Data is still being analysed, but ANOVA, chi square and multiple logistic regression will be used to examine associations (and potential predisposing factors) between recurrence and patient characteristics.

Results: Preliminary data indicates 2 (6%) of the 32 affected CN limbs incurred a recurrence of CN. Both of these occurred on the same foot as the original CN, but in a different joint. Further analysis will focus on the characteristics of the participants and assess predisposing risk factors.

Conclusions: There is limited research identifying the prevalence of recurrence of CN, and limited research to date that has examined associations between recurrence and patient characteristics that may predispose patients to recurrence. This research will therefore make an important contribution to the field.

77 Which learning activities enhance physiotherapy practice? A systematic review and meta-analysis of quantitative studies

Leahy E[1,2,3], Chipchase L[4], Calo M[3], Blackstock F[2]

[1]Northern Health; [2]Western Sydney University; [3]La Trobe University; [4]University of Canberra

Background: Physiotherapy expertise requires career-long participation in learning activities due to a rapidly expanding

evidence base. Determining which learning activities are effective would enable the physiotherapy profession to enhance clinical expertise and incorporate research into practice. This systematic review aimed to evaluate which learning activities enhance physiotherapy practice.

Method: In this systematic review and meta-analysis, eight databases were searched through to March 2017. Randomised controlled trials (RCTs) evaluating physiotherapy learning activities were included. Outcomes of interest were physiotherapist knowledge, affective attributes and behaviour, as well as patient outcomes. Risk of bias assessment was completed using the PEDro scale. Where possible, meta-analysis and GRADE was used to synthesise results.

Results: Twenty-six RCTs were identified. Twenty studies reported therapist outcomes and nine reported patient outcomes. There was limited quality evidence that courses improved physiotherapist knowledge, and low-level evidence that peer assessment and feedback was more effective than case discussion at improving knowledge. There were inconsistent results for the effect of learning activities on affective attributes. Courses with active learning components appeared to be more effective at changing physiotherapist behaviour. Courses completed by physiotherapists did not improve patient outcomes, however the addition of a mentored patient interaction appeared beneficial.

Conclusions: Physiotherapy knowledge and clinical behaviour appeared to be enhanced by courses. Courses that included active learning strategies such as peer assessment and feedback were of most value. Patient outcomes were only enhanced when a course was combined with mentored patient interactions.

78 Care towards the end of life for over 75s – How does it look in North West Melbourne?

Williams S[1], Lemmon C[1], Panayiotou A[1], Batchelor F[1], Hwang K[1], Watt J[2], Hayes B[2], Aras D[2], Perich C[3], Gore F[4], O'Leary S[5], Cunningham K[6], Newbound J[7], Brijnath B[1]

[1]National Ageing Research Institute; [2]Northern Health; [3]Western Health; [4]Mercy Health; [5]North Western Melbourne Primary Health Network; [6]Banksia Palliative Care; [7]North and West Metropolitan Region Palliative Care Consortium; ([1-7]On behalf of the Melbourne Ageing Research Collaboration).

Background: Care towards the end of life can involve multiple services across different settings. Integration of services and communication with older people and their families is essential but not always achieved. This study investigated the care people over 75 years received in the last 6 months of life aiming to identify areas for improvement.

Method: Fifty health records of deceased people aged >75 who died in hospital, residential care, or community settings were analysed. Interviews were held with four older people towards the end of their life and seven bereaved families.

Results: Audit sample included 43% from CALD background, 36% with diagnosis of dementia, 66% died in hospital, and 26% died in RACF. The average age at death was 86 years. Recognition of death occurred greater than one day prior to death in 40% of cases. Cessation of active treatment occurred 2.9 days before death. 44% received specialist palliative care. 53% were transferred to a different place (e.g. unit/ward, facility) within the last week of life. The interviews highlighted the importance of care coordinators and informal care. Conflict within the family and communication barriers can be significant moderators of end of life care.

Conclusions: Care services for older people towards the end of their life need to ensure formal (GPs, health services, community carers) and informal carers are supported by specialist palliative care services and initiated as early as possible.

79 How to Choose? Choosing Wisely at Northern Health

Pearson K[1]

[1]Northern Health

Background: The Choosing Wisely Australia program contains many recommendations which could be implemented. This study developed an approach which can be used, at health service level, to apply the Choosing Wisely Australia program.

Method: A "heat-map" approach was used to rate relevance of each Choosing Wisely recommendation to our health service, based on volume, cost and risk of each procedure/investigation.

Results: 158 individual recommendations were available from the Choosing Wisely Australia. Some of these recommendations were considered to be similar or essentially the same (i.e. duplicates), leaving a list of 129 unique recommendations. For each of these recommendations, a rating (low; medium; high) was applied to estimate the: relevance and/or volume of the treatment/procedure/investigation at the health service; financial cost for the treatment/procedure/investigation per patient; inherent risk of each treatment/procedure/investigation. From these ratings a heat map matrix was developed and presented to the clinical leadership of the health service to facilitate identification of priority areas for further investigation (i.e. data collection and review against best practice). A sample of the heat map matrix will be presented.

Conclusions: The list of Choosing Wisely Australia recommendations is long and can appear overwhelming. Applying a heat map model can assist clinicians, managers and health services to identify recommendations to prioritise projects and interventions.

80 How effective are commercial activity monitors in changing physical activity?

Lynch C[1,2]

[1]Northern Health; [2]RMIT University

Background: Commercial activity monitors (e.g. Fitbit etc.) have received significant interest as tools for promoting physical activity thereby improving health-related outcomes. They potentially increase physical activity through self-monitoring and other behaviour change tools, such as social comparison. This systematic review aims to synthesize the efficacy results of commercial activity monitors within published physical activity interventions.

Method: Electronic databases and journal references were searched for relevant articles. Data sources included Pubmed, CINAHL, Cochrane CENTRAL, EMBASE, PsycINFO, and SportDiscus. Out of the 1,957 retrieved, 22 articles met the inclusion criteria. These articles were reviewed for quality based on a JBI Sumari risk of bias tool and content for intervention components.

Results: Most articles were determined to be of medium quality while two were of low quality, and one of high quality. Nine studies were included in meta-analysis. A positive trend in effects on measures of physical activity was ascertained compared with both wait-list, usual care or comparator behavioural physical activity interventions.

Conclusions: There is preliminary evidence suggesting that the use of commercial activity monitors can increase physical activity. However, devices alone or with minimal behavioural change support are insufficient to change health-related outcomes.

Broadmeadows Hospital
35 Johnstone Street
Broadmeadows Vic 3074
T. (03) 8345 5000

Northern Health Craigieburn
274-304 Craigieburn Road
Craigieburn Vic 3064
T. (03) 8338 3000

Northern Health Bundoora
1231 Plenty Road
Bundoora Vic 3083
T. (03) 9495 3100

Northern Hospital
185 Cooper Street
Epping Vic 3076
T. (03) 8405 8000

Northern Health

www.nh.org.au