RESEARCH ABSTRACT BOOK 2017

Northern Health

Our Vision

Outstanding health care for our community.

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 to ensure long-term financial viability and sustainability.

Our Mission

At Northern Health 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
- Partnership – we collaborate

Guest Speakers

Professor Vassilis Kostakos

Professor Vassilis Kostakos is a Professor of Human Computer Interaction at the School of Computing and Information Systems, University of Melbourne. Previously he was Professor at the University of Oulu (where he was founding director of the Center for Ubiquitous Computing), adjunct faculty at Carnegie Mellon's HCI Institute, and Assistant Professor at the University of Madeira. He holds a PhD in Computer Science from the University of Bath. He was a Fellow of the Academy of Finland Distinguished Professor program (2010), and a Marie Curie Fellow (2012). He is a founding editor of ACM's journal IMWUT (Interactive, Mobile, Wearable, and Ubiquitous Technologies). He is the recipient of the IBM Open Collaborative Faculty Award, and in 2012 was USAID's Winner of the Tech Challenge for Atrocity Prevention.

His research is on next-generation interactive computing, and works in the area of Ubiquitous Computing, which is also known as Internet of Things, Ambient Computing, Pervasive Computing. His work has focused on developing novel computing technologies that can sense and understand human behaviour, and can intelligently react to it. His contributions range from novel sensing techniques on smartphones to data analytics platforms.

Professor Catherine Itsiopoulos

Professor Catherine Itsiopoulos is a recognised leader in Dietetics and has international standing as a leader in Mediterranean diet research. She is an Accredited Practising Dietitian, Deputy Chair of the Australian Dietetics Council, and is the founding Head of the Department of Dietetics and Human Nutrition at La Trobe University. Her current position is the Head of School of Allied Health at La Trobe University.

Catherine has extensive experience and a strong research interest in dietetic training, dietetic competency evaluation and implementation, and international benchmarking of dietetic examination systems. Catherine's primary research area of interest is Mediterranean diet studies focussing both on migration impact on diet and lifestyle and chronic disease risk and dietary clinical intervention trials using the traditional Cretan Mediterranean diet (and elements of) as intervention models in the prevention and management of metabolic syndrome, Non-Alcoholic Fatty Liver Disease, type 2 diabetes, cardiovascular disease, depression and mood disorders.

Professor Shitij Kapur

Professor Shitij Kapur, MBBS, FRCPC, PhD, FMedSci is the Dean, Faculty of Medicine, Dentistry and Health Sciences and Assistant Vice-Chancellor (Health), University of Melbourne. Shitij is a clinician-scientist with expertise in psychiatry, neuroscience and brain imaging. He trained as a Psychiatrist at the University of Pittsburgh, and undertook a PhD and Fellowship at the University of Toronto. He is a Diplomate of the American Board of Psychiatry and Neurology, similarly Board Certified in Canada and has a specialist medical license in the United Kingdom.

Professor Kapur's main research interest is in understanding Schizophrenia and its treatment. Using brain imaging, clinical trials and animal models better understanding of antipsychotic action, its relationship to brain dopamine receptor blockade, the role of appropriate dosing of these drugs and has led to the development of the 'salience' framework of psychosis and the 'early onset' hypothesis of antipsychotic action; and a better understanding of how 'biomarkers' might be best incorporated into psychiatric care and drug development. Shitij has published over 300 peer-reviewed papers, his work has received over 30,000 citations, has an H-index of over 85 and has received various national and international awards including the AE Bennett Award of the Society for Biological Psychiatry, Paul Janssen Award of the CINP. He is a Distinguished Fellow of the American Psychiatric Association; a Fellow of the Academy of Medical Sciences, UK, and a Fellow of King's College London, UK.

Dr Lisa Kuhn

RN, PhD, MHSc, GradDipNur, EmergCert, DipAppSci(Nur), MACN, Associate Professor of Emergency Nursing, Monash University

Associate Professor Lisa Kuhn is an emergency nurse researcher whose national research profile is well established and growing internationally. Lisa commenced her career as an emergency nurse and has over 25 years of clinical, academic and research experience in this area. Her main research interests involve ensuring equity in early cardiovascular healthcare for women and disadvantaged groups through generating and translating evidence into practice. She uses quantitative, qualitative and mixed methods to research a broad range of issues including heart disease, emergency care and mental health. Lisa has received several peer-reviewed scientific awards and the prestigious Alfred Deakin Postdoctoral Research Fellowship. She is developing a strong track record in regards to publications, invited presentations and attracting grant support.

Dr Frances Batchelor

Dr Frances Batchelor (PhD, MHSt, Grad Dip Ed (Sport Science), B App Sc (Physio)), is a physiotherapist and research fellow with 30 years clinical experience working with older people. Since completing her PhD at the end of 2010 (titled Falls Prevention After Stroke), Dr Batchelor's research has focussed on falls prevention in all settings and with low and high risk cohorts, physical activity in cohorts such as frailer older people and people with cognitive impairment and the development of evidence-based resources for use by health professionals and care workers. She is Director of Clinical Gerontology at the National Ageing Research Institute, and Research Program Manager at Melbourne Ageing Research Collaboration, a consortium of 11 Melbourne-based organisations who are collaborating to improve the lives of older people across four major themes: falls prevention, dementia, healthy ageing and end of life care.

Rebecca Jessup

Rebecca Jessup is currently the Acting Associate Director of Podiatry and Orthotics at Northern Health, and a Research Fellow at the Cabrini Institute Department of Epidemiology and Preventative Medicine. She has just submitted her PhD on health literacy in hospitalised patients, for which she received an NHMRC scholarship and studied through Deakin University's Health Systems Improvement Unit, a WHO Collaboration Centre for Health Literacy. Rebecca has been working as both clinician and manager in various roles at Northern Health since 2001.

Abstracts

1 Effect of weight loss interventions on body composition and functional parameters in overweight COPD patients: Systematic review

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

Ambulatory Services, Broadmeadows Hospital, Bundoora Extended Care Centre

Background: Evidence suggests that weight loss may be beneficial for overweight patients with Chronic Obstructive Pulmonary Disease (COPD), however gaps exist regarding the best management of these patients. A systematic review was conducted investigating weight loss interventions in overweight COPD patients and the effects on body weight and functional parameters.

Method: Five databases, PubMed, ProQuest, Medline, EMBASE and CINAHL were searched. English language was the only limit included.

Results: Two quasi-experimental and two Randomised Controlled Trials (RCT) met inclusion criteria. Weight loss strategies were lifestyle focused with diet and/or exercise prescriptions; study durations ranged from 2-12 months. Significant reductions in weight were seen in the diet only (mean reduction BMI -7.2kg/m2) and diet with exercise (mean reduction BMI -2.4kg/m2) interventions but not with exercise interventions alone. In studies which achieved significant weight loss, lung function improved although did not reach significance. Significant improvements in physical function (measured as 6MWD) was seen in studies that included diet with exercise training and exercise training alone.

Conclusions: The review showed that significant reductions in weight may improve lung and physical function through dietary interventions alone and when combined with exercise, however studies to date have been unable to demonstrate statistical significance. Although physical function improved with weight loss, it also improved with exercise regardless of weight loss. Further investigations exploring the impact of lifestyle interventions incorporating diet and exercise strategies, and weight loss in overweight COPD patients are required.

2 Right person, right time, right clinician: Introduction of a Back Assessment and Management Service

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Ambulatory Services

Background: Back pain is responsible for greater loss of quality of life than any other musculoskeletal condition. It is widely reported that fewer than 10 per cent of referrals to specialist spinal clinics are appropriate for surgical intervention. In 2015, patients referred Northern Health neurosurgery experienced significant waiting periods and had limited access to appropriate conservative management for spinal problems.

Method: The Back Assessment and Management Service (BAMS) was introduced with the assistance of a Victorian Department of Health and Human Services Workforce Innovation Grant. This involved a multi-disciplinary team across Northern Health and Plenty Valley Community Health (PVCH) consisting of physiotherapists, a rheumatologist and pain physician as well as administrative support. Patients were able to access early conservative management at PVCH and BAMS retained strong links to the Neurosurgical service for early referral when required. Data was kept on waiting times for both the BAMS and Neurosurgical clinic services, as well as patient demographic and outcome information and patient and workforce satisfaction.

Results: Over 300 appointments were offered in BAMS in the data collection period of 11 months. Waiting times for the Neurosurgical clinic dropped from over two years to less than two months and have remained steady at these levels, and the waiting list dropped from over 1400 patients to none. Surveys reveal high patient and workforce satisfaction with the service.

Conclusions: Along with strengthening the Northern Health/PVCH partnership, BAMS provided patients with spinal pain early access to evidence-based care through an innovative multidisciplinary program.

3 Non-pharmacological interventions for managing fatigue in Chronic Kidney Disease – what works? A systematic review and meta-analysis

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[1]Northern Health

Ambulatory Services

Background: Studies have suggested that fatigue effects as many as three quarters of people with Chronic Kidney Disease (CKD) or End Stage Renal Disease (ESRD). This review aimed to investigate whether non-pharmacological interventions were effective in managing fatigue in the CKD/ESRD populations.

Method: This systematic review and meta-analysis sourced studies from the earliest date available until October 2016 from six databases (CINAHL, PubMed, Medline, OTSeeker, PEDro and PsychInfo). Included studies were randomised controlled trials, measured fatigue in CKD/ESRD populations, exclusively investigated non-pharmacological interventions and were published in a peer reviewed journal. The PEDro scale was used to assess risk of bias.

Results: Fourteen studies were included in the systematic review and 12 in the meta-analysis. Included studies investigated exercise, complementary medicines (reflexology, acupressure, massage, and aromatherapy), nurse led case management and cognitive behavioural therapy (CBT) for sleep. Meta-analysis found there was very low quality evidence in support of exercise (SMD = -0.77; 95 per cent CI = -1.32, -0.22), low quality evidence in support of complementary medicines (SMD = -0.76; 95 per cent CI = -1.09, -0.43) and inconclusive evidence for CBT for sleep or nurse led case management.

Conclusions: This review was unable to draw strong conclusions due to a low quality of evidence and high risk of bias. Further high quality research is required to determine if interventions such as exercise, complementary medicine, case management or CBT are effective in managing fatigue for people with CKD/ESRF.

4 The maximum tolerated dose of walking for community-dwelling people after hip fracture: a dose-response trial

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Ambulatory Services

Background: Regular physical activity is associated with positive health outcomes but it can be difficult for people to return to physical activity after hip fracture and therapists do not know how much exercise to prescribe. This phase I dose-response trial aimed to determine the maximum tolerated dose of prescribed walking per week for community-dwelling adults after hip fracture.

Method: Community-dwelling adults [n=21, 16 women, mean age ± standard deviation (SD), 75 ± 9 years] who were cognitively alert, attending community rehabilitation after a hip fracture (mean ± SD days post fracture, 110 ± 47 days), able to walk with or without a gait aid and for whom it was safe to participate in physical activity were recruited from two Northern Health community rehabilitation centres. Participants were individually supervised completing prescribed doses of moderate intensity walking over the period of one week. Three participants were required to complete a dose of walking prior to dose escalation for the next cohort of three participants. Dose escalation ceased when more than one participant in a cohort had an adverse event or was unable to tolerate the dose or if the maximum dose of 150 minutes per week was achieved.

Results: The maximum tolerated dose of walking for adults after hip fracture was 100 minutes per week. No adverse events occurred but participants were unable to tolerate higher doses.

Conclusions: Community-dwelling older adults recovering from hip fracture can complete a sufficient amount of moderate intensity physical activity to maintain and improve their health.

5 A group lifestyle intervention program is associated with reduced emergency department presentations for people with metabolic syndrome

PEIRIS CL[1,2], Taylor NF[1,3], Hull S[2], Anderson A[2], Belski R[1], Fourlanos S[2,4], Shields N[1,2]

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Ambulatory Services

Background: One quarter of the world's adults have metabolic syndrome. To address the incidence in Melbourne's north the 'Take Action Now' (TAN) lifestyle intervention program of group exercise and education was developed at Craigieburn Health Service. This research evaluates the effects of the TAN program on emergency department presentations, hospital admissions, metabolic parameters, exercise endurance, waist circumference and weight for people with metabolic syndrome.

Method: A retrospective, case-control study of adults (n=58, mean age 60±7 years) with metabolic syndrome referred to the self-management program between 2013 and 2015. The intervention program consisted of eight weekly sessions of group exercise and education. The intervention group was compared to a group of people who declined to attend the program.

Results: Participants who attended the lifestyle intervention program had significantly fewer emergency department presentations [Risk Ratio (RR) 0.31, 95 per cent Confidence Interval (CI) 0.11 to 0.83] and potentially avoidable emergency department presentations (RR 0.06, 95 per cent CI .004 to .097) over the follow-up period (mean 495±224 days per participant). Lifestyle group participants increased their exercise endurance [6-minute walk test Mean Difference (MD) 41m, 95 per cent CI 20 to 62, p<0.001] and had a mild decrease in weight (MD -0.82kg, 95 per cent CI -1.49 to -0.16, p=0.018) and waist circumference (MD -1.33cm, 95 per cent CI -2.07 to -0.58, p=0.002) after eight weeks. There were no differences between the groups in metabolic parameters or hospital admissions.

Conclusions: Implementation of a group lifestyle intervention program to improve activity and self-management skills is associated with a decrease in Emergency Department presentations.

6 A cross-sectional study of sub-acute meal experience and short-order menu usage at Northern Health

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[1]Northern Health

Broadmeadows Hospital, Bundoora Extended Care Centre

Background: Malnutrition is prevalent in the hospital setting with sub-acute rates up to 49 per cent (Kaiser et al, 2009). The

aim of this study is to review the current foodservice system at Northern Health by investigating physical and organisational barriers to eating, and the use and acceptability of the short order menu at sub-acute campuses Bundoora Extended Care Centre (BECC) and Broadmeadows Hospital (BH).

Method: Observational surveys were conducted during patient mealtimes (n=250) in addition to patient satisfaction surveys (n=34) to identify physical and organisational barriers to eating at BECC and BH. Interview-style questionnaires assessing the short order menu were conducted on patients (n=9), dietitians (n=9), menu monitors (n=4) and foodservice staff (n=7). Thematic analysis of the survey results to develop recommendations was then completed.

Results: Physical and organisational barriers identified included difficulty with packaging (65 per cent), requiring assistance with meals (33 per cent), interruptions at meal periods (32 per cent) and incorrect food items received (50 per cent). Major findings for the short order menu included 73 per cent of dietitians reporting difficulties with ordering of short order items, and only 20-25 per cent of patients being aware of the short order menu. 20-50 per cent of patients reported increased oral intake at mealtimes with short order items.

Conclusions: Key study recommendations centred on development of protected mealtime policies and providing feeding assistance at meals. In regards to short order menu, dietitians require further upskilling in ordering items and improved patient communication around menu use.

7 Somatosensory stimulation to improve hand and upper limb function after stroke

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Broadmeadows Hospital

Background: To determine the efficacy of somatosensory stimulation on upper limb motor function after stroke.

Method: Systematic review of parallel or quasi randomized controlled trials with meta-analysis. Five electronic databases (Medline, CINAHL, Embase, PEDro and OT Seeker) were searched from inception to October 2016. Included studies were English-language randomized controlled trials where a sensory intervention was applied below the elbow to improve upper limb motor control of adults after stroke. One outcome needed to measure arm function at an impairment or activity level. Study selection and quality assessment (using the PEDro scale) were independently conducted by two reviewers. Meta-analysis was completed where there was sufficient homogeneity between trials.

Results: Fifteen articles were included reporting data from 14 randomized controlled trials (627 participants). There was low quality evidence from four trials that sensory electrical stimulation did not improve upper limb motor function compared to placebo (SMD 0.4, 95 per cent CI 0.07 to 0.87, I^2 38 per cent) and moderate quality evidence from three trials that it did not improve motor impairment (MD 3.45 units, 95 per cent CI 1.47 to 8.36, I^2 35 per cent). Low quality evidence from two trials demonstrated therapist delivered sensory stimulation did not improve upper limb motor function (SMD 0.25, 95 per cent CI 0.20 to 0.69, I^2 0 per cent) compared to usual care.

Conclusions: Current evidence suggests somatosensory stimulation is not effective in improving upper limb motor function or impairment after stroke.

8 In older populations, do Non-English-Speaking patients have a poorer understanding of their diagnosis, medications and reason for admission to a Geriatric Evaluation and Management unit compared to English-Speaking patients?

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Bundoora Extended Care Centre

Background: There is a known association between poorer health outcomes and patients' lack of understanding of diagnosis and medications. This is particularly relevant in older patients who often have multiple comorbidities and medications. This study aimed to determine whether hospitalised patients of Non-English-Speaking Background (NESB) had a poorer understanding of diagnosis and medications compared to English-Speaking Background (ESB) patients.

Method: A survey set in Bundoora Extended Care Centre. Consecutive patients aged 65 and over without significant cognitive impairment were recruited and answered standardised questions about understanding of admission diagnosis (to acute hospital), reason for admission to GEM (Geriatric Evaluation and Management Unit) and medications. Interpreters were used for NESB patients. Answers were scored 'full-credit', 'partial-credit' or 'no-credit' to reflect the accuracy of understanding.

Results: Sixty-six patients were recruited (30 NESB), median age 81 years. Overall, understanding of admission diagnosis and reason for admission to GEM was good, with no statistically significant difference between ESB and NESB patients. However, understanding of medications taken prior to admission was poor, with 66.7 per cent of overall patients scoring 'no-credit' for this. NESB patients were more likely to score 'no-credit' compared to ESB patients (80 per cent vs 55.6 per cent, p=0.036). This pattern was more pronounced when assessing understanding of medications initiated during admission, with 100 per cent of NESB patients scoring 'no-credit' compared with 72.2 per cent for ESB (p=0.001).

Conclusions: Reassuringly, patients had a reasonable understanding of diagnosis and purpose of GEM. Lack of understanding of medications, especially among NESB patients, needs to be improved.

9 Eye Gaze Technology use for people with Motor Neurone Disease: A systematic review.

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Bundoora Extended Care Centre

Background: People with Motor Neurone Disease (MND) require Alternative and augmentative Communication (AAC) options to support their rapidly changing communication and physical needs and limitations. Eye Gaze Technology (EGT) is an innovative high tech method of controlling computers with eye movements, which is flexible, dynamic, and individualised. EGT has the potential to enable people with severe physical limitations to access the world around them, socialise, control their environment, communicate independently and increase quality of life. This study aims to systematically review the evidence in relation to implementation of EGT within the MND population.

Method: A systematic review of the literature was conducted. Eight electronic databases, select journals and citations searched. Methodological quality was evaluated, and each study was classified using the International Classification of Functioning, Disability and Health (ICF). Study results considered: accuracy and speed of message transfer; opportunities for communication, social networking, independence and environmental control; and wellbeing, mental health and life satisfaction.

Results: EGT was found to be: significantly faster but less accurate than scanning; easier but less efficient than manual letter boards; faster and more accurate than brain-computer interface methods; and reduces depression, improving quality of life.

Conclusions: The data from this study contributes to understanding the efficacy of EGT for intervention with a population of significant and rapidly changing needs. It also provides a base for further, stronger research using EGT.

10 Innovative method for medication supply: Rivaroxaban after-hours pack prove to be safe, efficient and cost-effective

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Emergency Services

Background: Direct Oral Anticoagulant (DOAC) is increasingly the treatment of choice for venous thromboembolism given its ease of use compared to warfarin. To ensure safe prescribing of DOAC and prevent delay of supply for dischargeable patients with Deep Venous Thrombosis (DVT) presenting to Emergency Department (ED) outside pharmacy hours, we implemented a "Rivaroxaban after-hours pack" system, which requires prescribers to obtain approval through GuidanceMS.

Method: A retrospective evaluation of DVT patients discharged from ED with Rivaroxaban after-hours packs from April 2015 to December 2016, with minimum follow-up of six months. Data collected included baseline demographics, investigations, medication history, potential contraindications and length of stay.

Results: Seventy-seven patients with newly diagnosed DVT (median age 52 years) were discharged from ED with rivaroxaban after-hours pack. 98.7 per cent of patients met weight criteria of safe prescribing. All patients had eGFR >30 mL/min. Of 67 patients who had liver function testing done, one did not meet the criteria. Two patients had active malignancy at time of prescribing. No patients had mechanical valves nor antiphospholipid syndrome. All patients received pharmacist follow-up via telephone conversation for education with referral to Thrombosis Outpatients. One patient re-presented with clinically significant bleeding. There was marked improvement in length of stay for patients with rivaroxaban compared to traditional warfarin for DVT patients (8.0 hours vs 124 hours, $p<0.001$).

Conclusions: All DVT patients were safely prescribed and given Rivaroxaban through this system, with significant reduction in length of stay in hospital without increased bleeding rates. This system is efficient, safe and cost-effective.

11 ED Nursing Shift Leaders' perceptions of their role in responding to escalation of care for patient clinical deterioration.

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Emergency Services

Background: Clinical leadership is fundamental to patient safety and is vital to an effective response to patient clinical deterioration. The Emergency Department (ED) Nursing Shift Leader is a key leadership role, however to date there have been no studies exploring the management of clinical deterioration from the perspective of the ED Nursing Shift Leader. The aim of this study was to explore ED Nursing Shift Leaders' perceptions of their role in responding to episodes of escalation of care for patient clinical deterioration.

Method: A prospective exploratory descriptive design was used to address the study aims. Participants were recruited from the senior emergency nurses at the study site that fulfilled the role of being in charge of the ED. In-depth semi-structured interviews were conducted between December 2015 and March 2016.

Results: Two major themes and four subthemes were identified from the interviews. The first major theme of Clinical Risk

Management comprised sub-themes of Clinical Skills and Confidence. The second major theme of Resource Management comprised sub-themes of Human Resource Management and Logistical Resource Management.

Conclusions: Strong collaboration, logistical management and expert clinical skills were all identified as fundamental to the Nursing Shift Leaders capacity to respond to escalations of care for clinical deterioration within in a complex team environment such as the ED. Investment in this frontline leadership role has the potential to benefit the team, the organisation and ultimately improve patient outcomes.

12 Emergency Department Nursing Shift Leaders' responses to episodes of escalation of care for clinical deterioration

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Emergency Services

Background: Recognising and responding to clinical deterioration is a national patient safety priority. The aim of this study was to determine the frequency, nature, and response of ED Nursing Shift Leaders to episodes of escalation of care for patient clinical deterioration.

Method: A prospective exploratory descriptive design was used to address the study aims. The study was conducted in an urban district ED in Melbourne, Australia. Participants were recruited from the senior emergency nurses at the study site that fulfilled the role of being in charge of the ED. Study data were collected between October and December 2015 across a variety of shifts.

Results: This study had three major findings. First, escalation of care for patients who are clinically deteriorating to the Nursing Shift Leaders is a common occurrence. A total of 37 episodes of escalation of care for clinical deterioration were observed across a variety of shifts, equating to 1.02 episodes of escalation of care per hour. Second, Nursing Shift Leaders rely on advanced clinical emergency nursing skills to recognise, prioritise and respond to escalation of care for a clinically deteriorating patient. Finally, the Nursing Shift Leaders' role in responding to escalation of care for clinical deterioration is multifaceted.

Conclusions: The Nursing Shift Leader role is crucial in identifying, responding to and managing escalation of care for patient clinical deterioration and has a direct impact on patient outcomes. The Nursing Shift Leader role is complex and requires a high level of management and clinical acumen. Opportunities to maintain these skills should be provided on an ongoing basis.

13 A novel Emergency Department staffing model utilising a Senior Medical Access Physician

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Emergency Services

Background: The Northern Hospital Emergency Department (ED) is one of the busiest in Victoria and has struggled to meet performance indicators. Northern Health approved funding to employ an extra Emergency Physician (EP) shift per day from January 2017. This project was designed to compare two distinct ED staffing models to determine if either achieved improved ED performance.

Method: Prospective collection of performance data across two consecutive phases, each of six weeks duration, combined with the review of data from a 12 week control period. In phase one, the additional daily EP was allocated to the Fast Track (FT) area. In phase two, the additional EP became the Senior Medical Access Physician (SMAP), and assumed responsibility for overall management of flow within the ED. This study involved 40,000 patient presentations over a 24 week period. Data collected included daily results for National Emergency Access Target (NEAT), Average Length of Stay (ALOS) and time to bed request (TTBR). Means and standard deviations were obtained for each phase. Independent t-tests were used to calculate the significance of differences between means.

Results: Statistically significant improvement in mean overall NEAT was achieved when compared with both FT and control. ALOS and TTBR were both lowest in the SMAP phase.

Conclusions: Deployment of an additional EP shift per day in a SMAP role has been shown to improve flow, and thus measurable performance within the ED.

14 Exploring disparities in receipt of adjuvant chemotherapy in Culturally and Linguistically Diverse (CALD) groups

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Medicine

Background: Globally, racial and ethnic disparities exist in treatments and outcomes for cancer patients. In Australia however there are little published data relating to cancer patients from Culturally and Linguistically Diverse (CALD) backgrounds. In this study we aimed to explore disparities in the receipt of adjuvant chemotherapy in cancer patients from CALD groups, as this may influence how clinicians approach

treatment decision-making for patients from different CALD backgrounds.

Method: Retrospective analysis of patients discussed at multidisciplinary meetings who were recommended to receive adjuvant chemotherapy for early-stage breast cancer (eBC) or early-stage colorectal cancer (eCRC) from July 2011 to October 2014. We compared rates of adjuvant chemotherapy uptake between those who identified English as their first-preferred language versus those who did not. We specifically explored the category of patients who were recommended adjuvant treatment as the two groups would be similar in terms of disease and performance status.

Results: Of the 211 patients identified, the proportion of patients who identified English as their first-preferred language was 72.5 per cent and 75.4 per cent for eBC and eCRC groups respectively. There was no significant difference in adjuvant chemotherapy uptake between those who identified English as their first-preferred language versus those who did not (80.3 per cent versus 81.8 per cent; p=0.802). There was also no difference in the rate of chemotherapy completion (75.6 per cent versus 79.7 per cent, p=0.564).

Conclusions: No difference was observed in receipt of adjuvant chemotherapy in patients from CALD backgrounds. Although this is a small, single-institution retrospective study, it is the first study to assess these differences in Australia.

15 P-selectin as a marker of cardiovascular risk in normal controls and myeloproliferative neoplasm

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[1]Austin Pathology; [2]Northern Health; [3]Australian Centre for Blood Diseases

Medicine

Background: P-selectin is an adhesion molecule secreted by both endothelium and platelets and has been shown to be higher in patients with cardiovascular risk factors. Given its role in inflammation and thrombogenesis, we evaluated its role in normal controls and Myeloproliferative Neoplasm (MPN).

Method: Normal controls, without history of cardiovascular or thrombotic disease, and patients with MPN were recruited. Thromboelastography was performed on whole blood while Calibrated Automated Thrombogram (CAT) and P-selectin were performed on platelet-poor plasma stored at -80^{o}C.

Results: Eighty-nine normal controls (59 females, 30 males) and 37 MPN patients (20 females, 17 males) were recruited. MPN patients had markedly higher median P-selectin levels (109.9 vs 49.3 ng/mL, p<0.01), and those with higher P-selectin levels had higher platelet counts (p<0.01). Higher P-selectin levels were also associated with lower vWF activity (74 per cent vs 101 per cent, p=0.04) and factor VIII levels (91 per cent vs 123 per cent, p=0.02). No differences were seen between P-selectin levels and other global coagulation assays. In normal controls, higher P-selectin is associated with older age, raised LDL (p=0.03) and triglycerides (p=0.02), as well as higher maximum amplitude (60.0 vs 56.0 mm, p=0.01). Interestingly, CAT parameters were lower with reduced velocity index (63.9 vs 83.0 nM.min, p=0.01) and thrombin peak (206.2 vs 241.0 nM, p=0.02).

Conclusions: P-selectin is markedly higher in MPN patients and is likely related to increased platelet secretion. In normal controls, higher P-selectin is associated with poor lipid profile, older age and male sex, and could serve as a marker of cardiovascular risk.

16 Real-world experience of direct oral anticoagulants use

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Medicine

Background: Direct oral anticoagulant (DOAC) is increasing used in the management of Atrial Fibrillation (AF) and Venous Thromboembolism (VTE). There is limited local data evaluating the real-world use of DOACs, particularly compliance to prescribing recommendations and safety data.

Method: Retrospective evaluation of patients commencing/continuing on DOAC between September 2013 and June 2016, through Northern Health.

Results: Eight hundred and eighty-four patients (median age 69 years) were identified. The average creatinine clearance (CrCl) at commencement was 85.9mL/min, with 10 patients having CrCl<30mL/min. The most common indication was AF (n=523, 59.1per cent) and Rivaroxaban 20mg (35.9 per cent) was most commonly used followed by apixaban 2.5mg (22.4 per cent). The remaining indications were for VTE treatment (n=277) and maintenance/thromboprophylaxis (n=83) with the majority initially treated with Rivaroxaban (96.4 per cent; average anticoagulation duration=5.2 months). There were 27 episodes of clinically significant bleeding (ISTH-SSC score 3/4). These patients were older (median age 78, p=0.02) and six patients (22.2 per cent) were on concurrent anti-platelet therapy, compared to 13.2 per cent in non-bleeders (p=0.18). The bleeding rate in our study is 2.1 per cent (5/238) for Rivaroxaban, 3.3 per cent (3/90) for Dabigatran and 6.2 per cent (12/195) for apixaban use in the AF group while Rivaroxaban bleeding rate for VTE use is 2.2per cent (7/235). In terms of recurrence, there were 10 episodes of ischaemic stroke (1.9 per cent) and nine VTE (2.5 per cent).

Conclusions: The bleeding and recurrent thrombosis rate in our study is largely comparable to real-world studies although interestingly, it was higher in AF patients on apixaban.

17 Direct oral anticoagulant use in patients with active malignancy: Evaluation of demographics and safety outcomes

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Medicine

Background: There is limited data on the use of Direct Oral Anticoagulants (DOACs) in cancer patients with Venous Thromboembolism (VTE). We aim to evaluate the use of DOACs in these patients in a real-world setting, both in Atrial Fibrillation (AF) and VTE.

Method: Retrospective evaluation of patients commenced or continued on DOACs at the Northern Hospital between September 2013 and June 2016.

Results: Fifty-four cancer patients on DOACs (median age 78 years; 66.7 per cent males) were identified of which 74.1 per cent (n=40) had solid organ malignancies and 25.9 per cent (n=14) had haematological malignancies. Twenty-three (42.6 per cent) patients were on DOACs for VTE-related causes and the remaining (n=31, 57.4 per cent) for AF (average CHADS2VASC score 4)**.** The median CrCl at DOACs commencement was 66.8 mL/min. The most commonly used DOAC in VTE was Rivaroxaban 20mg daily (16/23, 69.6 per cent) while apixaban 2.5mg twice daily was the most commonly used in AF (12/31; 38.7 per cent). The latter group had median age 84 years with median CrCl 40.5 mL/min. Overall, there was one episode (1.8 per cent) of major bleeding (ISTH-SSC score 4) involving a patient with metastatic colorectal cancer on Rivaroxaban 20mg daily for VTE; and one episode of proven recurrent VTE while on rivaroxaban 20mg daily, which was comparable to our warfarin/enoxaparin era (1/23(4.3 per cent) vs 9/240(3.9 per cent), p=0.89) recurrence on therapeutic anticoagulation). No episodes of thrombotic stroke or deaths related to DOAC use were captured.

Conclusions: DOACs appear to be effective and safe for both AF and VTE treatment in cancer patients. Larger prospective studies are required to confirm these results.

18 Utility of global coagulation assays in myeloproliferative neoplasm: thromboelastography, thrombin generation and overall haemostatic potential

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Medicine

Background: Myeloproliferative Neoplasm (MPN), such as Polycythaemia Vera (PV) and Essential Thrombocythaemia (ET), are independent risk factors for cardiovascular and thrombotic events. However, there are no routinely available laboratory tests to evaluate one's thrombotic risk beyond the assessment of blood counts. Global coagulation assays such as thromboelastography, thrombin and fibrin generation may be better surrogate measures of thrombosis.

Method: Participants with MPN were recruited. Thromboelastography (TEG 5000S) was performed on citrated whole blood while thrombin generation using Calibrated Automated Thrombogram (CAT) and fibrin generation using Overall Haemostatic Potential (OHP) assays were done on stored platelet-poor plasma.

Results: Thirty-eight MPN patients (20 females, 18 males) with median age 65 years were recruited including 26 patients with ET (68.4 per cent) and eight PV (20.5 per cent). When compared to normal controls, there was no significant difference in maximum amplitude (clot strength) although the lysis time (LY30) was significantly higher (5.1 per cent vs 0.9 per cent, $p<0.01$) using TEG independent of the use of aspirin. CAT, however, showed higher thrombin peak (260.8 vs 227.3 nM; $p=0.01$) and velocity index (93.4 vs 70.1 nM.min; $p<0.01$) with preserved endogenous thrombin potential. Fibrin generation parameters were significantly reduced in the MPN cohort ($p<0.01$) with preserved overall fibrinolytic potential (OFP).

Conclusions: This study demonstrates a strong association between MPN with high lysis time and a reduction in fibrin generation parameters, which is contradictory to the prothrombotic nature of MPN. It may be a protective prognostic marker and could represent an underlying compensatory effect. Further prospective clinical studies to confirm these findings are proposed.

19 Global coagulation assays in normal control: the impact of age, ethnicity and gender

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Medicine

Background: Global coagulation assays may be better surrogate measures of an individual's thrombosis risk. However, it is important to evaluate the differences within the normal population prior to the inclusion of these assays into studies on diseased populations.

Method: Normal controls with no thrombotic/cardiovascular history and no anticoagulant/antiplatelet use were recruited. Thromboelastography using citrated whole blood was performed with TEG 5000S and platelet-poor plasma were obtained for assessment of thrombin generation with Calibrated Automated Thrombogram (CAT) and fibrin-aggregation with Overall Haemostatic Potential (OHP) assay.

Results: Ninety-six normal controls (median age 44 years) were recruited. Females had more prothrombotic TEG and CAT parameters ($p<0.01$) as well as increased fibrin generation

(overall coagulation potential, OCP) but relatively preserved proteolysis (OHP) resulting in increased fibrinolysis (overall fibrinolytic potential (OFP). Normal controls ≥50 years had more prothrombotic TEG (particularly reduced clot lysis) with increased fibrin generation and proteolysis. The impact of age on CAT was minimal. East Asians (n=31) had lower endogenous thrombin potential (p<0.01) compared to participants with European origin (n=54) with minimal differences seen on TEG and fibrin generation. Interestingly, there were two distinct patterns of CAT curves with the concave/flattened type being more common in males (11/31 vs 12/65 females) and in those with poor lipid profile.

Conclusions: This study highlights the differences seen in gender, age and ethnicity on global coagulation assays within our normal population, as well as unique patterns seen with different global coagulation assays. Further studies are required to assess the clinical significance of these differences.

20 Evaluation of global coagulation assays in haemodialysis patients

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Medicine

Background: Chronic Kidney Disease (CKD), and haemodialysis in particular, is thought to be a hypercoagulable state, which may contribute to increased cardiovascular risks. Given the limitations of available coagulation testing in assessing thrombotic risks, we aim to evaluate the changes of global coagulation assays in patients with CKD undergoing haemodialysis.

Method: Fasting blood samples were collected from haemodialysis patients for baseline investigations as well as experimental testing with thromboelastography (TEG 5000S) utilising citrated whole blood. Additional samples were double-centrifuged to obtain platelet-poor plasma for later assessment with Calibrated Automated Thrombogram (CAT) and Overall Haemostasis Potential (OHP).

Results: Twenty-one patients were recruited and the results were compared to age-matched normal controls. Haemodialysis patients had lower platelet count with increased fibrinogen, VWF antigen and factor VIII levels (p<0.01). They had more prothrombotic TEG profile with increased maximal amplitude (71.1 vs 60.0 mm, p<0.01) and reduced clot lysis (0.0 per cent vs 0.5 per cent, p<0.01). Interestingly, there was no significant difference in thrombin generation parameters. D-dimer was markedly increased in haemodialysis patients independent of age with only four patients found to be within normal range (770 vs 189 ng/mL, p<0.01) but this did not correlate with fibrin generation parameters.

Conclusions: Haemodialysis patients appear to have a more prothrombotic state with markedly increased D-dimer, which questions the clinical usefulness of D-dimer, in predicting venous thromboembolism, in this population. The lack of correlation with the fibrin generation assay may signify reduced renal clearance of D-dimer. Further investigation utilising pre- and post-dialysis serum and urine D-dimer may help confirm this.

21 Evaluation of global coagulation assays in normal and thrombocytopenic populations

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Medicine

Background: Routine coagulation testing only assesses time to initial clot formation and is not validated as a bleeding assessment tool. Global coagulation assays such as thromboelastography (TEG) and Calibrated Automated Thrombogram (CAT) may provide a more complete assessment of an individual's coagulation profile. We aim to evaluate how global coagulation assays differ between thrombocytopenic patients and normal controls.

Method: Blood samples were collected from patients with platelet<150x10^9/L for baseline laboratory investigations and global coagulation assays. Citrated whole blood was analysed using TEG® 5000 analyser and CAT was performed on platelet-poor plasma.

Results: Fifty-eight samples (30 males, 28 females; mean age 57.5 years; 24 immune thrombocytopenia/other causes, 34 chemotherapy/malignancy-related thrombocytopenia) were collected. Thrombocytopenic participants (average platelet 79x10^9/L) had reduced clot lysis (0.0 per cent vs 0.6 per cent; p<0.01) on TEG without significant difference in clot strength (maximum amplitude, 59.3 vs 57.8 mm; p=0.38) while CAT showed reduced endogenous thrombin potential (1252.2 vs 1353.0 nM.min; p=0.040). On sub-analysis, participants with marked thrombocytopenia (0–50x10^9/L) had prolonged clot formation time (K-time, 3.4 vs 2.3 min; p<0.01) with reduced clot strength (47.2 vs 57.8 nM.min; p<0.02) and lysis (0.0 per cent vs 0.6 per cent; p<0.01). Conversely, participants with platelet count 100–150x10^9/L had reduced K-time (1.7 vs 2.3 min; p<0.01) and increased clot strength (66.4 vs 57.8 nM.min; p<0.01) compared to normal controls.

Conclusions: Marked thrombocytopenia (<50x10^9/L) showed hypocoagulable parameters, which validate current clinical practice of managing this population as high bleeding risk. Interestingly, lysis was markedly reduced in thrombocytopenic population, suggesting compensatory mechanisms to reduce bleeding risk.

22 Evaluation of global coagulation assays in patients with risk factors for cardiovascular disease

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Medicine

Background: Predicting an individual's Cardiovascular Disease (CVD) risk remains challenging and we aim to evaluate the use of global coagulation assays (thromboelastography, Calibrated Automated Thrombogram (CAT) and fibrin generation with Overall Haemostatic Potential (OHP) assay) in patients at-risk of CVD.

Method: This pilot study recruited patients with high-risk cardiovascular risk factors: chronic renal impairment, diabetes mellitus and/or, those with ≥2 traditional risk factors. Fasting blood samples were collected for baseline investigations as well as experimental testing with thromboelastography (TEG 5000S) utilising citrated whole blood. Additional samples were double-centrifuged to obtain platelet-poor plasma for later assessment with CAT and OHP.

Results: Fifty-five patients (26 males; 29 females with median age 61 years) were recruited and the results were compared to age-matched normal controls. High-risk CVD patients had more prothrombotic TEG parameters with increased maximum amplitude and markedly reduced clot lysis ($p<0.01$), with significance increasing with higher Framingham scores. Interestingly, the endogenous thrombin potential (1242.2 vs 1363.0 nM/min; $p=0.01$) and thrombin peak (199.6 vs 227.3 nM; $p=0.02$) were paradoxically reduced with no difference seen in OHP. Aspirin and statin were not associated with significant difference in the parameters.

Conclusions: Patients at-risk of CVD demonstrated increased clot strength with reduced lysis on whole blood TEG, but interestingly showed an inverse association with platelet-poor thrombin generation parameters. This paradoxical finding may be due to compensatory mechanisms within the Virchow's triad and may represent a useful biomarker in CVD. A larger prospective study is being conducted to confirm these findings and identify the underlying pathophysiology.

23 Screening for infectious causes and the use of faecal calprotectin in patients with IBD flares

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Medicine

Background: Calprotectin is a protein biomarker that is present in faeces when intestinal inflammation occurs. Calprotectin has also been shown to be of great value in the ongoing assessment of known Inflammatory Bowel Disease (IBD) patients, with a higher biomarker concentration being reflective of a potential relapse or impaired mucosal healing. Furthermore, infectious causes can trigger IBD flares.

Method: A retrospective audit was undertaken to determine the total number of IBD patients who had a faecal calprotectin measured and/or had a stool culture including testing for Clostridium Difficile that were managed at the Northern Hospital between 1 January 2015 – 28 February 2017. A total of 112 patients presented with IBD flares with 15 patients being managed in ED and 97 patients requiring admission over this time period (n=112).

Results: Within the ED population, one patient had a stool culture and testing for Clostridium Difficile, but no faecal calprotectin measurement. All of the other 14 patients were tested for neither. Out of the 97 patients with IBD that required admission, 57 (50.9 per cent) had a stool culture including testing for Clostridium Difficile, however, no faecal calprotectin testing was done. 21 patients (18.8 per cent) were tested for infectious causes and faecal calprotectin and 16 patients were tested for neither (14.2 per cent).

Conclusions: Active screening for infectious causes and a baseline faecal calprotectin are crucial in managing patients with IBD flares. It is imperative that patients are appropriately screened to prevent the need for unnecessary endoscopic procedures and to guide appropriate medical therapy.

24 Non-Hodgkin Lymphoma treatment outcomes at Northern Health: Focusing on elderly patients with Diffuse Large B Cell Lymphoma

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Medicine

Background: Non-Hodgkin Lymphoma (NHL) is the most common haematological malignancy, with Diffuse Large B Cell Lymphoma (DLBCL) being the most prevalent subtype. We aim to evaluate the impact of DLBLC treatment outcomes at Northern Health, particularly in elderly patients (age >70) where literatures are limited.

Method: Retrospective evaluation of patients with DLBCL requiring systemic immuno-chemotherapy treatment at Northern Health between 2011 to 2017.

Results: In total 39 patients with DLBCL were analysed. Amongst them 49 per cent are elderly (Median Age 77.6 years; 63.1 per cent females). Compared with younger patients, elderly patients were more likely to present with higher International Prognostic Score (IPI) (average score 3 vs 2, $p=0.015$) and poorer functional status (47 per cent vs 20 per cent, $p=0.01$). The most common immuno-chemotherapy regimen used was RCHOP, with frequent upfront dose reduction noted in the elderly group. Elderly patients were less likely to complete all planned

treatments (58 per cent vs 90 per cent, p=0.02), and less likely to be in complete remission at the end of treatment (57 per cent vs 95 per cent, p=0.01). There was no significant difference in complication rates. At median follow up of 692 days (range 12-1676 days), there were more relapses in the elderly, with all-cause mortality being significantly higher (37 per cent vs five per cent, p= 0.01).

Conclusions: Elderly patients with DLBCL have poorer disease characteristics and functional status at diagnosis, which often necessitates dose reduction to ameliorate toxicities. This may in turn contribute to worsened treatment outcomes despite the use of anthracyclines and immunotherapy.

25 Retrospective observational study comparing two anaemia management protocols for patients on maintenance haemodialysis

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Medicine

Background: It is recognised that haemodialysis patients require iron replacement in conjunction with Erythropoietin-Stimulating Agents (ESA) to manage anaemia. However, the balance of iron replacement and ESA dosing is not well described. We describe the impact of an iron protocol using Transferrin Saturation (TSAT) to evaluate iron repletion and ferritin to assess iron overload. Previously we used iron dosing based on gender, haemoglobin (Hb) and ferritin alone. We hypothesised this would result in increased use of iron, reduced use of ESA and improved Hb stability. Aim: To determine whether a new protocol results in improved iron stores, haemoglobin stability and reduced ESA use.

Method: A retrospective observational study of 70 chronic haemodialysis patients (33 female, mean age 70.0) was conducted. Hb, TSAT, ferritin, iron and ESA doses were collected for six months before and after the protocol change on 1 December 2015. ESA dosing was physician determined.

Results: The mean iron dose/patient increased over six months (665mg v. 995mg; p<0.001). The mean ferritin was 279µg/L at pre-3-6 months and 416µg/L at post-3-6 months (p<0.001). There was no significant change in TSAT (20.5 per cent v. 22.6 per cent; p=0.04). The mean Hb over the pre-6 months was 110.0±15.7g/L, then 110.5±16.1g/L at month 4 post (p=0.74), 110.8±15.9g/L at month 5 (p=0.58) and 112.2±16.1g/L at month 6 (p=0.21). The mean darbepoietin dose over pre-6 months was 106µg per month/patient and reduced to 104µg at month 4 post, 93µg month 5 and 88µg month 6 (not statistically significant). The cost saving was $53.08 per month/person.

Conclusions: Increased iron replacement is associated with stable haemoglobin, significant ferritin elevation, reduced ESA and reduced overall cost of managing anaemia in haemodialysis patients.

26 Implementing an integrated care co-ordination platform for pharmacy services at Northern Health

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Medicine, Ambulatory Services

Background: The aim of this project was to trial an integrated care co-ordination platform for clinical and dispensary pharmacy services, using the Medtasker application.

Method: Medtasker was implemented on three wards for a six week trial. It was used for communication between clinical pharmacists and dispensary staff, and for tracking pharmacy tasks. The work flow on the trial wards was evaluated against three control wards. The data was collated from the Medtasker application, and from standard pharmacist recording procedures (HealthPower).

Results: Medtasker recorded a total 1750 tasks completed by three clinical pharmacists over a six week period, predominately drug chart review (471) and completion of the medication management plan (345), which are auto-generated tasks assigned to clinical pharmacists for all patients. Control wards recorded 220 drug chart reviews and 196 medication management plans completed. The benefits reported by pharmacists included robust communication between dispensary and ward pharmacists, less interruptions due to phone-calls and the ability to self-assign tasks providing a reminder to complete tasks.

Conclusions: The use of Medtasker provided an accurate reflection of tasks completed by pharmacy staff which is not being captured currently as tasks can be completed in real-time. It provides managers with real-time data on workload. The work flow on trial and control wards were matched in complexity and work patterns. The pharmacy department intends to extend the use of Medtasker to all clinical pharmacists, and the hospital intends to trial the use of Medtasker for hospital staff as a communication tool and task based platform.

27 The Northern Hospital experience with Oxaliplatin/ 5-Fluorouracil/ Leucovorin treatment

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Medicine

Background: The use of Oxaliplatin/ 5-Flurouracil/ Leucovorin (FOLFOX) improves outcomes for patients with stage III colon cancer. Neoadjuvant chemotherapy is also used in the perioperative setting for higher risk, fit patients with resectable liver-only stage IV disease. We aimed to evaluate demographics, rates of chemotherapy delivery, pattern of dose adjustments, and survival for our patients. We also compared safety data

between our patients and patients from the phase III multicenter international study of Oxaliplatin/ 5-Fluorouracil/ Leucovorin in the Adjuvant Treatment of Colon Cancer (MOSAIC).

Method: Analysis of consecutive patients treated with FOLFOX for potentially curable cancer between 1 January 2010 to 30 June 2013.

Results: The median age for our cohort of 50 patients was 62 years. At the time of chemotherapy initiation, 64 per cent of patients had a performance status of ECOG 0. 72 per cent of patients completed 12 cycles of treatment, however only 9.3 per cent of patients completed 12 cycles with no dose changes. There were no treatment-related deaths. The recorded rates of adverse events experienced by our group of patients were less than those observed in patients from MOSAIC. After a median follow-up time of 62.5 months, 70 per cent of our overall cohort was alive.

Conclusions: The planned course of FOLFOX chemotherapy was delivered in the majority of our patients with dose modifications. The reported toxicity was acceptable. Survival of Northern Hospital patients with stage III colon cancer treated with FOLFOX was similar to the MOSAIC clinical trial. The pattern and extent of dose adjustments were elucidated.

28 Evaluation of referral patterns for newly diagnosed breast cancer to the Familial Cancer Centre

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Medicine

Background: Women aged 50 or less with triple negative breast cancer and males with breast cancer are recommended to undergo genetic testing for BRCA1 or BRCA2 mutations as these cancers may be associated with an underlying genetic predisposition. Aims: to investigate whether patients at The Northern Hospital (TNH) diagnosed with cancers that potentially have an underlying genetic cause receive an assessment by a Familial Cancer Centre (FCC) and what the outcomes of these assessments are.

Method: Patients with a new diagnosis of breast cancer from January 2011 to March 2016 at TNH were identified. Of these, female patients with triple negative breast cancer aged 50 years or less and male breast cancer patients were selected based on current EVIQ guidelines, and audited to see whether they were referred to the associated Familial Cancer Centre and what the outcome of this referral was, including whether the patient underwent BRCA testing.

Results: From January 2011 to May 2016 at TNH, 12 female patients and six male patients met the above selection criteria. Of the six male patients with breast cancer, four patients agreed to be referred to the FCC whilst two patients refused. None of the four male patients assessed by the FCC were found to be BRCA 1 or 2 positive. Results regarding the female patients are under analysis and will be presented during Northern Health Research Week.

Conclusions: Patients with a new diagnosis of breast cancer that meet guidelines for genetics assessment are appropriately referred to the FCC for assessment of BRCA 1 and 2 status.

29 Pleurocentesis and patient safety: An audit of the new Pleural service

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Medicine

Background: Pleurocentesis is a common procedure which may be carried out in general wards. BTS guidelines recommend the use of real-time ultrasound guidance for all pleural procedures to improve safety and success rate. At The Northern Hospital, previous non-ultrasound guided pleurocentesis has resulted in serious complications over the years.

Method: Retrospective analysis of clinical records on pleural procedures done from February 2015 to July 2015. Comparison was made to similar data from the pleural service.

Results: The new pleural service was introduced at The Northern Hospital in February 2017. In the first five months of the service, 24 pleurocentesis were done. Fifty-eight percent of cases were done within 24 hours of request with an average time-to-tap of 0.8 days. There was no complication recorded. Comparing to the pleurocentesis done at the same period in 2015, 17 pleurocentesis were performed. Pleural effusion was marked by radiology and patients were sent to a different location to be tapped by the referring team. The average time-to-tap was 5.6 days. Complication rate was 18 per cent which included pneumothoraces and dry taps requiring further intervention.

Conclusions: These results demonstrate that the introduction of the pleural service led to a significant improvement in safety, with a major reduction in wait-time. This was translated into a reduction in the total inpatient length of stay. All procedures are currently done under ultrasound guidance by accredited staff from the pleural service.

30 Outcomes of hospital in the home treatment of acute decompensated congestive cardiac failure compared to traditional in-hospital treatment in the elderly population

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Medicine

Background: Acute decompensated Congestive Cardiac Failure (CCF) represents a large burden of disease requiring acute hospital admission in the elderly population. The Hospital in the Home (HITH) model of care is an alternative to traditional inpatient treatment of decompensated CCF and has been associated with less adverse events and decline in ability to perform Activities of Daily Living (ADLs), higher rates of patient and care giver satisfaction and similar efficacy (in the measures of mortality and readmission) compared with inpatient treatment. This quality assurance study aims to compare the outcomes of older patients treated by The Northern Hospital's (TNH) HITH unit for acute decompensated CCF with those admitted to hospital for treatment.

Method: The study is a retrospective file review of 64 patients 65 years or older treated by TNH's HITH service for acute decompensated CCF compared with an age and sex matched "control" group of 64 patients treated in hospital. The primary outcomes are readmission and mortality; the secondary outcome is presence of complications.

Results: There was no difference in mortality within 60 days of discharge, time to death, readmission at 30 days, readmission at 60 days, time to readmission and presence of complications between the "HITH" and "control" group of patients. HITH patients had a longer length of stay (median 6 days) than the "control" patients (median four days) p = 0.001 and were more likely to be already known to a community heart failure services prior to their admission, p = 0.011.

Conclusions: In appropriately selected older patients, HITH is a safe and efficacious alternative to inpatient management of acute decompensated CCF.

31 Compartment syndrome of the deltoid and pectoralis major in a young man following Quetiapine use

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Medicine

Background: A 28-year-old Caucasian male presented with compartment syndrome of his left deltoid and pectoralis major with brachial plexus compression. There was no identifiable traumatic insult or trigger for his condition. He reported taking more than his usual dose of Quetiapine (around 1200mg) around 12 hours prior to the onset of his symptoms. Isolated deltoid and pectoralis major compartment syndrome is rare and its association with quetiapine is not known.

Method: A literature review was carried out to research the potential relationship between quetiapine and compartment syndrome.

Results: A few case reports identified olanzapine (which is also an atypical anti-psychotic) to be associated with compartment syndrome.

Conclusions: Quetiapine and Olanzapine have similar effects on serotonin (5HT) receptors. It is possible that an overdose of quetiapine caused a surge of calcium influx and prolonged muscle depolarisation causing an accumulation of serotonin inside the muscle cells in turn causing toxicity and rhabdomyolysis which resulted in compartment syndrome.

32 Lag time to achieve peak toe pressure following revascularisation in patients with foot ulceration.

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Medicine, Ambulatory Services

Background: The Toe Systolic Pressure (TP) is a non-invasive test used for the assessment of Peripheral Arterial Disease (PAD). This information is used, along with other clinical measures, to determine the requirement for vascular surgical intervention. This is the first study of its sort to investigate when TP reached their maximum and as such assist facilitate suitability of some wound management practices for foot ulcers.

Method: This was a pilot study with demographic data of consenting patients admitted to The Northern Hospital (TNH) with a foot ulcer undergoing a revascularisation procedure was collected. TNH Podiatry staff performed TP prior to revascularisation and then again at days one, three, seven and 14 post revascularisation, to monitor the progression of the patient's lower limb arterial perfusion.

Results: A total of 21 patients undergoing 22 vascular interventions were included in this study. 42.8 per cent (n=9) patients were female. Average age was 68.2 (range 52-86). Eighty-six per cent (n=19) patients had history of T2DM, 4.5 per cent (n=1) had T1DM and 9.5 per cent (n=2) with nil history of diabetes mellitus. Median time frame for improvement in TP post revascularization was 3.0 days, interquartile range (IQR) 1.5-12.3 days.

Conclusions: This study found that TPs reached their maximum value at three days post revascularisation. Given the small sample size, it is difficult to infer that these results can be applied clinically to guide patient care. However, it may be used at the clinicians discretion in conjunction with other clinical investigations to identify when arterial perfusion is optimised, which may impact on further wound management planning.

33 D-dimer and residual thrombus can stratify risk of recurrent venous thromboembolic events

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Medicine

Background: Abnormal D-dimer after cessation of anticoagulation is a well-recognised risk factor for recurrent Venous Thromboembolic events (VTE). In Australia however, D-dimer has not been widely used to risk stratify VTE recurrence. Our aim was to retrospectively analyse the relationship between post-treatment D-dimer, residual thrombus and VTE recurrence.

Method: Medical records of patients attending a tertiary hospital with a diagnosis of VTE between January 2013 and June 2015 were retrospectively reviewed.

Results: The total number of reviewed patients was 443. Of these, 101 patients (41 males, 60 females) had post-treatment D-dimer testing. Patients with D-dimer >1000ng/mL had a 100 per cent recurrence rate, or relative risk of 16.3 (95 per cent CI 6.3-42; p<0.0001) compared to patients with normal post-cessation D-dimer. Those with D-dimer 500-1000ng/mL had a recurrence rate of 33.3 per cent, or relative risk 5.4 (95 per cent CI 1.8-16.7; p=0.0033). Patients with normal D-dimer and no residual thrombus had the lowest rate of recurrence, with a trend towards significance - RR 0.15 (95per cent CI 0.02-1.34; p=0.09). Patients with post-cessation D-dimer >500ng/mL did not have outcome affected by the presence of residual thrombus.

Conclusions: Post-treatment D-dimer can stratify the risk of VTE recurrence, with the highest in those with D-dimer >1000ng/ml. D-dimer between 500-1000ng/mL conveys an intermediate risk of recurrence. Presence of residual thrombus has relevance in patients with normal post-treatment D-dimer, and may be associated with a higher risk of recurrence. This information can help to identify patients suitable for long-term prophylaxis, now a feasible and safe option in the era of novel anticoagulants.

34 Small vessel dysfunction demonstrated by retinal photographs in complicated pregnancies

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Medicine

Background: Retinal vessels are affected by the same factors as placental vessels. We have shown previously that retinal arterioles become smaller in pregnancies complicated by preeclampsia, gestational diabetes and small for gestational age babies. The aim of this study was to investigate whether retinal small vessels also demonstrated endothelial dysfunction.

Method: Twenty women with complicated pregnancies (13 with gestational diabetes, four with small babies and one with preeclampsia) and 13 women with normal pregnancies were studied. Each provided a brief medical history, and underwent retinal photography (Canon non-mydriatic camera) and dynamic vessel analysis (dilatation in response to a flickering light) (DVA, IMedos, Germany). DVA results were expressed as a per cent change in arteriole or venular calibre. Results were compared with the Student's t test. This project had the approval of the Northern Health HREC and all participants provided written informed consent.

Results: Dilatation appeared to increase between trimesters two and three in normal women. All of the complicated pregnancies were examined in trimester three. For gestational diabetes, dilatation was 3.2 + 1.2 per cent (n=10) compared with 4.4 + 2.3 per cent (n=6) for the controls (p=0.23). For mothers of small for gestational age babies, dilatation was 2.6 + 1.1 per cent (n=10) compared with 4.4 + 2.3 per cent for the normal (p=0.25). Recruitment is continuing.

Conclusions: Our numbers are small but results suggest endothelial dysfunction in the systemic small vessels in women with gestational diabetes and in women with small for gestational age babies.

35 Endothelial dysfunction worsens progressively with diabetic and non-diabetic renal failure

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Medicine

Background: Small vessels narrow progressively as renal function deteriorates from CKD 1 through to CKD5. The aim of this study was to investigate whether small vessel endothelial function also deteriorates with progressive renal failure.

Method: Subjects attending the renal clinic were recruited, and demographic data recorded as well as eGFR. They then underwent retinal imaging (CANON retinal camera) and Dynamic Vessel Analysis (DVA) (Imedos) which measures the amount of dilatation in response to a flickering light. Retinal images were examined for microvascular and diabetic grading and small vessel calibre. Results were compared with the student's t test and one way ANOVA. This project had the approval of the Northern Health HREC and all participants provided written informed consent.

Results: Forty-eight subjects with non-diabetic renal failure and 33 with diabetic renal failure stages CKD1- 5 were studied. Endothelial dysfunction worsened for arterioles in those with diabetic renal failure (per cent dilatation for CKD1 =2.65 + 2.08 n=12, compared with 0.025 + 0.51 per cent for CKD5, n=4) (p=0.001). Endothelial dysfunction also worsened for non-diabetic renal failure between CKD1 (3.47 per cent + 2.18 dilatation, n=19) and 0 + 1.05 per cent dilatation for CKD4, n=3)

(p=0.015). The effect for diabetes was worse than for renal failure alone.

Conclusions: These results indicate endothelial dysfunction in renal failure and that the effect is worse in those with renal failure due to diabetes.

36 Small vessel disease in Chronic Obstructive Pulmonary Disease (COPD)

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[1]Northern Health

Medicine

Background: We have shown previously that COPD is associated with small vessel dilatation probably as a consequence of smoking. Small vessel dilatation represents a risk factor for cardiac events in large epidemiological studies. Here we have undertaken a retrospective study of retinal images from patients with COPD using fractal analysis to determine whether there are also structural small vessel changes.

Method: Altogether 144 patients with COPD according to GOLD criteria had undergone retinal imaging with a non-mydriatic retinal camera. These photographs were examined by a trained grader using a computer-based programme, International Retinal Imaging Software (IRIS-Fractal, 1.5, National University of Singapore). Retinal images centred on the optic disc were examined, and images cropped to a predefined area of 3.5 disc radii centred on the optic disc. The software traced retinal vessels and recorded a raw fractal dimension which described the complexity of the branching pattern of the retinal vessels. Results were then compared with age and gender matched controls without COPD.

Results: There was no difference in the mean fractal dimensions of patients with COPD and matched controls (p= NS). We are now looking whether there is a difference between patients with the most severe COPD and normal controls.

Conclusions: These results suggest that overall COPD is not associated with new small vessel formation in the retina or elsewhere in the body. This contrasts with renal failure where the fractal dimensions are progressively diminished as renal failure worsens. Small vessel formation and complexity may increase if there is a compromised blood flow but in COPD the dilatation may already represent a sufficient response to hypoxemia. Nevertheless the dilatation still indicates an increased cardiac risk.

37 Retinal venular dilatation correlates with increased diseases vessel score in patients undergoing coronary angiography

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Medicine

Background: Large epidemiological studies suggest that retinal venular dilatation predicts cardiac events in women. This result was not confirmed in one study of angiography patients where retinal photography was performed preangiography. However our previous investigation suggested that venular dilatation correlates with worse coronary angiography results using a Leaman score (L Cheng B Med Sc, 2011) when the images were taken after the procedure. The aim of this study was to determine if venular calibre changed with angiography and if venular dilatation preangiography predicted worse cardiac disease.

Method: Twenty patients undergoing coronary angiography underwent retinal imaging with a CANON non-mydriatic retinal camera. Angiogram reports were examined for the number of vessels with more than 70 per cent stenosis. Retinal vessel calibres were measured by an independent grader at CERA. Results were compared between patients with diseased vessels and no diseases vessels (Students t test). In addition 16 patients had their calibres measured pre and post angiography.

Results: Patients with any diseased vessels had a mean venular calibre of 223.2 + 16.3 um and those with normal vessel had a calibre of 206.9 + 10.8 (p=0.015). There was no change in venular calibre before and after coronary angiography despite the injection of GTN, contrast, verapamil and heparin (p NS).

Conclusions: Widened retinal venular calibre correlates with increased risk of coronary artery disease. This may reflect an increased prevalence of the risk factors of smoking and diabetes in this population since both dilate venules.

38 Specific targeted strategies to improve safety for anticoagulants and raise awareness for high-risk medicines

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Medicine, Surgery, Women's and Children's, Emergency Services

Background: Reviewing all medication incidents in the hospital showed anticoagulants as the second most prevalent (opiates were most prevalent but felt less significant due to non-clinical documentation issues). The top-5 medication classes were identified and an awareness campaign followed.

Method: An Intense Project Plan (IPP) was developed. Leadership and Multidisciplinary Team (MDT) involvement resulted in (not entirely inclusive):

- Detailed risk assessment of primary and secondary care touch points for anticoagulants resulting in updates of policies and procedures
- Introducing new systems for known high risk issues (Dossette®)
- Role consistency for written and verbal information to patients

- Education program for all new and existing staff with 'roll call' managed by pharmacy
- In-Depth Case Reviews (IDCR) of all anticoagulation incidents by select MDT

Clear accountabilities for specific staff leaders were assigned and project managed. Improvements and interventions were presented to the Medication Safety Committee.

Results: A four year review of medication incidents (n=2654) showed 1050 (131.25 per 6-months) incidents in the top-5 with 11.8 per cent (312) for anticoagulants. Following the IPP, all medication incident reporting rose by 53 per cent (477) with the top-5 increasing by 92 per cent (252). The reporting of anticoagulation incidents rose only by 23 per cent (48) in that period and accounted for 10.1 per cent of all medication incidents.

Conclusions: The IPP and leadership generated improvements in anticoagulant safety: a more informed, competent workforce, recognising anticoagulant issues; updated procedures reflecting safe practice; information consistency for patients; scrutiny of incidents by MDT to improve safety. Focused improvements in communication of high-risk medications have seen an increase in awareness.

39 Innovation: Addressing pharmacy skill mix to improve patient flow and patient safety

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Medicine

Background: Ward pharmacy services have moved ahead from a primarily supply function to more clinical roles over recent years. Despite this, pharmacists continue to perform many non-clinical supply and clerical tasks in order to achieve national targets for patient flow, improving patient safety and patient satisfaction. A Ward-Based Pharmacy Technician (WBT) would release pharmacist time to spend on the patients being admitted to hospitals with multiple co morbidities and poly-pharmacy.

Method: Results were obtained for a high turnover ward over three weeks in April 2017 comparing parameters to usual pharmacy services without a WBT in October 2016. Data collected included waiting times for inpatient requests, discharge prescription turnaround time, and number of Medication Management Plans (MMPs).

Results: The innovative WBT model provided quantifiable benefits: 58 per cent reduction for time for inpatient dispensing; 55 per cent reduction in turnaround time for discharge prescriptions; 39 per cent increase in MMPs. Medication storage and security was also addressed by a complete re-organising/re-labelling a cluttered medicines room. Nursing and prescribing staff also indicated support for the initiative. These results indicate the following benefits:

- Reduced missed doses
- Improved patient satisfaction
- Reduced medication risk
- Reduced length of stay
- Improved patient flow

Conclusions: Having a dedicated WBT has been shown to improve safety, quality, and pharmacy efficiency. Nursing staff support this initiative allowing incorporation of the pharmacist into the MDT, improving coordination of supply issues and enhanced communication and prioritisation.

40 Heart Failure in the Community: A Northern population focus

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Medicine

Background: Heart failure is a major comorbidity in the community. This audit aims to examine the characteristics of heart failure patients in the community, and identify areas of care that could be optimised in the primary care setting, to reduce the overall burden of disease.

Method: Four primary care practices in the Northern suburbs were audited in 2016. A database was built, auditing patients with heart failure symptoms. Nursing home patients were excluded.

Results: A total of 390 patients were included in the final analysis. The average age was 78±9 years, and 50 per cent were male. The majority (40.5 per cent) of them had heart failure with preserved ejection fraction (HFpEF), 36.4 per cent had heart failure with reduced ejection fraction (HFrEF), and 21.8 per cent did not have a formal diagnosis for their symptoms. Only a minority of these patients (5.8 per cent) were admitted to a tertiary hospital in the preceding year. Of the 142 patients with HFrEF, the majority (48.1 per cent) had moderate left ventricular dysfunction, 19.1 per cent had severe, 17.1 per cent had mild and 8.4 per cent had mild-to-moderate dysfunction. Prescription of target dose, guideline-based angiotensin converting enzyme inhibitor or angiotensin receptor blocker, beta-blocker, mineralocorticoid antagonists were suboptimal at 20.5 per cent, 21.0 per cent, and 6.4 per cent respectively.

Conclusions: The majority of heart failure burden of disease is managed in the primary care setting, with only a minority requiring care in the tertiary hospital setting. However, one in five of these patients do not have a formal diagnosis, and prescription of target dose, guideline-based medications remains suboptimal. This finding is clinically significant to allow planning of programs to improve adherence to best standard care, with a particular focus on primary care based interventions.

41 Northern Health Heart Failure Snapshot: A comorbid and social challenge

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Medicine

Background: Northern Health Heart Failure (HF) hospitalisations have increased 1500 (2014/15) to >2000 (2016/17). The Victorian Cardiac Outcomes Registry (VCOR) is a "snapshot" of patients presenting to hospital with Acute Decompensated Heart Failure (ADHF) over a 30 day period.

Method: This study included patients admitted to Northern Health with ADHF as the primary diagnosis, within a 30 day period in 2015 and 2016. Patients were given a Participant Information Sheet (PIS) with the option of opting out. Baseline data, admission treatment and discharge status was collected, with a 30 day discharge follow up data collection. Baseline data collected was secure through Monash University's REDCap system.

Results: Northern Health participated in the VCOR snapshot data collection in 2015; 18 patients and 2016; 35 patients. In 2015 (30 per cent) compared 2016 (11 per cent) showed a decrease in readmissions. In 2015 (18 per cent) compared to 2016 (5 per cent) reduced mortality rate. The average length of stay has decreased, 2015; six days and 2016; five days. Depression (2015; 27.8 per cent and 2016; 34.3 per cent) and medication non-compliance (2015; 16 per cent and 2016; 14.3 per cent) was highlighted as prominent compared with other hospitals (average; 18.9 per cent and 8.9 per cent respectively).

Conclusions: Northern Health HF patients have significant higher rates of depression and medication non-compliance compared to other hospitals. HF mortality, length of stay and readmissions were reduced from 2015 to 2016. This is likely to translate into poor outcomes for patients and increased health system costs. Further research with view to improved targeting of resources is recommended.

42 Short duration clinically-based interprofessional activities prepare heath professional students for the workforce: A systematic review

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Organisation Wide

Background: Interprofessional education is important in preparing a health professional workforce that is collaborative and practice-ready. The aim of this review was to examine the benefits of participation in short duration clinically-based interprofessional activities for health care professional students.

Method: A systematic review was completed. Eight electronic databases (MEDLINE, CINAHL, PUBMED, EMBASE, PsychINFO, PEDRO, ERIC, OT Seeker) were searched from 1996 to June 2017. Full-text English-language articles reporting on outcomes of short duration clinically-based interprofessional activities that involved health professional students from at least two disciplines were included in the review. Studies were excluded if they evaluated longer duration, iterative or simulation-based interprofessional activities. Data were analysed descriptively and using content analysis with a mixed deductive and inductive approach based on the Interprofessional Education Collaborative (IPEC) Core Competencies for Interprofessional Collaborative Practice framework.

Results: Of 521 identified articles, 13 were included that assessed two types of interprofessional activities (shadowing and patient reviews) completed by students from medicine, pharmacy, nursing and allied health. All students reported a positive experience of interprofessional education. Student perceived that shadowing activities over 2-10 hours during in their first and second year improved their understanding across all domains of the IPEC Core Competencies for Interprofessional Collaborative Practice framework. Students who completed patient review activities completed over 2.5-4 hours during the third to fifth years of training also perceived they developed clinical skills in addition to improving their understanding of roles and responsibilities and teamwork.

Conclusions: Preliminary evidence suggests short duration clinically-based interprofessional activities can help prepare health professional students to be collaborative members of the future workforce.

43 A cross-sectional study of patient's meal experience and short-order menu usage at The Northern Hospital

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Organisation Wide

Background: Prevalence of malnutrition in the acute hospital settings is up to 40 per cent (Barker et al, 2011). This study aims to review current foodservice systems at Northern Health by investigating physical and organisational barriers to eating, and the use and acceptability of the short-order menu at The Northern Hospital (TNH).

Method: Observational surveys (n=178) and patient satisfaction surveys (n=54) were conducted during mealtimes to identify physical and organisational barriers to eating. Interview-style questionnaires assessing the short-order menu were conducted on patients (n=22), dietitians (n=5), menu monitors (n=7) and foodservice staff (n=17). Thematic analysis of the survey results was completed.

Results: Physical and organisational barriers identified included difficulty with packaging (23 per cent), difficulty self-feeding (22 per cent) and interruptions at meal periods (16 per cent).

Patients reported being happy with the appearance (89 per cent), taste (80 per cent) and smell (78 per cent) of their meals; patients reported good menu choices available (86 per cent). Major short order menu findings included 100 per cent of dietitians reporting good understanding of the use of short-order items, and 60 per cent of patients being aware of the short order menu. Ninety-five per cent of food service staff felt the range of items on the short-order menu was good, 43 per cent of menu monitors agreed.

Conclusions: Key study findings to be further explored include identifying need for and provision of feeding assistance and options for easy to open food packaging. It is recommended to provide patients a list of all food items available on the short-order menu and to develop this list in multiple languages.

44 Cultural perspectives on colorectal cancer screening and reporting bowel symptoms – The Arabic-Australian Story

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Surgery

Background: Many of Australia's Culturally and Linguistically Diverse (CALD) communities have lower participation rates in prevention and screening programs than native Australians. These communities may be not aware of and discuss Colorectal Cancer (CRC) physical signs and symptoms which may lead to a reduced rate of screening and/or unwillingness to report bowel symptoms and seek medical help. The overall aim of this project was to explore the attitudes, knowledge and beliefs of the Arabic community in Australia to CRC screening and reporting of bowel symptoms.

Method: A cross-sectional study of 110 competent (able to provide consent) Arabic-Australians over 18y attending The Northern Hospital was performed. A standardised survey in English or Arabic was administered and results collated and analysed.

Results: Most reported prostate cancer (41 per cent) was the most common cancer in men and breast cancer (88 per cent) in women. Fifty-one per cent believed cancer was not hereditary and 88 per cent cancer is always or sometimes cured. CRC knowledge was relatively poor: only 41 per cent had heard about CRC screening and 8/34 (24 per cent) had participated. Barriers to screening included: no knowledge about CRC (38 per cent), ignorance/carelessness about health (37 per cent), fear (18 per cent), no time (8 per cent) and language barriers (6 per cent).

Conclusions: Most Arabic-Australians are likely to undergo CRC screening once they have been educated and will report bowel symptoms to their GPs. Further research with a larger sample, more males and other religious groups would further explore the Arabic-Australians attitude towards CRC and allow targeted strategies to optimise outcome.

45 Real world use of clinical and radiological features for appendicectomy – a 5 year study

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Surgery

Background: Decisions for operations drive throughput in high turnover units such as acute general surgery. Pre-operative clinical and radiological features of appendicitis are well described but evaluation of actual use in decision-making and predicting outcomes are limited. We aim to use a large dataset of appendicectomies performed through a busy metropolitan acute surgical unit to evaluate the utility, effectiveness and outcomes for the pre-operative assessment for appendicitis.

Method: Retrospective data review of all appendicectomies performed in adults over a five year period at the Northern Hospital. Analysis of pre-operative clinical, radiological, intra-operative, histological and outcome/complication features with statistical analysis of known predictive factors (Alvarado score >7 and CT diagnosis of appendicitis).

Results: One thousand two hundred and ninety-eight appendicectomies were performed in the audit period between July 2012 and June 2017. One thousand two hundred and seventy-four were laparoscopic, with a median hospital stay of two days and 5.2 per cent readmission rate. Preliminary analysis using 233 patients show that Alvarado score >7 is predictive for appendicitis (PPV 85 per cent) but not often present in our data (76, 33 per cent). CT features for appendicitis was predictive (PPV 95 per cent) but not often used (38 per cent) of which 11 per cent had both Alvarado >7 and CT appendicitis. Importantly, comparing high vs low Alvarado score or CT positive or negative appendicitis, did not predict longer hospital stay and readmissions.

Conclusions: Surprisingly, known clinical or radiological predictive features were not often used in the decision for appendicectomy and did not predict outcomes. Real world data shows decision for appendicectomy may be based on clinical impression with comparative clinical outcomes.

46 Breast Magnetic Resonance Imaging outcomes and utility of multidisciplinary discussion

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Surgery

Background: Breast Magnetic Resonance Imaging (MRI) has a role in diagnosis and treatment of breast disease, which may be

limited by reduced sensitivity, high false positive rate and high cost. To improve targeted imaging and delineate clinical context in complex cases, a multidisciplinary meeting (MDM) discussion may have a positive impact as it does for breast cancer cases.

Method: Retrospective collected data for all breast MRI performed between 2013-2017 at a single institute were included (demographics, indication/s, conventional imaging and MRI findings). Indications were either diagnostic (no diagnosis breast cancer) or treatment (current diagnosis breast cancer). Post imaging MDM discussion impact was evaluated based on expectant versus change in management due to MRI findings.

Results: Of 196 breast MRI performed, 95 (48 per cent) were for diagnostic and 34 (17 per cent) for treatment purposes (34/303 (11 per cent) of total cases of breast cancer). For the diagnostic group, indications included radiological change (43/95), clinical breast mass (49/95) or axillary mass with unknown primary (3/95). Eleven (11 per cent) new lesions were identified by MRI, with two suspicious lesions requiring excision (both benign). Treatment MRI were to determine multifocal (28/34) or contralateral (6/34) disease, with eight (23 per cent) new pathological lesions identified. MDM discussion changed clinical management in ten (33 per cent) patients with treatment MRIs, but limited impact was noted for diagnostic MRI.

Conclusions: In our cohort, diagnostic breast MRI has limited sensitivity, with limited management change post-MDM discussion. It has greater value in treatment with a proven management impact.

47 The role of culture and sensitivity in the management of sacrococcygeal pilonidal abscesses

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Surgery

Background: Current practice for patients who present to hospitals with acute sacrococcygeal pilonidal abscess is operative management. Wound swabs are routinely taken in the peri-operatively and antibiotics are initiated empirically pending culture and sensitivity results. Our aim of the study is to evaluate whether the results of wound swabs change post-operative antibiotic therapy for these patients, and to identify the common microorganisms.

Method: This is a retrospective study which includes patients presented to The Northern Hospital, Victoria with acute sacrococcygeal pilonidal abscess from 1 January 2013 to 30 June 2016. Data was collected using hospital electronic medical records. Patients who had wound swabs taken were identified and their post-operative management analysed.

Results: There were 297 presentations identified within the study period. Two hundred and twenty-four cases (224 out of 297, 75.4 per cent) had wound swab taken, out of which 130 (130/297, 43.8 per cent) cases were followed up in outpatient clinic and *one case* (1/130, 0.8 per cent) had a subsequent change in antibiotics based on the wound swab result. Common microorganisms grown were mixed anaerobes (127/224, 56.7 per cent) and skin flora (41/224, 18.3 per cent). There were six representations within six weeks period post-discharge, five of which had wound swab taken during their initial presentation and none grew multi-drug resistant microorganisms.

Conclusions: Majority of the patients who presented for treatment of acute sacrococcygeal pilonidal abscess had wound swabs taken peri-operatively. Results of wound swabs did not change post-operative management and particularly antibiotic therapy in nearly all of our study population. The most common microorganisms cultured was mixed anaerobes.

48 Development of a platform to automate processing of orthopaedic research questionnaires

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Surgery

Background: Patients participating in research studies at The Northern Hospital's Orthopaedic Surgery Department are assessed by various means including scored outcome questionnaires. The manual scoring of these forms is time consuming and prone to error. Optical Mark Recognition (OMR) software is used in various applications for the rapid and accurate scanning of respondent data.

Method: Existing research questionnaires were customised into an OMR readable format. The software 'Remark Office OMR 8' was configured to read these questionnaires and the system was used to score 13 sets of four different questionnaires (Tegner Lysholm Knee Scoring Scale, Kujala Scoring Quesionnaire, Knee Injury and Osteoarthritis Outcome Score, IKDC Subjective Knee Evaluation Form) consisting of 45 pages and 280 optical marks in total. These questionnaires were scanned in two paradigms, one in page order and one out of order with some pages inverted. The scans were then processed using the OMR software and the processing speed and accuracy were compared against conventional manual scoring.

Results: The OMR software successfully recorded 280/280 (100 per cent) optical marks across all questionnaires in both paradigms. All marks were processed in 39 seconds when ordered and 58 seconds when out of order. This compared to a processing time of nine minutes and 41 seconds when processed manually.

Conclusions: The outlined method accurately processed 13 research questionnaires with superior efficiency compared to manual processing. Implementation of this method will allow for the processing of clinical research data with greater efficiency and data integrity.

49 Rationalisation of colonoscopy for rectal bleeding – preliminary validation of a new schema

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Surgery

Background: Rising demand for colonoscopy places a burden on our healthcare system. Colonoscopy is indicated in patients with features associated with Colorectal Cancer (CRC) like Per-Rectal Bleeding (PRB). Whilst detecting CRC early is essential to optimise prognosis, PRB is common and not highly predictive. The aim of this study was to validate a new stratification tool for determining the urgency of colonoscopy in those with PRB which may assist clinical judgement.

Method: A retrospective study using computerised records of elective colonoscopies for PRB 2011-2015 at The Northern Hospital was performed. Urgency was determined using the stratification tool and compared to clinician-determined categorisation. The primary outcome was CRC incidence and sensitivity and specificity. Secondary outcomes were factors associated with CRC. Chi-squared was used for analysis.

Results: There were 2,878 patients, mean age 54.8 years, 52 per cent male. CRC incidence was 3.3 per cent (n=96). Per current practice, urgent colonoscopies were seen in median 28 (range 1-389), semi-urgent 146 (14-901) and elective 329 (11-1973) days. In both schemes CRC incidence decreased with decreasing urgency category. 28.6 per cent more category 1 colonoscopies were performed in the new system with more cancers detected; although the yield of CRC was not statistically significant (6.0 per cent v 4.6 per cent, p=0.10). Sensitivity was 96.88 per cent v 75.00 per cent and specificity 30.34 per cent v 59.17 per cent in the new system v current practice.

Conclusions: The new scheme can safely detect those at high risk of cancer, however, more work needs to be done to improve the specificity of the scheme to address system efficiency and colonoscopy load.

50 Conversion to total knee arthroplasty following knee arthroscopy in patients with meniscus tear and pre-existing osteoarthritis: A retrospective cohort study

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Surgery

Background: Osteoarthritis is a degenerative joint condition that is a significant cause of disease burden in Australia with nine per cent of the general population having this condition. Arthroscopic surgery shows insufficient benefit to be indicated in the primary management of osteoarthritis alone however, it may be appropriate with certain coexisting pathology. We aim to investigate whether coexisting meniscal pathology impacts rate of conversion to Total Knee Arthroplasty (TKA) following arthroscopy.

Method: Medical records of patients over the age of 50 who have undergone knee arthroscopy between 2008-2012 at Northern Health were reviewed to identify if patients fit the inclusion criteria which included Magnetic Resonance Imaging (MRI) or intra-operative confirmation of meniscus tear and radiological evidence of osteoarthritis (Kellgren-Lawrence grade 1-4). Medical records were used to determine if subjects underwent a TKA within five years of undergoing index arthroscopic surgery and time until being placed on the waiting list for surgery.

Results: From a sample size of 39 patients, 18.75 per cent progressed to TKA within five years of arthroscopy. Gender, age and the presence of mechanical symptoms did not significantly affect the rate nor time to progression to TKA. There is association between Kellgren-Lawrence grade and rate of conversion to TKA.

Conclusions: Despite a lack of significance in this study, an association between severity of osteoarthritis and rate of conversion indicates opportunity for further research involving greater patient numbers in this population.

51 Recurrent laryngeal nerve assessment and outcomes in thyroidectomy

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Surgery

Background: Intraoperative damage to the Recurrent Laryngeal Nerves (RLN) during thyroid surgery can result in temporary and permanent vocal cord palsy. RLN injury rate have been reported to range between 0.5-20 per cent. Traditionally, standard assessment to preserve the RLN is direct visualization. Recently, utilisation of the Nerve Integrity Monitor (NIM) to assist in RLN preservation has increased. Ideally, all thyroidectomy patients should undergo pre- and post-operative Vocal Cord Checks (VCC). Since 2016, the Northern Hospital has instituted policy for routine pre-operative VCC and utilisation of NIM for all thyroidectomies. We aim to analysed factors hindering adequate RLN assessment, evaluated operative outcomes since NIM introduction and identified areas of deficiency.

Method: A retrospective analysis was undertaken of thyroidectomy surgery between January 2014 to June 2017. Patient demographics, operative indications and pathology were analysed, as well as rates of VCC and clinical outcomes.

Results: Preliminary results from January 2016 to July 2017 include 135 patients. 74.07 per cent of these underwent hemithyroidectomy, 14.07 per cent total thyroidectomy and 11.85 per cent completion thyroidectomy, all with NIM. The majority did not undergo preoperative VCC. There were two

reported RLN palsy (1.5 per cent), both temporary and rate comparable to previous audit periods. Postoperative VCC were only performed for suspected palsy and not routinely.

Conclusions: Our preliminary data suggest a deficiency in preoperative VCC and a stable rate of RLN despite use of NIM. Increase in post-operative VCC may provide more accurate data on asymptomatic RLN injury.

52 Ideal positioning of elevated rim acetabulum liners in primary Total Hip Replacement

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Surgery

Background: Instability post Total Hip Replacement accounts for up to 34 per cent of revisions in major joint registries. Lipped liners are associated with reduced risk of instability or revision for instability. We aim to determine the ideal positioning of elevated-rim acetabular liners in primary total hip replacement.

Method: In 14 patients, lipped liner trial liners were placed intraoperatively in various positions around the posterior clock-face of the implanted acetabular shell component. For each liner position, stability of the hip was tested at 80 degrees of hip flexion with gradually increasing internal rotation until subluxation occurred, at which point the position of the hip was measured using smart-phone accelerometer-based goniometers. Smart phone goniometers were first validated against a computer assisted navigation system.

Results: The most common liner position that imparted greatest stability to posterior subluxation was posteriorly and inferiorly (8 o'clock position for left hip, 4 o'clock position for right hip). The range for most stable liner position for different patients varied from posterosuperior (11 o'clock/1 o'clock position) to directly inferior (6 o'clock position). The average difference in internal rotation between most stable and least stable liner positions was 21 degrees.

Conclusions: In a hip replacement performed through a posterior approach, placing the lip of the elevated liner in the posteroinferior quadrant may impart more stability than in the posterosuperior quadrant.

53 Mechanisms underlying the antiemetic effect of acupuncture point stimulation: A systematic review and meta-analysis

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Surgery

Background: Nausea and vomiting are common, unpleasant consequences of surgery, chemotherapy and motion. Stimulation of acupuncture points has shown potential in the treatment of nausea and vomiting. The objectives of this study were to systematically review the mechanisms of action, and possible interactions with pharmacological antiemetics.

Method: English and Chinese databases including PubMed, EMBASE and CNK were searched from inception to November 2016. Controlled trials of acupoint stimulation in humans or animals in the treatment or prevention of nausea and vomiting due to surgery, drug administration or motion that also reported concurrent physiological changes were included. Risk of bias was assessed for randomisation, blinding and completeness of outcomes.

Results: Sixteen studies of moderate to low quality with 861 participants out of 2085 papers met the selection criteria. All trials reported that acupoint stimulation reduced nausea or vomiting compared to sham or control. Six trials found that acupoint stimulation lowered peripheral serotonin (5-HT) levels; meta-analysis of four trials (n=228) showed significantly lower 5-HT levels in acupoint groups compared with sham or control (SMD – 0.76 (-1.07, -0.45), $z = 4.86$, $p < 0.001$). Other results in acupoint groups showed moderation of the effects of emetic stimuli on vagal tone, gastric function and other biochemistry compared to sham or control. The antiemetic effect of acupuncture was blocked by naloxone.

Conclusions: Acupuncture may enhance the action of pharmacological antiemetics by reducing peripheral concentrations of 5-HT, and may have a protective effect on autonomic nervous system balance and gastric function, possibly mediated via endogenous opioids.

54 Health professionals' attitudes towards incorporating acupuncture / acupressure into the management of post-operative nausea and vomiting: A hospital survey

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Surgery

Background: Level one evidence supports the use of acupuncture / acupressure for managing Post-Operative Nausea and Vomiting (PONV). This study aimed to survey health professionals' attitudes to acupuncture / acupressure, in preparation for implementing this effective intervention into peri-operative care.

Method: A validated, anonymous survey with 43 questions was emailed or distributed in hard copy at meetings to anaesthetists, midwives, nurses, obstetricians and gynaecologists and surgeons at The Northern Hospital in 2016.

Results: One hundred and sixty-five completed surveys were returned with a response rate of 40 per cent. Participants included 106 females (64 per cent), 48 males (29 per cent) and 11 missing data, and over three quarters (76 per cent) were aged between 20 and 50 years old. Seventy-seven per cent agreed that effective non-drug therapies for PONV should be used. Eighty-three per cent of respondents considered acupuncture / acupressure "clearly alternative" medicine or "neither mainstream nor alternative". Forty-two per cent of respondents believed this therapy was effective for PONV. After being told acupuncture / acupressure was effective for PONV, 81 per cent would encourage patients to use acupressure for PONV if it was offered at the hospital, and 88 per cent wanted to have further education about this form of therapy.

Conclusions: Health professionals at Northern Hospital strongly supported the evidence-based use of acupuncture / acupressure for PONV despite considering the therapy non-mainstream. A national survey is needed to ascertain a broad view on this issue.

55 Implementing acupressure for post-operative nausea and vomiting: A preliminary report

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Surgery

Background: Post-Operative Nausea and Vomiting (PONV) is a significant problem in patients who have surgery under general anaesthesia. Northern Hospital is one of the first in the world to implement acupressure, the only non-pharmacological intervention in the guidelines, to prevent and treat PONV. At this early stage of implementation, we aimed to audit patient files and examine, among patients who were given acupressure: 1) per cent of patients whose PONV risk was assessed per guidelines; 2) per cent of patients who met the PONV risk factor at two out of four or above; 3) use of anti-emetics in the first 24 hours after surgery in relation to the level of PONV risk.

Method: We audited the files of 56 patients who were given acupressure pre-operatively between April and July. Data were extracted from the Operative Checklist, progress notes and drug chart.

Results: Out of the 56 patients, 14 per cent had no record of PONV risk assessment; 13 per cent had one risk factor, and 29 per cent, 25 per cent and 20 per cent had two, three and four risk factors, respectively. Fifty-four per cent did not require any anti-emetics in the first 24 hours. Among those whom risk was assessed, antiemetic use was 14 per cent for those with one risk factor, 41 per cent, 29 per cent and 75 per cent for risk of 2, 3, 4.

Conclusions: The majority of patients who were given acupressure met the inclusion criteria. PONV risk assessment can be improved. A higher PONV risk is associated with a higher use of anti-emetics. The effectiveness of acupressure will be assessed at a later stage.

56 A novel technique for intra-operative flexor pulley dilation in delayed digital flexor tendon repair

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Surgery

Background: Zone 1 Flexor Digitorum Profundus (FDP) avulsion injuries require surgical fixation to re-approximate the tendon to the volar base of the distal phalanx. When treatment has been delayed, oedematous tendon can be too swollen to pass through contracted A2 and/or A4 pulley. Current techniques used to overcome this include excising half of the FDP tendon and releasing annular pulleys.

Method: In this series of three patients, we describe a novel technique for intraoperative flexor pulley dilation using paediatric urethral sounds. Serial paediatric urethral sounds, ranging from six to 14 French (diameter of 2mm to 4.67mm), were sequentially inserted into the A2 and A4 pulleys in an anterograde and retrograde fashion. The largest 14 French sound was left in situ, dilating the appropriate pulley, whilst the tendon was retrieved and prepared for repair.

Results: In all cases, passage was met with minimal resistance and gliding within the pulley was observed at the completion of repair with no bowstringing. All three patients were followed up for a minimum of three months with good tendon excursion and range of motion.

Conclusions: We describe a novel technique to correct the collapsed flexor pulley system encountered during delayed FDP tendon repair, using intraoperative serial dilation of annular pulleys with urethral sounds. In our series, all three patients had successful primary reattachment of FDP avulsion in a delayed setting. We plan to observe long term outcome in a larger series using this technique.

57 Pertussis vaccination: What matters in pregnancy?

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Women's and Children's Services

Background: 'Whooping Cough' illness caused by bacteria Bordetella pertussis is an important worldwide cause of

morbidity and mortality, especially for infants less than 12 months of age. During 2008-2011, infants accounted for 47 per cent of hospitalisations in Australia. In 2012 Australia adopted the 'Gestational Vaccination' strategy: all pregnant women are offered government-funded pertussis-vaccine every pregnancy irrespective of prior vaccination history. We aimed to determine enablers, barriers and rate of pertussis-vaccine uptake among women giving birth in a university-affiliated, level II hospital.

Method: We surveyed new mothers on day of discharge from the maternity ward for four weeks, between February and March 2017, excluding bereaved women and those with insufficient English to consent. The survey was self-administered and collected quantitative and qualitative survey information. We present summary, descriptive information. We used binary logistic regression to establish factors associated with non-vaccination.

Results: Two hundred and four of 224 (91.07 per cent) women consented to participate. 54.4 per cent of participants recalled pertussis vaccination during pregnancy. Reported obstacles to vaccination included opposition to being vaccinated during pregnancy (33.3 per cent), unawareness of vaccine availability (22.1 per cent), lack of time or difficult access (13.24 per cent) or believing it was not necessary as they had been vaccinated within the previous five years (8.82 per cent).

Conclusions: We found low pertussis vaccination coverage among pregnant women delivering in an Australian outer suburban hospital. Obstacles to vaccination include pre-conceived notions about vaccine harm or insufficient health provider guidance. Vaccination uptake might be increased by incorporating vaccine prescription and administration into antenatal care and educating maternity care providers about pertussis vaccination.

58 Development of a culturally appropriate nutrition education resource for Iraqi women with Gestational Diabetes Mellitus

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Women's and Children's Services

Background: Seventy per cent of women attending the Gestational Diabetes Mellitus (GDM) clinics at Northern Health are born outside of Australia with Iraqi women being one of the largest multicultural groups accessing the service. Whilst dietitians often provide women with nutrition education materials translated into their first language, there is limited availability of dietary resources tailored to the specific food and cultural practices of these different cultural groups.

Method: Interviews were undertaken with 11 Iraqi women attending the Northern Health antenatal clinics to explore cultural food practices and beliefs during pregnancy and perceptions of a healthy pregnancy. Qualitative analysis of the interview data identified common themes, which were used to develop a healthy eating handout tailored for Iraqi women with GDM. This handout was then evaluated with five Iraqi women attending the Northern Health GDM clinics.

Results: Eight key overarching themes as well as multiple sub-themes were identified including 'rice is a common staple consumed in the diet every day', and 'eating 'everything' or 'as much as you can' is considered healthy while you are pregnant'. On evaluating the new healthy eating handout, four of the five Iraqi women stated overall they preferred the new handout over the generic healthy eating handout that is given in the GDM clinics.

Conclusions: This pilot study, looking at a qualitative, consumer focused method of developing culturally appropriate education materials, validates that Iraqi women with GDM have a greater preference to nutrition education materials that have been tailored to their cultural eating practices and food preferences.

59 A cue based oral feeding clinical pathway strategy for preterm infants requiring nasogastric feeding

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Women's and Children's Services

Background: The establishment of oral feeding in preterm infants is often delayed due to poor coordination of sucking and swallowing, neurological immaturity and respiratory compromise. Consequently, enteral feeds in such infants are delivered through a nasogastric tube. Strategies to minimise the duration of nasogastric tube feeding and optimise the transition to oral feeding have been shown to enhance growth and development, and decrease special care nursery length of stay.

Method: The Neonatal Unit at The Northern Hospital has introduced a cue based oral feeding clinical pathway for preterm infants requiring nasogastric feeding. Infants have their oral feeds upgraded according to infant cues, and have their tubes removed when they have achieved a minimum of four full sucking feeds within a 24 hour period. This audit investigated and compared the outcomes of infants both before and after the introduction of the strategy. The study included 438 infants (n=146 intervention and n=292 control).

Results: Infants in the intervention group reached full oral feeding significantly earlier than controls (16.9 $\pm$ 14.5 days vs 20.0 $\pm$ 16.2 days, p=0.03). Infants in the intervention group were discharged home an average of 1.3 days sooner than controls, but this was not statistically significant (21.3 $\pm$ 14.8 days vs 22.6 $\pm$ 16.4 days, p=0.72). There was no statistically significant difference in weight gain between the two groups.

Conclusions: The cue based oral feeding clinical pathway was successful in achieving earlier full oral feeds in preterm infants requiring nasogastric feeding.

60 The incidence and adverse outcomes of perinatal substance use at The Northern Hospital, 2012 – 2016

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Background: Perinatal substance use is implicated in adverse pregnancy outcomes, including preterm birth, low birthweight and congenital defects. No studies have investigated the incidence of drug use in our region.

Method: A retrospective audit analysing routinely collected antenatal data from The Northern Hospital from 2012 to 2016. Birthing data was cross-correlated with hospital funding coding. Multivariable regression analysis using SPSS evaluated for adverse pregnancy outcomes.

Results: Substance use was recorded in 166 of 16,294 births (1.02 per cent), with marijuana used most commonly (77.7 per cent), followed by opioids (17.5 per cent), stimulants (11.5 per cent) and polydrugs (6.6 per cent). Pregnant women reporting drug use were more likely to be young, Australian-born, Aboriginal or Torres Strait Islander, unemployed, to smoke, have a partner who smoked, have received no antenatal care and have a mental health condition. Substance use was associated with increased risks of preterm birth (aOR 2.1, 95 per cent CI 1.2, 3.4), low birthweight (aOR 3.1, 95 per cent CI 2.0, 5.0), small for gestational age (aOR 3.5, 95 per cent CI 2.3, 5.2), feeding difficulties (aOR 3.2, 95 per cent CI 1.7, 6.2), admission to special care or neonatal intensive care (aOR 2.5, 95 per cent CI 1.7, 3.5) and longer hospital stays (aOR 1.9, 95 per cent CI 1.7, 2.0). Neonatal withdrawal syndrome occurred in 2.7 cases per 1000 live births.

Conclusions: The incidence of perinatal substance use in our setting was comparable to elsewhere in Australia. Despite high national rates of antenatal care, women using drugs and their infants remain an at-risk group. Improving antenatal access remains a key priority at The Northern Hospital.

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