This research report is a snapshot of the research that was conducted across the Illawarra Shoalhaven Local Health District (ISLHD) in 2016. This is not an exhaustive list.

Research Central relies on reported data from researchers.

This publication is proudly supported by the staff specialists of ISLHD and we thank them for their ongoing support.

The research report was prepared by Professor Leonard Arnolda, Clinical Associate Professor Marianna Milosavljevic, Janaye Fish, Ivana Goluza, Jay Borchard, Dr Sayne Dalton, Dr Jose Cuenca and Amanda Dale.
In 2016, ISLHD clinicians had affiliations with: Czech Republic, UK, India, USA, Canada, Spain, Sweden, South Korea, Italy, Romania, Hungary, Belgium, Argentina, France, Singapore and Germany.

- Staff involved in research projects: 158
- Grant applications: 25
- SSA approvals: 97
- Peer reviewed publications: 106
- Conference presentations: 60
- Higher research degrees: 56
- Current grant funding: $1,712,076
- Additional clinical trials: 14
Foreword

Ms Margot Mains, Chief Executive

We are very proud to bring you the 2016 ISLHD Research Report. This is my third year in the position of Chief Executive and I am pleased to see many of the initiatives outlined in the 2015 Research Directions Steps Forward Paper come to fruition. These include: the appointment of two research leaders- the Clinical Director of Health and Medical Research, Professor Leonard Arnolda and Professor of Nursing and Midwifery, Val Wilson; the establishment of the Illawarra Health and Medical Research Institute (IHMRI) Clinical Research Trials Unit (CRTU) on the grounds of Wollongong Hospital; the development of the Illawarra Health Information Platform (IHIP); the commencement of the Research Governance Board; and the ongoing work on streamlining the research ethics process for ISLHD staff.

This year’s report continues to grow in size and content as we strive to build a vibrant and sustainable research culture. In this edition you will find: a summary of the research outcome measures for 2016, current research projects, Research Central activities for the year; progress report on our six joint PhD Scholarship holders, biographies of new staff involved in research; ISLHD authored peer-reviewed publications, and a new section focussing on two of our major research partners IHMRI an CHRISP. I hope you enjoy reading the 2016 ISLHD Research Report.
I am now in my second year at the helm as Clinical Director of Health and Medical Research for the district. It has been a very busy time and we have achieved a number of highlights over the past 12 months including: the rollout of the ISLHD data platform; the opening of the IHMRI Clinical Research Trials Unit (CRTU) at Wollongong Hospital; the provision of several research education forums and workshops; the commencement of an ISLHD Research Governance Board and the development of a Graduate Certificate in Health Research at the UOW and the ongoing management of over a hundred ISLHD research projects.

The health district committed a significant level of resources into research infrastructure by developing the Centre for Health Research Illawarra Shoalhaven Population (CHRISP). This centre provides a sophisticated information platform to connect data for health and medical research in the Illawarra. These datasets are available for use in ethically-approved research and for planning and evaluation projects which aim to improve the health of the population of the Illawarra and beyond.

The IHMRI Clinical Research Trials Centre (CTRU) is now located within the grounds of Wollongong Hospital. This facility is available to all ISLHD employees and provides an opportunity for staff to gain experience in running a clinical trial. The principal role of IHMRI is to help the smaller units who may not have enough work for a full time employee and insufficient experience to assess feasibility and budget and build their skills in this area.

This year's research report includes updates of the research activity, biographies of staff, updates on IHMRI and CHRISP and this year we have included more details of notable staff peer-reviewed publications from 2016. I hope you enjoy this edition and look forward to continuing our work in building a strong and vibrant research culture within ISLHD.
Research Central

Fosters the development of research skills through educational workshops, mentoring programs and resource allocation.

Provides individual project support including: assistance with developing a research question and study design, guidance with statistical analysis, review and feedback of manuscripts, and assistance with dissemination through available resources.

Guides and supports researchers through ethics and site-specific processes.

Communicates clinician achievements in research internally through various outlets.

Links clinicians to researchers with expertise and facilitates collaborations with other entities for greater research impact.

**Director of Health and Medical Research**
Professor Leonard Arnolda

**Research Manager**
Honorary Clinical Associate Professor Marianna Milosavljevic

**Research Clinicians**
Janaye Fish
Ivana Goluza
Jay Borchard
Dr Jose Cuenca
Dr Sayne Dalton
Lina Baytieh

Research Governance

Advises and liaises with investigators, sponsors and other stakeholders regarding the preparation of applications for site authorisation and ethics processes.

Fosters effective communication with universities and research institutes, particularly in the promotion and management of collaborative research programs and grants management.

Management of:

Site-specific research governance review and authorisation in accordance with NSW Health Policies and Guidelines including associated contracts and support documentation.

Intellectual Property arising from health and medical research that involves staff or resources of ISLHD.

Honorary Research Associates appointments and ISLHD-IHMRI researcher affiliations.

Requests from third parties for access to patient data or transfer of human tissue.

**Research Governance Officer**
Kristy Pierce

**Administrative Support Officer**
Leigh Lees
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General Practitioners (GPs) are responsible for primary prescribing decisions in most settings. Elderly patients living in Advanced Care Facilities (ACFs) often have significant co-morbidities to consider when selecting an appropriate drug therapy. Careful assessment is required when considering appropriate medication use in frail older patients as they have multiple diseases and thus multiple medication. Many physicians seem reluctant to discontinue other physicians’ prescriptions, resulting in further polypharmacy. Therefore it is relevant to ascertain and synthesise the GP views from multiple settings to understand the processes that might promote appropriate deprescribing medications in the elderly. The aims of this study were to 1) compare and contrast behavioural factors influencing the deprescribing practices of GPs providing care for ACF residents in two separate countries, 2) review health policy and ACF systems in each setting for their potential impact on the prescribing of medications for an older person in residential care of the elderly, and 3) based on these findings, provide recommendations for future ACF deprescribing initiatives. A review and critical synthesis of qualitative data from two interview studies of knowledge, attitudes, and behavioural practices held by GPs towards medication management and deprescribing for residents of ACFs in Australia and Sweden was conducted. A review of policies and health care infrastructure was also carried out to describe the system of residential aged care in the both countries. Our study has identified that deprescribing by GPs in ACFs is a complex process and that there are numerous barriers to medication reduction for aged care residents in both countries, both with similarities and differences. The factors affecting deprescribing behaviour were identified and divided into: intentions, skills and abilities and environmental factors. In this study we show that the GPs’ behaviour of deprescribing in two different countries is much dependent on the larger health care system. There is a need for more education to both GPs and ACF staff as well as better cooperation between the different health care systems and appropriate monetary incentives for elderly care to achieve better conditions for deprescribing practice.

To determine if a model of home-based dietetic care improves dietary intake and weight status in a specific group of older adults post-hospitalisation. The Department of Veterans’ Affairs clients aged 65 years and over were recruited from hospitals in a regional area of New South Wales, Australia (n = 32 men, n = 36 women). Nutritional status was assessed at home at baseline (within two weeks post-discharge) and three months post-discharge using a diet history, a food frequency checklist and Mini Nutritional Assessment (MNA). Personalised dietary advice was provided by a single dietitian according to participants’ nutritional status. Mean body weight improved significantly (P = 0.048), as well as mean MNA score (21.9 ± 3.5 vs 25.2 ± 3.1) (P < 0.001). Mean energy, protein and micronutrient intakes were adequate at baseline and three months, except for vitamin D. At three months, the underweight group (body mass index (BMI) < 23 kg/m²) had significantly higher mean protein intake per body weight (1.7 ± 0.4 g/kg) compared to those who were a desirable weight (BMI 23–27 kg/m²) (1.4 ± 0.3 g/kg) or overweight (BMI > 27 kg/m²) (1.1 ± 0.3 g/kg) peers (P < 0.001). There was significant improvement in energy intake contributed from oral nutrition supplements (+95.5 ± 388.2 kJ/day) and milk (+259.6 ± 659.8 kJ/day). Dietetic intervention improved nutritional status 3 months after hospital discharge in older adults living in the community.


To describe difficulties experienced with recruitment of frail, malnourished inpatients aged 65+ years to a 12-week multidisciplinary home-based nutrition and physical activity intervention (SUSTAIN) and to identify factors associated with non-participation. A multidisciplinary team approach to recruitment involved monthly team meetings, weekly clinician case conferences and strategic planning to accommodate patient needs (provision of transport, easy access to facilities, appropriate written/verbal information). Intensive recruitment occurred in eligible inpatients from a major acute tertiary and rehabilitation hospitals in a local health district over seven months. Of the 124 patients screened, 88 were not eligible, 32 declined, and 4 consented. Neither socio-demographic nor clinical characteristics (age, gender, clinical diagnosis, birthplace, cognitive function, length of stay or nutritional status) explained non-participation or ineligibility or refusals rates. The advanced age and poor overall health status of this population necessitates alternative recruitment strategies to improve participation in clinical trials and improve generalisability for clinical practice.

Reduced toe flexor strength is an independent predictor of falls in older people. However, it is unknown whether strengthening programs can restore toe flexor strength in older individuals. The aim of this study was to investigate whether a progressive resistance training program, focused specifically on the foot muscles, could improve toe flexor strength in community-dwelling older people. After baseline testing, 85 men and women (age range 60-90 years) were randomized to either a supervised, progressive resistance training (n=43) or a home-based exercise (n=42) group for 12 weeks. A further 32 participants were recruited for a control group. The primary outcome measures were hallux and lesser toe flexor strength pre- and post-intervention. Secondary outcome measures were exercise compliance, components of the Foot Health Status Questionnaire and single-leg balance time. Average class attendance was 89% with 68 participants from the two intervention groups (80%) completing the follow-up assessments. Participants in the supervised, progressive resistance training group significantly increased their toe strength (up to 36%; P<0.02), whereas there was no change in toe strength in either the home-based or control groups. This increased toe strength was accompanied by a significant improvement in perceived general foot health and single-leg balance time compared to the other groups (P<0.05). Progressive resistance exercises are a viable intervention to increase toe flexor strength in older adults. A clinical trial is now required to determine whether this intervention can reduce the number of falls suffered by older adults.


The co-administration of multiple drugs (polypharmacy) is the single most common cause of adverse drug events in the older population, and residents of long-term care facilities (LTCFs) are at particularly high risk of medication harm. ‘Deprescribing’ – the withdrawal of an inappropriate medication with goal of managing polypharmacy and improving outcomes – may improve the quality of life of LTCF residents. The RELEASE study sought to explore perceptions of medication use and the concept of deprescribing in LTCFs. Focus groups and interviews were conducted with General Practitioners (GPs), pharmacists, nursing staff, residents and their relatives within three LTCFs in the Illawarra-Shoalhaven region of NSW, Australia. Audiotapes were transcribed verbatim and, using the Integrative Model of Behaviour Prediction as a framework, thematic analysis of transcripts was conducted using QSR NVivo 10. Participants acknowledged the burden of too many medications (time to administer, physical discomfort, cost), yet displayed passivity towards medication reduction. Residents and relatives lacked understanding of medicine indications or potential harms. Willingness to initiate and accept medication change was dependent on the GP, who emerged as a central trusted figure. GPs preferred ‘the path of least resistance’, signalling systems barriers (poor uniformity of LTCF medical records, limited trained LTCF personnel); time constraints (resident consultations, follow-up with specialists and family); and the organisation of care (collaborating with LTCF staff, pharmacists and prescribing specialists) as obstacles to deprescribing. Targeted engagement is required to raise awareness of the risks of polypharmacy in LTCFs and encourage acceptance of deprescribing amongst residents and their relatives. GPs are integral to the success of deprescribing initiatives within this sector.

Aim of this study was to describe the dietary pattern, Mediterranean diet adherence and nutritional status of older persons with cognitive impairment. A six-month observational study was conducted in the Geriatric outpatient department in Wollongong Hospital. We recruited 36 community dwellers, aged 65 years and over with a diagnosis of cognitive impairment. All participants completed a comprehensive geriatric and dietetic assessment. Socio-demographic and anthropometric data were collected. Nutritional status was assessed using the Mini Nutritional Assessment (MNA). Adherence to Mediterranean diet was assessed using the Mediterranean Diet Adherence Screen (MEDAS). Only 14% (5/36) of participants consumed a Mediterranean diet. 6% of participants were malnourished and 22% were identified as at risk of malnutrition. Factors associated with increased likelihood of consuming Mediterranean diet were: being younger females (68.5 vs 78.2 years); having live-in social support (100% vs 65%); having a Mediterranean background (60% vs 16%); being moderately physically active (80% vs 35%); being well nourished; an absence of ischaemic heart disease (0% vs 26%); an absence of falls (0% vs 42%) and taking fewer medications (80% vs 49%). The main dietetic reasons for the low MEDAS score were the low consumption of sofrito, legumes, nuts, seafood, olive oil and wine. Most participants in this study were not following a Mediterranean diet and had a low rate of malnutrition. Future intervention such as dietary education of carers with an emphasis on the Mediterranean diet components is vital to improve dietary intake of older people with cognitive impairment.

This study aimed to identify quality indicators of dietetic services from the perspectives of older malnourished patients. Satisfaction surveys were conducted with a purposive sample of 28 females and 28 males (median age 81 years) who had been seen by a dietitian for malnutrition assessment between March and July 2015. In-depth, face-to-face, semi-structured interviews were undertaken with a sub-sample of four females and six males (median age 81 years). Interviews were transcribed verbatim. Two researchers examined transcripts and open-ended survey responses. Thematic analysis was conducted to identify quality indicators. Four structure, five process and three outcome quality indicators were identified. The sample of older malnourished patients recognised a need for supportive environments. They identified that the hospital setting did not provide this. In contrast they described benefits of community based follow-up. Dietitians demonstrating professional competence and providing clear and simple information that was tailored to the patient’s medical concern and that promoted independence was valued. Additionally, the interpersonal communication skills such as listening and kindness were important. The quality indicators identified from the perspectives of older malnourished patients may facilitate dietetic services to perform, assess and improve services for this patient group toward PCC.

Driving assessment and rehabilitation research

Geoffrey Murray

The guidelines for the assessment of driving are clear when there are specific medical conditions, however it is not as clear for patients with many co-morbidities or progressive disorders. This requires doctors to make a judgement about the patient’s ability to drive. However, most doctors have concerns about ability to assess driving and their ability to predict outcomes of formal driving tests are poor. The aim of the present study was to provide a thorough driving assessment using state of the art driving simulators in conjunction with visual and cognitive tests applied by a rehabilitation specialist in the rehabilitation outpatient clinic. The decision at the clinic is compared to a paper assessment from an occupational therapist on road. The reliability will be assessed through inter-rater comparison.

An observational study to document inter-observation in the reporting of plain radiographs of constipated palliative care patients

Greg Barclay

Current practice upholds the use of abdominal radiographs to diagnose constipation. There is however, no evidence to support this practice. The aim of this work is to sample a larger cohort of palliative care clinicians with the three aims of exploring across multiple sites if; palliative care staff are reliably able to use a faecal loading score to report a plain radiograph; if staff are able to predict patient’s symptoms based on the appearance of a radiograph; if patient’s self reported symptoms correlate with staff assigned faecal loading score. The research results will have implications in use of radiographs to diagnose constipation.
Investigating the association between nutritional status and functional outcomes

Emily Taylor, Steven Bowden, Karen Charlton, Kelly Lambert

Malnurition is highly prevalent in the rehabilitation setting, particularly for the elderly population. There are serious consequences for the health and wellbeing of these patients, and hence why it is important to assess nutritional status. This study aimed to investigate the relationship between nutrition status and changes in functional ability in elderly rehabilitation patients. The project comprised of a systematic literature review and a retrospective observational study. The research concluded that improvements in nutritional status are beneficial to improving the rate of recovery of functional improvement in elderly rehabilitation patients. Nutrition status was found to be significantly associated with improvement in the function ability, highlighting the importance of nutrition in the rehabilitation setting for this patient type.

Diagnostic utility of lumbar puncture in older patients with altered mental status

Muhammad Aslam Khan, Jan Potter

Altered mental status (AMS) is a common reason for presentation of older patients to the emergency department and hospitalisation. These patients pose great challenge to the treating physicians to identify the cause of their AMS promptly so that appropriate treatment is not delayed. Among various causes of AMS in elderly patients, central nervous system (CNS) involvement is regarded most serious due to its high morbidity and mortality, if correct diagnosis and management is delayed. The lumbar puncture (LP) is regarded as an important test for different CNS pathologies especially for infection and inflammatory conditions. However, in elderly who present with vague signs and symptoms, and may not have primary CNS pathology, the decision to perform LP is quite challenging. It is usually performed in older people when secondary causes affecting CNS have been ruled out and primary CNS pathology strongly suspected. While LP has a very high yield in children and young adults, the diagnostic utility of this test in elderly patients, with multiple comorbidities and underlying cognitive impairment, is unclear. Thus, this clinical audit aimed to determine the diagnostic indications of LP and its final outcome, in older people with AMS, to determine its diagnostic value.
A multicentre, randomised, double-blind, placebo controlled trial to evaluate the effectiveness and safety of sailuotong (SLT), a standardised herbal medicine formula in patients with vascular dementia and alzheimer's disease with cerebrovascular disease

Jan Potter, Kim Henderson, as part of SLT trial investigators headed by Dennis Chang, National Institute of Complementary Medicine (NICM)

Dementia is the leading cause of mental and physical disability in the elderly. Vascular dementia (VaD) that accounts for 15-20% of all dementia cases is a syndrome of acquired cognitive functional impairment with a complex pathophysiological basis. Viable pharmaceutical options are currently lacking as the conventional VaD drug regimen does not appear to address the complex and multi-system nature of VaD. Medical Sciences have employed conventional pharmaceutical techniques to develop a novel, standardised herbal formulation, Saiuotong (SLT) targeting VaD. Data from pre-clinical studies have shown significant improvements in memory functions and in pathogenic biochemical parameters in various animal models. Appropriate safety of SLT has also been shown in acute and chronic toxicity and herb-drug interactions studies. With strong preclinical and clinical results, we propose to undertake a rigorous phase III clinical trial of SLT in 226 patients with mild to moderate probable VaD or Alzheimer’s disease with cerebrovascular disease (AD+CVD). The aim of this 52 week randomised, multicentre, double-blind, placebo controlled trial is to: determine the efficacy of SLT on cognitive function and activities of daily living, and monitor the safety of SLT as a treatment for VaD or AD+CVD during a 52 week treatment period. Primary outcome measure include Vascular Dementia Assessment Scale cognitive subscale (VaDAS-cog) and Alzheimer’s Disease Cooperative Study Activities of Daily Living Inventory (ADCS-ADL).

Medication use in a geriatric population diagnosed with dementia: quality audit comparing current practice to NHMRC guidelines

Jan Potter, Justin Turner, Warren Rich, Janaye Fish

The ‘Clinical Practice Guidelines and Principles of Care for People with Dementia’ by the National Health and Medical Research Council (NHMRC) were released in 2016, and are the first Australian guidelines on dementia. The guidelines make over one hundred recommendations across a broad range of issues relating to dementia including early identification, diagnosis, access to care, support and medication prescribing. This research project aims to conduct a retrospective audit of patients admitted to a specialist geriatrics clinic across the ISLHD, to determine the rate of adherence to the guidelines.
Objective structured clinical examination in delirium recognition

Miriam Coyle, Alera Riley-Henderson, Elise Robinson, Anne French, Narelle Every, Victoria Traynor, Pam McAllen

With support and funding from the Agency of Clinical Innovation (ACI), collaboration between the ISLHD Division of Aged Care, Rehabilitation and Palliative Care and the School of Nursing at UoW, has developed an education program. This will give nurses and allied health staff the skills and knowledge to recognise the development of delirium. An objective structured clinical examination (OSCE) was created based on common signs and symptoms of delirium. A total of sixty staff from Bulli and Coledale Hospitals participated in the program, which was delivered by Clinical Nurse Consultants and Clinical Nurse Educators to nursing and allied health staff from both hospitals. The project has currently been extended to St George Hospital (STGH) with Dr Rita Chang, due to successful UOW and STGH funding of $25,000.

Acceptance and valued-living in palliative care patients, caregivers and significant others

Esther Davis, Geoff Lyons, Greg Barclay

A significant proportion of caregivers of palliative care patients experience severe psychological distress and complicated grief, with little known on the psychological impact of those who share a close relationship with patients. This project aims to evaluate an Acceptance and Commitment Therapy intervention, a guided self-help programme, for caregivers and significant others through a two-armed randomised controlled trial.

Correlation between Observational Scales of Sedation and Comfort and Bispectral Index Scores

Michael Barbato, Greg Baclay, Jan Potter, Wilf Yeo and Jason Chung

When palliative care patients enter the phase of unconsciousness preceding death, it is standard practice to initiate or continue a subcutaneous infusion of an opioid plus or minus a sedative. The doses are determined somewhat empirically and adjustments are based on clinical assessment and observational measures of sedation and comfort. Following reports that these observational measures could be misleading, this study assesses their validity by comparing them with an objective measure of sedation, the Bispectral Index Score (BIS).
I became involved in research when I was a registrar training to be a geriatrician. What fascinated me was the nutritional state of patients on the geriatric wards and how different they were in comparison to patients on the general medical, cardiology and surgical wards. They were markedly more undernourished than the other patients! This prompted me to begin reading into the literature as to why this may be. Anecdotally when I looked around the ward, it appeared to be quite a practical issue; they just didn’t eat! I wanted to record their nutritional status and the clinical course of the acute admissions within the geriatric unit. We used an indirect calorimeter with a ventilated hood and we followed the patients throughout the admission, recording every calorie they ate during that time. The finding was that 70% of them were not consuming enough calories to lie still without a fever without losing weight. So of course, they were going to lose weight!

After that finding, I received a grant from the Scottish Office to do a randomised controlled trial for prescription of nutritional supplements and thus we created an intervention prescribing sip feed supplements in the medicine chart during hospital stay to see if it’s an effective way of reducing weight loss. The findings were encouraging and they were published in the Journal of Parenteral and Enteral Nutrition. Using quality studies on the same topic, we were able to complete a systematic literature review that was published in the British Medical Journal and subsequently became a Cochrane review, to conclude that supplementation produced a small but consistent weight gain in older people with a reduced mortality in older people who are undernourished. We were able to apply the evidence through local hospital protocol.

What the experience provided me was a real insight into research methodology. It became very clear to me when we skim through journals and guidelines, there is a need to critically analyse and understand the methodology before you can apply it to your practice. The steps I have outlined earlier demonstrate creating, understanding and applying evidence from research.

When I came to Australia, there were very different service needs to where I had come from. I came from a large tertiary teaching hospital in the United Kingdom with strong academic links and well established geriatric medicine services. There was at that time no geriatric medical service and I worked in the stroke unit but my goal was to develop geriatric medical services. I focused on research yet again at this point and one of the first research projects I conducted was looking at the Aged Care Assessment Team (ACAT). Community referrals to ACAT where the team determined that a routine review in the community for support services was required. We found that 44% of these clients presented acutely unwell to ED before that assessment. This highlighted that often functional decline in the elderly is indicative of illness rather than aging and...
“What a research culture means to me is facilitation of the smallest of projects up to externally funded grants and clinical trials. I think there is a risk if only the large, high level research is recognised and supported because that means only a few individuals in the whole country, in the whole world will be doing research and they would be developing a track record in areas that the population may not need.”

this unfortunately often goes unrecognised. When this research was presented, people became interested in geriatrics in the area and the service started to gain some traction. If you are going to recruit and retain health professionals, you need a department that has academic rigour.

We need to be demanding research on what the population health needs are, not repeatedly funding the same ideas.
“BioBanking” is the storing of tissue, blood products and health information for future research. ISLHD began biobanking in August 2014 in collaboration with the Centre for Oncology Education and Research Translation (CONCERT) based at the Ingham Institute associated with Liverpool Hospital.

CONCERT is a diverse consortium of 200+ professional members spanning all aspects of cancer research, diagnosis, treatment and care. CONCERT’s NSW institutional stakeholders include University of New South Wales, Western Sydney University, Ingham Institute for Applied Medical Research, South Western Sydney Local Health District, UOW, ISLHD and IHMRI. The principal investigator of the CONCERT Biobank project in ISLHD is Professor Morteza Aghmesheh, with patient consent and biospecimen preparation performed by NSWHP staff Ashleigh Splitt and Adam Stewart.

The biobanking project allows consenting patients, diagnosed with cancer, to participate by donating samples of tumour and adjacent normal tissue, blood and other relevant bodily fluids, which are taken during surgery. The biospecimens and information relevant to the patient’s cancer diagnosis are stored at the Ingham Institute for Applied Medical Research, based at Liverpool Hospital. Subject to approval processes these
specimens are then available for cancer research projects immediately and in the future.

“Since commencement in August 2014 a total of 80 patients have donated biosepcimens for tissue banking in ISLHD. Of these cases, 17 were Gastric Cancer (GCa), 43 were Head and Neck Cancers (HNCa) and 20 were Neurological (NRO).”

A total of 1417 biospecimens have been collected in ISLHD so far. Of these, 259 are fresh frozen and normal adjacent tissue, 1094 are blood and blood products, 32 are Formalin-Fixed Paraffin Embedded Tissue (FFPE), with 32 respective haematoxylin and eosin slides (H&E). 61% of participants were male and the majority were between the ages of 55 and 69.

The CONCERT Biobank has many affiliated ongoing research projects, with the CONCERT Biobank in ISLHD collecting additional samples for ‘Personalisation of systemic therapy in gastric cancer’ project, led by Dr Daniel Brungs, a CONCERT Clinical Fellow, Medical Oncologist and PhD Candidate (UOW) at Wollongong Hospital.

The CONCERT Biobank has recently received additional funding from Cancer Institute NSW to increase staffing levels in ISLHD. This will permit the rollout to other surgical specialties including colorectal surgery, increasing participant collection numbers in our district and building a valuable resource for future research.

Other enhancements under development include commissioning of tissue banking data base and management software that will integrate more detailed clinical data with the samples, further increasing their value to future research projects.

Presentations:

Brungs, D, Splitt, A, Ranson, M, Kang, S, Bell, G, Carolan, M & Aghmesheh, M (2016). Biobanking at a Regional Tertiary Hospital: Initial experience and analysis of barriers to patient consent, a poster presented at the 2016 annual scientific meeting of the Clinical Oncology Society of Australia in Gold Coast

The main objective of this study is to demonstrate the performance characteristics of the Magic Plate (MP) system when operated upstream of the patient in transmission mode (MPTM). The MPTM is an essential component of a real-time QA system designed for operation during radiotherapy treatment. Of particular interest is a quantitative study into the influence of the MP on the radiation beam quality at several field sizes and linear accelerator potential differences. The impact is measured through beam perturbation effects such as changes in the skin dose and/or percentage depth dose (PDD) (both in and out of field). The MP was placed in the block tray of a Varian linac head operated at 6, 10 and 18 MV beam energy. To optimize the MPTM operational setup, two conditions were investigated and each setup was compared to the case where no MP is positioned in place (i.e., open field): (i) MPTM alone and (ii) MPTM with a thin passive contamination electron filter. The in-field and out-of-field surface doses of a solid water phantom were investigated for both setups using a Markus plane parallel (Model N23343) and Attix parallel-plate, MRI model 449 ionization chambers. In addition, the effect on the 2D dose distribution measured by the Delta4 QA system was also investigated. The transmission factor for both of these MPTM setups in the central axis was also investigated. The transmission factor for both of these MPTM setups in the central axis was also investigated using a Farmer ionization chamber (Model 2571A) and an Attix ionization chamber. Measurements were performed for different irradiation field sizes of and . The change in the surface dose relative to was measured to be less than 0.5% for the 6 MV, 10 MV, and 18 MV energy beams. Transmission factors measured for both set ups (i & ii above) with 6 MV, 10 MV, and 18 MV at a depth of and a depth of 10 cm were all within 1.6% of open field. The impact of both the bare MPTM and the MPTM with 1 mm buildup on 3D dose distribution in comparison to the open field investigated using the Delta4 system and both the MPTM versions passed standard clinical gamma analysis criteria. Two MPTM operational setups were studied and presented in this article. The results indicate that both versions may be suitable for the new real-time megavoltage photon treatment delivery QA system under development. However, the bare MPTM appears to be slightly better suited of the two MP versions, as it minimally perturbs the radiation field and does not lead to any significant increase in skin dose to the patient.

While first-line palliative chemotherapy (CT1) improves survival and quality of life in advanced biliary cancer (ABC), there is no randomized evidence to support second-line chemotherapy (CT2) in ABC. We aim to explore the role of CT2 in ABC. We performed a retrospective review of all patients who received one or more lines of chemotherapy for ABC at four Australian cancer centres between 2008 and 2011. A Cox proportional hazard model was developed to determine the impact of clinicopathologic variables on overall survival (OS) from time of progression on CT1. We identified 73 patients who received palliative chemotherapy for ABC. Twenty-five patients (34%) received two or more lines of chemotherapy. Patients with a preserved performance status on progression on first-line chemotherapy (CT1) were more likely to receive second-line chemotherapy (CT2) (P < 0.001). Disease control rate with CT2 was 36%, and mean progression-free survival was 3.2 months (95% confidence interval 1.5–4.9 months). The following variables were significant in the univariate analysis of OS from time of progression on CT1: lines of chemotherapy (P = 0.0001), Eastern Cooperative Oncology Group performance status at progression on CT1 (P < 0.0001) and disease control with CT1 (P = 0.027). Lines of chemotherapy received and performance status remained significant in the multivariate analysis for OS from progression on CT1. Second-line chemotherapy is feasible in a subset of patients with ABC. Even after accounting for confounding variables, CT2 appears to increase OS in ABC, although we are unable to exclude other unmeasured factors such as tumor biology. These findings warrant further evaluation with prospective trials.
Gastric cancer is a significant global health problem. It is the fifth most common cancer and third leading cause of cancer-related death worldwide (Torre et al. in CA Cancer J Clin 65(2):87–108, 2015). Despite advances in treatment, overall prognosis remains poor, due to tumour relapse and metastasis. There is an urgent need for novel therapeutic approaches to improve clinical outcomes in gastric cancer. The cancer stem cell (CSC) model has been proposed to explain the high rate of relapse and subsequent resistance of cancer to current systemic treatments (Vermeulen et al. in Lancet Oncol 13(2):e83–e89, 2012). CSCs have been identified in many solid malignancies, including gastric cancer, and have significant clinical implications, as targeting the CSC population may be essential in preventing the recurrence and spread of a tumour (Dewi et al. in J Gastroenterol 46(10):1145–1157, 2011). This review seeks to summarise the current evidence for CSC in gastric cancer, with an emphasis on candidate CSC markers, clinical implications, and potential therapeutic approaches.

Treatment uncertainties in radiotherapy are either systematic or random. This study evaluates the sensitivity of fractionated intensity-modulated proton therapy (IMPT) lung treatments to systematic and random setup uncertainties. Treatments in which single-field homogeneity was restricted to within ±20% (IMPT20%) were compared to full IMPT (IMPTfull) for 10 patients with lung cancer. Four-dimensional Monte Carlo calculations were performed using patient computed tomography geometries with ±5 mm systematic or random setup uncertainties applied over a 35 x 2.5Gy(RBE) treatment course. Fifty fractionated courses were simulated for each patient using both IMPT delivery methods with random setup uncertainties applied each fraction and for 3 energy-dependent spot sizes (big spots, ≈18-9 mm; intermediate spots, ≈11-5 mm; and small spots, ≈4-2 mm). These results were compared to Monte Carlo recalculations of the original treatment plan assuming zero setup uncertainty. Results are presented as the difference in equivalent uniform dose (ΔEUD), V95 (ΔV95), and target dose homogeneity (ΔD1-D99). Over the whole patient cohort, the ΔEUD was 2.0 ± 0.5 (big spots), 1.9 ± 0.7 (intermediate spots), and 1.3 ± 0.4 (small spots) times more sensitive to 35 mm systematic setup uncertainties in IMPTfull compared to IMPT20%. IMPTfull is 1.9 ± 3.9 ± 0.9 (big spots), 2.1 ± 3.1 (intermediate spots), and 1.5 ± 0.6 (small spots) times more sensitive to random setup uncertainties than IMPT20% over a fractionated treatment course. The ΔV95 is at least 1.4 times more sensitive to systematic and random setup uncertainties for IMPTfull for all spot sizes considered. The ΔD1-D99 values coincided within uncertainty limits for both IMPT delivery methods for the 3 spot sizes considered, with higher mean values always observed for IMPTfull. The paired t-test indicated that variations observed between IMPTfull and IMPT20% were significantly different for the majority of scenarios. Significantly larger variations were observed in ΔEUD and ΔV95 in IMPTfull lung treatments in addition to higher mean ΔD1ΔD99. The steep intra-target dose gradients in IMPTfull make it more susceptible to systematic and random setup uncertainties.


Plane-parallel ionisation chambers are regularly used to conduct relative dosimetry measurements for therapeutic kilovoltage beams during commissioning and routine quality assurance. This paper presents the first quantification of the polarity effect in kilovoltage photon beams for two types of commercially available plane-parallel ionisation chambers used for such measurements. Measurements were performed at various depths along the central axis in a solid water phantom and for different field sizes at 2 cm depth to determine the polarity effect for PTW Advanced Markus and Roos ionisation chambers (PTW-Freiburg, Germany). Data was acquired for kilovoltage beams between 100 kVp (half-value layer (HVL) = 2.88 mm Al) and 250 kVp (HVL = 2.12 mm Cu) and field sizes of 3-15 cm diameter for 30 cm focus-source distance (FSD) and 4 x 4 cm2-20 x 20 cm2 for 50 cm FSD. Substantial polarity effects, up to 9.6%, were observed for the Advanced Markus chamber compared to a maximum 0.5% for the Roos chamber. The magnitude of the polarity effect was observed to increase with field size and beam energy but was consistent with depth. The polarity effect is directly influenced by chamber design, with potentially large polarity effects for some plane-parallel ionisation chambers. Depending on the specific chamber used, polarity corrections may be required for output factor measurements of kilovoltage photon beams. Failure to account for polarity effects could lead to an incorrect dose being delivered to the patient.

Patient-reported outcome (PRO) measures have been used widely to screen for depression, anxiety, and symptoms in cancer patients. Computer-based applications that collect patients’ responses and transfer them to the treating health professional in real time have the potential to improve patient well-being and cancer outcomes. Objective: This study will test the feasibility and acceptability of a newly developed eHealth system which facilitates PRO data capture from cancer patients, data linkage and retrieval to support clinical decisions and patient self-management, and data retrieval to support ongoing evaluation and innovative research. Methods: The eHealth system is being developed in consultation with 3 overarching content-specific expert advisory groups convened for this project: the clinical advisory group, technical advisory group, and evaluation advisory group. The following work has already been completed during this phase of the study: the Patient-Reported Outcome Measures for Personalized Treatment and Care (PROMPT-Care) eHealth system was developed, patient-reported outcomes were selected (distress, symptoms, unmet needs), algorithms to inform intervention thresholds for clinical and self-management were determined, clinician PRO feedback summary and longitudinal reports were designed, and patient self-management resources were collated. PROsaig, a custom information technology system, will transfer PRO data in real time into the hospital-based oncology information system to support clinical decision making. The PROMPT-Care system feasibility and acceptability will be assessed through patients completing PROMPT-Care assessments, participating in faceto-face cognitive interviews, and completing evaluation surveys and telephone interviews and oncology staff participating in telephone interviews. Results: Over the course of 3 months, the system will be pilot-tested with up to 50 patients receiving treatment or follow-up care and 6 oncology staff at 2 hospitals in New South Wales, Australia. Data will be collected to determine the accuracy and completeness of data transfer procedures, extent of missing data from participants’ assessments, acceptability of the eHealth system and usefulness of the self-management resources (via patient evaluation surveys and interviews), and acceptability and perceived usefulness of realtime PRO reporting (via oncology staff interviews) at the completion of the pilot phase. Conclusions: This research investigates implementation of evidence into real world clinical practice through development of an efficient and user-friendly eHealth system. This study of feasibility and acceptability of the newly developed eHealth system will inform the next stage of larger scale testing and future implementation of the system as part of routine care.


Nodal metastasis from cutaneous squamous cell carcinoma (SCC) is poorly predicted clinically and is associated with a high mortality rate. From 2010 to 2013, patients with high-risk cutaneous SCC were assessed with sentinel node biopsy (SNB) either at the time of primary cutaneous tumor resection or at secondary wide local excision. Of 57 patients, 8 (14%) had nodal metastasis. Significant predictors of metastasis are the number of high-risk factors (p = .008), perineural invasion (PNI; p = .05), and lymphovascular invasion (LVI; p = .05). During a mean of 19.4 months, 9 patients developed recurrence and 6 died of cutaneous SCC, indicating that over 1300 patients would be required for a randomized controlled trial with 80% power to detect a significant difference in disease-free survival.
Lymph node metastasis occurs in 14% of patients with high-risk cutaneous SCC. Larger studies will be required to identify which “high-risk” factors should be considered as an indication for surgical assessment of the nodal basin.


Stereotactic body radiation therapy (SBRT) aims to deliver a highly conformal ablative dose to a small target. Dosimetric verification of SBRT for lung tumors presents a challenge due to heterogeneities, moving targets, and small fields. Recent software (M3D) designed for dosimetric verification of lung SBRT treatment plans using an advanced convolution-superposition algorithm was evaluated. Ten lung SBRT patients covering a range of tumor volumes were selected. 3D CRT plans were created using the XiO treatment planning system (TPS) with the superposition algorithm. Dose was recalculated in the Eclipse TPS using the AAA algorithm, M3D verification software using the collapsed-cone-convolution algorithm, and in-house Monte Carlo (MC). Target point doses were calculated with RadCalc software. Near-maximum, median, and near-minimum target doses, conformity indices, and lung doses were compared with MC as the reference calculation. M3D 3D gamma passing rates were compared with the XiO and Eclipse. Wilcoxon signed-rank test was used to compare each calculation method with XiO with a threshold of significance of p<0.05. M3D and RadCalc point dose calculations were greater than MC by up to 7.7% and 13.1%, respectively, with M3D being statistically significant (s.s.). AAA and XiO calculated point doses were less than MC by 11.3% and 5.2%, respectively (AAA s.s.). Median and near-minimum and near-maximum target doses were less than MC when calculated with AAA and XiO (all s.s.). Near-maximum and median target doses were higher with M3D compared with MC (s.s.), but there was no difference in near-minimum M3D doses compared with MC. M3D-calculated ipsilateral lung V20 Gy and V5 Gy were greater than that calculated with MC (s.s.); AAA- and XiO-calculated V20 Gy was lower than that calculated with MC, but not statistically different to MC for V5 Gy. Nine of the 10 plans achieved M3D gamma passing rates greater than 95% and 80% for 5%/1 mm and 3%/1 mm criteria, respectively, M3D typically calculated a higher target and lung dose than MC for lung SBRT plans. The results show a range of calculated doses with different algorithms and suggest that
M3D is in closer agreement with Monte Carlo, thus discrepancies between the TPS and M3D software will be observed for lung SBRT plans. M3D provides a useful supplement to verification of lung SBRT plans by direct measurement, which typically excludes patient specific heterogeneities.

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Testing for mismatch repair (MMR) status in colorectal cancer (CRC) may provide useful prognostic and predictive information. We evaluated the impact of such testing on real-world practice regarding adjuvant chemotherapy for patients with resected CRC. A total of 175 patients with stage II and III mismatch repair-deficient (MMRD) CRC were identified from an Australian population-based study of incident CRCs. Their treatment decisions were compared with those for a cohort of 773 stage-matched patients with mismatch repair-proficient (MMRP) CRCs. The effect of MMR status, age, and pathologic characteristics on treatment decisions was determined using multiple regression analysis. Overall, 32% of patients in stage II and 71% of patients in stage III received adjuvant chemotherapy. Among the stage II patients, those with MMRD cancer were less likely to receive chemotherapy than were MMRP cases (15% vs. 38%; p < .0001). In this group, the treatment decision was influenced by age, tumor location, and T stage. MMR status influenced the treatment decision such that its impact diminished with increasing patient age. Among patients with stage III tumors, no difference was found in the chemotherapy rates between the MMRD and MMRP cases. In this group, age was the only significant predictor of the treatment decision. The findings of this study suggest that knowledge of the MMR status of sporadic CRC influences treatment decisions for stage II patients, in an era when clear recommendations as to how these findings should influence practice are lacking.

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An elevated beta-hCG level (Beta subunit of human chorionic gonadotropin) in a non-pregnant woman raises the suspicion of a germ cell tumour especially choriocarcinoma. Paraneoplastic syndrome involving beta-hCG secretion in other malignancies can be easily overlooked. We encountered a case in which the patient was found to have an elevated beta-hCG level and the clinical diagnosis was further confounded by the finding of a pelvic mass. A 50-year-old post-menopausal woman with a history of smoking was found to have a high beta-hCG level (128 IU/L) during investigation following motor vehicle accident. Pelvic ultrasound at that time showed no evidence of intrauterine or ectopic pregnancy and no tumour. CT scan of the chest showed a 3 mm nodule in the right middle lobe. No other tumour markers were elevated. Within three months, serum beta-hCG level rose up to 1206 IU/L, and CT scan and PET scan showed multiple lesions in lungs, mediastinum, liver, left pelvis, bone and right adrenal gland. Subsequent biopsy of the left pelvic mass showed an adenocarcinoma with DPAS-positive cytoplasmic vacuoles and positive expression of pan-cytokeratin, CK7 and TTF-1. Beta-HCG was diffusely positive in the malignant cells as well as in background stroma. PLAP, CD117, CD30, AFP, CK20, CDX-2, PAX-8, ER, PR, P63 and WT-1 were negative. Overall features were consistent with a metastasizing pulmonary adenocarcinoma with paraneoplastic beta-hCG secretion. The possibility of sampling limitation of a somatic malignancy arising from mixed germ cell tumour was considered but there were no pelvic tumour identified in initial presentation and no evidence of germ cell tumour in the biopsy sample.

The pursuit of real-time image guided radiotherapy using optimal tissue contrast has seen the development of several hybrid magnetic resonance imaging (MRI)-treatment systems, high field and low field, and inline and perpendicular configurations. As part of a new MRI-linac program, an MRI scanner was integrated with a linear accelerator to enable investigations of a coupled inline MRI-linac system. This work describes results from a prototype experimental system to demonstrate the feasibility of a high field inline MR-linac. The magnet is a 1.5 T MRI system (Sonata, Siemens Healthcare) was located in a purpose built radiofrequency (RF) cage enabling shielding from and close proximity to a linear accelerator with inline (and future perpendicular) orientation. A portable linear accelerator (Linatron, Varian) was installed together with a multileaf collimator (Millennium, Varian) to provide dynamic field collimation and the whole assembly built onto a stainless-steel rail system. A series of MRI-linac experiments was performed to investigate (1) image quality with beam on measured using a macropodine (kangaroo) ex vivo phantom; (2) the noise as a function of beam state measured using a 6-channel surface coil array; and (3) electron contamination effects measured using Gafchromic film and an electronic portal imaging device (EPID). (1) Image quality was unaffected by the radiation beam with the macropodine phantom image with the beam on being almost identical to the image with the beam off. (2) Noise measured with a surface RF coil produced a 25% elevation of background intensity when the radiation beam was on. (3) Film and EPID measurements demonstrated electron focusing occurring along the centerline of the magnet axis. A proof-of-concept high-field MRI-linac has been built and experimentally characterized. This system has allowed us to establish the efficacy of a high field inline MRI-linac and study a number of the technical challenges and solutions.

Previously, the E-R relationship of RAM in pts with gastric cancer in the second line setting has been reported. The subject of this report is the E-R relationship of RAM in pts with advanced colorectal cancer from the RAISE trial. Pts received RAM (8 mg/kg) q2w plus FOLFIRI or placebo (PL) q2w plus FOLFIRI in RAISE. Nine-hundred and six pts (85% of the ITT population) were evaluable for E-R analysis. Pharmacokinetic (PK) samples were collected; a population PK analysis was conducted. A model-predicted minimum concentration at steady state (Cmin,ss) was used for correlation with efficacy and safety variables. RAM treated pts were categorized into 4 quartiles according to the Cmin,ss level. Kaplan-Meier analysis, Cox regression, ordered categorical and logistic regression analyses were performed to evaluate E-R relationships. RAM was safe and effective at 8 mg/kg q2w in combination with FOLFIRI. Exposure-response analyses based on pk data suggest higher RAM exposures were associated with longer PFS and OS, smaller hazard ratios, and potentially increased neutropenia. Similar findings have been reported in the gastric cancer trials with RAM (Tabernero J et al. J Clin Oncol 33, 2015, suppl 3; abstr 121).


To improve quality and personalization of oncology health care, decision aid tools are needed to advise physicians and patients. The aim of this work is to demonstrate the clinical relevance of a survival prediction model as a first step to multi institutional rapid learning and compare this to a clinical trial dataset. Data extraction and mining tools were used to collect uncurated input parameters from Illawarra Cancer Care Centre’s (clinical cohort) oncology information system. Prognosis categories previously established from the Maastricht Radiation Oncology (training cohort) dataset, were applied to the clinical cohort and the radiotherapy only arm of the RTOG-9111 (trial cohort). Data mining identified 125 laryngeal carcinoma patients, ending up with 52 patients in the clinical cohort who were eligible to be evaluated by the model to predict 2-year survival and 177 for the trial cohort. The model was able to classify patients and predict survival in the clinical cohort, but for the trial cohort it failed to do so. The technical infrastructure and model is able to support the prognosis prediction of laryngeal carcinoma patients in a clinical cohort. The model does not perform well for the highly selective patient population in the trial cohort.

Miller, A. A. (2016). The Informatics of the Planning Target Volume-why it cannot and should not be changed. Journal of Radiation Oncology Informatics, 8(1), 1-9. The ICRU defined the Planning Target Volume (PTV) as a static and geometrical volume in 1993. Radiation oncologists continue to manually alter PTVs in their daily practice when critical organs at risk (OAR) are too close to high dose PTVs. This practice is examined and shown to be non-standard (defies the ICRU definitions), inaccurate (all DVHs look perfect when the plan is manifestly NOT perfect), and useless for outcomes research (automatically analysed DVHs will find situations where the PTV_unaltered overlaps the OAR_unaltered, but will fail to find situations where an OAR_unaltered would be overlapped by a PTV_unaltered, but is not overlapped by a PTV_altered.


A prediction model (M4) can successfully classify PUL into low and high risk groups. We aim to externally validate the M4 model in classifying women in a non-UK population, into low and high risk pregnancies of unknown location (PULs). Methods: A retrospective analysis of
women classified with PUL attending a Sydney-based teaching hospital between June 2006 and March 2016. PUL was defined as nil signs of intra- or extra-uterine pregnancy on transvaginal ultrasound (TVS). The reference standard was the final characterisation of PUL as failed PULs or intra-uterine pregnancies (IUPs) (low risk), or as ectopic pregnancies (EPs) (high risk). M4 is a multinomial logistic regression model based on the serum human chorionic gonadotrophin (hCG) levels at presentation and 48 h later. This model was applied to each PUL and the estimated risks of failed PULs, IUPs or EPs were recorded. In the event that M4 classified women to have an EP risk ≥ 5%, then these women were classified high risk. Results: 8360 consecutive women underwent TVS and 7.94% (664/8360) women were classified with a PUL. 57 women were excluded due to incomplete data. The final diagnoses were 64.4% (391/607) failed PULs, 23.5% (143/607) IUPs and 12% EPs (73/607; includes EPs and persisting PULs). 454 were considered low risk of which 397 (87.4%) were failed PULs or IUPs and 22 were EPs. 67% (49/73) of the EPs were considered high risk. The M4-based protocol classified 17.6% of failed PUL, 31% of IUP and 69% of EP as at high risk. For all PUL this protocol classified 69% of PUL as at low risk, and amongst these 95% were indeed failed PUL or IUP. Thus, of PUL classified as at low risk using M4, about 1 in 19 would be an EP. Conclusions: We have externally validated prediction model M4 which classified around 69% of PULs as low risk, of which around 95% were later characterised as failed PULs or IUPs, while still classifying 69% of EPs as high risk.


The RAISE phase III clinical trial demonstrated that ramucirumab + FOLFIRI improved overall survival (OS) [hazard ratio (HR) = 0.844, P = 0.0219] and progression-free survival (PFS) (HR = 0.793, P < 0.0005) compared with placebo + FOLFIRI for second-line metastatic colorectal carcinoma (mCRC) patients previously treated with first-line bevacizumab, oxaliplatin, and a fluoropyrimidine. Since some patient or disease characteristics could be associated with differential efficacy or safety, prespecified subgroup analyses were undertaken. This report focuses on three of the most relevant ones: KRAS status (wild-type versus mutant), age (<65 versus ≥ 65 years), and time to progression (TTP) on first-line therapy (<6 versus ≥ 6 months). OS and PFS were evaluated by the Kaplan–Meier analysis, with HR determined by the Cox proportional hazards model. Treatment-by-subgroup interaction was tested to determine whether treatment effect was consistent between subgroup pairs. Patients with both wild-type and mutant KRAS benefited from ramucirumab + FOLFIRI treatment over placebo + FOLFIRI (interaction P = 0.526); although numerically, wild-type KRAS patients benefited more (wild-type KRAS: median OS = 14.4 versus 11.9 months, HR = 0.82, P = 0.049; mutant KRAS: median OS = 12.7 versus 11.3 months, HR = 0.89, P = 0.263). Patients with both longer and shorter first-line TTP benefited from ramucirumab (interaction P = 0.9434), although TTP <6 months was associated with poorer OS (TTP ≥ 6 months: median OS = 14.3 versus 12.5 months, HR = 0.86, P = 0.061; TTP <6 months: median OS = 10.4 versus 8.0 months, HR = 0.86, P = 0.276). The subgroups of patients ≥ 65 years versus <65 years also derived a similar ramucirumab survival benefit (interaction P = 0.9521) (≥ 65 years: median OS = 13.8 versus 11.7 months, HR = 0.85, P = 0.156; <65 years: median OS = 13.1 versus 11.9 months, HR = 0.86, P = 0.098). The safety profile of ramucirumab + FOLFIRI was similar across subgroups. These analyses revealed similar efficacy and safety among patient subgroups with differing KRAS mutation status, longer or shorter first-line TTP, and age. Ramucirumab is a beneficial addition to second-line FOLFIRI treatment for a wide range of patients with mCRC.


To report on significant dose enhancement effects caused by magnetic fields aligned parallel to 6 MV photon beam radiotherapy of small lung tumors. Findings are applicable to future inline MRI-guided radiotherapy systems. A total of eight clinical lung tumor cases were recalculated using Monte Carlo methods, and external magnetic fields of 0.5, 1.0, and 3 T were included to observe the impact on dose to the planning target volume
(PTV) and gross tumor volume (GTV). Three plans were 6 MV 3D-CRT plans while 6 were 6 MV IMRT. The GTV’s ranged from 0.8 to 16 cm³, while the PTV’s ranged from 1 to 59 cm³. In addition, the dose changes in a 30 cm diameter cylindrical water phantom were investigated for small beams. The central 20 cm of this phantom contained either water or lung density insert. For single beams, an inline magnetic field of 1 T has a small impact in lung dose distributions by reducing the lateral scatter of secondary electrons, resulting in a small dose increase along the beam. Superposition of multiple small beams leads to significant dose enhancements. Clinically, this process occurs in the lung tissue typically surrounding the GTV, resulting in increases to the D98% (PTV). Two isolated tumors with very small PTVs (3 and 6 cm³) showed increases in D98% of 23% and 22%. Larger PTVs of 13, 26, and 59 cm³ had increases of 9%, 6%, and 4%, describing a natural fall-off in enhancement with increasing PTV size. However, three PTVs bounded to the lung wall showed no significant increase, due to lack of dose enhancement in the denser PTV volume. In general, at 0.5 T, the GTV mean dose enhancement is around 60% lower than that at 1 T, while at 3 T, it is 5%-60% higher than 1 T. Monte Carlo methods have described significant and predictable dose enhancement effects in small lung tumor plans for 6 MV radiotherapy when an external inline magnetic field is included. Results of this study indicate that future clinical inline MRI-guided radiotherapy systems will be able to deliver a dosimetrically superior treatment to small (PTV < 15 cm³), isolated lung tumors over non-MRI-Linac systems. This increased efficacy coincides with the reimbursement in the United States of lung CT screening and the likely rapid growth in the number of patients with small lung tumors to be treated with radiotherapy.


Modern stereotactic radiation therapy modalities utilize small beams and large dose gradients to deliver radiation in few fractions, reducing the possibility to correct for mistakes during the treatment process. Therefore, in order to ensure best possible treatment for the patient, quality assurance for such treatments necessitates a stable, linear, and sensitive radiation detector with high spatial resolution and radiation hardness. In this work, two silicon detector arrays with high spatial resolution have been characterized by 6 MV and 18 MV medical LINAC irradiation, and 5.5 MeV He2+ heavy ion microprobe. A maximum discrepancy of 0.6 mm in field size has been found when comparing to two-dimensional radiochromic film dose profile, and charge collection efficiency obtained by means of ion beam induced charge collection (IBICC) is 66% when operating the array in photovoltaic mode. Radiation damage study by photons and photoneutrons is presented.


Pembrolizumab is a humanized monoclonal antibody against programmed death 1 (PD-1) that has antitumor activity in advanced non-small-cell lung cancer (NSCLC), with increased activity in tumors that express programmed death ligand 1 (PD-L1). In this open-label, phase 3 trial, we randomly assigned 305 patients who had previously untreated advanced NSCLC with PD-L1 expression on at least 50% of tumor cells and no sensitizing mutation of the epidermal growth factor receptor gene or translocation of the anaplastic lymphoma kinase gene to receive either pembrolizumab (at a fixed dose of 200 mg every 3 weeks) or the investigator’s choice of platinum-based chemotherapy. Crossover from the chemotherapy group to the pembrolizumab group was permitted in the event of disease progression. The primary end point, progression-free survival, was assessed by means of blinded, independent, central radiologic review. Secondary end points were overall survival, objective response rate, and safety. Median progression-free survival was 10.3 months (95% confidence interval [CI], 6.7 to not reached) in the pembrolizumab group versus 6.0 months (95% CI, 4.2 to 6.2) in the chemotherapy group (hazard ratio for disease progression or death, 0.50; 95% CI, 0.37 to 0.68; P<0.001). The estimated rate of overall survival at 6 months was 80.2% in the pembrolizumab group versus 72.4% in the chemotherapy group (hazard ratio for death, 0.60; 95% CI, 0.41 to 0.89;
The response rate was higher in the pembrolizumab group than in the chemotherapy group (44.8% vs. 27.8%), the median duration of response was longer (not reached [range, 1.9+ to 14.5+ months] vs. 6.3 months [range, 2.1+ to 12.6+]), and treatment-related adverse events of any grade were less frequent (occurring in 73.4% vs. 90.0% of patients), as were grade 3, 4, or 5 treatment-related adverse events (26.6% vs. 53.3%). In patients with advanced NSCLC and PD-L1 expression on at least 50% of tumor cells, pembrolizumab was associated with significantly longer progression-free and overall survival and with fewer adverse events than was platinum-based chemotherapy.


The present study investigated the relationship between two goal-related appraisals – perceived cancer-related interference and perceived attainability of important personal goals – and psychological distress among non-metastatic breast cancer patients across the short-term treatment and recovery period. Forty-five women completed self-report questionnaires at approximately 1 and 6 months following surgery. A mixed idiographic-nomothetic goal methodology assessed perceived cancer-related interference and attainability of self-generated important personal goals. Psychological distress symptoms were assessed with the Depression Anxiety Stress Scales short form. Correlation analyses and general linear modelling were used to evaluate the hypothesised relationships over time. Average cancer-related interference and attainability of important personal goals were significantly associated with concurrent depression, anxiety and stress symptoms at 6 months following surgery. Perceived attainability of highly important goals at 6 months post-surgery uniquely predicted change in psychological distress symptoms over time. The findings suggest that low perceived attainability of important personal goals may be an important predictor of elevated distress symptoms across the short-term following surgery. Further insight into the relationship between these negative goal appraisals and psychological functioning among different groups of cancer patients could inform the provision of targeted psychosocial support.

Leap forward for Lung Cancer Patients

One of ISLHD’s very own clinicians, Dr Ali Tafreshi, is leading the leap forward for lung cancer patients with his research collaborators, making an international impact. Ali has been collaborating with researchers from around the world, on a clinical trial examining the effectiveness of different cancer treatments for a specific type of lung cancer. The research has recently been presented at the ESMO (European Society of Medical Oncology) conference and Ali is a co-author of the paper published in The New England Journal of Medicine. This journal is not only noted as one of the most prestigious peer-reviewed medical journals in the world, coming in with an impact factor of nearly 60, but is also recognised as the oldest continuously published journal, commencing in 1812. Some researchers wait a lifetime to have their research published in such an esteemed journal, and as such is a notable achievement worthy of high praise.

Dr Ali Tafreshi is a staff specialist medical oncologist working out of the Illawarra Cancer Care Centre.
and Shoalhaven Cancer Care Centre’s, and Wollongong Private Hospital. His expertise lies in a range of areas including lung cancer, and his experience spans across several prominent cancer centres including Olivia Newton-John Cancer and Wellness Centre, Monash Medical centre and St. Vincent’s. In addition to his clinical work, Ali is extensively involved in research and is currently the lead and co-investigator of several international clinical trials. On top of all of this, it appears Ali has an adventurous side, recently climbing Mt Kilimanjaro to raise awareness and funds for cancer research!

142 sites across 16 countries, including Australia took part in the clinical trial, with Wollongong recognised as having one of the highest recruitment numbers out of all of the sites internationally. The results of the clinical trial showed that a specific group of lung cancer patients treated with Pembrolizumab, a novel immunotherapy agent, had higher response rate, longer progression-free and overall survival, as well as fewer treatment-related adverse events, than patients receiving standard chemotherapy regimens.

“It’s a great time to be a medical oncologist and looking after cancer patients, medical oncology is one of most rapidly evolving fields in medicine”. Dr Tafreshi states that research and clinical trials are important tools to help us in our fight against different cancers, however “not every trial ends with practice changing treatments”. Whilst this is a distinguished achievement, Dr Tafreshi is continuously humbled by his patients. “It is impossible to run trials without patients, and their families’ dedication. Even if there is no guarantee the new treatment is going to benefit them, a lot of times they have philanthropic approach and if they know it could be beneficial for others they just go for it.”

On behalf of the ISLHD, Research Central would like to congratulate Dr Tafreshi, his team, and his collaborators on their research success. The results of this study highlight the importance of clinical research for providing the best care for our patients.

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Metastatic basal cell carcinoma is exceedingly uncommon, with a poorly defined natural history, and its incidence, risk factors, patterns of spread, prognosis and potential treatment options are not well understood. This retrospective single institution case series aims to shed light on these issues. Aggressive local management in patients with locoregional disease may result in long-term survivors.

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Tyler, M. K. (2016). Quantification of interplay and gradient effects for lung stereotactic ablative radiotherapy (SABR) treatments. Journal of Applied Clinical Medical Physics, 17(1), 158-166. doi: 10.1120/jacmp.v17i1.5781

This study quantified the interplay and gradient effects on GTV dose coverage for 3D CRT, dMLC IMRT, and VMAT SABR treatments for target amplitudes of 5-30 mm using 3DVH v3.1 software incorporating 4D Respiratory MotionSim (4D RMS) module. For clinically relevant motion periods (5 s), the interplay effect was small, with deviations in the minimum dose covering the target volume (D99%) of less than ± 2.5% for target amplitudes up to 30 mm. Increasing the period to 60 s resulted in interplay effects of up to ± 15.0% on target D99% dose coverage. The gradient effect introduced by target motion resulted in deviations of up to 3 3.5% in D99% target dose coverage. VMAT treatments showed the largest deviation in dose metrics, which was attributed to the long delivery times in comparison to dMLC IMRT. Retrospective patient analysis indicated minimal interplay and gradient effects for patients treated with dMLC IMRT at the NCCI.

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Flattening filter-free (FFF) beams are becoming the preferred beam type for stereotactic radiosurgery (SRS) and stereotactic ablative radiation therapy (SABR), as they enable an increase in dose rate and a decrease in treatment time. This work assesses the effects of the flattening filter on small field output factors for 6 MV beams generated by both Elekta and Varian linear accelerators, and determines differences between detector response in flattened (FF) and FFF beams. Relative output factors were measured with a range of detectors (diodes, ionization chambers, radiochromic film, and microDiamond) and referenced to the relative output factors measured with an air core fiber optic dosimeter (FOD), a scintillation dosimeter developed at Chris O’Brien Lifehouse, Sydney. Small field correction factors were generated for both FF and FFF beams. Diode measured detector response was compared with a recently published mathematical relation to predict diode response corrections in small fields. The effect of flattening filter removal on detector response was quantified using a ratio of relative detector responses in FFF and FF fields for the same field size. The removal of the flattening filter was found to have a small but measurable effect on ionization chamber response with maximum deviations of less than 3.0% across all field sizes measured. Solid-state detectors showed an increased dependence on the flattening filter of up to 3.16%. Measured diode response was within ±1.1% of the published mathematical relation for all fields up to 30 mm, independent of linac type and presence or absence of a flattening filter. For 6 MV beams, detector correction factors between FFF and FF beams are interchangeable for a linac between FF and FFF modes, providing that an additional uncertainty of up to ±1.6% is accepted.


Simulations of clinical proton radiotherapy treatment plans using general purpose Monte Carlo codes have been proven to be a valuable tool for basic research and clinical studies. They have been used to benchmark dose calculation methods, to study radiobiological effects, and to develop new technologies such as in vivo range verification methods. Advancements in the availability of computational power have made it feasible to perform such simulations on large sets of patient data, resulting in a need for automated and consistent simulations. A framework called MCAUTO was developed for this purpose. Both passive scattering and pencil beam scanning delivery are supported. The code handles the data exchange between the treatment planning system and the Monte Carlo system, which requires not only transfer of plan and imaging information but also translation of institutional procedures, such as output factor definitions. Simulations are performed on a high-performance computing infrastructure. The simulation methods were designed to use the full capabilities of Monte Carlo physics models, while also ensuring consistency in the approximations that are common to both pencil beam and Monte Carlo dose calculations. Although some methods need to be tailored to institutional planning systems and procedures, the described procedures show a general road map that can be easily translated to other systems.


MRI-linac therapy is a rapidly growing field, and requires that conventional linear accelerators are operated with the fringe field of MRI magnets. One of the most sensitive accelerator components is the electron gun, which serves as the source of the beam. The purpose of this work was to develop a validated finite element model (FEM) model of a clinical triode (or gridded) electron gun, based on accurate geometric and electrical measurements, and to characterize the performance of this gun in magnetic fields. The geometry of a Varian electron gun was measured using 3D laser scanning and digital calipers. The electric potentials and emission current of these guns were measured directly from six dose matched true beam linacs for the 6X, 10X, and 15X modes of operation. Based on these measurements, a finite element model (FEM) of the gun was developed using the commercial software opera/scala. The performance of the FEM model in magnetic fields was characterized using parallel fields ranging from 0 to 200 G in the in-line direction, and 0-35 G in the perpendicular direction. The FEM model matched the average measured emission current to within 5% across all three modes of operation. Different high voltage
settings are used for the different modes; the 6X, 10X, and 15X modes have an average high voltage setting of 15, 10, and 11 kV. Due to these differences, different operating modes show different sensitivities in magnetic fields. For in line fields, the first current loss occurs at 40, 20, and 30 G for each mode. This is a much greater sensitivity than has previously been observed. For perpendicular fields, first beam loss occurred at 8, 5, and 5 G and total beam loss at 27, 22, and 20 G. A validated FEM model of a clinical triode electron gun has been developed based on accurate geometric and electrical measurements.
In 2016, Dr Oborn continued his work on MRI proton therapy and MRI linac that was showcased in the 2015 Annual Research Report. The article below is a reflection of how Dr Oborn became involved in the field and where he sees the technology moving in terms of clinical applications and useful methods of undertaking this important research.

MRI guided radiotherapy concepts were starting to evolve in 2004, around the same time I completed my Masters by Research degree at the Centre for Medical Radiation Physics. That project was in collaboration with the Illawarra Cancer Care Centre (ICCC), I decided to pursue that as a PhD topic, so I modelled skin doses in magnetic fields and the implications for MRI guided therapy.

After I completed my PhD, I had a decision to make; do I go into a clinical or research position? What had happened in the last 5 years is that Australia has a program to realise MRI guided radiotherapy through the Australian MRI Linac project at the Ingham Institute (Liverpool) led by Professor Paul Keall at Sydney University. During that time, Dr Martin Carolan had faith in the potential in the area and had created a research position within ICCC, so I pursued that opportunity. Through the Australian MRI-linac Program grant I received some funding to study various aspects of MRI-guided radiotherapy. My time in this position is approximately 50% modelling MRI guided radiotherapy concepts, 25% X-rays and 25% MRI-guided proton therapy.

In 2016 I was successful in obtaining a research contract with the Belgian company IBA (Ion Beam Applications), the worlds largest supplier of proton therapy systems. This funds 25% of my time to work on modelling the integration of a proton therapy system with an MRI-scanner. Also in 2016 we received notice that the Australian MRI-linac program NHMRC grant was succesful in renewal for 2018-2022 ($7M). Thus the link between ICCC and Liverpool will continue.

Illawarra CCC is a natural collaborator (CONCERT etc) of Liverpool and the MRI-linac Program. The future of the work will continue through simulations and modelling of the dosimetry of the MRI-linac system as well as the integration.

In the long term ICCC could benefit from access to clinical trials associated with world-first MRI-guided radiotherapy treatment for specific cancer types/locations. Cancer sites which would benefit from MRI guidance include those that are mobile, such as lung, abdomen, liver, and some head and neck cancers.

We expect a further 12 months of research and development before the generation-1 system is ready for any clinical trials. The first clinical trials would be non-dynamic cases such as brain and prostate. With confidence the more challenging dynamic tumors would be treated next. It could be expected that patients within Australia may start to benefit fully from MRI-guided radiotherapy within about 2-3 years.
Australia and New Zealand have the highest rates of melanoma in the world. More than 12,000 people are diagnosed every year. It is the third most common cancer in both men and women and the incidence is increasing rapidly worldwide. In this Phase 3, placebo study for patients with late stage [StgIIIb to IVM1c] melanoma, we are using a combination of standard of care Pembrolizumab [also known as keytruda] an anti-pd1 immune checkpoint inhibitor, with talimogene laherparepvec [TVEC] or placebo. TVEC is a genetically modified herpes simplex 1 virus which is administered via intralesional injection directly into the melanoma. The virulence factors have been removed so that the virus replicates specifically in tumour cells. When it replicates it releases a lot of tumour derived antigen which activates the T cells. In the genetically modified virus there is a little cassette of GCSF and that stimulates antigen presentation. The hope is that when we combine an anti-pd1 with TVEC we will get more tumour kill. The primary objective of the study is to evaluate the efficacy of TVEC with pembrolizumab versus placebo with pembrolizumab, as assessed by progression free survival and overall survival.

Although many patients with hormone receptor positive (HR+), human epidermal growth factor receptor 2 negative (HER-) breast cancer may be cured of their disease with optimal local and systemic therapy, a significant number of patients with stage II and stage III disease will experience disease recurrence. Methods to improve efficacy of endocrine therapy and delay the onset of resistance are needed. Some oestrogen receptor positive breast cancers biologically may demonstrate features suggestive of sensitivity to CDK4/6 inhibition with agents such as palbociclib. Given the demonstrated activity and safety of palbociclib in the first line treatment of metastatic Hormone receptor positive and HER2-ve breast cancer there is interest in whether the benefits of CDK4/6 inhibition may translate into the adjuvant setting. This is a prospective, 2 arm, international, multicentre, randomised, open-label, Phase 3 study evaluating the addition of 2 years of palbociclib to standard adjuvant endocrine therapy for patients with HR+/HER2- early breast cancer.

Advanced biliary cancer is a rare but highly lethal cancer and most patients have a rapid decline in performance status with disease progression. This results in a limited pool of patients available for second line chemotherapy trials. This pilot study sought to answer two questions: firstly, was there an available patient population to adequately determine the efficacy/safety of NAB-paclitaxel and capecitabine in second line treatment; secondly, is doublet chemotherapy a suitable investigational treatment in this patient population. This is an investigator initiated, national trial with Professor Aghmesheh and Dr Daniel Brungs responsible for the study design and conduct. Five NSW Health sites are involved in the recruitment of study participants. The pilot study successfully recruited 10 patients within the planned recruitment time and showed that treatment was safe and tolerable. Two patients (from the target 10) remain on treatment. Progression free and overall survival results are pending.

Head and neck cancer describes a range of tumours that arise in the head and neck region including the oral cavity, pharynx, larynx, nasal cavity, paranasal sinuses and salivary glands. The worldwide incidence exceeds half a million cases annually, ranking it as the fifth most common cancer worldwide. Patients with locally recurrent...
and metastatic head and neck cancer present a therapeutic challenge with generally quite poor prognosis. This is a randomised active controlled, multi-site, open-label trial of pembrolizumab (keytruda) versus standard of care in patients with advanced head and neck cancer. The primary objective in this study is to compare the overall survival of patients with recurrent/metastatic head and neck cancer treated with pembrolizumab compared to standard treatment. ISLHD acted as lead site in the National Mutual Acceptance for this study.

OPAL

Stephen Dunn
Carly Leighton

Lung cancer is one of eight national health research priority cancer areas with patients often experiencing poorer prognosis, more severe physical effects and more pronounced psychosocial distress. One of the key open sources of personalised support for cancer patients is the Cancer Helpline in each state. However, lung cancer patients are under-represented among users and less than a third are aware of its services. The aim of the project is to try to engage patients to the service and compare the effectiveness of standard care versus either a proactive telephone delivered support and information service from a trained nurse consultant or a proactive online delivered support and information from a trained nurse consultant.

INTELLANCE1

Ali Tafreshi
Carly Leighton

Glioblastoma is the most common and aggressive type of primary brain tumour in adults. Standard treatment may include surgical resection, chemotherapy, radiation therapy and immunotherapy. Despite advances in treatment, the prognosis of patients with glioblastoma remains poor. This is a collaborative study being conducted with Southern Medical Day Care Centre who are delivering the medical oncology component of the study. ISLHD is providing the radiotherapy component of the study. It is a Phase 2b/3 randomised, double blind, placebo study comparing efficacy and safety of ABT-414 versus placebo with standard of care radiation/Temozolomide plus adjuvant temozolomide followed by ABT-414/placebo monotherapy in subjects with newly diagnosed glioblastoma.

CannabisCINV

Morteza Aghmesheh

Pilot and definitive randomised double-blind placebo-controlled trials evaluating an oral cannabinoid-rich THC/CBD cannabis extract for secondary prevention of chemotherapy induced nausea and vomiting.

JAVELIN HEAD AND NECK 100

Morteza Aghmesheh

A randomised double-blind phase 3 study of Avelumab in combination with standard of care chemoradiotherapy in the front-line treatment of patients with locally advanced squamous cell carcinoma of the head and neck.
Cancer Care Centre staff

ICCC staff enjoying the 2016 Annual Research Dinner

June Rose and Professor Andrew Miller discussing research data.

Professor Morteza Aghmesheh & Professor Tim Skyring at the 2016 Annual Research Dinner.

Professor Philip Clingan, Professor Paul de Souza and Desmond Yip at the CONCERT Translational Research Workshop.

Anthony Arnold and Emily Hazzard at the 2016 Annual Research Dinner.
Two thirds of all cases of acute lymphoblastic leukaemia (ALL) occur in children or adolescents. Treatment regimens for children with ALL now produce excellent results with cure rates around 80%. In contrast, treatment for adults appears to be substantially inferior with cure rates less than 40%. This may be due to inferior treatment protocols, different disease biology, poorer compliance or a combination of these. With no standard approach to the treatment of ALL in older adolescents and young adults and global evidence supporting treating this young adult population with paediatric protocols, the objective of this study is to establish whether a BFM (Berlin-Frankfurt-Munster) protocol can be administered to patients with newly diagnosed and untreated ALL aged between 15 and 40 years in a comparable timeframe to patients under 15 years of age.

Chronic Lymphocytic Leukemia (CLL) is a malignancy of B cells that predominantly affects the older population. Chemoimmunotherapy combinations have been the standard of care now for young, fit patients whose CLL requires treatment. However, elderly CLL patients who are unable to tolerate combination chemoimmunotherapy regimens, or those who have considerable comorbidities or those with high risk cytogenetics, have poorer clinical outcomes, shorter duration of remission and rapid progression of their disease following treatment with standard of care regimens. Btk (bruton’s tyrosine kinase) plays a crucial role in B cell development/maturation and is a critical kinase for CLL development and expansion. Targeted agents for Btk inhibition are currently being used in the treatment of CLL, ibrutinib is the first-in-class inhibitor. This study is assessing whether ACP-196, a second generation Btk inhibitor, is non-inferior to ibrutinib in regard to progression free survival in patients with previously untreated chronic lymphocytic leukaemia.

Leukaemia is a neoplastic proliferation of haematopoietic cells. Due to the excessive proliferation these cells often end up replacing the normal blood forming elements of the bone marrow, resulting in conditions like neutropenia and anaemia. Acute myeloid leukaemia (AML) can occur at any age and accounts for a third of all leukaemias diagnosed in patients over 20 years. Its incidence increases with age, with median time of diagnosis around 65yrs. The standard treatment for AML is chemotherapy given in two phases, induction and post remission (consolidation) therapy. In elderly AML patients, remission rates can be a little lower than in younger patients, shorter in duration and treatment related mortality higher. The primary objective of this study is to evaluate whether maintenance therapy with oral azacitidine improves overall survival compared with placebo in patients >55 years who achieved first complete remission after induction with intensive chemotherapy, with or without consolidation chemotherapy.
Kimberly Cartwright
Catherine Martin, Tameika Tubaro

Diffuse large B-cell lymphoma (DLBCL) is a distinct histological type within mature B cell non-Hodgkin lymphoma that is characterised by large tumour cells and aggressive clinical behaviour. It accounts for approximately 31% of all newly diagnosed malignant lymphomas. DLBCL has two biologically distinct entities which were classified by gene expression profiling, the germinal centre B-cell (GCB) and the activated B-cell (ABC) types. Standard of care for this patient group is CHOP chemotherapy combined with an anti-CD20 monoclonal antibody called rituximab. The different DLBCL types have been reported to have different clinical outcomes with the standard chemotherapy protocol. Lenalidomide has been shown to suppress proliferation of ABC cells in vitro and delay tumour growth. This study is designed to evaluate the efficacy and safety of lenalidomide with R-CHOP chemotherapy versus placebo-R-CHOP chemotherapy in previously untreated ABC type diffuse large B-cell lymphoma.

This process occurs in the lung tissue typically surrounding the gross tumor volume (GTV), resulting in increases to the D98% (PTV). Two isolated tumors with very small PTVs (3 and 6 cm³) showed increases in D98% of 23% and 22%. Larger PTVs of 13, 26, and 59 cm³ had increases of 9%, 6%, and 4%, describing a natural fall-off in enhancement with increasing PTV size. However, three PTVs bounded to the lung wall showed no significant increase, due to lack of dose enhancement in the denser PTV volume. In general, at 0.5 T, the GTV mean dose enhancement is around 60% lower than that at 1 T, while at 3 T, it is 5%–60% higher than 1 T. Monte Carlo methods have described significant and predictable dose enhancement effects in small lung tumor plans for 6 MV radiotherapy when an external inline magnetic field is included. Results of this study indicate that future clinical inline MRI-guided radiotherapy systems will be able to deliver a dosimetrically superior treatment to small (PTV < 15 cm³), isolated lung tumors over non-MRI-Linac systems. This increased efficacy coincides with the reimbursement in the United States of lung CT screening and the likely rapid growth in the number of patients with small lung tumors to be treated with radiotherapy.
New Projects

Integrative oncology in Australia - exploring unmet needs and mapping service provision

Caroline Smith (NICM), Jennifer Hunter (NICM)
Jane Ussher (WSU), Geoff Delaney (SWSLHD), Suzanne Grant, Kate Templeman

This was a comprehensive, national survey of private and public health services that was conducted throughout 2016. Organisations (including those in the ISLHD) who provided specialised cancer care were identified and invited to answer a questionnaire. Along with mapping service provision, we asked each organisation to identify the two most important unmet needs in their region. Given the high use of Complementary Medicine (CM) by cancer survivors we asked whether they provided any CM services and inquired about the organisation’s CM policies. We are grateful for the cooperation and support from ISLHD and their participation in the survey.

CALD Project (levels and correlates of cancer clinical trial participation by patients from underrepresented populations in South Western Sydney and ISLHD)

Carly Leighton

As little as 1-2% of all cancer patients participate in clinical trials with certain populations of patients being underrepresented in trials. This limits generalisability of trial results and increases disparities in care and outcomes. This research project aims to evaluate clinical trial participation among cancer patients from underrepresented populations.

Ongoing Projects

Measurement of radiation dose from cone-beam CT for image-guided radiation therapy: a comparison of methodologies

Jarryd Buckley (UOW), Dean Wilkinson, Peter Metcalfe (UOW)

Imaging of the patient in the treatment position prior to delivering external beam radiation therapy ensures that the radiation dose is delivered precisely to the targeted region. In recent years, cone-beam computed tomography (CBCT) has become a common tool for image-guidance, providing 3D anatomical imaging of the patient on the treatment couch. CBCT can be used for adjusting the positioning of the patient based on anatomical landmarks, as well as assessing changes in patient anatomy over the course of treatment. While CBCT imaging provides many benefits for image-guidance in radiation therapy, it does come at the cost of additional radiation dose to the patient. The wide cone-shaped beam used for CBCT means that traditional methods of calculating dose for common multi-slice CT scanners are not applicable. This project evaluated various methods of quantitatively measuring the radiation dose from CBCT in order to provide an indication of the dose received to a patient as a result of CBCT imaging and hence optimise its use in the clinical setting.
Clinical Newgraduate Research Fellow

Exploring interdisciplinary collaboration with dietitians for dehydration management in cancer services.

Supervisors: Professor Andrew Miller, Associate Professor Karen Walton, Dr Anne McMahon, Professor Linda Tapsell and Clinical Associate Professor Marianna Milosavljevic.

Emily is the inaugural recipient of the Clinical New graduate Fellowship funded by the Cancer Care Division. Research Central caught up with Emily to see how she was progressing in her role as a new graduate dietitian while completing her PhD.

I am very grateful to be in this unique position; it is a great mix of developing my clinical skills while having the opportunity to undertake a clinically relevant PhD. I started in 2016, so I have completed my first year and my time was spent in planning and preparing for the next two years. A big part of the year was also spent conducting a literature review and developing the research question and methods. It all led to the proposal that I presented late last year as part of my PhD requirements at University of Wollongong. It’s been an exciting year, and I have a host of wonderful supervisors but it wasn’t without its challenges. Logistics and attempting to balance clinical dietetics and a PhD takes organisation and collaborating and devising a research question that was relevant and needed addressing with all the supervisors. The benefits of doing clinical dietetics is that it makes the research that I do a lot more relevant and questions that I am asking, more necessary. Hopefully, the research outcomes will be more translatable to practice. The other benefit of my mixed role is that the clinical days break up the research days which help me stay engaged.

In 2017, I am submitting an abstract to the Canadian Dietetic Conference and I will hopefully be able to present my work. What I am also really excited about is the possibility of traveling and collaborating with the Cancer Service in University of Washington Medical Centre. We are also liaising with a few other contacts at University of Pennsylvania, which would be great to expand the research and be able to compare the management of dehydration here in regards to collaboration and to what is usual practice in the American setting.

Everyone at the Cancer Care Centre has been so welcoming, it is such a busy place but everyone is happy to help. It is a very happy place, which may seem counter intuitive but I think it is the team and management that make it a positive place for staff and patients.
Collaboration for a Cause: Translational Cancer Research Interest Workshop

The inaugural Clinical and Translational Research Interest Workshop was held at City Beach Function Centre, which saw some of the greatest minds in cancer research and care from the Illawarra, Sydney, Australian Capital Territory and surrounds gather. The event aimed to bring together clinicians, research academics, allied health professionals and community members all for one cause: promoting translational research from bench to bedside and community; and fostering collaborative partnerships.

The event started with opening remarks from the organising committee members, Professor Marie Ranson (IHMRI) and Professor Mori Aghmesheh (ISLHD) who shared the vision of the workshop. Presentations throughout the day included a plenary on immunotherapy in solid cancers by Associate Professor Catriona McNeil from Chris O’Brien Lifehouse, an animated and engaging display by host Dr Bruce Ashford, Surgeon and PhD candidate, for the Q&A session which was all wrapped up by Dr Daniel Brungs, medical oncologist and PhD candidate from the Illawarra Cancer Care Centre. Topics included data mining, tissue banking, patient expectations from research, biomarkers of metastasis, integrating MRI with proton therapy, nutritional management and borderline resectable pancreatic cancer, just to name a few.

Despite the heavy rain during the whole day (washing out any beach stroll expectations), nearly 100 people were in attendance on the day highlighting the great network of research that has been established so far. The lively and collegial atmosphere on the day augurs well that the event will continue to grow and provide an annual forum for researchers, clinicians and community from all walks of life to meet.

The event was sponsored by the Centre for Oncology Education & Research Translation (CONCERT) and held in collaboration with the IHMRI, a joint initiative between ISLHD and UOW.

The Direct Observation of Procedural Skills (DOPS) form is used as a workplace-based assessment tool in the current Australian and New Zealand College of Anaesthetists curriculum. The objective of this study was to evaluate the reliability of DOPS when used to score trainees performing ultrasound-guided regional anaesthesia. Reliability of an assessment tool is defined as the reproducibility of scores given by different assessors viewing the same trainee. Forty-nine anaesthetists were recruited to score two scripted videos of trainees performing a popliteal sciatic nerve block and an axillary brachial plexus block. Reliability, as measured by intraclass correlation coefficients, was -0.01 to 0.43 for the individual items in DOPS, and 0.15 for the ‘Overall Performance for this Procedure’ item. Assessors demonstrated consistency of scoring within DOPS, with significant correlation of sum of individual item scores with the ‘Overall Performance for this Procedure’ item (r=0.78 to 0.80, P<0.001), and with yes versus no responses to the ‘Was the procedure completed satisfactorily?’ item (W=24, P=0.0004, Video 1, and W=65, P=0.003, Video 2). While DOPS demonstrated a good degree of internal consistency in this setting, inter-rater reliability did not reach levels generally recommended for formative assessment tools. Feasibility of the form could be improved by removing the ‘Was the procedure completed satisfactorily?’ item without loss of information.

Injury is a leading cause of death and disability for children. Regionalised trauma systems have improved outcomes for severely injured adults, however the impact of adult orientated trauma systems on the outcomes of severely injured children remains unclear. The objective of this study is to review the processes of care and describe the impacts of a regionalised trauma system on the outcomes of severely injured children. This article describes the design of a mixed methods cohort study evaluating the paediatric trauma system in New South Wales (NSW), the most populous state in Australia. Recommendations and an implementation strategy will be developed for aspects of the paediatric trauma care system that require change. All injured children (aged <16 years) requiring intensive care, or with an Injury Severity Score (ISS) ≥ 9 treated in NSW, or who died following injury in NSW in the 2015–16 financial year, will be eligible for participation. Injury treatment and processes will be examined via retrospective medical record review. Quality of care will be measured via peer review and staff interviews, utilising a human factors framework. Health service and cost outcomes will be calculated using activity based funding data provided by the Ministry of Health. Health-related quality of life (HRQoL) proxy measures will occur at baseline, 6 and 12 months to measure child HRQoL and functional outcomes. This will be the first comprehensive analysis undertaken in Australia of the processes and systems of care for severe paediatric injury. The collaborative research method will encourage clinician, consumer and clinical networks to lead the clinical reform process and will ultimately enable policy makers and service providers to ensure that children seriously injured in Australia have the best opportunity for survival, improved functional outcome and long-term quality of life.


Simulation is a valuable research tool used to evaluate the clinical performance of devices, people and systems. The simulated setting may address concerns unique to complex clinical environments such as the Emergency Department, which make the conduct of research challenging. There is limited evidence available to inform the development of simulated clinical scenarios for the purpose of evaluating practice in research studies, with the majority of literature focused on designing simulated clinical scenarios for education and training. Distinct differences exist in scenario design when implemented in education compared with use in clinical research studies. Simulated scenarios used to assess practice in clinical research must not comprise of any purposeful or planned teaching and be developed with a high degree of validity and reliability. A new scenario design template was devised to develop two standardised simulated clinical scenarios for the evaluation of a new assessment framework for emergency nurses. The scenario development and validation processes undertaken are described and provide an evidence-informed guide to scenario development for future clinical research studies.

The aim of this study was to evaluate the effect of the new evidence-informed nursing assessment framework HIRAID (History, Identify Red flags, Assessment, Interventions, Diagnostics, reassessment and communication) on the quality of patient assessment and fundamental nontechnical skills including communication, decision making, task management and situational awareness. Assessment is a core component of nursing practice and underpins clinical decisions and the safe delivery of patient care. Yet there is no universal or validated system used to teach emergency nurses how to comprehensively assess and care for patients. A pre-post design was used. The performance of thirty eight emergency nurses from five Australian hospitals was evaluated before and after undertaking education in the application of the HIRAID assessment framework. Video recordings of participant performance in immersive simulations of common presentations to the emergency department were evaluated, as well as participant documentation during the simulations. Paired parametric and nonparametric tests were used to compare changes from pre to postintervention. From pre to postintervention, participant performance increases were observed in the percentage of patient history elements collected, critical indicators of urgency collected and reported to medical officers, and patient reassessments performed. Participants also demonstrated improvement in each of the four nontechnical skills categories: communication, decision making, task management and situational awareness. The HIRAID assessment framework improves clinical patient assessments performed by emergency nurses and has the potential to enhance patient care.

Smith NA, Yeow YY. Use of the Montreal Cognitive Assessment test to investigate the prevalence of mild cognitive impairment in the elderly elective surgical population.

Postoperative cognitive disorders are common in elderly patients. Pre-existing cognitive impairment including mild cognitive impairment may be an important risk factor for developing postoperative cognitive dysfunction and may not be detected in a standard preoperative interview, yet is not routinely sought. Our primary aim was to estimate the prevalence of mild cognitive impairment among elderly patients presenting to our hospital for elective surgery using a simple established screening tool: the Montreal Cognitive Assessment test. Secondly, we wished to determine the proportion of patients with mild cognitive impairment who presented with this information available, the effect of increasing age on the prevalence of mild cognitive impairment and whether the timing and location of testing influenced results. We used the Montreal Cognitive Assessment test to screen preoperative patients aged 65 years and over. Our results suggested a potential prevalence of mild cognitive impairment of 56%, with prevalence increasing with age. No patients in the sample had a recorded diagnosis of mild cognitive impairment. Testing in either the preadmission clinic or on admission on the day of surgery yielded similar results. We found the Montreal Cognitive Assessment test to be a simple screening tool that was easily administered during the pre-admission visit.
**New Projects**

**Reflective practice in anaesthesia trainees: can the skills of self-reflection be taught?**

Natalie Smith

Clinical expertise is more than just repeated experience. Medical specialists should possess the capacity for self-monitoring and critical self-analysis, and to be able to apply new learning to their future practices. Self-reflection is an essential skill in the development of professional practice and a necessary pre-requisite for life-long learning. It could be reasonably expected that a good programme would teach or at least foster the development of such an important skill. This project is a randomised controlled study that will develop and trial a teaching package designed to increase the quality of self-reflection skills in anaesthesia trainees.

**Plasma-Lyte 148® versus Saline (PLUS) study**

Martin Sterba, Veerendra Jagarlamudi, Michael Davis, Mahadev Patil, Adam Purdon, Alan Davey-Quinn, Matthew Macpartlin, Cartan Costello, Ahmad Elgendy, Wenli Geng

This project is a prospective, multi-centre, parallel group, concealed, blinded, randomised controlled trial. Participants are assigned to receive either Plasma-Lyte 148, a balanced crystalloid solution, or 0.9% saline for all resuscitation episodes whilst in the intensive care unit. The aim of this project is to test the null hypothesis that there is no difference in 90-day all-cause mortality between patients assigned Plasma-Lyte 148 for intravascular volume resuscitation and crystalloid fluid therapy in the intensive care unit compared to those assigned 0.9% saline.

**Factors predicting representation and admission in patients with a primary presentation of back pain to the ED**

Wayne Triner, Murray Crowe, Kylie Mansfield

Back pain is a very common condition with lifetime prevalence in Australia estimated at approximately 79%. While back pain is commonly treated in general practice, patients often present to the emergency department at hospitals. Back pain is very difficult to diagnose. Patients may often get misdiagnosed, and as a result of the difficulty in diagnosis, patients regularly receive more investigations than is necessary, resulting in increased radiation exposure, unnecessary surgery and excessive cost to the health system. There is a need to better identify and characterise patients that present with back pain to the emergency department. This project is a retrospective audit of patients with primary presentation of back pain to the emergency department, to identify representation rates and characteristics.

**The perioperative course of patients with Obesity Hypoventilation Syndrome (OHS)**

Natalie Smith, John Deady

This project is being undertaken to evaluate the hypothesis that patients with Obesity Hypoventilation Syndrome (OHS) have a complicated perioperative course with likely need for closer anaesthetic attention and resources to manage the perioperative period smoothly. The project is a retrospective audit and analysis of medical records spanning across Wollongong, Liverpool and Concord Hospital. The project aims to describe the perioperative course of patients with known OHS and analyse the data both qualitatively and quantitatively. It is hoped that the results of the research will increase our understanding of any complications that patients with OHS have during and after anaesthetic so that workplace practices can be improved.
A multi-centre, cluster randomised, crossover, registry trial comparing the safety and efficacy of proton pump inhibitors with histamine-2 receptor blockers for ulcer prophylaxis in intensive care patients requiring invasive mechanical intervention

Martin Sterba, Michael Davis, Mahadev Patil, Veerendra Jagarlamudi, Adam Purdon, Alan Davey-Quinn, Matthew Macpartlin, Cartan Costello, Ahmad Elgendy, Wenli Geng

Patients who require treatment in the intensive care unit can develop stomach or duodenal ulcers, commonly when life support is required or when the patient develops a bleeding tendency as a result of their illness. It is possible that these kinds of ulcers may cause lifethreatening bleeding. Patients who require life support in the intensive care unit are typically given one of two types of medicines with an aim to prevent ulcers: proton pump inhibitors, or histamine-2 receptor blockers. While the prevention of ulcers is very important, the medicines used to prevent ulcers may have side effects. This study will establish which of the two types of medicines commonly used for stress ulcer prophylaxis in intensive care patients who require life support leads to the lowest risk of complications.

Medical Student Perception of Emergency Department Education Based Upon Seniority of Supervisor

Wayne Triner, Florence Huynh, Teresa Treweek

Many emergency medicine physicians believe that the time demands of clinical productivity limit their ability to effectively teach medical students. The primary aim of this project is to measure medical student’s perceived quality of bedside instruction based upon pairing with either an Emergency Department registrar or with an intern on rotation throughout the Emergency Department. The project further aims to determine the impact on productivity, as measured by patients per hour, on the direct supervision when paired with a student.
Ongoing Projects

Implementation and evaluation of an emergency nursing assessment framework: HIRAID

Belinda Munroe, Kate Curtis, Kate Ruperto, Orinda Jones, Tracey Couttle

Patient assessment in the emergency department (ED) is unique compared to other areas of clinical nursing as patients may present with a variety of complaints, non-specific signs and symptoms, and often without a prior medical diagnosis or available baseline data. The HIRAID assessment framework (History, Identify Red flags, Assessment, Interventions, Diagnostics, reassessment and communication) (Figure 1) is an assessment tool designed to provide novice emergency nurses with a structured approach to patient assessment post triage. It was original founded on expert opinion and revised to reflect current research evidence. HIRAID was tested in the simulated setting and demonstrated to improve the quality of patient assessment, decision-making and communication skills of novice emergency nurses. HIRAID has now been implemented in Emergency Departments across ISLHD. The next phase of this research aims to determine if the implementation of HIRAID improves emergency patient safety, quality of care and communication.

Use of the six minute walk test to predict recovery and complications in morbidly obese patients undergoing elective surgery

Natalie Smith, Mark Shulman, Stephen Asha, Vanitha Visvalingham, Philip Collins, Jessica Paton

The aim of this study was to assess the ability of the 6 minute walk test to predict post-operative functional recovery and medical complications in patients presenting to the pre-admission clinic with a BMI of >30kg/m2. Secondary aims include an exploration of the predictive value of a number of other variables such as spirometry, waist circumference and several blood tests. The study is on target with recruitment, with over 125 patients recruited by end of 2016. The study is on target to be completed in 2017.

Improving knowledge and documentation surrounding not for resuscitation plans and end of life discussions

Michael Watts, Celine Hill, Amy Khan, Concetta Mercuri, Jen Larson, Karin Tarne, Wendy Fenton, Louise Huempel, Joe Wilbers, Lisa Collins, Zvisinei Zvavanjanj

This project aimed to improve knowledge and documentation of “Not for Resuscitation Plan Form.” The observational study identified a number of deficits highlighting a need for better documentation. The new “Resuscitation Plan Forms” showed considerable improvements in the audit when compared to the previous “Not for CPR forms”. The results of this research are being disseminated to nursing and medical staff for education purposes.

Figure 1: HIRAID framework
Consensus was reached with the surgeons to discontinue this practice. Subsequent prospective data collection was commenced to determine effectiveness, with weekly feedback to the Department Head of Orthopaedics. Data from 137 operations pre-intervention (6 months) were compared with 205 operations post-intervention (12 months). The median patient age was 72 years in both groups. Following the intervention, reductions in gentamicin use were demonstrated for IDC insertion (59/137 (42%) to 4/205 (2%), $P < 0.01$) and removal (39/137 (28%) to 6/205 (3%), $P < 0.01$). No gentamicin use was observed during the final 40 weeks of the post-intervention period. There were no significant differences between the groups for pre-operative bacteriuria, surgical site infections or acute kidney injury.

A collaborative approach using quality improvement methodology can lead to an evidence-based reappraisal of established practice. Regular rolling audits and timely feedback were useful in sustaining change.
Healthcare-associated Clostridium difficile infection (HCA-CDI) remains a major cause of morbidity and mortality in industrialized countries. However, few data exist on the burden of HCA-CDI in multi-site non-metropolitan settings. This study examined the introduction of an antimicrobial stewardship programme (ASP) in relation to HCA-CDI rates, and the effect of HCA-CDI on length of stay (LOS) and hospital costs. A comparative before-and-after intervention study of patients aged ≥16 years with HCA-CDI from December 2010 to April 2016 across the nine hospitals of a non-metropolitan health district in New South Wales, Australia was undertaken. The intervention comprised a multi-site ASP supported by a clinical decision support system, with subsequent introduction of email feedback of HCA-CDI cases to admitting medical officers. HCA-CDI rates, comparative LOS and hospital costs, prior use of antimicrobials and proton pump inhibitors, and appropriateness of CDI treatment. HCA-CDI rates rose from 3.07 to 4.60 cases per 10,000 occupied bed-days pre-intervention, and remained stable at 4 cases per 10,000 occupied bed-days post-intervention (P=0.24). Median LOS (17 vs six days; P<0.01) and hospital costs (AU$19,222 vs $7861; P<0.01) were significantly greater for HCA-CDI cases (N=91) than for matched controls (N=172). Half of the patients with severe HCA-CDI (4/8) did not receive initial appropriate treatment (oral vancomycin). HCA-CDI placed a significant burden on the regional and rural health service through increased LOS and hospital costs. Interventions targeting HCA-CDI could be employed to consolidate the effects of ASPs.

Candida osteoarticular infections are being reported with increasing frequency, possibly due to an expanding population at risk. However, Candida costochondritis is uncommon. We report two cases of Candida costochondritis in patients who presented with subacute-onset chest wall swelling and whose only identifiable risk factor was a history of recent intravenous drug use.


Review objective: The objective is to identify the effectiveness of topical medications in reducing radial artery spasm in patients undergoing transradial coronary procedures.


Review question/objective: The quantitative objective is to identify the effectiveness of vasodilatory medications on radial artery spasm in patients undergoing transradial coronary artery procedures.


To determine the cost and affordability of a gluten-free healthy food basket for four reference families in Australia. A secondary aim was to determine the price differential between commonly available gluten-free and gluten-containing food staples. Exploratory study using an amalgamation of two commonly used food basket costing methods. Two food basket types were constructed for four common Australian family types. These were designated the Healthy Food Basket and modified (gluten-free) Healthy Food Basket. Baskets were priced at five locations and costs as a proportion of the Equivalised Household Disposable Income and average weekly earnings for welfare recipients were calculated. The price differential for four common bread and cereal staples were also calculated per 100 g. The gluten-free healthy food basket was significantly more expensive compared to a gluten-containing healthy food basket for all family types. The gluten-free basket was considered unaffordable for three of the four common family types. Gluten-free staples are significantly more expensive than their gluten-containing counterparts. Compliance to a gluten-free diet may be more difficult for some families due to the significant price discrepancy of gluten-free items. Families on welfare with people who require a gluten-free diet are particularly vulnerable to food insecurity. Consideration should be given to the creation of a national subsidised medical foods program to enable equitable access to affordable gluten-free staple foods via prescription.

Intravascular large B cell lymphoma (IVLBCL) is a rare condition with a predilection for central nervous system involvement and is often misdiagnosed. This case report describes a 58-year-old gentleman who presented with paraparesis and subsequent dramatic neurological deterioration initially attributed to acute disseminated encephalomyelitis. Upon post-mortem examination, the correct diagnosis of intravascular large B cell lymphoma was reached. This condition has a poor prognosis but can be chemotherapy responsive. It is hoped that this case report will raise awareness of a rare and diagnostically challenging illness.


Iron deficiency is a common complication in patients with IBD and oral iron therapy is suggested to exacerbate IBD symptoms. We performed an open-labelled clinical trial to compare the effects of per oral (PO) versus intravenous (IV) iron replacement therapy (IRT). The study population included patients with Crohn’s disease (CD; N=31), UC (N=22) and control subjects with iron deficiency (non-inflamed, NI=19). After randomisation, participants received iron sulfate (PO) or iron sucrose (IV) over 3 months. Clinical parameters, faecal bacterial communities and metabolomes were assessed before and after intervention. Both PO and IV treatments ameliorated iron deficiency, but higher ferritin levels were observed with IV. Changes in disease activity were independent of iron treatment types. Faecal samples in IBD were characterised by marked interindividual differences, lower phylotype richness and proportions of Clostridiales. Metabolite analysis also showed separation of both UC and CD from control anaemic participants. Major shifts in bacterial diversity occurred in approximately half of all participants after IRT, but patients with...
CD were most susceptible. Despite individual-specific changes in phylotypes due to IRT, PO treatment was associated with decreased abundances of operational taxonomic units assigned to the species Faecalibacterium prausnitzii, Ruminococcus bromii, Dorea sp. and Collinsella aerofaciens. Clear IV-specific and PO-specific fingerprints were evident at the level of metabolomes, with changes affecting cholesterol-derived host substrates. Shifts in gut bacterial diversity and composition associated with iron treatment are pronounced in IBD participants. Despite similar clinical outcome, oral administration differentially affects bacterial phylotypes and faecal metabolites compared with IV therapy.


Posaconazole therapeutic drug monitoring (TDM) is recommended to promote effective antifungal prophylaxis, but its utility has yet to be optimized. Breakthrough invasive fungal infections have been reported with serum concentrations <700 mcg/L, but there is little evidence to determine the optimal serum concentration for efficacy or concentrations associated with toxicity. Challenges for effective monitoring are greater in settings without posaconazole TDM facilities because of the long turnaround time before receipt of results. Thirty-eight TDM episodes were performed on 18 patients in a regional center in Australia during a 30-month period. Australian guidelines recommend a trough serum concentration of ≥700 mcg/L. The response to concentrations below the recommendation threshold (700 mcg/L), the final serum plasma concentration for each patient, and the appropriateness of TDM were evaluated. A total of 19 (50%) concentrations were recorded to be <700 mcg/L. Of these 19 concentrations, the drug dose was increased on only 4 occasions. Eleven of 18 patients (61%) had initial concentrations <700 mcg/L, with only 3 (27%) among those achieving final concentration ≥700 mcg/L: 5 patients with initial concentrations <700 mcg/L did not have any further TDM testing. Nine of the 18 (50%) patients had a final concentration <700 mcg/L. Five of 7 (71%) patients with initial concentrations ≥700 mcg/L had further TDM with no reasoning documented. The results demonstrate a lack of confidence and consistency in ordering, interpreting, and following up posaconazole concentrations. Therefore, the use of TDM should be carefully considered, especially in regional centers. Such settings should consider the practicalities of posaconazole TDM and try to improve the process to ensure consistency and optimization of patient care.


The aim of this study was to test the feasibility and acceptability of a novel interdisciplinary intervention on weight loss. A 3-month parallel, blinded, randomised controlled trial compared the effects of an interdisciplinary model of care (individualised interdisciplinary advice delivered through dietitians) with control (general advice on diet and physical activity delivered by primary care nurses). The primary outcome was assessing feasibility and acceptability of the protocol, with secondary outcomes including body weight, clinical, dietary, physical activity and psychological variables. Twenty-four participants were randomised and 21 included in the final analysis. The recruitment rate was 42% (24/57) and the eligibility rate 83% (24/29). The withdrawal rate was low (13% overall) compared with similar trials. Attendance at study visits was higher in the intervention arm compared with control (100 vs 83%), which may be an artefact of the greater individualised treatment provided by primary care nurses. This study confirmed the feasibility and acceptability of the novel interdisciplinary lifestyle intervention within the region.

Radical cystectomy and urinary diversion is the treatment of choice for invasive bladder cancer. Quality of life (QOL) is an important outcome of surgery. This review compares the QOL after continent and incontinent urinary diversion in radical cystectomy for patients with primary invasive bladder cancer. A systematic review and meta-analysis of clinical studies published after January 2000 was performed according to the PRISMA guidelines. Quality appraisal and data tabulation were performed using pre-determined forms. Data were synthesised by narrative review and random-effects meta-analysis using standardized response means. Heterogeneity and bias was assessed by Tau(2) and I(2) values and Funnel plots. Twenty-nine studies (3754 patients) were included for review. Pooled post-operative FACT and SF-36 scores showed no difference in overall QOL between continent and incontinent diversion (p = 0.31). Subgroup analysis demonstrated greater improvement in physical health for incontinent (p = 0.002) compared to continent diversions, but no differences in mental health (p = 0.35) and social health (p = 0.81). Qualitative analysis showed patients with neobladder had superior emotional function and body image compared to cutaneous diversion. QOL may improve to similar or better levels compared to baseline after 1 year, but data remains scarce. Patients report poor urinary and sexual function after surgery compared the general population. Long-term QOL is unclear. Levels of heterogeneity and bias were low. QOL after radical cystectomy is comparable after either continent or incontinent urinary diversion. Post-operative QOL may improve, but urinary and sexual dysfunction remains inferior to the general population. Patient choice is key to selection of reconstruction method.


Current guidelines recommend that patients with non-ST elevation myocardial infarction (NSTEMI) are treated with medical management alone, or in combination with coronary angiography within 24 h. Recent research suggests that NSTEMIs show angiographic evidence of complete occlusion at rates comparable to STEMI, suggesting a subgroup of NSTEMI patients who require urgent angiography. Novel ECG changes, termed ‘STEMI-equivalents’, have been described as a way of identifying this subgroup. The aim of this study was to determine whether patients with STEMI-equivalent ECG changes experience similar degrees of myocardial damage, and would thus benefit from urgent PCI. Cardiac catheterisation databases at The Wollongong Hospital were searched for STEMI, and NSTEMI patients with complete occlusion of the culprit vessel, between January 2011 and December 2013. A total of 1429 patients underwent angiography during this time period. Of these, 220 were eligible for ECG analysis. We found 10-25% of NSTEMIs with ‘STEMI equivalent’ ECG changes correlated with complete vessel occlusion on angiography. These patients demonstrated equivalent initial troponin readings. Recognition of STEMI-equivalents represent a chance for earlier intervention with prompt coronary angiography, as these findings are often associated with complete occlusion of the culprit vessel. These findings provide further evidence supporting the potential inclusion of STEMI-equivalents in future ACS guidelines.

and a low number of referrals for coronary angiograph. Use of existing chest pain pathways was also low. We have identified gaps in evidence based medicine in these patients, ordering, interpreting, and following up posaconazole concentrations. Therefore, the use of TDM should be carefully considered, especially in regional centers. Such settings should consider the practicalities of posaconazole TDM and try to improve the process to ensure consistency and optimization of patient care.

The Global Registry of Acute Coronary Events (GRACE) risk score (GRS) is a validated scoring system which estimates the probability of death within 6 months of hospital discharge in patients with acute coronary syndrome (ACS). The frequency with which this score is integrated into clinical practice in smaller rural hospitals is unknown. The aim of this study was to document incorporating the GRS into standard practice in a 143 bed secondary healthcare facility as the acute care hospital for a local population of over 100,000. This is hoped to improve guideline compliance in the management of patients with ACS. We performed a retrospective analysis of patients admitted with a diagnosis of ACS over the month of December 2015 to January 2016. We calculated their GRS and reviewed their acute management, including appropriate medical therapy and referral for coronary angiogram. Of the 352 presentations with chest pain to ED, 72 patients were admitted with ACS. Most notable findings were deficits in initiation of an ACE-I and a low number of referrals for coronary angiograph. Use of existing chest pain pathways was also low. We have identified gaps in evidence based medicine in these patients.
**Renal**

**New Projects**

**Reducing the burden of dialysis Catheter Complications: A National Approach (REDUCTION Trial)**

Karumathil Murali, Pauline Byrne, as part of REDUCTION trial investigators

Healthcare associated infections (HAI) are important causes of mortality and morbidity and patients with kidney disease are highly vulnerable to HAI, due to wide use of central venous haemodialysis catheters. These catheters, while essential to the delivery of the life-sustaining dialysis treatment, are a major driver of bloodstream infection. Currently in Australia and New Zealand, there is no systematic or standardised approach to responding to the challenges arising from dialysis catheter use. The REDUCTION partnership aims to define the clinical burden of dialysis catheter exposure and bacteraemia across Australia and New Zealand, and reduce dialysis catheter related bacteraemia through a suite of evidence based interventions. Participating units across Australia and New Zealand will collect standardised catheter information for 6-9 months, to establish and monitor the usual practice of catheter use and bacterial prevention that are in current practice. Renal units will be allocated to carry out REDUCTION suite of interventions on all patients who receive dialysis catheters under their care. Study data will be collected until 2 weeks after the catheter has been removed. It is hoped that the findings of this study will further medical knowledge and may improve how renal physicians care for kidney disease patients requiring catheters in the future.

**A clinical quality audit of patient characteristics and adverse events in patients receiving resonium A (Sodium Polystryene Sulfonate) in one Local Health District**

Karumathil Murali, Rachel Bowden, Kelly Lambert, Warren Rich

Resonium A is a medication used to control or prevent life threatening hyperkalemia. It’s use is not without risk of adverse events. However no local data exists that describes the characteristics of patients receiving Resonium A, nor of the frequency of side effects or adverse events. This retrospective clinical quality audit seeks to describe the characteristics of patients receiving Resonium A in the last 12 months and to document the occurrence of side effects and adverse events. Obtaining data via a retrospective medical note review, this clinical quality audit will be used to (i) inform and guide the development of new protocols for patient care (ii) highlight characteristics of patients at high risk of adverse events

Education and planning did not lead to any major benefit for patients with advanced renal disease. The results were presented in abstract form in the Australia New Zealand Society of Nephrology conference and we are planning to write up a full journal article.
Exploring the openability of hospital food and beverage packaging with renal patients and staff: does packaging impede dietary intake in renal patients

Alison Bell, Kelly Lambert, Jacqueline Chevis, Karen Walton, Mansu Subedi, Haba Hassanin

Accessing packaged food and beverages is essential for good nutrition in hospital, yet this same packaging can present a barrier to adequate nutrition. An initial exploratory hospital based study conducted at Wollongong Hospital found that both patients and staff experienced difficulties opening food and beverage items. A subsequent series of studies with well, community living, older adults demonstrated that the openability problems experienced in hospital are also experienced by well older adults. This study seeks to ‘revisit’ vulnerable hospitalised adults in the Renal Ward as well as the renal nursing staff to review the association between strength and dexterity and efficient opening of food and beverage packaging. We will also use an integrated qualitative and quantitative methodology to explore dietary intake and experiences with food and beverage packaging to gain greater insights into those experiences and to review the impact of some recent changes to hospital offerings.

Chronic use of Sodium Polystyrene Sulfonate (Resonium) safely enables wider implementation of Renin-Angiotensin-Aldosterone inhibition in patients with kidney disease

Karumathil Murali, Kelly Lambert, Warren Rich, Rachel Bowden

Hyperkalaemia is a barrier to full implementation of Renin-Angiotensin-Aldosterone inhibition (RAAI) using medications, which are very important in treating patients with kidney disease. Acute treatment of hyperkalaemia with Resonium is routine practice, but gastrointestinal safety concerns – mainly intestinal necrosis reported with use of Resonium and Sorbitol has lead to variation in chronic use of Resonium. This retrospective study examines the practice of chronic use of Resonium in patients with kidney disease including those on dialysis in the local health district and evaluate whether it is helping to widen the RAAI implementation. We also evaluate adherence to chronic Resonium therapy in a random sample of dialysis patients in this cohort.

Incidence of Hyperkalemia in patients on Heparin or Low molecular weight heparin

Shabana Khan, Geoff Murray, Maureen Lonergan

Hyperkalemia is a common medical condition that can be defined as serum potassium concentration exceeding 5.0mmol/l. Drug induced hyperkalemia is the major cause of increased potassium levels in everyday clinical practice. This exploratory study aims to investigate the incidence of high potassium in patients on heparin or low molecular weight heparin as well as describe the characteristics associated with heparin associated hyperkalemia. Patients on injectable deep vein thrombosis prophylaxis in rehabilitation and surgical wards will be eligible to be recruited with data collections occurring from electronic medical records. Inclusion criteria included patients admitted to hospital for surgical procedure, minimum 5 days treatment with heparin or low molecular weigh heparin, atleast one high reading of serum potassium within 5-8 days after starting the therapy. Exclusion criteria include high serum potassium on admission, end stage renal stage, high potassium due to other medical conditions, oral or IV potassium.
A clinical quality audit of vaccination compliance for Hepatitis B, pneumococcus, influenza and pertussis in hemodialysis patients

Hicham Hassam, Kelly Lambert, David Wingert, Louella McCarthy

Patients undertaking dialysis are commonly immunocompromised and are often unable to generate an adequate response to vaccinations. The vaccination status of the local dialysis population is unknown. This project will be used to inform local strategies to improve vaccination protection.

Are Illawarra kidney transplant recipients discharged from transplant centres too soon? A retrospective analysis of kidney transplant recipients post discharge

Jane Holt, Kelly Lambert, Coralie Wilson, Grace Miller

The study aims to describe the outcomes of kidney transplant patients in the Illawarra Shoalhaven local health district (ISLHD) in order to determine the type and number of complications after transplant.

An exploration of factors associated with improvement in aerobic capacity and completion of a cardiac rehabilitation exercise program

Anthony Tyson, Kelly Lambert, Greg Peoples, Matt Lindfield

There are few studies looking at the successful implementation and completion rates in patient who attend cardiac rehab exercise programs. This project is a retrospective audit of the outcomes from patients who have attended the exercise program.

Improving peritonitis rates in the ISLHD Renal Service

Margreet Gutker, Anna Lee, Danielle Field, Vanessa Minch

The project is a survey of patients undertaking peritoneal dialysis as part of a quality improvement project. Patients on peritoneal dialysis are at risk of peritonitis which is the leading complication of Peritoneal Dialysis. Between 50-55 patients are currently doing peritoneal dialysis in their home environment in the ISLHD catchment area. The ISLHD home dialysis training unit will provide training to these patients over a period of approximately 5 days to teach them the correct protocol to self dialyse, keep the area clean and avoid infection. If the patient remains infection free, they are able to remain at home rather than being admitted to hospital or attending the dialysis units for haemodialysis treatment. The ISLHD rates of peritonitis are above the international standard and we would like to improve this with the overall project aim being to reduce the incidents of peritonitis in patients treated with Peritoneal Dialysis by 50% within 18 months.

The CKD-FIX Study: Controlled trial of slowing of Kidney Disease progressions From the Inhibition of Xanthine oxidase

Jane Holt, Mikki Smyth

The CKDFIX study (Controlled trial of slowing of Kidney Disease progression From the Inhibition of Xanthine oxidase) is an investigator initiated, multicentre, prospective, randomised, double blind, placebo controlled parallel arm trial, which has been funded by the National Health and Medical Research Council (NHMRC), to assess the effect of allopurinol, (a drug that lowers uric acid levels in the body), on slowing the progression of CKD. This study which investigates whether an inexpensive drug like allopurinol (already familiar to most doctors) delays kidney function decline, has the potential to have great impact on the clinical management of CKD and ultimately improve the outcomes of patients with CKD. Recruitment of patients for this project has now closed and the ISLHD Renal Unit was identified as a site with outstanding recruitment rates nationally.

How do people with kidney failure make sense of complex dietary advice?

Kelly Lambert, Judy Mullan, Kylie Mansfield

The dietary prescription for people with kidney failure is complex and multifaceted. However, there has been no research to date that has explored how people with kidney failure ‘make sense’ of this complex dietary advice. Therefore the overall aim of this research is to explore how people with kidney failure make sense of complex dietary advice and to determine if this impacts on treatment adherence. Semi structured interviews were undertaken with patients with kidney disease. Interviews were also undertaken with renal dietitians from across Australia and New Zealand to explore the strategies used by renal dietitians to help patients with kidney failure make sense of the complex dietary advice provided and to describe any barriers to this education process.
Protection of the peritoneal dialysis catheter: current practices for patients who swim

Anna Lee

Peritoneal Dialysis (PD) is an accepted treatment modality for patients with chronic kidney disease (CKD), offering a convenient and effective treatment that can be carried out at home. Centres do not generally recommend swimming for peritoneal dialysis patients due to the risk of peritonitis, catheter exit site or tunnel infections. General recommendations exist in regards to swimming pools or rivers and avoiding spas, but the literature and evidence to support these is limited. The aim of this study was thus to describe the clinical practices and recommendations provided to patients with peritoneal dialysis (PD) in regards to swimming in a cross section of Australian PD units. It is hoped that this research will serve to highlight the variability within peritoneal dialysis units and provide a starting point for further research. It will also provide basis to make some recommendations for patients on PD who want to swim.

The Australian Calciphylaxis Registry

Jane Holt

Calciphylaxis is an uncommon condition that generally affects patients with chronic kidney disease (CKD). It is characterized by calcification of small blood vessels causing thrombosis, which results in a loss of blood supply to the skin or other tissues supplied by the involved blood vessel. Mortality rates are in the order of 80% and this has not changed in decades. Little is known about the factors that predispose people to the development of Calciphylaxis. This registry will provide information for patients and their families on research and advances in management and information on research programs in which their participation might be useful.

Impact of renal Health Pathways on GP referral practices to the ISLHD Renal Service

Mikki Smyth, Kelly Lambert, Steve Gibbeson

The project is a prospective collection of data on new referrals from general practitioners to renal specialists in the region. The overall aim is to describe the characteristics and information contained in the referrals post implementation of the HealthPathways project. The benefit to the patients and the institution is on a number of levels; it will provide important information regarding the quality of referral to the renal service and outcomes of the HealthPathways project. It will assist to improve triaging processes by the Renal Service; it will contribute to reducing waiting times for appointments delayed due to inadequate referral information.

Does evening primrose oil improve pruritis (itching) in a dialysis population?

Jane Holt, Barbara Meyer, Kelly Lambert, Lauren Roach, Anna Lee, Mikki Smyth, Janaye Fish

Pruritis or itching is common in end stage renal failure patients who are on dialysis treatment and can have a serious adverse effect on patient’s quality of life. The aim of this study is to determine if administration of omega-6 in the form of Evening Primrose Oil, is superior to omega-3 (fish oil) or a placebo (vegetable oil) for the treatment of pruritis. The project is currently in the data collection phase with recruitment occurring at Wollongong, Shellharbour and Shoalhaven Renal Units.

PDOPPS: Peritoneal dialysis outcomes and practice patterns

David Johnson, Maureen Lonergan, Melissa Magill

PDOPPS is a prospective, observational cohort study which aims to increase understanding of the impact of possible changes in approaches to the management of Peritoneal Dialysis (PD) by gathering worldwide information relating to PD techniques, complications and outcomes. The PDOPPS research is being conducted across 20 hospitals in australia and involves a collaboration
with international researchers. It is hoped that the research will help to improve the treatment, quality of life and survival of patients receiving a PD. This project is ongoing.

The IHMRI flagship study: Healthtrack

Linda Tapsell, Maureen Lonergan, Kim Alexander, Joseph Ciarrochi, Victoria Flood, Bridget Kelly, Gregory Peoples, Marianna Milosavljevic, Jan Potter, Catherine Zelinsk, David Steel

This project links senior researchers in medicine, public health/epidemiology, nutrition and dietetics, exercise science, and psychology in a population study and randomised control trial for weight management. Specifically, the study aims to determine a 'model of preventative care' in association with hospital and medical practitioners to support management of overweight residents in the Illawarra Shoalhaven region. This will be achieved by engaging a representative population sample of residents aged 25-55. Of these, some will be placed in a randomised trial supported by nutrition, exercise and behavioural advice and monitored for biophysical markers and body weight over 2 years. The wider community will benefit from the testing of a model of care incorporating dietary advice, physical activity and health coaching for overweight residents that are at risk of developing chronic diseases associated with obesity such as cardiac problems, type 2 diabetes and kidney problems. At present, there is no pathway for treatment and the successful trialling of a model of care will provide evidence to support policy changes and reduce the patient load on public hospitals.

Using disruptive technology to record the impact of peritoneal dialysis on body mechanics: Implications for reducing back pain and fatigue

Yvonne White, Maureen Lonergan, Jane Holt, Karumathil Murali

End-stage kidney disease accounts for approximately 15% of all hospitalisations in Australia. It is predicted that the cost of treatment will reach $12 billion between 2009-2020. Peritoneal dialysis (PD) involves the instillation of a large amount of fluid into the peritoneal cavity, where it remains for several hours before it is drained out. The net effect of this is increased mechanical stress on the lumbar spine on top of metabolic bone disease can lead to back pain and/or sciatica. There has been little attention to the changes in spinal mechanics or back pain associated with PD in the literature and even less in relation to body posture and biomechanical changes as a consequence of PD. The aim of this study is to identify the patterns of change in biomechanics in relation to activity and reported fatigue for people receiving PD using an external device known as the SABEL Sense™.

Retrospective study to compare clinical characteristics and outcomes of patients who received renal replacement therapy education early vs late in course of severe renal failure

Karumathil Murali, Maureen Lonergan, Pauline Byrne, Jane Holt, Kelly Lambert, Ben Larkin, Chanel Chong, Melissa Magill

Caring for Australians with Renal Insufficiency (CARI) guidelines recommend that patients with an estimated glomerular filtration (eGFR) <30mls/mt be referred by general practitioners for dialysis to nephrology services. Patients referred early may not necessarily receive renal replacement therapy (RRT) education in a timely fashion and may end up commencing dialysis urgently. Patient related factors might be responsible for such a clinical course, however delayed initial discussion about RRT, late referral for RRT counselling by specialist nurses and late referral for access creation could also be important factors. This project aims to identify the variation in timing of RRT education and compare the characteristics and outcomes of patients referred as 'early' versus 'late' by reviewing case records of patients having undergone dialysis education in the last five years. It is anticipated that the results of the research will help to improve timing of RRT education referrals.

Investigating the relationship between cognitive function and treatment adherence in patients with chronic kidney disease: Potential causes, impact on outcomes and trial of improvement strategies

Karumathil Murali, Steven Roodenrys, Judy Mullan, Maureen Lonergan, Melissa Magill, Janaye Fish

This research aims to explore the relationship between cognitive function and adherence in CKD patients. It further aims to evaluate whether routine cognitive testing followed by targeted measures to improve adherence are effective. The project is currently in the data collection phase. Approximately 200 patients have been consented and are being conducting cognitive function interviews in regular intervals.
Following my time in Canada, I went to India and submerged in clinical work. In 2006, I moved to Australia and my first staff appointment took me to Orange in country NSW. I did thoroughly enjoy the workplace, but I was the sole nephrologist at the site, time and resources to conduct serious research were limited. Despite this I completed a MD program in Clinical Epidemiology, which gave me a clearer and deeper research perspective.

After moving to Wollongong in late 2011, the ISLHD presented multiple opportunities to engage in research, including big hospitals, several specialist colleagues with different expertise, proximity to UOW and IHMRI, the establishment of Research Central, and a network of clinicians who are willing to share their clinical expertise and ideas. Department of nephrology has been able to establish a streamlined clinical research framework, including a renal research focus group which meets monthly. Research in the nephrology department is picking up momentum, and I have drawn a share from that stream.

Dr Karumathil Murali, Staff Specialist Nephrology

Dr Karumathil Murali, is a Staff Specialist Nephrologist, working in Shellharbour and Wollongong Renal Units. Taking the plunge to join the PhD program at University of Wollongong three years ago, Dr Murali has been able to embed research into his clinical practice, but acknowledges that a conductive workplace, supportive colleagues and a responsive research team played a big role in taking the project off the ground. Here is his story:

My interest in research started a long time ago, while I was doing a post graduate fellowship in Nephrology, in Toronto, Canada in 2001. I didn’t know much about research, but with guidance and encouragement from my clinical supervisor, I decided to do a retrospective project. The research was on blood pressure control in patients on peritoneal dialysis and the work resulted in a publication in an international journal. I only contributed to a small part of the process but it was a great experience.
“Research culture... is willingness on the part of every member in the health service to be involved or utilising research. I think this is happening and great leadership in “Research Central” has been integral to this change.”

I must specifically comment the helping hand offered by my friend, and fellow Staff Specialist in Neurology, Dr John Carmody, whose encouragement removed my hesitation to take up a PhD. John lead by example - he showed it is possible to do PhD working full-time and that was very reassuring. With all opportunities though I acknowledge some major barriers. For myself, and other clinicians the main barrier is the shortage of time and resources - with clinical work taking up most of the time - rightly so, given patient care is our primary responsibility, teaching commitments, which I view as very important, and the lack of a rigid deadline for most research related activities, which puts them to the back of an often disorderly queue of work. However none of these barriers is insurmountable if you have sufficient drive.

I commenced my part-time PhD three years ago, focusing on medication adherence behaviour in patients with kidney disease. It is well known that treatment adherence is poor in all chronic diseases, but this is under-recognized by clinicians. Treatment of kidney disease is extremely complex and patient’s harmonious participation in the treatment is essential for good outcomes. So these patients are very vulnerable. It is hoped that the research will provide information and insights that may improve the way our current and future patients are treated. I have been blessed with a very committed research team of supervisors and colleague researchers. The most important part in research is to build the research team. Research is all about teamwork. You just play your part.

Over the past few years, there has been a lot of talk about building a research culture in ISLHD. To me, a research culture should look like everybody being involved in research in some way. It doesn’t have to be publishing papers, but at least utilising research or contributing in the form of clinical audits or helping medical students as an example.
Meningococcal disease in Illawarra Shoalhaven, NSW during the years 2000-2015

Spiros Miyakis, Shane Cameron, Peter Newton, Diane Lovatt

This study explores the invasive meningococcal disease (IMD) trends in the Illawarra Shoalhaven region from 2000 to 2015, utilising a retrospective case series design. The focus will be on the proportion of cases according to sociodemographic variables, risk factors, development of complications, distributions of serogroups and geotypes, antibiotic susceptibilities, as well as the management received. This study is hoped to construct a longitudinal view of IMD which will provide an important perspective on the burden of IMD in the region.

Sepsis kills: a prospective observational study of adult inpatients commenced on a Sepsis Pathway in a tertiary Australian Hospital

Kimberly Cipko, Stuart Bond, Alistair Reid

The aims are to describe the characteristics of patients who develop sepsis and to assess whether the implementation of a sepsis pathway in Wollongong Hospital has resulted in more appropriate prescribing of initial antibiotics. As part of our analysis, we will also examine whether the empirical antibiotic regimes in our pathway are adequately covering the pathogens responsible for sepsis in our local area. Once the project is complete, we hope to have a better understanding of the types of patients which develop sepsis in our hospital and the impact of the new Sepsis Pathway on the appropriate prescription of antibiotics. It is hoped that this will help shape any future improvements to the Sepsis Pathway and therefore help the timely and appropriate prescription of effective antimicrobials to help reduce mortality from sepsis at ISLHD.

INN-TOP-005: A phase 3 randomised, placebo-controlled, blinded study to investigate the safety and efficacy of a topical Gentamicin-collagen sponge in combination with systemic antibiotic therapy in diabetic patients with an infected foot ulcer

Spiros Miyakis, Ivana Goluza, Fiona Love, Farshid Nikam

The hypothesis is that a local antibiotic therapy as an adjuvant would be superior to systematic therapy alone. Collagen topical matrix in patients with moderate to severe diabetic foot infections administered in conjunction with systemic antibiotics and wound therapy. The standard of care (SOC), did not meet their primary endpoint of clinical cure of infection after 28 days versus either placebo plus SOC or SOC alone.

While there were trends toward clinical response (clinical cure plus improvement) in the COGENZIA arm and the placebo collagen-matrix arm, it did not achieve statistical significance on their shared primary endpoint of clinical cure after 28 days. While Innocoll continues to analyze the clinical results, the top-line data suggests that the addition of gentamicin delivered topically through COGENZIA, in conjunction with SOC, does not confer sufficient additional clinical benefit over the placebo, administered with SOC, or SOC alone.

CAMERA 2: Combination antibiotic therapy for methicillin resistant staphylococcus aureus infection

Niladri Ghosh, Joshua Davis, Steven Tong

CAMERA 2 is an investigator initiated, multicentre, parallel group, open labelled randomised controlled trial looking at combination antibiotic therapy for Methicillin Resistant Staphylococcus Aureus (MRSA) infection. Wollongong is one among the 25 hospitals around Australia and Singapore participating in this trial. The current trial CAMERA 2 is based on the results of the pilot CAMERA 1 randomised control trial which compared vancomycin alone compared with vancomycin plus flucloxacillin for adults with MRSA bacteremia with encouraging results. The trial is coordinated by the Menzies School of Health Research in Darwin with the study being funded by a research grant from the NHMRC. Vancomycin is the current standard antibiotic therapy for invasive MRSA infections.
but around 25% fail treatment, leading to poor outcomes. Few animal studies have assessed combination of vancomycin and β-lactams (e.g. fluclaxacillin) and found synergy. There is only one observational study published in humans which found higher rate of microbiological eradication in combination therapy as compared to vancomycin. To date we have screened 563 potential participants of which 150 were enrolled. The recruitment rate is marginally surpassing our predicted target rates and appears to be stable.

**MERINO: Randomised controlled trial of meropenem versus piperacillin- tazobactam of bloodstream infections due to ceftriaxone non-susceptible escherichia coli and klebsiella spp**

Spiros Miyakis, Janaye Fish, Samia Shawkat, Peter Newton

This study is a randomised controlled, multicentre trial which aims to compare Meropenem versus Pipercaillin-Tazobactam for the definitive treatment of bacteremia from strains E.coli and Klebsiella spp resistant to 3rd generation cephalosporins, but susceptible in vitro to Pipercaillin-Tazobactam. The project commenced in 2014 and screening continues for the project and it is hoped recruitment will continue into 2017.

**PIANO: Prosthetic joint infection in Australia and New Zealand observational study**

Joshua Davis, Alistair Reid, Simeon Crawford, Janaye Fish

This project is a multicentre prospective observational study of prosthetic joint infections in Australia and New Zealand. The project aims to describe the clinical, laboratory, microbiology and radiological features of patients presenting with prosthetic joint infections and their management. The project is currently in the data collection phase. Participants recruited are followed up for two years. It is anticipated that this study will help enable future intervention studies on prosthetic joint infections.

**MERINO 2: controlled trial of meropenem versus piperacillin- tazobactam for definitive treatment of bloodstream infections caused by AmpC beta-lactamase producing enterobacter spp., citrobacter freundii, morganella morganii, providencia spp. or serratia marcescens in low-risk patients**

Spiros Miyakis, Janaye Fish, Samia Shawkat, Peter Newton

Antibiotic resistance is a problem of immense public health significance. This research project will use a randomised, controlled phase IV non-inferiority trial design comparing two drug regimens (piperacillin/tazobactam and meropenem) for bloodstream infections caused Enterobacter spp., Serratia marcescens, Providencia spp., Morganella morganii or Citrobacter freundii. Demonstrating, in a well-designed clinical trial, that the use of piperacillin-tazobactam for serious infections is non-inferior to established options such as carbapenems would prove invaluable to antimicrobial stewardship programs aiming to restrict carbapenem or quinolone use. This project is ongoing.
**Colchicine in Patients with Acute Coronary Syndromes (COPs trial)**

Astin Lee, Taufik Fetahovic, Stephen Mackay, Martin Walker, Joe Femia, Fady Zaky, Avedis Ekmejian

Recent studies have suggested that colchicine, an anti-inflammatory drug that is widely used for inflammatory conditions such as gout, has a beneficial role in people with coronary artery disease. This study aims to investigate the long-term benefits of adding low-dose colchicine to standard medical therapy after a heart attack. Following consent, patients will be randomised to standard medical therapy or colchicine in addition to standard medical therapy. Participants who are allocated to treatment group will receive colchicine for 12 months. Participants will be followed up during this period. The main outcomes to be measured include mortality, recurrent heart attacks, urgent need to unblock the cardiac arteries and stroke. Health-related quality of life will also be evaluated using validated questionnaires.

**Anxiety, Health Literacy and Radial artery spasm (ATLAS) in patients having coronary catheterisation**

Ritin Fernandez, John Khoo, James Weaver, Astin Lee

This study will assess the association between anxiety and radial artery spasm in patients undergoing transradial coronary procedures. Further, the study will assess the association between health literacy and anxiety. It seeks to confirm that preprocedural anxiety is higher in patients with low health literacy. The study population will be recruited from the outpatients presenting for coronary angiography or percutaneous coronary intervention at Wollongong and St George hospitals. Anxiety will be evaluated one hour preprocedure using the Strat Trait Anxiety Inventory Questionnaire. Health literacy level will be evaluated using a validated 16 health literacy screening questions on a 5 Point Likert scale. The incidence of radial artery spasm will be identified from the catheter lab reports. Radial artery spasm will be defined as pain and restricted movement of the catheter. Radial artery spasm may also be defined based on angiographic evidence of diffuse narrowing of the artery. The study findings will be used to intensify preventative efforts for patients with elevated preprocedural anxiety. The findings will also be used to guide efforts to better empower patients with low health literacy.

**Health educational videos in cardiovascular care for Indigenous Australians: A health professional’s perspective**

Karen Charlton, Scott Winch, Jordan Stanford, Anne McMahon

The Better Cardiac Care Initiative for Aboriginal and Torres Strait Islander people is a national project supported by the Australian Health Ministers Advisory Council. It aims to reduce mortality and morbidity from cardiac conditions by increasing the access to services, better managing risk factors and treatment, and improving the coordination of care. Better Cardiac Care, proposed a series of culturally appropriate, evidence based educational videos, developed as part of a broader package to improve cardiac care. The research team has had direct feed-in to development of the resources through a systematic literature review process to identify key principles for Indigenous health promotion and engagement with the DVD production team to ensure appropriate content and format. The purpose of this research project is to evaluate two of the four educational videos which aim to improve health literacy, knowledge and awareness of chronic disease in indigenous patients. The resources were evaluated by determining the acceptability, usability and value of these health videos with health care providers in NSW clinical settings. In-depth interviews were conducted with staff working in cardiac care (n = 17). Data was interpreted using an inductive thematic analysis approach guided by the Grounded Theory. The educational videos were seen as a valuable tool to alleviate the challenges that result from organisational barriers currently entrenched in the healthcare system. Challenges to current health care delivery included lack of time and resources that are culturally acceptable. The use of Indigenous actors, patient empowerment and use of simple and positive messages were recognised as the strength behind the design of the videos. Further suggested improvements to the video resources included more information to allow setting of realistic expectations for patient care. Novel DVD resources that were developed following culturally specific principles for Indigenous health were found to be a useful...
addition to current cardiac care practice. Further evaluation of their ability to impact on patient knowledge and practices is required.

**Do STEMI patients have an increased risk of in hospital bleeding after Thienopyridine and Fibrinolytic therapy, PCI procedures or a combination of both?**

Shristy Shetty, Pratrap Shetty, Astin Lee

Bleeding is an independent risk of mortality in the current era of highly potent agents and following primary percutaneous intervention used in T-segment elevation myocardial infarction (STEMI) patients. This retrospective audit aims to identify the predictors of in-hospital bleeding complications and mortality in STEMI patients after treatment including Fibrinolytic Therapy, Primary Percutaneous Intervention and Rescue Percutaneous intervention or Facilitated PCI. The secondary aim is to validate the CRUSADE bleeding risk score and investigate the performance of the score in accurately evaluating the risk of bleeding in STEMI patients admitted to the Wollongong Hospital. It is hoped that by determining the predictors of bleeds in hospital following treatment of STEMI, it will allow for identification of high risk groups, hence different treatment strategies will be offered by physicians.

**Prospective, multicentre, international registry of male and female patients newly diagnosed with Atrial Fibrillation and treated with Rivaroxaban (TRIO8890)(River registry)**

Astin Lee, Taufik Fetahovic, Martin Walker, Joe Femia, Fady Zaky, Avedis Ekmejian, Stephen Mackay

In 2014, there were over 437,000 Australians living with the effects of stroke. This is predicted to increase to 709,000 in 2032. Atrial Fibrillation (AF), when the left upper chamber of the heart beats rapidly and unpredictably, is a risk factor for stroke. Oral anticoagulation, treatment that has been demonstrated to be effective in numerous clinical trials as part of the management of AF to prevent stroke. However, it is thought that the very tight control of anticoagulant therapy in clinical trials results in lower rates of therapeutic failure than is seen in real life. This makes accurate assessment of the value and economic benefits of antithrombotic agents difficult. The registry aims to discover the real-life outcomes of 5000 patients with non-valvular AF treated with Rivaroxaban, who have at least one additional investigator-determined risk factor for stroke. This non-interventional, observational registry will capture anticoagulation treatment with Rivaroxaban at diagnosis; patient management, and subsequent long term outcomes of people started on stroke prevention.
**Evaluating heart failure patients recall and reported self-management post discharge following formalised inpatient education**

Renee Stubbs, Darron Webber, Leah Aitken, Kirsty Price, Amanda Paloff, Leila Wall, Tracey Lee

This project aims to assess self-management behaviours of heart failure patients before and after a planned formal in-hospital education session. The education provided aims to increase the patients’ knowledge on how to self-manage and to ensure appropriate support networks are in place prior to discharge. This project has been ongoing at Wollongong Hospital with more staff involved in delivering education and assessing patient’s self-management. It has resulted in discharge education for heart failure management being tailored throughout the district.

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**CONCORDANCE Registry -Cooperative National Registry of Acute Coronary Care, Guideline Adherence and Clinical Events**

Marc Aquilina, Tony Tiberio, Renee Stubbs, Stephen Mackay, Janine Gibbs, Pratap Shetty, Astin Lee

The CONCORDANCE registry is a prospective observational funded ACS registry. The registry allows us to measure our performance using a standard set of KPI's which we can benchmark against national and international aggregate data. Data is collected from the first 10 patients per month presenting with Acute Coronary Syndrome.

**Cardiac dose Heparin and therapeutic levels**

Marc Aquilina

Acute coronary syndrome Heparin doses are capped at a patient weight of 80kg. The study aims to investigate whether there is a delay in reaching a therapeutic activated partial thromboplastin time for patients 80kgs and above compared to patients under this weight threshold.
Gastroenterology

New Projects

Controlled trial of a decision aid for ulcerative colitis patients: Enhancing patients quality of life, empowerment, quality of decision making and disease control

Thomas Lee, Claudia Rogge, Jennifer Roberts

This project aims to improve the quality of life, empowerment, quality of decision making and disease control of patients receiving treatment for ulcerative colitis (UC). To achieve this an Ulcerative Colitis Patient Decision Aid (UCPDA) has been developed and is used to identify what information UC patients most wanted to see in a web based decision aid; what outcomes (positive and negative) were most important to patients and how much they wanted to hear about surgical options for UC. The project consist of a pilot test of decision aid and study procedures in UC patients under usual clinical care where 10 UC patients will be recruited through Dr Susan Connor at Liverpool Hospital. The second part of the project evaluates the efficacy of the intervention (implementation of the UCPDA) compared to standard care in a clustered randomised controlled trial (CRCT).

Participants will complete all of the study measures online over an 18 months time period. The primary outcomes measures the quality of life and patient empowerment. The secondary outcome measures the quality of decision making, patient anxiety, medication adherence, UC disease activity, clinical outcomes and work productivity. The process measures will access the implementation and acceptability of the UCPDA for patients who have utilised the UCPDA.

Ongoing Projects

Poor Health related quality of life in inflammatory bowel disease: Identifying targetable risk factors and receptivity to psychological intervention in a regional population

Cara Salehi, Jennifer Roberts, Thomas Lee

This project aimed to determine specific risk factors for reduced quality of life in patients with inflammatory bowel disease, and whether patients have certain help-seeking behaviours that would increase the likelihood of responding to psychological interventions aimed at increasing quality of life.

An investigation into nutrition and quality of life of patients with gastroenterological issues

Jennifer Roberts

1. A study examining exclusive enteral nutrition for patients with Chron’s Disease using oral multi-nutrient liquid supplements as the only dietary intake for up to 6 weeks. This study is in the recruitment phase.
2. A comparison of oral iron tablets on gut bacteria. This study has been completed and published in Gut Journal.
3. Monitoring health and quality of life outcomes of patients with inflammatory bowel disease. This study is in the data collection phase, collection of quality of life surveys.

Bowel preparation: An intervention targeting patient factors to improve quality of bowel preparation, to increase the efficiency of colonoscopy services after a positive faecal occult blood test

Thomas Lee, Kendall Williams, Ria Kanazaki, Jenny McDonald, Ivan Valiozis, Arthut Grillas, Shehan Abey, Huang Chien, Claudia Rogge, David Swartz, Rob Gordon, Megan Blanchard, Karen Holding, Noureddin Alhajjir

This prospective randomised controlled trial was completed in 2015. The study aimed to determine whether additional patient contact in the days prior to a colonoscopy, to discuss the bowel preparation, leads to improved quality of bowel preparation in patients presenting for a colonoscopy after positive faecal occult blood test. Investigators aim to have the project written up for submission to the Cancer Council by mid 2016.
Hospital outcomes in current smokers with presentations of adult community-acquired pneumonia

Michael Rennie, Vinu Abraham, Ivana Goluza, Spiros Miyakis

Community Acquired Pneumonia (CAP) is a significant cause of morbidity and mortality around the world, with European evidence suggesting an incidence of 1.07-1.2 per 1000 person-years and increasing to 14 per 1000 person year in adults aged over 65 years of age. Significant evidence now supports a positive dose-dependent relationship between current smoking and incidences of CAP. Whilst the increased risk of CAP is well established, there is little evidence to support a relationship between current smoking and poorer hospital outcomes, including an absence of Australian studies. This retrospective audit seeks to investigate the relationship between current smoking and hospital outcomes and mortality for CAP in a regional Australian setting with a high smoking prevalence.

A 12 month clinical audit of ISLHD patients presenting with chronic lung disease

Nick Spiliopoulos, Cassandra Davis, Michelle Taylor

This clinical audit includes admissions from July 2015 to July 2016 of patients with chronic lung disease admitted at Shoalhaven, Shellharbour and Wollongong Hospitals. This study is exploratory in nature and aims to establish what the preductors are of greater than one hospital admission and 28 day mortality in ISLHD patients. The secondary aims is to explore a number of demographic characteristics of the population in order to review and standardise standards of care.
Near infrared spectroscopy (NIRS) enables continuous monitoring of dynamic cerebrovascular autoregulation, but this methodology relies on invasive blood pressure monitoring (iABP). We evaluated the agreement between a NIRS based autoregulation index calculated from invasive blood pressure monitoring, and an entirely non-invasively derived autoregulation index from continuous non-invasive blood pressure monitoring (nABP) using the Finometer photoplethysmograph. Autoregulation was calculated as the moving correlation coefficient between iABP and rSO2 (iTOx) or nABP and rSO2 (nTOx). The blood pressure range where autoregulation is optimal was also determined for invasive (iABPOPT) and non-invasive blood pressure measurements (nABPOPT). 102 simultaneous bilateral measurements of iTOx and nTOx were performed in 19 patients (median 2 per patient, range 1-9) with different acute pathologies (sepsis, cardiac arrest, head injury, stroke). Average iTOx was 0.01 ± 0.13 and nTOx was 0.01 ± 0.11. The correlation between iTOx and nTOx was \( r = 0.87, p < 0.001 \), 95% agreement 3 0.12,
bias = 0.005. The interhemispheric asymmetry of autoregulation was similarly assessed with iTOx and nTOx (r = 0.81, p < 0.001). Correlation between iABPOPT and nABPOPT was r = 0.47, p = 0.003, 95% agreement 3 32.1 mmHg, bias = 5.8 mmHg. Coherence in the low frequency spectrum between iABP and nABP was 0.86 3 0.08 and gain was 1.32 3 0.77.The results suggest that dynamic cerebrovascular autoregulation can be continuously assessed entirely non-invasively using nTOx. This allows for autoregulation assessment using spontaneous blood pressure fluctuations in conditions where iABP is not routinely monitored. The nABPOPT might deviate from iABPOPT, likely because of discordance between absolute nABP and iABP readings.

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To investigate the correlation between early changes in cerebrovascular autoregulation (CVAR) and neurological outcome and mortality in patients admitted to the intensive care unit with septic shock. A prospective observational study in a tertiary, university-affiliated ICU, of 28 patients with septic shock (median age, 66 years; interquartile range [IQR], 56-74 years), with a median APACHE III score of 86 (IQR, 55-119). We used the correlation in time between cerebral tissue oxygenation (measured with near infrared spectroscopy) and mean arterial pressure to determine the tissue oxygenation reactivity index (TOx) as a measure of CVAR. Low TOx represents intact CVAR and high TOx represents impaired CVAR. We performed the measurements in the first 3 days after admission to the ICU. Survival and neurological outcomes, measured using the modified Rankin Scale and the Cerebral Performance Category scale, were censored 3 months later. All survivors of septic shock had a good neurological outcome. The TOx for Days 1-3 was higher (P < 0.001) in non-survivors (median, 0.04 [IQR, 0.12-0.24]) compared with survivors (median, -0.02 [IQR, -0.13 to 0.05]). The TOx was independently associated with survival at 3 months (odds ratio, 0.13 [95% CI, 0.01-0.69]; P < 0.05) using logistic regression analysis. CVAR is impaired early in septic shock and is independently associated with mortality at 3-month follow-up. Information based on bedside monitoring of CVAR in the ICU could form a valuable adjunct to guide haemodynamic optimisation in patients with septic shock.

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Elective treatment of the contralateral clinically node-negative (cN0) neck is not routinely recommended for lateralized oral cavity squamous cell carcinoma (SCC). We sought to determine the failure rate in the untreated contralateral neck in patients with lateralized oral SCC undergoing treatment of the primary and ipsilateral neck and to identify any features placing patients at sufficient risk of contralateral regional failure to justify elective treatment. We identified 688 patients with oral SCC undergoing curative surgery 3 adjuvant therapy between 1985 and 2012 from a prospectively collected database. Patients with midline primaries and those undergoing bilateral neck treatment were excluded. The primary endpoint was isolated contralateral neck failure. Of 481 patients, 14 (2.9%) developed isolated contralateral neck recurrence, with median time to recurrence of 8 months. Patients with poorly differentiated tumours or pathologically proven ipsilateral nodal metastases were at significantly higher risk of contralateral recurrence (hazard ratio (HR) 3.6, 95% confidence interval (CI) 1.1-11.9, P = 0.037 and HR 4.6, 95% CI 1.5-13.8, P = 0.006 respectively). Presence of both of these factors conferred a 10% risk of contralateral failure. Patients with lateralized oral SCC undergoing treatment of the primary tumour and ipsilateral neck have a low rate of isolated contralateral neck failure. Although poorly differentiated primaries and ipsilateral nodal metastases were predictors of contralateral recurrence, the risk remains relatively modest in this subset of patients suggesting close observation may be more appropriate than elective treatment. Our results support current recommendations for observation of the cN0 contralateral neck in lateralized oral SCC.
Professor of Surgery, Peter Cosman

Hawkeye and Professor Peter Cosman: What does a famous TV Surgeon have in common with our own Professor of Surgery?

Inspiration: Dr Cosman was inspired to pursue a career in medicine after watching too many episodes of M.A.S.H. This, for those too young to know, was an iconic TV Series that aired from 1972-83. It was the character “Hawkeye” that captured Peter’s attention. Hawkeye was a highly skilled and trained person who was able to make a significant contribution. Yet he was still a down-to-earth character with a sense of humour. So this first sparked Peter’s interest in the area of medicine, in particular surgery.

Peter does come from a family who have always supported learning for learning sake and he also has an uncle and a younger brother who are doctors. Peter looked up to his uncle and with a family member and a larger-than-life TV hero, it led Peter to a career in medicine. Peter attended Fort St High in Sydney and after finishing high school did a Bachelor of Arts. That helped me gain a broader perspective on life. He then went on to study medicine.

What Peter enjoys about his job is that fact it requires you to: define a problem; then identify the resources required to fix the problem; then take the action that helps address the problem. This gives you almost instant gratification whereas other specialities such an internal medicine often require a longer term approach where management of symptoms is required and there is always the quick fix you find in surgery.

When asked why do research? Peter describes a recent conversation with another surgical colleague in which his colleague remarked: “when you are on your deathbed you won’t be thinking why you didn’t want more gall bladders but more about what sort of contribution have you made in your career, how many lives did you help improve?”

As a surgeon when you operate on a patient you change that patient’s life forever. It changes that patient’s life in a very tangible way. Peter was interested in teaching and research because it is a way to expand the influence and a way to do something good for many, not just a few. There is a quote Peter refers to when thinking about his approach to research. He describes the title of a famous lecture given by the eminent US Physicist Richard Feynman “There is always room at the bottom”. Peter believes there is room for everyone to get involved in research at some level. It is not always about thinking of the very big questions but in fact just the opposite, it is thinking about problems you face every day when looking after your patients. You start with the simple questions that are small but relevant to patients. Then develop your research skills.

Peter also has a very strong interest in teaching surgical skills to trainee doctors and his PhD was looking at virtual reality as a training method. Similar to how pilots do some of their training in simulation units, Peter was looking at how trainee doctors could master their basic surgical skills before working on patients.

Phase contrast cine MRI with determination of pulsatile aqueductal cerebrospinal fluid (CSF) stroke volume and flow velocity has been suggested to assess intracranial pulsations in idiopathic normal pressure hydrocephalus (iNPH). We aimed to compare this non-invasive measure of pulsations to intracranial pressure (ICP) pulse wave amplitude from continuous ICP monitoring. We hypothesised that a significant correlation between these two markers of intracranial pulsations exists. Fifteen patients with suspected iNPH had continuous computerised ICP monitoring with calculation of mean ICP pulse wave amplitude (MWA) from time-domain analysis. MRI measured CSF aqueductal stroke volume and peak flow velocity. Mean MWA was 5.4mmHg (range 2.3-12.4mmHg). Mean CSF stroke volume and peak flow velocity were 65μl (range 3-195μl) and 9.31cm/s (range 1.68-15.0cm/s), respectively. No significant correlation between the invasive and non-invasive measures of pulsations existed (Spearman r=-0.30 and r=-0.27, respectively; p>0.05). We observed marked intra-individual fluctuation of MWA during continuous ICP monitoring of an average of 6.0mmHg (range 2.8-12.2mmHg). The results suggest a complex interplay between measures of pulsations derived from snapshot MRI measurements and continuous computerised ICP measurements, as no significant relationship existed in our data. Further study is needed to better understand the temporal profile of CSF MRI flow studies, as substantial variation in MWA over the course of several hours of ICP monitoring is common, suggesting that these physiologic fluctuations might obscure MRI snapshot measures of intracranial pulsations.


The process of re-infusion of proximal stoma output into the distal limb of a stoma is utilised infrequently hence, as the author discovered there is little evidence to draw on when faced with such a challenge. Joe’s story describes the care of a man who presented with a bowel perforation and subsequently required stoma formation. Re-infusion of effluent from the proximal limb in conjunction with enteral feeds into the distal stoma limb was successfully established. Joe was able to sustain his nutritional requirements including weight and serum blood chemistry until stoma reversal, without parenteral nutrition. Eliminating the need for parenteral nutrition reduced potential complications such as sepsis from long term PICC line, liver dysfunction and venous thrombosis. There were significant cost savings and all levels of nursing staff could maintain and care for the process. A vital part of the success was the attitude of ward staff in embracing the procedure. In addition empowering Joe to participate in learning was of great benefit so he could direct nursing staff when needed. This was all facilitated by a multidisciplinary approach and good communication within the team.


To compare morbidity and in-hospital mortality in patients who underwent surgery for femoral neck fracture on weekends versus on weekdays. Records of 90 men and 225 women (mean age, 80.5 years) who underwent surgery for femoral neck fractures on weekends or public holidays (n=110) or on weekdays (n=205) were retrospectively reviewed. The morbidity and in-hospital mortality of the 2 groups were compared. The 2 groups were comparable in terms of age, sex, and time to surgery, but more hemiarthroplasties were performed on weekdays (35.0% vs. 25.0%, p=0.036). Compared with surgery on weekdays, surgery on weekends was associated with increased in-hospital mortality (3.4% vs. 9.1%, p=0.04). None of the potential confounders (age, type of surgery, presenting hospital, and time to surgery) had a significant effect on in-hospital mortality. In patients with femoral neck fractures, surgery on weekends was associated with increased in-hospital mortality but not with increased morbidity after adjusting for confounders, compared with surgery on weekdays.
Surgery in adult obstructive sleep apnea (OSA) has undergone significant advancement in recent years and continues to evolve. It is a modality of treatment used in the context of failed device use, specifically, failed continuous positive airway pressure or mandibular advancement splint. In this context, the role of surgery is either as salvage therapy or to facilitate better tolerance of device use. Other treatments such as weight loss, adjuvant nasal therapy (medical ± prephase nasal surgery) and positional devices may be combined with airway surgery. In general, patients with OSA are managed with in-hospital monitoring perioperatively.

To study the patterns of care of penile cancer diagnosed in the state of New South Wales (NSW) over a 10 year period and determine factors that are associated with differences in survival. All invasive penile cancer diagnosed between 2001 and 2009 in NSW, Australia, were identified from the Central Cancer Registry. Records of treatment from the Admitted Patient Data Collection and deaths from the Registry of Births Deaths and Marriages were electronically linked. Predictors of receiving an inguinal lymph node dissection (ILND) were analysed using multivariable logistic regression. Survival analyses were performed with Kaplan-Meier and Cox proportional hazards models. A total of 220 men were diagnosed with penile cancer over the 10 years from 69 centres. The median number of penile operations performed over 10 years was <4. Radical penile surgery (partial or total penectomy) was performed in 70% of the cases and the proportion of patients receiving radical surgery increased over time (P = 0.015). Only 53/220 men with invasive penile cancer received an ILND. Younger age and higher stage were the only factors that predicted whether ILND was performed. Overall survival (OS) was predicted by age, stage, marital status and co-morbidity status. Low centre volume decreased OS by 37% (HR 0.63 [95% CI: 0.40-0.97]). For men who received ILND, low centre volume decreased OS by 60% (HR 0.40 [95% CI: 0.19-0.85]). There is a decreasing trend for the use of conservative penile surgery and median centre volumes for penile cancer surgery in NSW are low. A decrease in overall survival is observed in men treated in lower volume surgery centres.

This study aims to evaluate Apnea-Hypopnea Index (AHI) outcomes of upper airway adult obstructive sleep apnea (OSA) reconstructive surgery, as compared with outcomes of suboptimal continuous positive airway pressure (CPAP) therapy, in response to reviews claiming unreliable surgical AHI reduction. Prospective cohort study. Single-surgeon series at medical centers within Wollongong, Australia. Adult patients with OSA who were partial device users or who refused CPAP were considered candidates for upper airway surgery (N = 48). Subjects underwent physical examination and polysomnography before and after surgery. Three groups were delineated on the nature of their suboptimal CPAP therapy: group 1, partially using CPAP or refusing long-term CPAP despite adherence (with available download data); group 2, unable or refusing to use CPAP with 2 sleep studies over time; group 3, unable or refusing to use CPAP with 1 sleep study over time. Collected data included demographics and AHI outcomes. Average AHI across all 3 groups with suboptimal CPAP therapy before surgery was 30.24 ± 17.17 events per hour sleep, as compared with the average postoperative AHI of 7.65 ± 6.59 events per hour sleep. This decrease was shown to be statistically significant with Wilcoxon signed-rank test (P < .0001). AHI outcomes are superior with surgery in untreated or suboptimally treated adult OSA patients prescribed CPAP.
Obstructive Sleep Apnoea (OSA) is a condition of upper airway collapse during sleep, characterised by stoppages or reductions in airflow that may be associated with repetitive oxygen saturation. The Innovation Campus hosted a workshop titled “Sleep Apnoea - Beyond CPAP” that included Wollongong Hospital’s Ear, Nose and Throat surgeon, Professor Stuart MacKay who has teamed up with Professor Gordon Wallace to use 3D printing to create experimental models wherein the airway collapse that causes sleep apnoea can be simulated and novel treatments investigated.

The workshop brought together scientists/engineers and clinicians including international guests. Professor Stacey Ishman from Cincinnati Children’s Hospital Medical Centre who presented on Novel Diagnostics and Therapeutics for children with sleep breathing disorders. Professor Edwards Weaver from the University of Washington in Seattle discussed the importance of research in sleep apnoea surgery and Dr Rich Leowis expanded on this by describing his work on hyoid expansion for OSA. Professor Peter Eastwood gave the audience an overview of existing airway models in OSA.

This expert group discussed a range of current surgical treatments, adjuvant and novel therapeutics. With anywhere from 4-24% of adult men and 2-9% of women being affected, this debilitating condition will be more manageable in the near future with the latest advances in research offering a number of promising avenues.

A selection of active trials underway by Professor Stuart MacKay:

- RCT in multi-level upper airway surgery for CPAP failure

- A prospective paediatric OSA cohort scoring system study

- A prospective Nyxoah mini-hypoglossal nerve stimulator trial, a prospective assessment of nasopharyngoscopic evaluation of mandibular advancement study

- An airway modelling and manipulation study traversing domains of building a replicable laboratory model of a human upper airway

We report an unusual emergency presentation of C. difficile-related pseudomembranous colitis causing an isolated post-inflammatory ischaemic colonic stricture and a large bowel obstruction (LBO). We postulate the patient’s episode of diarrhoea several months earlier was the onset of C. difficile infection. Subsequent prolonged sub-clinical colitis may have resulted in an inflammatory stricture, further exacerbated by relapse of colitis (with associated colonic oedema) after the second course of antibiotics. It is unlikely the focal sigmoid diverticula were implicated in the aetiology. This form of mechanical LBO is distinct from the paralytic ileus seen in C. difficile-related toxic megacolon. The presence of a true mechanical aetiology for LBO should always be confirmed prior to surgery. This was accomplished in our case with gastrografin enema and attempted sigmoidoscopy. No evidence of pseudomembranous colitis was seen macroscopically on limited sigmoidoscopy; although it is known that pseudomembranes may be absent in the rectosigmoid, but visible proximally. This case demonstrates C. difficile-related disease is one (of several) reasons clinicians should rationalize antibiotic use.
Four Seasons of Research in Pictures

Professor Leonard Arnolda, Dr Marianna Milosavljevic and Dr Matin Sterba at the Four Seasons of Research.

Attendees using the opportunity to learn about research taking place within the specialty they work in.

Dr Farshid Nikam presenting on the vascular research projects.

Samantha Jakimowicz PhD candidate with the Manager of Research, Dr Marianna Milosavljevic.
Incidence of MRSA-infected cutaneous abscesses in a paediatric population

Brielle Wood, James Williams, Steven Craig

The incidence of skin and soft tissue infections and localised purulent lesions have increased recently at a time when methicillin-resistant Staphylococcus aureus (MRSA) has emerged globally. In Australia, the yearly admissions for treatment of cutaneous abscesses increased by 48% between 1999-2000 and 2007-2008 and studies have shown that abscess formation and severity of disease is associated with MRSA infections. There is limited data on the current incidence of MRSA-infected cutaneous abscesses within an Australian paediatric population and we sought to establish the incidence within a regional area of Australia. Hence, this retrospective audit is examining patients under 16 years of age who presented to ISLHD with a cutaneous abscess (code L02) between 2010 and 2015 that were drained and had a wound culture. The results of this study may help to inform regional antibiotic guidelines.

Evaluation of the relationship between body mass index and short-term postoperative complications in patients undergoing major colorectal surgery.

Kara Goon, Marianna Milosavljevic, Soni Putnis, Gregory Peoples, Ivana Goluza

Increased body mass index (BMI) is a risk factor for colorectal cancer and diverticular disease and will likely impact the outcomes of colorectal surgery. Research into BMI and colorectal surgical outcomes has been conflicting. The aims of this study are to explore the relationship between BMI and short-term postoperative complications, length of stay and 30-day mortality following major colorectal surgery. Methods: A retrospective review of 264 patients undergoing major colorectal surgery over a one-year period was performed. Data collected included patient demographics, operative variables, incidence of postoperative complications, length of stay, and 30-day mortality. BMI was divided into 4 groups. BMI was calculated in 242 patients. Obese patients had an increased mean number of complications (1.9, p=0.011) when compared with normal weight (1.1) and overweight patients (1.1).

Obese patients had an increased incidence of superficial and deep surgical site infections (SSI; 18.8% and 5.8% respectively) compared to normal weight patients (4.3% and 0% respectively, p<0.05). Postoperative atelectasis was increased in obese patients compared to overweight patients (p = 0.02). BMI did not affect length of stay or 30-day mortality. Across all patients in this cohort the most common complication was ileus (21.6%) followed by superficial SSI (11.8%). These results demonstrate a relationship between obesity and increased postoperative complications. Quality improvement initiatives for obese patients may include early initiation of prophylactic treatments to reduce the incidence of postoperative complications. More highly powered research is warranted, as well as further investigation into the incidence of postoperative ileus given the high prevalence within this cohort.

Allergic Rhinitis and Sleep Disturbed Breathing (SDB) in Children undergoing Adenotonsillectomy (A&T)

Stuart MacKay, Terry Sands, Andrew Jones, Sue-Ellen Holmes

Obstructive sleep apnoea represents the severe end on a continuum of sleep disordered breathing (SDB) in childhood and ranges from 1% to 5.7% with a peak incidence ages of three to six. The primary therapeutic intervention for sleep disordered breathing (SDB) in children is adenotonsillectomy (A&T) because adenotonsillar hypertrophy is often a defining characteristic of upper airway collapse.

However, post-operative symptoms of SDB such as snoring, restless sleep and daytime fatigue remain in approximately 10-20% of patients. For those children whose residual sleep symptoms prove severe, CPAP is the preferred option. Others experiencing milder disruption are left untreated. Incomplete resolution highlights a multimodal cause to increased airway resistance and collapse. Allergic Rhinitis (AR) results in blockage due to nasal mucosa edema and nasal secretions, which increases upper airway resistance predisposing children to partial or whole upper airway obstruction during sleep. The aim of this project is to clarify the link between postoperative residual sleep symptoms and AR in a large cohort of children undergoing adenotonsillectomy. The second aim is to recommend best practice therapeutic options.
Evaluation of the relationship between body mass index and short-term postoperative complications in patients undergoing major colorectal surgery.

Kara Goon, Marianna Milosavljevic, Soni Putnis, Gregory Peoples, Ivana Goluza

Increased body mass index (BMI) is a risk factor for colorectal cancer and diverticular disease and will likely impact the outcomes of colorectal surgery. Research into BMI and colorectal surgical outcomes has been conflicting. The aims of this study are to explore the relationship between BMI and short-term postoperative complications, length of stay and 30-day mortality following major colorectal surgery.

Methods: A retrospective review of 264 patients undergoing major colorectal surgery over a one-year period was performed. Data collected included patient demographics, operative variables, incidence of postoperative complications, length of stay, and 30-day mortality. BMI was divided into 4 groups.

Results: BMI was calculated in 242 patients. Obese patients had an increased mean number of complications (1.9, p=0.011) when compared with normal weight (1.1) and overweight patients (1.1). Obese patients had an increased incidence of superficial and deep surgical site infections (SSI; 18.8% and 5.8% respectively) compared to normal weight patients (4.3% and 0% respectively, p<0.05). Postoperative atelectasis was increased in obese patients compared to overweight patients (p = 0.02). BMI did not affect length of stay or 30-day mortality. Across all patients in this cohort the most common complication was ileus (21.6%) followed by superficial SSI (11.8%).

Discussion/Conclusion: These results demonstrate a relationship between obesity and increased postoperative complications. Quality improvement initiatives for obese patients may include early initiation of prophylactic treatments to reduce the incidence of postoperative complications. More highly powered research is warranted, as well as further investigation into the incidence of postoperative ileus given the high prevalence within this cohort.

Australian and New Zealand Hip Fracture Registry

John McKenzie, James Brinton

The Australian and New Zealand Hip Fracture Registry was established in 2014. The Registry works in parallel with the guidelines for hip fracture care that includes measure of time-to-surgery, as well as milestones both before and after patients operations. These are aimed at improving the journey for patients suffering a hip fracture. ISLHD chose to take part in the registry to better benchmark their performance in the delivery of care to patients with hip fracture, of which approximately 300 patients are seen each year. The registry will allow Wollongong Hospital staff to pool information, compare data to national standards and report on successes. Since the commencement of the registry, data from over 3000 patients from across more than 40 different organisations has been entered into the Registry, with Wollongong Hospital contributing 200 patients. Improving the average time from fracture to surgery remains a local priority and data entry will continue at Wollongong Hospital.
With a slight frame, but an energetic and passionate attitude, Laurencia is one of three visionary vascular surgeons at Wollongong Hospital. Coupled with David Huber, Tam Nguyen and CNC James Brinton, and a number of young emerging doctors, they form a clinical and research group wanting to explore numerous research questions in the area in order to provide novel and research backed procedures nationally and internationally. We spoke with Laurencia about how early beginnings and the motivations to undertake research.

I started my research journey with a few papers when I was in Argentina doing general surgery. I was able to create some impact clinically with publications during my time in Canada. I published a paper that justified doing endovascular surgery in a fully equipped endovascular hybrid operating suite with a permanently mounted high-resolution image intensifier. At that time it was a very hot topic, as some surgeons were doing endovascular cases in a catheterization laboratory, or in an angiography suite. It was one of the papers that was referenced when people were trying to justify building a hybrid operating room.

Dr Huber has always been a visionary; he implemented a hybrid operating theatre in Wollongong, which was the first one in Australia. Now, it is mandatory everywhere. We had people coming from all over Australia, examining our hybrid here. Dr Huber has always had an interest in innovation and so have other surgeons here at Wollongong. Similarly, I came from training places where people had interest in innovation and research.

I think that’s how we were able to lead a number of areas clinically, always trying to find the best way or the newest way of doing things and being able to be creative.

I personally think that we haven’t done enough research to show our clinical expertise and outcomes; this is where I see an opportunity moving forward. Dr Huber has performed some outstanding work over the years, nobody knew how advanced he was, for example, he did the first endovascular iliac aneurysm repair using bilateral iliac branch device in the world. He has done a lot of research; but hasn’t had the opportunity to showcase what he and the unit have accomplished.

We are at the point where we are invited to all the relevant scientific and clinical meetings globally. We are an excellence centre for the AngioJet system and utilising it for deep vein thrombosis surgery. We felt that there was need to expand the service and treat Pulmonary Embolism (PE), and the Power Pulse Spray technique is providing fantastic results. I presented our six case studies recently and Dr Michael Jaff, the godfather of PE grabbed me afterwards and said that was pretty impressive. This initial series shows that the Power Pulse Spray technique with the AngioJet system is safe, simple and effective in treating massive and sub massive acute pulmonary embolism.

The next step is to publish the data, and we have a lot of promising projects but as we said we need to publish. It is not about the fame and glory; it is about justifying and being allowed to keep delivering. The government is clamping down on resources, I want to show that technology and innovation not only improves patient care but also saves money.
Clinical practice guideline for the prevention and management of venous leg ulcers
Debbie Blanchfield

In 2005 a large number of Australia’s wound care leaders endorsed the need for an Australian Clinical Practice Guideline for the Prevention and Management of Venous Leg Ulcers. The guideline became international within its development and was launched in 2011, some six years after initial work began. The document is called The Australian and New Zealand Clinical Practice Guideline for Prevention and Management of Venous Leg Ulcers.

In 2015 the committee recognised that it had been some years since the original research and to ensure the guideline remained evidence-based there was a need to look at the current literature related to venous leg ulcers. Small working groups were formed to perform literature reviews on each of the topics within the guideline. The small working groups will work collaboratively to appraise the research, ensure accuracy of the data that is extracted and interpret the relevance of the evidence in developing draft recommendations for clinical practice. Debbie Blanchfield will lead one of the working groups in conducting a literature review on diagnosis of venous disease and venous leg ulcers.

BCCA: Bi-National Colorectal Cancer Audit
Andrew Still, Soni Putnis, Robert Winn

The Bi-National Colorectal Cancer Audit (BCCA) is a CSSANZ initiative used for clinical audit of the surgical practices of Australian and New Zealand colorectal surgeons for the purpose of quality assurance as well as research. Colorectal surgeons at Wollongong Hospital are involved in ongoing prospective data collection of colorectal patients.

To describe the outcomes of a public hospital maternity unit in rural New South Wales (NSW) following the adaptation of the service from an obstetrician and general practitioner obstetrician (GPO) led birthing service to a low-risk midwifery group practice (MGP) model of care with a planned caesarean section service (PCS). A retrospective descriptive study using quantitative methodology. Maternity unit in a small public hospital in rural New South Wales, Australia. Data were extracted from the ward based birth register for 1172 births at the service between July 2007 and June 2012. Birth numbers, maternal characteristics, labour, birthing and neonatal outcomes. There were 750 births over 29 months in GPO and 277 and 145 births over 31 months in MGP and PCS, respectively, totalling 422 births following the change in model of care. The GPO had 553 (73.7%) vaginal births and 197 (26.3%) caesarean section (CS) births (139 planned and 58 unplanned). There were almost universal normal vaginal births in MGP (>99% or 276). For normal vaginal births, more women in MGP had no analgesia (45.3% versus 25.1%) or non-invasive analgesia (47.9% versus 38.6%) and episiotomy was less common in MGP than GPO (1.9% versus 3.4%). Neonatal outcomes were similar for both groups with no difference between Apgar scores at 5 min, neonatal resuscitations or transfer to high-level special care nurseries. This study demonstrates how a rural maternity service maintained quality care outcomes for low-risk women following the adaptation from a GPO to an MGP service.

The IDEA (International Deep Endometriosis Analysis group) statement is a consensus opinion on terms, definitions and measurements that may be used to describe the sonographic features of the different phenotypes of endometriosis. Currently, it is difficult to compare results between published studies because authors use different terms when describing the same structures and anatomical locations. We hope that the terms and definitions suggested herein will be adopted in centers around the world. This would result in consistent use of nomenclature when describing the ultrasound location and extent of endometriosis. We believe that the standardization of terminology will allow meaningful comparisons between future studies in women with an ultrasound diagnosis of endometriosis and should facilitate multicenter research.


To develop and assess the performance of a preoperative ultrasound-based endometriosis staging system (UBESS) to predict the level of complexity of laparoscopic surgery for endometriosis. This was a multicenter prospective and retrospective cohort study on consecutive women with suspected endometriosis who underwent laparoscopy between June 2009 and July 2013. Each woman underwent a systematic transvaginal ultrasound evaluation to assess the pelvis for different phenotypes of endometriosis, and the diagnostic performance of ultrasound for these different phenotypes was evaluated relative to the gold standard, laparoscopy. A three-stage preoperative UBEDS was developed to assess the severity of pelvic endometriosis, based on the histological phenotypes of endometriosis, the anatomical locations of deep infiltrating endometriosis and their sonographic markers of local invasiveness. The three stages of UBEDS (I-III) were then correlated with the three levels of complexity of laparoscopic surgery for endometriosis described by the Royal College of Obstetricians and Gynaecologists (Levels 1-3). The end-points were the diagnostic performance of UBEDS to predict the level of complexity of laparoscopic surgery for endometriosis, i.e. UBEDS stage I to predict Level-1 laparoscopic surgery, UBEDS stage II to predict Level-2 laparoscopic surgery and UBEDS stage III to predict Level-3 laparoscopic surgery. The analysis included 192 women, with a mean 3 SD age at diagnosis of endometriosis of 23.7 ± 9.3 years and a mean duration of symptoms prior to presentation of 42 months. Predominant reported locations of pelvic pain were left iliac fossa (32%), right iliac fossa (29.5%) and lower abdomen (61%) and predominant symptoms included dyspareunia (57.5%), dysmenorrhea (58.5%) and dyschezia (41.5%). The accuracy, sensitivity, specificity, positive and negative predictive values and positive and negative likelihood ratios of UBEDS I for predicting a requirement for Level-1 laparoscopic surgery were: 87.5%, 83.3%, 91.7%, 90.9%, 84.6%, 10 and 0.182; those of UBEDS II for predicting Level-2 surgery were: 87.0%, 73.7%, 90.3%, 65.1%, 93.3%, 7.6 and 0.292; and those of UBEDS III for predicting Level-3 surgery were: 95.3%, 94.8%, 95.5%, 90.2%, 97.7%, 21.2 and 0.054, respectively.

UBEDS could be utilized to predict the level of complexity of laparoscopic surgery for endometriosis. It has the potential to facilitate the triage of women with suspected endometriosis to the most appropriate surgical expertise required for laparoscopic endometriosis surgery. UBEDS needs to be validated externally in multiple centers to assess its general applicability. Copyright © 2016 ISUOG. Published by John Wiley & Sons Ltd.

A prediction model (M4) can successfully classify PUL into low and high risk groups. We aim to externally validate the M4 model in classifying women in a non-UK population, into low and high risk pregnancies of unknown location (PULs). Methods: A retrospective analysis of women classified with PUL attending a Sydney-based teaching hospital between June 2006 and March 2016. PUL was defined as nil signs of intra- or extra-uterine pregnancy on transvaginal ultrasound (TVS). The reference standard was the final characterisation of PUL as failed PULs or intra-uterine pregnancies (IUPs) (low risk), or as ectopic pregnancies (EPs) (high risk). M4 is a multinomial logistic regression model based on the serum human chorionic gonadotrophin (hCG) levels at presentation and 48 h later. This model was applied to each PUL and the estimated risks of failed PULs, IUPs or EPs were recorded. In the event that M4 classified women to have an EP risk ≥ 5%, then these women were classified high risk. Results: 8360 consecutive women underwent TVS and 7.94% (664/8360 women were classified with a PUL. 57 women were excluded due to incomplete data. The final diagnoses were 64.4% (391/607) failed PULs, 23.5% (143/607) IUPs and 12% EPs (73/607; includes EPs and persisting PULs). 454 were considered low risk of which 397 (87.4%) were failed PULs or IUPs) and 22 were EPs. 67% (49/73) of the EPs were considered high risk. The M4-based protocol classified 17.6% of failed PUL, 31% of IUP and 69% of EP as at high risk. For all PUL this protocol classified 69% of PUL as at low risk, and amongst these 95% were indeed failed PUL or IUP. Thus, of PUL classified as at low risk using M4, about 1 in 19 would be an EP. Conclusions: We have externally validated prediction model M4 which classified around 69% of PULs as low risk, of which around 95% were later characterised as failed PULs or IUPs, while still classifying 69% of EPs as high risk.


Transvaginal ultrasound (TVU) is evolving as an essential tool in the work up for women with pelvic pain and suspected endometriosis. Several studies have demonstrated the accuracy and reliability of TVU for the diagnosis of pelvic deep infiltrating endometriosis and pouch of Douglas obliteration. Assessment of the anterior pelvic compartment for urinary DIE and uterovesical adhesions should also be considered in the TVU examination for women with pelvic/pain suspected endometriosis. In addition, the use of ultrasound markers such as ovarian endometriomas and ovarian immobility may also aid in the assessment for disease severity. The ability to map disease location and extent pre-operatively allows for appropriate triaging, surgical planning and patient counselling, and in turn, improved care for women with severe endometriosis. This update focuses on the most recent advances surrounding the use of TVU for the prediction of endometriosis location and severity.
About 15% of women who present to a gynaecology clinic have chronic pain (CPP). Up to 26% of this group will have underlying pouch of Douglas obliteration yet 82% of gynaecologists admit to not being able to perform advanced laparoscopic surgery. We aim to estimate the costs of a general gynaecologist’s conventional surgical approach (model 1) vs an ultrasound-based approach (model 2) to women with CPP and complex disease. Model 1: general gynaecologist seeing women with suspected endometriosis proceeds directly to diagnostic laparoscopy without an advanced ultrasound examination, finds underlying POD obliteration/complex endometriosis disease and then refers the woman to an advanced laparoscopic surgeon; model 2: general gynaecologist orders a detailed ultrasound examination by sonologist with expertise in endometriosis and refer cases with probably POD obliteration, complex endometriosis disease to a skilled advanced laparoscopic surgeon avoiding diagnostic laparoscopy. The costs to the public health system for consultation, ultrasound and various surgical interventions for endometrosis were retrieved from New South Wales Ministry of Health: consultation $A225, detailed ultrasound $A500, diagnostic laparoscopy $A2,541, colonoscopy $A4,880 and laparoscopic bowel surgery $A14,923. Calculations of the cost of treating complex disease were performed and compared for both clinical pathways. For an outpatient gynaecology unit that reviews 1000 new consultations annually, 15% (150/1000) women would have underlying POD obliteration with complex endometriosis. With model 1, the cost of treating each complex case is $A23,970, whereas for model (2) $A21,203. This means that there is a cost saving of $A2767 per case $A107913 annually. If there is a general gynaecologist has access to expert to ultrasound in the diagnosis of complex endometriosis, this results in significant cost savings to the public healthcare system.
When you meet Dr Shannon Reid, not only is her passion for her work immediately evident, she presents with a plethora of research ideas to improve the lives of those affected by pelvic pain and associated conditions. Originating from Vancouver, Shannon left her Research Scientist job to undertake a Bachelor of Medicine, Bachelor of Surgery (Honours) at the University of Sydney. She laughs as she reflects back on the nice photos of the Opera House, and the sunny Australian beaches found in the university brochure that initially enticed her to move half way around the world. In all seriousness though, “it was a good opportunity to experience life in another country.” Whilst she did return to Canada to complete part of her Obstetrics and Gynaecology speciality training, as well as a fellowship in Endometriosis, Pelvic Pain and Advanced Laparoscopic Surgery, she has embedded herself here at ISLHD, with her expertise spanning early pregnancy complications, pelvic pain/endometriosis and gynaecological pathology.

Cementing her knowledge of research, Shannon recently submitted her PhD for examination which focused on using ultrasound to predict the presence of deep infiltrating endometriosis and pelvic adhesions in women who have pelvic pain and suspected endometriosis. By determining whether or not deep infiltrating endometriosis and pelvic adhesions are present preoperatively can assist in predicting the complexity of the surgery, the required skill level of surgeons, and the required presence of certain surgery specialities, such as colorectal or urological surgeons. Shannon uses a unique dynamic technique during internal ultrasounds, where the probe is used to mobilise the organs to predict whether or not these organs glide smoothly against each other. If pelvic adhesions are present, there is a greater chance of a technically difficult surgery, and the presence of severe endometriosis. Shannon is now part of the International Deep Endometriosis Analysis (IDEA) group, which has recently developed a consensus statement on the sonographic evaluation of the pelvis in women with suspected endometriosis. This consensus statement was published in the Journal Ultrasound in Obstetrics and Gynecology in September 2016.

Her research aspirations don’t end there. Hot topics for future potential projects span from developing a universal scoring system using clinical and ultrasound features to predict endometriotic disease severity preoperatively, investigating how good clinicians are at diagnosing endometriosis at surgery, prior to histopathology results, and exploring how the removal of endometriosis improves fertility and quality life in the general gynaecology population as opposed to the IVF population. Her key to success? Teamwork, having a clear idea, extra circular time and persisting through the challenges. Liaise with Research Central to breakdown the mystery behind the research processes, and link up with colleagues and other researchers. Association with others will gain you knowledge and valuable research tips!
Magnesium sulphate at 30 to 34 weeks gestational age: Neuroprotection Trial

Warren Davis, Ian Wright, Caroline Crowther

Babies born preterm are at increased risk of dying compared with term babies and survivors are more likely to have complications that include admission to intensive care, breathing difficulties, bleeding around the brain and infection, and in early childhood, developmental delay and cerebral palsy. Magnesium sulphate is currently recommended for use in women at risk of preterm birth at less than 30 weeks gestation to increase the chance of the baby having fewer complications early in life and surviving free of cerebral palsy, learning and developmental problems later in life. The MAGENTA trial aims to assess whether giving magnesium sulphate to women prior to preterm birth between 30 and 34 weeks gestation reduces the risk of death of cerebral palsy in their children at 2 years corrected age. The project will involve data collection relating to the pregnancy, birth and care of the mother and baby while in hospital from cases notes, a developmental survey completed by mothers when their babies are 12 months corrected age, neurological and psychological evaluation for children at 2 years corrected age, parental/caregiver questionnaire relating to general health, use of health services and developmental progress and behaviour.

The trial has to date enrolled 1428 babies, 85% of the cohort, we will complete recruitment towards the end of 2017. The follow-up of the children at 2 years corrected age will be finalised in early 2020 and we hope to publish the trial results later that year.

External Validation of an Ultrasound Based Endometriosis Staging System (UBESS)

Shannon Reid

Although only 5-10% of women with endometriosis will have bowel involvement, currently it is very difficult to predict this group pre-operatively. This group of women require both gynaecological and colorectal input at surgery. As part of a previous project by the investigator, the Ultrasound Based Endometriosis Staging System (UBESS) was developed. The UBESS could be utilised to predict the level of complexity of laparoscopic surgery for endometriosis, and has the potential to facilitate the triage of women to the most appropriate surgical expertise required. The aim of this study is to externally validate UBESS to predict the level of complexity of laparoscopic surgery for endometriosis, as well as to assess its general applicability.

Bronchopulmonary dysplasia (BPD) is a major cause of mortality and long-term respiratory and neurological morbidity in very preterm infants. While survival rates of very preterm infants have increased over the past two decades there has been no decrease in the rate of BPD in surviving infants. Evidence from animal and human studies has suggested potential benefits of docosahexaenoic acid (DHA), an n-3 long chain polyunsaturated fatty acid, in the prevention of chronic lung disease. This randomised controlled trial aims to determine the effectiveness of supplementary DHA in reducing the rate of BPD in infants less than 29 weeks' gestation. This is a multicentre, parallel group, randomised, blinded and controlled trial. Infants born less than 29 weeks’ gestation, within 3 days of first enteral feed and with parent informed consent are eligible to participate. Infants will be randomised to receive an enteral emulsion containing DHA or a control emulsion without DHA. The DHA emulsion will provide 60 mg/kg/day of DHA. The study emulsions will continue to 36 weeks’ postmenstrual age (PMA). The primary outcome is BPD as assessed by the requirement for supplemental oxygen and/or assisted ventilation at 36 weeks’ PMA. Secondary outcomes include the composite of death or BPD; duration of respiratory support and hospitalisation, major neonatal morbidities. The target sample size is 1244 infants (622 per group), which will provide 90 % power to detect a clinically meaningful absolute reduction of 10 % in the incidence of BPD between the DHA and control emulsion (two tailed p =0.05). DHA supplementation has the potential to reduce respiratory morbidity in very preterm infants. This multicentre trial will provide evidence on whether an enteral DHA supplement reduces BPD in very preterm infants.

The preterm newborn is at high risk of developing cardiovascular compromise during the first day of life and this is associated with increased risk of brain injury. Standard treatments are volume expansion and administration of inotropes, typically dopamine and/or dobutamine, but there is limited evidence that inotropes improve clinical outcomes. This study investigated the efficacy of dopamine and dobutamine for the treatment of cardiovascular compromise in the preterm newborn using a piglet model. Preterm and term piglets were assigned to either dopamine, dobutamine or control infusions. Heart rate, left ventricular contractility, cardiac output, blood pressure, and cerebral and regional blood flows were measured during baseline, low (10 μg/kg/h), and high (20 μg/kg/h) dose infusions. At baseline, preterm piglets had lower cardiac contractility, cardiac output, blood pressure, and cerebral blood flow compared to term piglets. The response of preterm piglets to either dopamine or dobutamine administration was less than in term piglets. In both preterm and term piglets, cardiac output and cerebral blood flow were unaltered by either inotrope. In order to provide better cardiovascular support, it may be necessary to develop treatments that target receptors with a more mature profile than adrenoceptors in the preterm newborn.


This population-based study determined the delivery room management and outcomes of extremely preterm infants born with Apgar scores of 0. We linked birth, neonatal intensive care unit (NICU) and death records for babies who were born between 22 + 0 and 27 + 6 weeks of gestation with a one-minute Apgar score of 0, in New South Wales, Australia, between 1998 and 2011. We classified 2173/2262 (96%) of infants with a one-minute Apgar score of 0 as stillborn. Resuscitation was provided for 48/89 (54%) live births and 40/2173 (2%) stillbirths. Cardiac massage was given to 44 infants, including three 22-week stillborn babies. Of the 13 live births admitted to an NICU, 11 survived to hospital discharge. Most (98%) of the 2212 deaths occurred on the first day of life. One baby who was classified as stillborn lived for 51 days. Resuscitation increased the mean (95% confidence interval) duration of survival from 1 (0-2) to 45 (0-104) hours (p < 0.001). No infant with a five-minute Apgar score of 0 survived. Clinicians resuscitated extremely preterm infants without a detectable heartbeat, even at 22 weeks of gestation. No infant survived without resuscitation or if their heartbeat was not regained by five minutes.
Joanne is frank about the difficulties of conducting research alongside clinical duties. However, she also revels in research that brings about change and believes building up a research culture in non-tertiary centres is critical. She shares her thoughts with Research Central.

How I started in research was through the Royal Australasian College of Physicians (RACP) as part of the requirement of becoming a paediatrician. I was fortunate that I had a supervisor who was affiliated with the University and had lots of research experience. I was able to do a unique project that hadn't been done before. The study was examining the performance of the Australian Developmental Screening test in a clinical setting. We had 65 participants and the project was passed by the college and later published. That was years ago! It took a while to publish and so I thought that would be my first and last research project. I was part of a cohort that didn’t get taught research design, or how to do critical appraisal at university therefore, it was a very steep learning curve for me and labour intensive, so I was very happy to never do research again. The ethics approval was an eye opener although it ended up not being too painful and I had gained experience with the process.

When I got my first consultant job it was in a hospital associated with a University and I also took a position with the university. This meant there was an expectation I would do further research or supervise students doing research and I had to go on another steep learning curve yet again. I was a supervisor for a registrar doing a college project, the subject which was something I was interested in and just hadn’t had time to follow through on. I suggested it to her and she took it on and ran with it and we actually got that accepted as a poster at the RACP congress in 2016, so that was a rewarding experience as a supervisor.

As a department we are part of a few multi-centre trials such as the HUNTER and the KT bronchiolitis study. I quite enjoy the teamwork aspect and the fact that they have been started by other researchers/research assistants who have done all the beautiful ground work while I simply provide feedback on local trial processes and recruitment. The HUNTER trial has been very successful thus far, and the KT bronchiolitis study will be interesting because it is using a theory of Knowledge Translation as a way of increasing the uptake of an Australian bronchiolitis guideline in reducing use of therapies known to be of no benefit in the management of infants with bronchiolitis and we are one of the control groups.

To grow a research culture, assistance in progressing research projects is invaluable. For example receiving assistance from Research Central to complete the site specific assessment forms for both of our current multi-centre trials. It’s great to have that support in a non-tertiary centre as I think it is important that research is performed in settings such as ours and not just in the larger tertiary hospitals.
Clinicians in 25 countries prefer to use lower levels of oxygen to resuscitate preterm infants at birth. Acta Paediatrica: promoting child health, 105 (9), 1061-1066.

This study determined current international clinical practice and opinions regarding initial fractional inspired oxygen (FiO2) and pulse oximetry (SpO2) targets for delivery room resuscitation of preterm infants of less than 29 weeks of gestation. Methods An online survey was disseminated to neonatal clinicians via established professional clinical networks using a web-based survey programme between March 9 and June 30, 2015. Results Of the 630 responses from 25 countries, 60% were from neonatologists. The majority (77%) would target SpO2 between the 10th to 50th percentiles values for full-term infants. The median starting FiO2 was 0.3, with Japan using the highest (0.4) and the UK using the lowest (0.21). New Zealand targeted the highest SpO2 percentiles (median 50%). Most respondents agreed or did not disagree that a trial was required that compared the higher FiO2 of 0.6 (83%), targeting the 50th SpO2 percentile (60%), and the lower FiO2 of 0.21 (80%), targeting the 10th SpO2 percentile (78%). Most (65%) would join this trial. Many considered that evidence was lacking and further research was needed. Conclusion Clinicians currently favour lower SpO2 targets for preterm resuscitation, despite acknowledging the lack of evidence for benefit or harm, and 65% would join a clinical trial.


To systematically review outcomes of infants ≤28+6 weeks gestation randomised to resuscitation with low (≤0.3) vs high (≥0.6) fraction of inspired oxygen (FiO2) at delivery. Systematic review of randomised controlled trials of low (≤0.3) vs high (≥0.6) FiO2 resuscitation. Information was obtained from databases (Medline/Pub Med, EMBASE, ClinicalTrials.gov, Cochrane) and meeting abstracts between 1990 to 2015. Search index terms: preterm/resuscitation/oxygen. Data for infants ≤28+6 weeks gestation were independently extracted and pooled using a random effects model. Analyses were performed with Revman V.5. Death in hospital, bronchopulmonary dysplasia (BPD), retinopathy of prematurity >grade 2 (ROP), intraventricular haemorrhage >grade 2 (IVH), patent ductus arteriosus (PDA) and necrotising enterocolitis (NEC). A total of 251 and 253 infants were enrolled in 8 studies (6 masked, 2 unmasked) in the lower and higher oxygen groups, respectively, (mean gestation 26 weeks) between 2005 and 2014. There were no differences in BPD (relative risk, 95% CIs 0.88 (0.68 to 1.14)), IVH (0.81 (0.52 to 1.27)), ROP (0.82 (0.46 to 1.46)), PDA (0.95 (0.80 to 1.14)) and NEC (1.61 (0.67 to 3.36)) and overall mortality (0.99 (0.52 to 1.91)). Mortality was lower in low oxygen arms of masked studies (0.46 (0.23 to 0.92), p=0.03) and higher in low oxygen arms of unmasked studies (1.94 (1.02 to 3.68), p=0.04). There is no difference in the overall risk of death or other common preterm morbidities after resuscitation is initiated at delivery with lower (≤0.30) or higher (≥0.6) FiO2 in infants ≤28+6 weeks gestation. The opposing results for masked and unmasked trials may represent a Type I error, emphasising the need for larger, well designed studies.

Pembrolizumab is a humanized monoclonal antibody against programmed death 1 (PD-1) that has antitumor activity in advanced non–small-cell lung cancer (NSCLC), with increased activity in tumors that express programmed death ligand 1 (PD-L1). In this open-label, phase 3 trial, we randomly assigned 305 patients who had previously untreated advanced NSCLC with PD-L1 expression on at least 50% of tumor cells and no sensitizing mutation of the epidermal growth factor receptor gene or translocation of the anaplastic lymphoma kinase gene to receive either pembrolizumab (at a fixed dose of 200 mg every 3 weeks) or the investigator’s choice of platinum-based chemotherapy. Crossover from the chemotherapy group to the pembrolizumab group was permitted in the event of disease progression. The primary end point, progression-free survival, was assessed by means of blinded, independent, central radiologic review. Secondary end points were overall survival, objective response rate, and safety. Median progression-free survival was 10.3 months (95% confidence interval [CI], 6.7 to not reached) in the pembrolizumab group versus 6.0 months (95% CI, 4.2 to 6.2) in the chemotherapy group (hazard ratio for disease progression or death, 0.50; 95% CI, 0.37 to 0.68; P<0.001). The estimated rate of overall survival at 6 months was 80.2% in the pembrolizumab group versus 72.4% in the chemotherapy group (hazard ratio for death, 0.60; 95% CI, 0.41 to 0.89; P=0.005). The response rate was higher in the pembrolizumab group than in the chemotherapy group (44.8% vs. 27.8%), the median duration of response was longer (not reached [range, 1.9+ to 14.5+ months] vs. 6.3 months [range, 2.1+ to 12.6+]), and treatment-related adverse events of any grade were less frequent (occurring in 73.4% vs. 90.0% of patients), as were grade 3, 4, or 5 treatment-related adverse events (26.6% vs. 53.3%). In patients with advanced NSCLC and PD-L1 expression on at least 50% of tumor cells, pembrolizumab was associated with significantly longer progression-free and overall survival and with fewer adverse events than was platinum-based chemotherapy.


The educational and cognitive differences associated with low socioeconomic status begin early in life and tend to persist throughout life. Coupled with the finding that levels of sedentary time are negatively associated with cognitive development, and time spent active tends to be lower in disadvantaged circumstances, this highlights the need for interventions that reduce the amount of time children spend sitting and sedentary during childcare. The proposed study aims to assess the effects of reducing sitting time during Early Childhood Education and Care (ECEC) services on cognitive development in toddlers from low socio-economic families. We will implement 12-months 2-arm parallel group cluster randomised controlled trial (RCT) with Australian toddlers, aged 12 to 26 months at baseline. Educators from the ECEC services allocated to the intervention group will receive professional development on how to reduce sitting time while children attend ECEC. Participants’ cognitive development will be assessed as a primary outcome, at baseline and post-intervention, using the cognitive sub-test from the Bayley Scales of Infant and Toddler Development. This trial has the potential to inform programs and policies designed to optimize developmental and health outcomes in toddlers, specifically in those from disadvantaged backgrounds.
The safest ranges of oxygen saturation in preterm infants have been the subject of debate. In two trials, conducted in Australia and the United Kingdom, infants born before 28 weeks’ gestation were randomly assigned to either a lower (85 to 89%) or a higher (91 to 95%) oxygen-saturation range. During enrollment, the oximeters were revised to correct a calibration-algorithm artifact. The primary outcome was death or disability at a corrected gestational age of 2 years; this outcome was evaluated among infants whose oxygen saturation was measured with any study oximeter in the Australian trial and those whose oxygen saturation was measured with a revised oximeter in the U.K. trial. After 1135 infants in Australia and 973 infants in the United Kingdom had been enrolled in the trial, an interim analysis showed increased mortality at a corrected gestational age of 36 weeks, and enrollment was stopped. Death or disability in the Australian trial (with all oximeters included) occurred in 247 of 549 infants (45.0%) in the lower-target group versus 217 of 545 infants (39.8%) in the higher-target group (adjusted relative risk, 1.12; 95% confidence interval [CI], 0.98 to 1.27; P=0.10); death or disability in the U.K. trial (with only revised oximeters included) occurred in 185 of 366 infants (50.5%) in the lower-target group versus 164 of 357 infants (45.9%) in the higher-target group (adjusted relative risk, 1.10; 95% CI, 0.97 to 1.24; P=0.15). In post hoc combined, unadjusted analyses that included all oximeters, death or disability occurred in 492 of 1022 infants (48.1%) in the lower-target group versus 437 of 1013 infants (43.1%) in the higher-target group (relative risk, 1.11; 95% CI, 1.01 to 1.23; P=0.02), and death occurred in 222 of 1045 infants (21.2%) versus 185 of 1045 infants (17.7%) in the lower-target group versus 185 of 1045 infants (17.7%) in the higher-target group (relative risk, 1.20; 95% CI, 1.01 to 1.43; P=0.04).

In the group in which revised oximeters were used, death or disability occurred in 287 of 580 infants (49.5%) in the lower-target group versus 248 of 563 infants (44.0%) in the higher-target group (relative risk, 1.12; 95% CI, 0.99 to 1.27; P=0.07), and death occurred in 144 of 587 infants (24.5%) versus 99 of 586 infants (16.9%) (relative risk, 1.45; 95% CI, 1.16 to 1.82; P=0.001). Use of an oxygen-saturation target range of 85 to 89% versus 91 to 95% resulted in nonsignificantly higher rates of death or disability at 2 years in each trial but in significantly increased risks of this combined outcome and of death alone in post hoc combined analyses.

The perinatal period remains a time of significant risk of death or disability. Increasing evidence suggests that this depends on microcirculatory behavior. Sidestream dark-field orthogonal polarized light videomicroscopy (OPS) has emerged as a useful assessment of adult microcirculation but the values derived are not delineated for the newborn. We aimed to define these parameters in well term newborn infants. Demographic details were collected prospectively on 42 healthy term neonates (n = 20 females, n = 22 males). OPS videomicroscopy (Microscan) was used to view ear conch skin microcirculation at 6, 24, and 72 h of age. Stored video was analyzed by a masked observer using proprietary software. There were no significant differences between the sexes for any structural parameters at any time point. There was a significant increase over time in small vessel perfusion in female infants only (P = 0.009). A number of 6- and 72-h measurements were significantly correlated, but differed from the 24-h values. These observations confirm the utility of the ear conch for neonatal microvascular videomicroscopy. They provide a baseline for studies into the use of OPS videomicroscopy in infants. The changes observed are comparable with previous studies of term infants using these and other microvascular techniques. It is recommended that studies for examining the mature neonatal microvascular structure be delayed until 72 h of life, but studies of the physiology of cardiovascular transition should include the 24-h time point after delivery.


The longitudinal birth cohort design has yielded a substantial contribution to knowledge of child health and development. The last full review in New Zealand and Australia in 2004 identified 13 studies. Since then, birth cohort designs continue to be an important tool in understanding how intrauterine, infant and childhood development affect long-term health and well-being. This updated review in a defined geographical area was conducted to better understand the factors associated with successful quality and productivity, and greater scientific and policy contribution and scope. We adopted the preferred reporting items for systematic reviews and meta-analyses (PRISMA) approach, searching PubMed, Scopus, Cinahl, Medline, Science Direct and ProQuest between 1963 and 2013. Experts were consulted regarding further studies. Five inclusion criteria were used: (1) have longitudinally tracked a birth cohort, (2) have collected data on the child and at least one parent or caregiver (3) be based in Australia or New Zealand, (4) be empirical in design, and (5) have been published in English. 10665 records were initially retrieved from which 23 birth cohort studies met the selection criteria. Together these studies recruited 91,196 participants, with 38,600 mothers, 14,206 fathers and 38,390 live births. Seventeen studies were located in Australia and six in New Zealand. Research questions initially focused on the perinatal period, but as studies matured, longer-term effects and outcomes were examined. This review demonstrates the significant yield from this effort both in terms of scientific discovery and social policy impact. Further opportunities have been recognised with cross-study collaboration and pooling of data between established and newer studies and international studies to investigate global health determinants.


This study analyses the incidence of Neonatal Abstinence Syndrome (NAS) in a large geographically defined population in Australia. It included database linkage analysis of all births between 2000 and 2011 in New South Wales (NSW), Australia. The diagnosis of NAS was derived from hospital coding P96.1, ‘Neonatal withdrawal symptoms from maternal use of drugs of addiction’. Temporal trends were studied by comparing epoch 1 (2000-05) with epoch 2 (2006-11). The relationship with changes in maternal factors was further analysed. The NAS was coded in 3842 of 1 022 263 live born infants (0.38%). NAS incidence peaked at 5.07 per 1000
live births in 2002, decreasing to 3.18 in 2011 and was negatively correlated with maternal age (r = -0.7). The rate of NAS in epoch 2 (3.4 per 1000 births, 95% CI 3.28, 3.58) was significantly lower than in epoch 1 (4.1 per 1000 births, 95% CI 3.96, 4.33). Epoch 2 mothers were significantly older (mean 29.8 years vs. 28.3 years), less likely to be multiparous (OR 0.7, 95% CI 0.6, 0.9) or smoke (OR 0.4, 95% CI 0.4, 0.5). They were more likely to engage in antenatal care earlier (mean first visit: 14.1 vs. 18.9 weeks). Most infants (~80%) were born at term (>37 weeks gestation). The incidence of NAS as a discharge diagnosis has decreased in our population since 2002. Mothers are also older and engaging earlier in prenatal care. Whether these changes alter NAS presentation and diagnosis or whether pregnant women are using drugs that do not cause typical NAS (e.g. amphetamines) is uncertain and requires further study.

New Projects

Knowledge Translation in Australasian Paediatric Care Settings: a multi-centred, cluster, randomised controlled trial comparing a tailored, theory informed Knowledge translation versus passive dissemination of a bronchiolitis guideline.

Joanne Morris, Tegan MacDonald, Tracey Couttie, Simon Binks

Bronchiolitis is the most common lower respiratory tract infection in children less than 12 months and the most frequent cause of hospitalisation in infants under 6 months of age in Australasia. Treatment is well defined, however despite this substantial variation in practice occurs. The aim of this study is to determine for infants presenting to emergency departments and admitted to inpatient settings with bronchiolitis, does tailored, theory informed knowledge translation interventions increase the uptake of an Australasian bronchiolitis guideline in reducing the use of therapies/management known to be of no benefit in infants with bronchiolitis.

Improving Paediatric Hospital Care through Standardised Clinical Audit

Matthew Firth, Anthony Meany, Elizabeth Newman, Camilla Askie, Tracey Couttie

This project is an interventional study with qualitative sequential approach to improve compliance with the National Safety and Quality Health Service Standards (NSQHS) in a paediatric acute setting. Clinical practice and patient outcomes can be improved through the use of auditing and feedback. Ivers et al (2012) identified that there are several key modifiers that seem to impact the effect of using audit and feedback to support clinical quality improvement. Currently there are very few standardised clinical audit practices that are employed between health services in NSW. This limits the ability of facilities to benchmark their clinical services against external performance indicators. A state wide standardised approach to clinical auditing has the potential to achieve opportunities for clinical quality improvement in terms of enabling paediatric services to identify common themes and risks using objective data and implementing successful clinical quality improvements. The aims of this project include: 1. Standardising and optimising a clinical audit for acute paediatric facilities across NSW that assesses compliance with the NSQHS standards. 2. To explore the elements that continue to impact clinical quality improvement initiatives that enable recommendations for improving patient outcomes through the use of auditing. 3. To identify compliance risks across the NSQHS in paediatric units within NSW.

Pilot of the Beyond Milestones online education resource with Allied Health Professionals

Jennifer Nicol, Carmel Blayden, Sonia Hughes, Susan Sims, Arjun Rao

Beyond Milestones is a free online resource initially developed to instruct paediatric trainees in a systematic approach to critical and quality observation of normal child development. Previous research has demonstrated the effectiveness of the resource with medical clinicians. Piloting the use of the resource with allied health professionals would determine the effectiveness of the Beyond Milestones resource with this clinical group, as well as identify its potential application to allied health education. Pre and post assessments tools will be used with an allied health professional sample group, and evaluation data will be analysed to identify changes in attitudes, knowledge and usefulness. Based on the outcomes, recommendations will be made regarding the effectiveness and potential utilisation and modification of the Beyond Milestones resource for allied health education. This project is being led by the NSW Childrens Healthcare Network.
Ongoing Projects

HUNTER Trial

Brett Manley, Ian Wright, Joanne Morris, Patrice Nolan, Ashley Noel Blood

The HUNTER trial is a randomised clinical trial in Australian non-tertiary special care nurseries (SCNs), comparing the efficacy and safety of high flow nasal cannulae (HFNC) to continuous positive airway pressure (CPAP) as primary respiratory support after birth for preterm and term infants with early respiratory distress. If HFNC is as good as CPAP at supporting the breathing of newborn babies and helps to keep them in their birth hospital, then HFNC will become more widely accepted in SCNs. Furthermore small hospitals that do not currently have any way to support babies’ breathing may start to use HFNC.

Antibiotic use in neonates in the Illawarra Shoalhaven Local Health District

Ian Wright, Deborah Friend

The risks of antibiotic use in a neonate are many but include unwarranted exposure to potentially nephrotoxic and ototoxic drugs, mainly gentamicin noting that the risk increases with the increased length of use. Given that mothers rarely room with their infants while they are receiving antibiotic therapy, this clinical audit looked at the effect that prolonged and unwarranted use had on breastfeeding status upon discharge. Guidelines clearly define the parameters for use beyond 48 hours. Therefore this clinical audit aimed to identify if antibiotics are being used appropriately and if not, the ramifications both long and short term. Results from 101 term neonates receiving antibiotics showed that 29/101 received >48 hr antibiotics (mostly 5 days). Of these only 4 (<14%) had a clinical indication, only 2 of these were clear under current recommendations. There were no statistically significant differences in either historical, clinical signs or demographic parameters between those that received prolonged courses and those that did not. Prolonged antibiotic use was associated with a significant increase in length of stay (median 2 days more, p<0.001) but not a decrease in breastfeeding rates. The only factor that predicted use of a prolonged antibiotic course was AMO status, with only 4 percent of these being cared for by staff specialists (p<0.05). This audit demonstrates that there are opportunities to reduce prolonged antibiotic use, by adherence to evidence based guidelines.

Hemocue White Cell Count Diff study

Ian Wright, Krystle Lander, Ivana Goluza

Point of Care (POC) testing can be a useful clinical tool. A white cell count (wcc) differential POC device (HemoCue®, Radiometer) has been shown to be accurate in older children and adults. It has not been validated in neonates, where immature cells may theoretically alter results. Routine full blood count samples from 66 admitted babies were immediately tested in parallel on the POC device. Mean birth gestational age was 33.1 weeks (range 26.0-39.6) with median sampling at 15 days (range 0–92). POC operation and laboratory results were executed masked to the other method. Comparisons used Bland–Altman (mean and SD), Spearman Rank correlation and Wilcoxon as appropriate. POC and lab total wcc, neutrophils and lymphocytes were highly correlated (p < 0.0001). Mean Bland-Altman differences were small: total wcc 0.4 10^9/L (+/- 2SD 1.1 to -1.9), neutrophils 1.2 10^9/L (+/- 2SD 2.7 to -0.3), lymphocytes 0.7 10^9/L (+/- 2SD 1.3 to -2.7). Whilst statistically significant (p < 0.0001) these small absolute differences were clinically insignificant. Eosinophils were also significantly correlated; monocytes and baso-phils were not. 24% of original POC attempts resulted in error readings compared to 7% of laboratory samples being unsuitable for analysis. The POC device is highly correlated and in clinical agreement with laboratory values for total wcc, neutrophils and lymphocytes in this population.

Dr Sam der Sarkissian pipetting samples for the POC device reading.
Mental Health

Second-generation antipsychotics (SGAs), such as olanzapine, are used to treat schizophrenia; however, they have minimal benefits for cognitive deficits and cause metabolic side-effects such as obesity [1, 2]. Obesity has been linked to increased cognitive impairment, complicating the health issues of people with schizophrenia. Liraglutide is a synthetic glucagon-like peptide-1 (GLP-1) receptor agonist with antiobesity and neuroprotective properties; however, whether liraglutide can improve cognition during olanzapine treatment is unclear. The aim of this study was to examine the effects of liraglutide co-treatment on cognition and metabolic parameters during olanzapine treatment.

Methods: Sprague-Dawley rats were administered olanzapine (2mg/kg), liraglutide (0.4mg/kg), olanzapine+liraglutide cotreatment or vehicle (control) (n=12/group) for six weeks. Body weight, food intake and locomotor activity were recorded. Novel object recognition (NOR) and T-maze tests were conducted to examine recognition and working memory. Post-mortem white adipose tissue weight was recorded. Olanzapine caused significant body weight gain and increased white adipose tissue mass (p<0.05 vs control).

Conclusion: This study demonstrates that liraglutide co-treatment can improve locomotor activity, decrease adiposity and prevent weight gain side-effects associated with olanzapine administration. Liraglutide co-treatment was able to improve recognition memory impairment caused by olanzapine treatment; however, it had no effect on working memory. Further studies are required to understand the mechanisms underlying these changes, and to elucidate whether a link exists between olanzapine-induced obesity and liraglutide’s effect on cognition.


We read with interest Ruddock et al. (1) “Believing in food addiction: Helpful or counterproductive for eating behaviour?” The article reports two experiments that manipulated participants’ beliefs as to whether or not they had food addiction and then had them engage in a taste test. Contrary to the literature reporting that the concept of food addiction has the potential to negate personal responsibility and lead individuals to “overindulge.” Participants led to believe they scored high on food addiction ate less than those who believed they has scored lower.


Clinicians working in inpatient mental health facilities (IMHFs) face threats to both their physical safety and the emotional impact of the environment. The majority of previous research has focused on nursing staff; little has been done to explore the safety concerns of medical students. This study explores the pre-placement concerns and post-placement perceptions relating to physical and emotional safety in medical students undertaking their first placement in an IMHF. Two questionnaires were completed: a pre-placement questionnaire (n = 37) measuring students’ specific physical and emotional safety concerns and a post-placement questionnaire (n = 41) measuring their experience of physical and emotional safety. Information regarding suggestions for improving their feelings of safety on the placement was also gathered. The qualitative responses were analysed and common themes identified. With regard to physical safety, the key pre-placement concerns were physical outbursts/aggressive patients, a recent murder, inexperience and unpredictability of patients. Pre-placement concerns pertaining to emotional safety were as follows: personal issues, emotional involvement, emotional toll, confronting and inexperience. The primary themes identified after the placement experience were as follows: agitated/aggressive patients, the recent murder, support by staff, getting to know the patients.
and emotional toll. Identified themes in the suggestions for improving safety were as follows: the need for more skills training, encouragement to debrief and more information on dealing with the emotional toll. The key themes identified in the pre-placement concerns aligned directly with the post-placement themes. These factors need to be considered when student placements are being planned.


Individuals with mental illness from culturally and linguistically diverse (CALD) backgrounds have poorer health outcomes than their non-CALD peers. Support groups have been found to be an effective component of the treatment for both affective and psychotic disorders. The aim of this study is to investigate participants’ perceptions of a Macedonian Mental Health and Living Skills Program, a support group program for Macedonian individuals with a serious mental illness. Two focus groups were conducted with 22 CALD participants, with 11 participants in each group. The discussion centered on their perceptions and experiences of the group. The results indicated the following key themes that emerged from the focus group data: improved social opportunities; a sense of comfort and belonging; improved mood; increased motivation; better access to health information; and reductions in hospital admissions. In summary, the CALD participants perceived the support program to be highly beneficial and advantageous to their health and wellbeing.


This paper aims to describe the prevalence, assessment and management of affective disorders as well as functional (non-epileptic) seizures in people with epilepsy. This paper comprises a selective review of the literature of the common affective manifestations of epilepsy. Affective disorders are the most common psychiatric comorbidity seen in people with epilepsy and assessment and management parallels that of the general population. Additionally, people with epilepsy may experience higher rates of mood instability, irritability and euphoria, classified together as a group, interictal dysphoric disorder and resembling an unstable bipolar Type II disorder. Functional seizures present unique challenges in terms of identification of the disorder and a lack of specific management. Given their high prevalence, it is important to be able to recognise affective disorders in people with epilepsy. Management principles parallel those in the general population with specific caution exercised regarding the potential interactions between antidepressant medications and antiepileptic drugs. Functional seizures are more complex and require a coordinated approach involving neurologists, psychiatrists, general practitioners, nursing and allied health. There is very limited evidence to guide psychological and behavioural interventions for neurotic disorders in epilepsy and much more research is needed.


The aim of this study was to determine the prevalence and clinical correlations of catatonia in patients aged over 65 years who are referred to a consultation-liaison service within a regional area of Australia. Additionally, to examine if the use of standardised screening tools is likely to change the rate of diagnosis of catatonia within the consultation-liaison service. One hundred and eight referrals from general hospital wards were assessed using the Bush-Francis Catatonia Screening Instrument (BFCSI) and associated examination; each consented patient was screened for catatonic symptoms. If two or more signs were present on the BFCSI, then severity was rated using the Bush-Francis Catatonia Rating Scale. These clinical characteristics were compared with their socio-demographic and medical data. Results: Prevalence of catatonia was 5.5%. The most common symptoms appeared to be rigidity, posturing and immobility (67% of cases), and were elicited through routine psychiatric examination. Routine psychiatric history and examination are likely sufficient to elicit catatonic signs in a consultation-liaison setting. Standardised screening examination may be more suited for conducting research or for use when examining for catatonia in psychiatric inpatient settings.

Second generation antipsychotic drugs (SGAs) cause substantial body weight gain/obesity and other metabolic side-effects such as dyslipidaemia. Their antagonistic affinity to the histaminergic H1 receptor (H1R) has been identified as one of the main contributors to weight gain/obesity side-effects. The effects and mechanisms of betahistine (a histaminergic H1R agonist and H3 receptor antagonist) have been investigated for ameliorating SGA-induced weight gain/obesity in both animal models and clinical trials. It has been demonstrated that co-treatment with betahistine is effective in reducing weight gain, associated with olanzapine in drug-naïve patients with schizophrenia, as well as in the animal models of both drug-naïve rats and rats with chronic, repeated exposure to olanzapine. Betahistine co-treatment can reduce food intake and increase the effect of thermogenesis in brown adipose tissue by modulating hypothalamic HIR-NPY-AMPK (NPY: neuropeptide Y; AMPK: AMP-activated protein kinase) pathways, and ameliorate olanzapine-induced dyslipidaemia through modulation of AMPK-SREBP-1-PPAR-dependent pathways (SREBP-1: Sterol regulatory element binding protein 1; PPAR: Peroxisome proliferator-activated receptor-) in the liver. Although reduced locomotor activity was observed from antipsychotic treatment in rats, betahistine did not affect locomotor activity. Importantly, betahistine co-treatment did not influence the effects of antipsychotics on serotonergic receptors in the key brain regions for antipsychotic therapeutic efficacy. However, betahistine co-treatment reverses the upregulated dopamine D2 binding caused by chronic olanzapine administration, which may be beneficial in reducing D2 supersensitivity often observed in chronic antipsychotic treatment. Therefore, these results provide solid evidence supporting further clinical trials in treating antipsychotics-induced weight gain using betahistine in patients with schizophrenia and other mental disorders.


The paper presents a pilot study of Balint group work to establish it as a potential training tool in psychiatry. The aim was to test whether, in the training setting, it was possible for a cohesive group to form, such that trainees could make use of a Balint group experience. Nine psychiatry trainees were offered three 90-minute Balint sessions and provided written feedback. The trainees reported unanimously that group participation was a positive and worthwhile experience. They began to feel supported by their colleagues and experienced the method as an effective way to manage stress and anxiety. They reported that they experienced doctor–patient interactions in a different way, which appeared to correspond with a greater
understanding of the patient's experience. The pilot suggested that, within the public health training setting, a cohesive group could form such that trainees were able to make use of a Balint group experience. It suggested that this practice could be beneficial in managing the stresses, isolation and intense feelings of working with patients in this setting. The feedback indicated that the group helped trainees ‘think differently’ by fostering self-awareness and so furthered their development of psychodynamic skills.


Clinical guidelines originated in the United States in the early 1980s, initially as a cost-containment exercise. There are healthcare professionals who view clinical guidelines as the panacea for the delivery of quality health care, while others consider them to be sinister seeking to control and limit clinical decision making, enforcing ‘cookbook’ style medicine (Hopkins, 1995). Clinical guidelines are beneficial when they provide accessible knowledge of available treatment options and clear straightforward directives for clinical care. Standardised treatments can reduce variations in care and assist with identifying gaps that need to be addressed, thus encouraging clinical research and serving the needs of both clinicians and learners.

In addition to the above challenges, the clinical guidelines could also address contemporary challenges, those specifically pertaining to bipolar disorder such as the role of antidepressants in bipolar disorder, when to withdraw antipsychotics in a manic episode and the complexity of comorbidity. Another contemporary challenge relates to cognition, specifically how to minimise and manage cognitive impairment. Although challenges remain, the RANZCP clinical practice guidelines are accessible, pragmatic and comprehensive, providing directives for the provision of care for individuals with varied mood disorders concomitantly meeting the needs of a range of clinicians.


This article briefly reviews the literature pertaining to community treatment orders (CTOs) specifically how and why they are utilised and how effective mandated community treatment really is. This review discusses the use of CTOs in the context of the recovery model. This article highlights the shortfalls in the current CTO system while also demonstrating the increase in acute coercive care. The literature pertaining to the effectiveness of CTOs is inconsistent with more recent reviews denoting that there is now robust evidence the CTOs are not effective. Further treatment that aligns with the recovery model as oppose to mandated treatment is known to increase treatment compliance.


Depression is a significant global health issue that has previously been associated with negative early care experiences and insecure attachment styles. This has led to much interest in identifying variables that may interrupt this relationship and prevent detrimental personal, social and economic outcomes. Recent research has indicated associations between the two seemingly distinct constructs of secure attachment and mindfulness, with similar positive outcomes. One hundred and forty eight participants completed an online survey exploring a possible sequential cognitive processing model, which predicted that higher levels of mindfulness and then emotional regulation would mediate the relationship between attachment and depression. Full mediation was found in regards to secure, preoccupied and dismissive attachment, whereas partial mediation was identified in the case of fearful attachment. The results support the possibility of an alternative cognitive processing pathway that may interrupt the association between negative early care experiences and concomitant negative mental health outcomes. Further exploration of this relationship is indicated.
Depression is a major cause of morbidity and death globally, and its incidence is increasing. Increases have been linked to modern dietary changes, stress, loneliness, sleep deprivation and endocrine dysfunction. Its diagnostic criteria span psychological and physical symptoms, including low mood, negative thinking and changes in sleep, appetite and weight. Additionally, there are strong relationships between depression and physical health, particularly heart disease. Key biomarkers identified to operate at the nexus of physical and mental health include cortisol, oxytocin, omega-3 fatty acids and leptin. While these show potential for novel therapeutic strategies, studies show inconsistent results, likely due to complex interactions between biopsychosocial variables and heterogeneous symptom subtypes. Structural equation modelling (SEM) is an analytical technique allowing examination of complex interactions between variables that predict important outcomes, such as illness. SEM has been extensively applied to coronary heart disease to identify points for interventions among numerous lifestyle and physical factors. As yet, similar, comprehensive models of depression are lacking. Developing and testing complex models including key biological and psychosocial variables may lead to improved interventions. We quantified plasma cortisol, oxytocin, omega-3 fatty acid and leptin levels in 60 healthy participants and 60 meeting DSM-5 criteria for Major Depressive Disorder who were not receiving treatment. Participants completed detailed measures of psychopathology, stress, quality of life, psychosocial functioning, cognitive distortions and lifestyle data. Other physiological health-related measures included BMI, heart-rate, blood pressure and waist circumference. We employed correlational analyses and SEM using AMOS to test hypotheses about relationships between key physiological and psychological variables. Several individual biomarkers showed distinct relationships with psychopathology, distress, quality of life, psychosocial functioning and cognition. In particular, cortisol levels were related to stress, psychopathology, perceived lack of social support and depressive cognitive distortions. Oxytocin levels were inversely associated with psychopathology and positively associated with perceived social support. Physiological health indices including heart rate and blood pressure were related both to specific psychopathological symptoms and to hormone levels. These relationships were further explored through SEM. This study identified new information about links between several key biomarkers and specific symptoms in depression. Our application of SEM allows more complex understanding of the strength and direction of relationships between psychophysiological variables associated with depression. Further, large scale, studies are needed. This approach shows promise for increasing understanding of biological trajectories towards depression and ill health, which may potentially lead to targeted early interventions.


Starcevic (2016) emphasises that conceptualising problematic behaviours as an addiction has several consequences; the most pertinent being trying to address the behaviour devoid of the function that it is serving for the individual. Thus, perhaps the crux of the issue is the underlying psychopathology that is impelling the atypical behaviour. Therefore, collectively the impetus lies in understanding the underlying psychopathology in order to understand how the atypical behaviour is best conceptualised and designated. A behavioural addiction that has received a great deal of attention in the last decade is food addiction (FA). Our research in relation to FA has indicated that the concept appears to be intertwined with other forms of psychopathology (Pai et al., 2016). In a sample of the general population (n = 118), 9.32% (n = 11) were found to meet the Yale Food Addiction Scale (YFAS) criteria for FA; of those who met the FA criteria, 81.82% reported living with a long-term mental health condition. In a sample of individuals with severe mental illness (schizophrenia, schizoaffective disorder; n = 94), 26.59% (n = 25) met the YFAS criteria for FA, a prevalence rate much higher than in the general population. Thus, it appears that FA is associated with the co-occurrence of other mental illnesses.

The role of physical and social environment on mental health cannot be ignored. While this relationship is adequately explored in mental health research, analysing and assimilating them in mental health planning still remains a road less travelled. Computer-based mapping technology called geographic information systems (GIS) has presented mental health researchers with many new possibilities in this direction. GIS-based spatial mapping and analysis can provide a better insight into illness patterns, causes, interactions and service needs. This can in turn help in evaluating interventions and guide evidence-based health care policies. The aim of this letter is to inform us of the opportunities and usefulness of GIS in mental health research, planning and delivery.


Consultation-liaison psychiatry (CLP) services vary in terms of structure, function and responsiveness. It is not known whether evaluation measurements can be meaningfully compared across different CLP services to assess value and efficiency. The aim was to develop and test a common tool for measuring process and outcome measures in CLP. A data collection tool was developed using the literature and consultation with CLP clinicians. The tool was used to prospectively gather referral data, response times, health utilisation data and functional outcomes for individuals referred over seven months to three different CLP teams, servicing inner city, district and regional areas. The structure, staffing, liaison attachments and scope of practice varied between the services. The regional CLP service attended seven hospitals and had the highest referral rate and largest inpatient population pool. The three services received referrals for similar reasons and made similar diagnoses. Multimodal management was the norm, and CLP facilitated follow-up arrangements upon discharge. Only the district CLP service saw all emergency referrals within an hour. Age and need for an interpreter did not affect response times. Despite local differences in geography, CLP roles, hospital and community mental health service pathways and patient populations, the CLP data collection tool was applicable across sites. Staff resourcing and referral demand are key determinants of CLP response times.
I became a doctor because I always had an interest in people and health. This was, however, my first interaction with formal research and essentially it was part of the college requirements for psychiatry.

My question came out of everyday practice where there was an opportunity to see whether a nurse-led protocol of cardiometabolic monitoring was effective. Metabolic syndrome has increasingly become a burden in the psychiatric population due to second generation antipsychotics. Monitoring comprises of checking weight, height, Body Mass Index, waist circumference, blood pressure and glucose. Then the monitoring algorithm suggests an initial treatment plan involving diet and lifestyle methods as first line then moving onto metformin and other therapies, including referral to GPs and other healthcare providers.

I contacted Research Central and Marianna really guided me in terms of examining what we had done already and what the next step was as well as the study design. Jay assisted with a lot of the statistics. I could get a coherent result to write up my research. They were extremely helpful, and it was easier than I would of thought.

What I have learnt during the research process, is about appropriate statistics and the different types of studies that can be conducted. Specifically, I was looking at the audit, overall a lot of places use audits to evaluate their everyday practice so again formalising it and making a part of research. It was easier than I thought it would be. I am up to my final draft and I am open to doing research again in the future because my first experience was rewarding in terms of learning and creating a coherent project.

Most college programs have research components. My advice to other trainees is to have a think and look into what you can do in terms of audits and possible studies and then talk to Research Central to get some advice before you start. They do not just assist with the formalities, but can really provide some valuable advice and guide you, you are not doing it all on your own.
New Projects

**Functional Neurological Symptoms Group Study**

Keith Johnson

Functional Neurological Disorder is a common, neurological disorder that is poorly understood condition in the community that results in significant disability to the individual costs to the health system. It is estimated that up to 30% of patients who present in outpatient neurology departments have this disorder. Management has really been hampered by significant lack of evidence. This study aims to compare a three session monthly psychoeducation group for patients and their carers against treatment as usual to see if there is improvement of understanding of the condition, quality of life, well-being and health outcomes, and depression, stress and anxiety.

**Exploring the food service and dietetics services at the Shoalhaven Sub Acute Mental Health Service**

Clancy Henderson, Karen Walton, Anne McMahon, Candice Ashton, Grace Neil

This project aims to explore the food service and dietetics strategies and programs available to mental health consumers at the Nowra Sub Acute Mental Health Facility, a 20 bed community based facility that opened in June 2014. Admission to the Nowra Sub Acute Mental Health Facility is voluntary and involves up to a 28 day stay. The facility uses a recovery-orientated approach, and as such consumers are involved in their meal preparation, with food not being sourced from Nowra Hospital, but from local food suppliers so that consumers are directly involved in preparing their meals and making food choices. Consumers attend six dietetic group education sessions and have access to individual appointments with the dietitian. This project is a timely review of these novels approaches after two years of operation. The project will explore and review the food and nutrition approaches used, and make any further recommendations for practice.

**Are Community Treatment Orders Counterproductive?**

Nagesh Pai, Tim Coombs, Biju Rajan, Shae-Leigh Vella

This research project aims to investigate the differences between two patient groups with serious mental illness; those mandated to use a long acting injectable antipsychotic by a community treatment order and those who ‘freely’ choose to use long acting injectable antipsychotics on a range of psychosocial outcome variables. The study utilises a naturalistic cross-sectional design. The data to be analysed to determine if there is a difference in the psychosocial outcomes of the patients from the two different groups.

**The use of situation awareness by mental health nurses to inform the involuntary admission decision: An ethnographic study**

Christopher Patterson

The function of admitting a person to a mental health facility as an involuntary patient is a central component of contemporary mental health legislation and practice and is often based on the decision of a suitably qualified professional. Making the decision to admit someone as an involuntary patient is identified as a complex and clinical practice. Involuntary admission provides for the treatment of mental illness and promotion of safety of an individual and/or others, but impacts a person’s autonomy, liberty and human rights. Research of decision making in this context is limited. A greater understanding of the involuntary admission decision making process can be facilitated by contemporaneously studying how health professionals identify, use and make meaning of factors and elements in their environment to make the decision. This research project will be grounded in the qualitative and naturalistic methodological paradigm of ethnography. This research project is being led by the School of Nursing and Midwifery, University of South Australia.
Vitamin D screening and serum vitamin D levels in an inpatient sample: A clinical audit

Nalin Wijesinghe, Ivana Goluza, Kishan Wijesinghe, Nagesh Pai

The objective of the current study was to examine the pathology test utilisation of 25-hydroxyvitamin D (25(OH)D) within an Australian inpatient psychiatric setting. A retrospective audit of 300 random hospital files of those admitted as inpatients between Nov 2014 and Nov 2015 were included. Data was quantitatively analysed and described. Number of inpatients who had a vitamin D determination during their admission was 37/300 (12.33%). The mean vitamin D level of those tested was 51.63 nmol/l. Of those that were tested, 18/37 (48.6%) were deficient. There was a statistically significant difference in age and length of stay between those that were and were not tested for vitamin D levels, p value <0.001 and 0.017, respectively. This audit highlighted vitamin D screening inadequacy. However, there is evidence that screening is being used as per clinical judgement based on patient demographics. More research is recommended to establish tangible benefits of supplementation, while local practice provides valuable data for education and policy purposes.
**Ongoing Projects**

**Lithium: Friend or foe? An evaluation of the long term renal consequences of lithium therapy**

Nagesh Pai, Janaye Fish, Kelly Lambert, Karumathil Murali

Lithium remains today as the first choice maintenance treatment for mood disorders. However, uncertainty concerning Lithium’s adverse effects, including End Stage Kidney Disease, has meant that its use is on the decline. This proposed research project aims to close the gap in the literature by evaluating local evidence on the long term renal consequences of Lithium therapy, particularly investigating the specific factors associated with impaired renal function.

**SMHIBS: Sleep and Mental Health in Brain Injury Study**

Keith Johnson, Sriram Thazhathaveetil

Sleep disorders are very common in survivors of brain injury, affecting up to 70% of traumatic brain injury (TBI) survivors and encompass a wide variety of specific disorders including sleep disordered breathing, insomnia, circadian rhythm disorders, and parasomnias. People who have suffered a brain injury report greater fatigue, poorer sleep quality, and less restorative sleep.

Additionally, to date there has been little research on the impact of sleep disorders on recovery and well-being. The main objective of the study is to determine the prevalence of sleep disorders and mental illness within a population of individuals who have survived a brain injury and who are currently enrolled in an outpatient rehabilitation program. The study seeks to determine whether there is an association between fatigue, apathy, specific sleep disorders and comorbid mental illnesses as well as the nature of the injury and its treatment. This will provide insight to better characteristics of subgroups that may experience problems with fatigue and/ or sleep disturbances in the context of TBI that may complicate their recovery.

**Exploration of food addiction in people living with schizophrenia.**

Ivana Goluza, Jay Borchard, Esther Kiarie, Judy Mullan, Nagesh Pai

The term food addiction (FA) denotes a concept among researchers and lay consumers as a behavioural phenotype related to excessive food consumption. In this study we examined the prevalence of FA using the validated Yale Food Addiction Scale (YFAS) as well as the dimensional symptom count. In addition, we explored associations between participant characteristics and FA diagnosis. Outpatients attending a clozapine clinic and possessing a diagnosis of schizophrenia were invited to complete an anonymous survey using the YFAS. Ninety three surveys were used to calculate the diagnostic YFAS criteria for FA. The prevalence of FA found in this sample was 26.9%. Among individuals who did not meet “diagnostic” criteria FA, 77.4% endorsed 3 or more symptoms but did not report distress or impairment. The most common food addiction symptom was a persistent desire or repeated unsuccessful attempts to cut down consumption (97.9%). The significant finding in association between individual’s characteristics and diagnosis of FA was employment. Several factors related to reported results are postulated and discussed. The current study has found the prevalence of FA amongst people living with schizophrenia to be higher than the general populations but not as high as populations with disordered eating.

Static radiographic techniques are unable to capture the wealth of kinematic information available from lumbar spine sagittal plane motion. Demonstration of a viable non-invasive technique for acquiring and quantifying intervertebral motion of the lumbar spine in the sagittal plane. Videofluoroscopic footage of sagittal plane lumbar spine flexion-extension in seven symptomatic volunteers (mean age = 48 yrs) and one asymptomatic volunteer (age = 54 yrs) was recorded. Vertebral bodies were digitised using customised software employing a novel vertebral digitisation scheme that was minimally affected by out-of-plane motion. Measurement errors in intervertebral rotation (± 1°) and intervertebral displacement (± 0.5 mm) compare favourably with the work of others. Some subjects presenting with an identical condition (disc prolapse) exhibited a similar column vertebral flexion-extension relative to S1 (L3: max. 5.9°, min. 5.6°), while in others (degenerative disc disease) there was paradoxically a significant variation in this measurement (L3: max. 28.1°, min. 0.7°). By means of a novel vertebral digitisation scheme and customised digitisation/analysis software, sagittal plane intervertebral motion data of the lumbar spine data has been successfully extracted from videofluoroscopic image sequences. Whilst the intervertebral motion signatures of subjects in this study differed significantly, the available sample size precluded the inference of any clinical trends.
New Projects

**Delivering safe and effective test result communication, management and follow-up**

Andrew Georgiou, Ling Li, Maria Dahm, Julie Li, Johanna Westbrook

Information and communication technologies (ICT) play a key role in the communication and follow-up of pathology and medical imaging test results. However, new models of test management supported by ICT can only succeed when they are able to address the clinical governance challenges associated with safe test result management. Effective solutions must engage all stakeholders to arrive at decisions about who needs to receive test results, how and when the results are communicated and how they are acknowledged. This study aims to establish safe and effective test result management systems utilising evidence-based practice health ICT and consumer engagement. The research will be undertaken with the emergency departments, intensive care units and general admission wards of Prince of Wales, Royal Hospital for Women, Shellharbour, St George, Sutherland, Sydney Children’s and Wollongong Hospital. This project is being led by the Centre for Health Systems and Safety Research, Macquarie University in partnership with the South Eastern Area Laboratory Service and the Australian Commission on Safety and Quality in Health Care.

**Improving the appropriateness and usage of analgesia provided to patients from hospital after surgery or a procedure**

Margaret Jordan, Erica Wales, Amy Minett, Sonia Markocic, Claire Doyle, Nick Maytom, Kaitlin Faulkner

The aim of this project is to improve the appropriateness of medicines supplied at hospital discharge for people requiring analgesia after a procedure of surgery. This will be achieved by using a quality improvement methodology where an initial audit will be undertaken of medicines supplied to patients at discharge to establish a baseline adherence to established appropriateness criteria; interventions developed and implemented to improve appropriateness and a re-audit conducted to assesses any change in appropriateness. The potential outcomes of the project include an improvement in the appropriateness of analgesic medicines supplied at discharge from Wollongong Hospital with an attendant reduction in the supply of opioid medicines, and an increase in the appropriateness of use of other analgesics; and an increase in relevant patient information supplied at discharge concerning the intended use of the medicines supplied.

**Multisite study using the National Quality Use of Medicines Indicator 7.4: Percentage of patients taking antipsychotic medicines who receive appropriate monitoring for the development of metabolic side effect - pre and post practice intervention**

Margaret Jordan, Peter Chi Sing Cheung, Andrew O’Hanlon

Wollongong Hospital is part of a multi-site project, that aims to improve monitoring for patient complications related to antipsychotic use. Antipsychotic medicines are the mainstay for treatment of schizophrenia. Their use increases the risk of weight gain, diabetes, high blood pressure and high cholesterol, contributing to early development of cardiovascular disease and leading to increased and earlier death in patients with schizophrenia. Regular monitoring for these complications is recognised as an important component of care that will result in the early detection and treatment of these complications and therefore impact on a major cause of excessive mortality and premature death that occurs in this population. Until the 2014 release of the National Quality Use of Medicine Indicators, there had been no readily available indicators to measure quality use of medicines in mental health. An additional aim of this study is to familiarise Australian clinicians caring for mental health patients with the indicators and the methodologies used to measure clinical performance and to evaluate the success of quality improvement interventions in clinical settings. The multi-site, mixed-methods observational study will be conducted in three phases; retrospective collection of baseline data using the indicator, with feedback provided.
Improving the quality and communication of medication information on hospital discharge to general practitioners

Kerry Watts, Michelle Vine, Nicole Ridley, Kelly Lambert and Margaret Jordan

This project aims to improve communication between hospital pharmacists and general practitioners (GP’s) regarding medication changes made to patients while in hospital. This is in response to a previous published local study by a community GP that showed a high proportion of GP’s were not satisfied with this component of patient information. This research will evaluate changes to the content of information provided to patients and GP’s about patient medications on discharge. The wording of information will include, for the first time, details regarding the reason and time frame for patient’s medication changes during hospitalisation and send this information directly to the GP, from the clinical pharmacist. Education will be given to Pharmacists regarding the new formatting of medlist and the procedure for sharing the information with the GP. Data will be collated relating to the proportion of medlists that contain updated information, number of medlists sent to GPs, time spent providing additional medlists, proportion of patients who receive a reviewed medlist and evaluation of the GP’s satisfaction with the updated medication communication.

Ongoing Projects

AGAR National Surveillance Programs in 2015

Peter Newton, Melissa Hoddle, Heather Wren

In 2015, the Microbiology Department of SEALS South, based at Wollongong Hospital, joined the Australian Group on Antimicrobial Resistance (AGAR) to participate in the National Antimicrobial Resistance Surveillance Programs for 2015 and beyond. AGAR is a unique collaboration of clinical microbiologists and laboratory scientists from teaching hospitals and pathology service providers across Australia with each state and territory being represented. AGAR members use standardised methodology to continuously monitor the level of antimicrobial resistance in bacteria causing life threatening infections. They aim to gather antimicrobial susceptibility data, demographic data and clinical data for a range of bacteria isolated from blood cultures collected at Wollongong Hospital. SEALS South Microbiology Department continued their participation in the surveillance program throughout 2016, and plans to continue into 2017. Testing is currently being finalised and data submitted for isolates collected during the fourth quarter of 2016, with data from earlier in the year already submitted. Their participation in 2015, along with 6 other NSW centres and 30 other centres across Australia contributed to the publication of four reports, which can be accessed by the general public at http://www.agargroup.org/. Their participation in 2015 has contributed to Australia-wide data on antimicrobial resistance rates in Gram negative pathogens (family Enterobacteriaceae, Pseudomonas aeruginosa and Acinetobacter spp.), Staphylococcus aureus and Enterococcus spp. causing blood-stream infections. It has allowed Wollongong to compare local resistance rates with those of other centres in NSW and other states of Australia. In particular the molecular typing of MRSA strains performed as part of the Australian Staphylococcal Sepsis Outcome Program (ASSOP) has provided interesting insights into the molecular epidemiology of the recently emerged local MRSA clone and how that compares with other centres.
Margaret is a senior pharmacist here at the Wollongong Hospital. Her interest in research grew from examining everyday clinical practice on the wards. Many of her research questions have arisen from questioning current practice, while looking for ways to improve patient care through research. On one such occasion a pharmaceutical company recommended that heparin was not to be used with nitroglycerine because it would cause problems with the activated partial thromboplastin time (aPTT). In response to this Margaret and her colleagues conducted their own randomised controlled trial and found that there was no significant difference between combining the drugs vs single.

Working as a research assistant with Associate Professor Judy Mullan, they investigated warfarin use in a nursing home under a qualitative framework. This study uncovered a number of challenging issues such as the difficulty of monitoring diet in this unique setting (as warfarin’s effectiveness is dependent on diet). Additionally, communication of diet to offsite doctors was flagged as a major obstacle. As part of her Masters of Science Degree, Margaret later developed a warfarin management strategy which aimed to communicate important blood gas and blood results and medication related information to help assist doctor’s decision making. The findings from this series of studies not only changed practice in the participating nursing homes of the study but prompted doctors to consider the complexities of warfarin use. A number of General Practitioners reported to Margret years after the study ended that they were no longer administering warfarin in nursing homes due to the many barriers that exist with warfarin use as highlighted by her research.

Currently, Margaret and a team of fellow clinical pharmacists are designing a study to examine prescribing and distribution of hydromorphone in Wollongong Hospital. The team is aiming to create an algorithm that will assist with appropriate prescribing of hydromorphone to reduce over supplying this drug to patients. Margaret’s advice to up and coming researchers is to collaborate and get involved at the very beginning of a project’s development as well as to find out how you can help others.
Antimicrobial stewardship research report

- Stuart Bond, Pharmacist

1. Discontinuation of peri-operative gentamicin use for indwelling urinary catheter manipulation in orthopaedic surgery

We demonstrated a withdrawal of gentamicin use around catheter manipulation in orthopaedic surgery. This study was published in 2016 in the ANZ Journal of Surgery.

2. Improvement of antibiotic prescribing for community-acquired pneumonia

Published as a brief communication in Internal Medicine Journal in 2016, the educational intervention was associated with a reduction in duration of therapy and a reduction in inappropriate use of broad-spectrum antibiotics for mild-moderate pneumonia.

3. Association between Clostridium difficile infection, antibiotics and proton pump inhibitors in a regional and rural health district

We demonstrated the burden of healthcare associated Clostridium difficile infection in terms of length of hospital stay and hospital costs. Proton pump inhibitors and certain broad-spectrum antibiotics were over-represented in patients who acquired Clostridium difficile infection while in hospital. The study was published in the Journal of Hospital Infection in 2016.

4. Outcomes of multisite antimicrobial stewardship program implementation supported by a shared clinical decision support system

This study was conducted across ISLHD, SESLHD and the Sydney Children’s Hospital, to determine the impact of an antimicrobial stewardship program on antimicrobial usage and costs, CDI rates, infection-related length of stay and infection-related mortality. The study was completed in 2016 and published in the Journal of Antimicrobial Chemotherapy in 2017.

5. Analysing the effect of an interactive learning module on health professionals' knowledge of Vancomycin dosing, administration and monitoring

This research project analysed the design, implementation and effect of the Vancomycin Interactive (www.vancomycin.com.au). Knowledge survey scores were improved among nurses, while an improvement in knowledge scores was observed for doctors following a traditional email intervention. The study was published in the Journal of Medical Internet Research in 2017.

6. Inpatient sepsis pathway

The impact of adhering to an adult inpatient sepsis pathway in terms of antimicrobial susceptibility and mortality was investigated. Conducted by Dr Kimberly Cipko from the Infectious Diseases team, we found that there was an increased likelihood of susceptibility when the sepsis guideline was followed.

7. Posaconazole therapeutic drug monitoring

Conducted by medical student Patrick Lindsay, this study (published in the journal Therapeutic Drug Monitoring in 2016) investigated the utility of performing monitoring on the antifungal posaconazole in a non-reference hospital. A flowsheet for therapeutic drug monitoring was proposed.
Despite being tucked away in the hospital Microbiology Department, Peter is an active researcher collaborating with many health professionals across a multitude of hospitals. If there is a Wollongong Hospital project that contains laboratory data and/or co-operation chances are that Peter is involved. Many of Peter’s projects are collaborations with the Director of Infectious Disease, Associate Professor Miyakis. The relationship between these departments is best summed up by Peter as having exceptional synergy.

Such collaborations include the MERINO I and II clinical trials which are looking at particular gram negative organisms that express a certain resistance mechanism and whether use of an antibiotic that’s always been regarded as not being effective against those organisms instead of using a more broader spectrum antibiotic. Peter and his department play a crucial role in infectious disease related trials as they are the first point of contact for identifying potential eligible patients based on microbiological results. From here Peter and his team quickly notify the co-collaborators so patients can be screened and subsequently randomised into a treatment arm as soon as possible if appropriate.

As Peter puts it: “this is where our working relationships and communication links with the clinicians is key”

Not only does Peter collaborate with the Infectious Disease Department but he is currently working alongside Intensive Care Unit conducting a number of multi-centre clinical trials. Together they are investigating different antibiotic regimes for the treatment of ventilator associated pneumonia. This includes the INHALE and TRIUS trials.

Australia has the highest prevalence of actinic keratoses (AK) worldwide. Because of the risk of transformation of AK to invasive squamous cell carcinomas, consensus guidelines recommend that AK are removed using appropriate therapies to prevent progression to invasive disease. Daylight photodynamic therapy (PDT) is emerging as an efficacious treatment for AK, particularly for patients who require treatment of large areas of chronic actinic damage that can be exposed easily to daylight.

Daylight PDT with methyl aminolevulinate (MAL) cream is a simple treatment for AK, almost painless, well tolerated and convenient, requiring minimal time in the clinic. Randomised controlled studies from northern Europe and Australia support the use of daylight PDT as an effective therapy for grade I and II AK on the face and scalp. There is sufficient daylight to conduct daylight PDT in Australia at any time of the year and during most weather conditions. Hence, daylight PDT with MAL can be included as an effective and well-tolerated new treatment option for the treatment of AK in Australia. These consensus recommendations provide guidelines for Australian clinicians on the use of daylight PDT in the treatment of diagnosed AK.
Effect of the triple CCC project on multidisciplinary referrals rates and electronic referral systems in a regional hospital

Kerrie O'Leary, Tracey Hinke, Kerry Shanahan, Andrew Jones, Niladri Ghosh

In 2015, the Triple CCC (Care, Communication, Coordinate) project was commenced as a Clinical Redesign initiative targeting the improvement of patient, carer, and staff experiences with a focus on compliance with the NSW Ministry of Health Care Coordination Policy. The study addressed a section of the project, namely the effect of timing on written referrals into the hospital electronic referral system, referral rates, patient and staff satisfaction. It involved diagnostic methods including staff surveys, medical record audits, and staff tag-alongs. During 2016 the project continued to spread to all wards at Shellharbour Hospital, and has since evolved into the Triple CCC Program. The program has continued to improve care coordination processes related to referrals and liaison for patient transfer of care. Completion rates of the Admission Discharge Risk Assessment (ADRA) within 24 hours of patient admission has improved on the wards and allied health referrals have increased if the Transfer of Care Risk Assessment (TCRA) was positive. Furthermore, length of stay was reduced for patients admitted with respiratory infections/inflammations with catastrophic complications, injuries of major complexity to shoulder, arm, elbow, knee, leg and ankle, and non-surgical spinal disorders of major complexity. The care coordination model that was implemented from the Triple CCC Project continues to be the ‘way we work’ at Shellharbour Hospital and parts of the model have been applied at other facilities.

To evaluate the long-term cost-effectiveness of two home-based cardiac rehabilitation (CR) interventions (Healthy Weight (HW) and Physical Activity (PA)) for patients with cardiovascular disease (CVD), who had been referred to cardiac rehabilitation (CR) but had not attended. The interventions consisted of pedometer-based telephone coaching sessions on weight, nutrition and physical activity (HW group) or physical activity only (PA group) and were compared to a control group who received information brochures about physical activity. A cost-effectiveness analysis was conducted using data from two randomised controlled trials. One trial compared HW to PA (PANACHE study), and the second compared PA to usual care. A Markov model was developed which used one risk factor, body mass index (BMI) to determine the CVD risk level and mortality. Patient-level data from the trials were used to determine the transitions to CVD states and healthcare related costs. The model was run for separate cohorts of males and females. Univariate and probabilistic sensitivity analysis were conducted to test the robustness of the results. Given a willingness-to-pay threshold of $50,000/QALY, in the long run, both the HW and PA interventions are cost-effective compared with usual care. While the HW intervention is more effective, it also costs more than both the PA intervention and the control group due to higher intervention costs. However, the HW intervention is still cost-effective relative to the PA intervention for both men and women. Sensitivity analysis suggests that the results are robust. The results of this paper provide evidence of the long-term cost-effectiveness of home-based CR interventions for patients who are referred to CR but do not attend. Both the HW and PA interventions can be recommended as cost-effective home-based CR programs, especially for people lacking access to hospital services or who are unable to participate in traditional CR programs.
It is clear that there remains a global crisis in the development and consequences of chronic diseases such as obesity and type 2 diabetes. These conditions lead to complications that increase morbidity and mortality, such as heart disease, stroke, amputations, and kidney disease. We have learned a great deal about the pathogenesis of these disorders and also about both treatment and preventive interventions. Clearly, there remains considerable progress to be made specifically in addressing these conditions and, more importantly, in preventing these conditions in resource-poor areas.

Knowledge of the fasting plasma glucose of healthy women may assist in the setting of treatment targets for women with hyperglycaemia in pregnancy (HIP). This study examines the pregnancy glucose tolerance test results of 3344 women without HIP collected over a three-year period. The median fasting plasma glucose was 4.4 mmol/L with an interquartile range of 4.2–4.6 mmol/L and a 5th to 95th centile of 3.8–4.9 mmol/L. As the diagnostic fasting glucose level for HIP is ≥5.1 mmol/L, these data support a treatment target of ≤5.0 mmol/L.

The Australasian Diabetes in Pregnancy Society (ADIPS) has recently endorsed the World Health Organization (WHO) terminology and classification of hyperglycaemia in pregnancy. The prevalence is likely to increase, but no prospective data are available for a representative Australian population. To determine the prevalence of hyperglycaemia in pregnancy (HIP) using results from both the public and private sectors in a population that has a similar ethnicity to the overall Australian population. The results of all pregnancy oral glucose tolerance tests (POGTT) in the public sector and by a dominant private pathology provider in a major city have been prospectively collected for a three-year period and analysed using the ADIPS (WHO) criteria. The prevalence of hyperglycaemia in pregnancy (HIP) was 13.1% with diabetes mellitus in pregnancy (DMP) being 0.4% and gestational diabetes mellitus (GDM) being 12.7%. The new criteria will diagnose about one-third more women with GDM than the previous ADIPS criteria. This will have resource and health implications. Focussed local health economic data will be important.


To determine the effect of different seasons on the prevalence of gestational diabetes mellitus (GDM) by using World Health Organization criteria. The results of all pregnancy glucose tolerance tests (GTTs) were prospectively collected over a 3-year period in a temperate climate, and the results were grouped by season. The results of 7,369 pregnancy GTTs were available for consideration. In winter, the median 1-h and 2-h glucose results after GTT were significantly \( (P < 0.0001) \) lower than the overall 1-h and 2-h results. The prevalence of GDM at the 1-h diagnostic level was 29% higher in summer and 27% lower in winter than the overall prevalence \( (P = 0.02) \). The prevalence of GDM at the 2-h diagnostic level was 28% higher in summer and 31% lower in winter than the overall prevalence \( (P = 0.01) \). The prevalence of GDM varies according to seasons, which leads to the possible overdiagnosis of GDM in summer and/or underdiagnosis in winter. Further research into standardization of the GTT or seasonal adjustment of the results may need to be considered.

Michelle Martin, Diabetes CNC and Anne Harding, Diabetes Educator displaying their poster at the Nursing Research Forum.

Despite increasing research on activity-based funding (ABF), there is no empirical evidence on the accuracy of outpatient service data for payment. This study aimed to identify data entry errors affecting ABF in two drug and alcohol outpatient clinic services in Australia. An audit was carried out on healthcare workers’ (doctors, nurses, psychologists, social workers, counsellors, and aboriginal health education officers) data entry errors in an outpatient electronic documentation system. Of the 6919 data entries in the electronic documentation system, 7.5% (518) had errors, 68.7% of the errors were related to a wrong primary activity, 14.5% were due to a wrong activity category, 14.5% were as a result of a wrong combination of primary activity and modality of care, 1.9% were due to inaccurate information on a client’s presence during service delivery and 0.4% were related to a wrong modality of care. Data entry errors may affect the amount of funding received by a healthcare organisation, which in turn may affect the quality of treatment provided to clients due to the possibility of underfunding the organisation. To reduce errors or achieve an error-free environment, there is a need to improve the naming convention of data elements, their descriptions and alignment with the national standard classification of outpatient services. It is also important to support healthcare workers in their data entry by embedding safeguards in the electronic documentation system such as flags for inaccurate data elements.


To analyse the change in the estimated glomerular filtration rate (eGFR) in a cohort of health service users over a 7-year period. Background: One of the current controversies with respect to using eGFR to diagnose and stage chronic kidney disease (CKD) is how to take into account the age-related decline in renal function. Misclassification of non-pathological reduction in renal function as progressive CKD could lead to unnecessary testing and referrals. Methods: A longitudinal retrospective cohort study was conducted using data from the Southern.IML Research database. Adult patients with an eGFR test in both 2006 and 2013 were identified as the study population. Patients’ eGFR results (mL/min/1.73 m2) were stratified into four categories: <15 (stage 5), 15-29 (stage 4), 30-59 (stage 3) and ≥60. Data on 32,353 patients demonstrated that over the 7-year period 84.6% of patients remained in the same eGFR category. Further, of the 2,238 patients aged ≥70 years who started in stage 3; 76.2% had non-progressing CKD, 16.4% progressed to stage 4 CKD and 1.7% progressed to stage 5 CKD. The remaining 5.7% had improvement in eGFR to above ≥60. Conclusions: The eGFR and its change over time are crucial to the detection of CKD and for making decisions about diagnosis and treatment. The findings suggest that when managing stage 3 CKD an approach that uses time to help identify older patients with declining renal function may be taken. The majority of patients with stage 3 CKD can and should be managed by primary care physicians. Adoption of this approach into clinical practice has the potential to improve the quality of care and ensure the appropriateness of referrals to nephrologists.


Past studies have shown that the prevalence of gestational diabetes mellitus (GDM) has been underestimated, and this can have major implications for healthcare planning. With the changes in diagnostic criteria for GDM, we wanted to assess the accuracy of the diagnosis in a private hospital setting. Using data from the hospital’s obstetric database, medical records and a private pathology provider, we established the true prevalence of GDM and compared it with the NSW Perinatal Data Collection. The recorded prevalence of 6.8% was well below the real value of 15.0%.
Measures of prevention POLICY AND PROGRAM IMPLEMENTATION

Kathleen Conte, Penny Hawe

This research is looking at how digital systems for monitoring policy and program delivery (and recording KPI achievement) facilitate (and/or hinder) health promotion practice. Digital health promotion or prevention practice recording may one day be as routine and well-resourced as medical record keeping in health care. We need to plan now on making sure the designers of prevention recording systems have the best information on the range of practice activities and the least burdensome ways to capture it meaningfully.

Currently, Local Health Districts (LHDs) in NSW use a relatively new state-wide electronic monitoring system to track and report progress towards meeting key performance indicators. It is called PHIMS (Population Health Intervention Management System) and it’s currently focused on the implementation of child obesity prevention programs. We’ll be using PHIMS as a starting point in the research, not to evaluate PHIMS per se, or to document how particular aspects of the software could be tweaked - the Ministry is doing this work themselves. We’ll be looking more broadly at how the practice of recording integrates with the practice of health promotion – what practices it encourages/discourages, how it aligns with other activities, the side benefits and so on.

We seek to know things like:
- What range of work goes into achieving one completed “tick” in the monitoring system?
- Does this differ in different parts of the state? Why? How?
- What is captured and what’s not by the data system? What action is still “below the surface?”
- How does program and policy adaptation happen in practice?
- What other methods/tools/systems do staff use to monitor and improve their work?

This is a collaborative project steered by The Australian Prevention Partnership Centre (TAPPC) NSW Ministry of Health, Office of Preventive Health and the LHDs. The research uses an iterative, participatory approach. Throughout the research process, we consult with our partners, Health Promotion directors, and staff to inform and adapt the research approach to each LHD’s availability and insights.

The fieldwork involves: site visits and interviews (individual or group), informal conversations and observations (observing everyday routines and ‘shadowing’ some practitioners to get deeper insights). Total time in each LHD is likely to be 3-6 weeks, according to size and local LHD interests. Consent to take part is at both the LHD and individual practitioner level.

We will present our findings back to the local teams and facilitate discussion of implications and recommendations.
Darren first became interested in research during his earlier years as a psychology undergraduate. For those who aren’t familiar with the training of a psychologist it involves a perpetual bombardment of subjects relating to research design and statistics for four years. This resonated with Darren, where he later delved into experimental psychology, specifically visual psychophysics (the interaction between stimulus and sensation). After much introspection Darren walked away from the degree realising he wasn’t psychologist material. As any good health professional does Darren turned to the 1971 action thriller “dirty harry” for some direction in life. The message was delivered from none other than Clint Eastwood himself: “A man’s got to know his limitations”. That limitation being interpersonal skills (a skill argued by some as a necessity for a psychologist).

Since then Darren’s passion for data and health has found him working as an epidemiologist for the district. His research portfolio features a number of interesting and diverse projects. In the past he has examined trends in notifications of Chlamydia and how it’s associated with testing rates. This research highlighted that the apparent Chlamydia epidemic was driven by increased testing. The take home message? If you look more for it you will find it. Furthermore, collaborating with the University of Sydney, Darren is examining the role of the built environment on physical activity, mental health one such area is the walkability of the environment. Darren also has a strong interest in spatial epidemiology combining global information systems (GIS) and local health data to evaluate and monitor health patterns here in the Illawarra/Shoalhaven region. While Darren is involved in complex statistical geospatial models he strangely enough explains it as the confluence of geo-science methods, epidemiological skills, and creativity.

“I’m not a particularly artistic person, I can’t draw, I can’t paint. I play guitar well enough to annoy the neighbours, but there’s a certain sense of satisfaction in producing information that is informative and pleasing to the eye.”

Upon asking Darren what his advice was for up and coming researchers he gave three crucial points to navigate through the research process: research an area that interests you, work with but not for other experienced researchers and lastly document, document, document.
DTEXT: text messages on lifestyle risk factor modification and diabetes self-management for people with type 2 diabetes

Susan Furber*, Adrian Bauman, Stephen Colagiuri, Margaret Allman-Farinelli, Alison Hayes, Robert Moses*, Alison Webb*, Paul van den Dolder*, Franca Facci*, Lisa Franco*, Karen Waller*
*ISLHD investigators

The aim of this project is to determine the effectiveness and cost-effectiveness of a text message intervention (DTEXT) on lifestyle risk factor modification and diabetes self management for people with type 2 diabetes. This project will be a pragmatic randomised controlled trial across the Illawarra Shoalhaven region. The intervention group will receive mobile phone text messages for 6 months providing information and support on physical activity, nutrition, weight, smoking cessation and diabetes self management. The control group will continue with their standard care, including medication and lifestyle counselling as determined by their doctor. This project was the successful recipient of $565,225 from the Translational Research Grants Scheme (NSW Ministry of Health) (July 2016-June 2018).

Impact of the rapid expansion of pre-exposure prophylaxis (PrEP) on HIV incidence, in a setting with high testing and ART coverage, to achieve the virtual elimination of HIV transmission by 2020: a NSW HIV Strategy Implementation Project

Katherine Brown, Simon Marlton, Jodielee Little

The new ministry of Health HIV Strategy released on 1 December 2015, aims for the virtual elimination of HIV transmission in NSW by 2020. This extraordinary goal relies on two anti-retroviral therapy (ARV) - related interventions, in addition to traditional behavioural prevention. Critical to the new strategy’s success is the population based, targeted roll-out of HIV PrEP. PrEP involves taking one pill daily of co-formulated tenofovir disoproxil fumarate (TDF)/emtricitabine (FTC). TDF/FTC has been extensively used in millions of people with HIV for about 16 years.

The consumption of sugar-sweetened beverages among parents and their children who use early childhood services

Rani Lawler, Susan Furber, Lisa Franco

There is a need for the reduction of sugar-sweetened beverage (SSB) consumption following evidence linking SSBs with overweight and obesity and related co-morbidities. The aim of this pilot study was to determine SSB consumption behaviours of parents and children aged five and younger who attended a supported playgroup in ISLHD. In 2016, parents who attended four supported playgroups in the ISLHD were invited to participate in a short, anonymous cross-sectional survey. Fifty people agreed to participate, and of these, 38 were eligible and all completed the survey. Our study found that the consumption of SSB among children was low with 89% participants reportedly drinking 1 cup or less of SSBs per week. The majority of participants (97%) reported that their child drank 2 or more cups of water per day. The consumption of SSBs among parents and caregivers was low with 74% drinking 1 cup or less per week; 87% also reported low diet SSB consumption. Water consumption among parents and caregivers was high with 79% drinking 2 or more cups per day. SSB consumption including diet SSBs was low for both child and parent or caregiver, and daily water consumption was high for child and their parent or caregiver. There is the need for education on the sugar content in fruit juice and fruit drink, and further studies on SSB consumption in older children.
ISLHD Violence Abuse and Neglect (VAN) Service is undertaking a service redesign project called the VAN Sexual Assault (SA) Crisis Response Project. This executive endorsed 12 month project has been established to redesign the ISLHD SA On-Call Service with the objective of building an integrated, cost effective and sustainable district wide service response to SA presentations at Emergency Departments (ED) which will foster a coordinated and client centred approach to crisis care delivery. The project follows the Agency for Clinical Innovation (ACI) Centre for Healthcare Redesign (CHR) Methodology and includes five phases including project initiation, diagnostics, solution design, implementation monitoring and evaluation sustainability.

Project activities undertaken thus far include the establishment of the ISLHD VAN SA Crisis Response Project Steering Committee, a leadership body serving to monitor the progress of the project against its objectives and keep the project aligned with organisational strategy. As part of the diagnostics phase, the SA Crisis Response Project Staff Experience Survey has also been developed as a mechanism for better understanding the different experiences of staff who respond to SA crisis presentations at ISLHD EDs. This survey has been completed by 85 staff across the VAN Service, ISLHD emergency departments (EDs) and Medical Officers including GPs who provide a forensic medical response across the region. Committed to the process of triangulating data, the redesign team have facilitated five process mapping sessions with ISLHD ED and VAN Service staff, undertaken 64 Forensic Medical Examination (FME) time record audits, seven district wide brainstorming sessions, three patient interviews, external service reviews, a literature review, intensive root cause analysis and 8 district wide solution identification sessions.

Commencing the implementation phase of the project in January 2017, the redesign team continue to make progress with the ongoing support of the VAN service and its dedicated staff, ISLHD ED staff and the APHC executive sponsorship team. The project team are due to complete the initiative in July 2017 and will present their final work to the NSW Minister for Health in August 2017.
Ongoing Projects

ACCESS - STI and BBV surveillance system

Katherine Brown, Burnet Institute, the Kirby Institute and NRL in partnership with numerous other stakeholders and participating sites.

In Australia, national surveillance for sexually transmitted infections (STIs) and blood borne viruses (BBVs) is passive, in that it is based on reports by clinicians or laboratories of newly diagnosed cases of STI and BBV infection to local state and territory departments. Passive surveillance has demonstrated that the number of many STIs diagnoses, particularly chlamydia, has increased sharply over the past decade. The main limitation to passive surveillance is that it is dependent on the extent of testing, which may vary across population groups and over time. For STIs such as chlamydia, which is commonly asymptomatic, the notification rate is an underestimate of the true prevalence as many cases go undetected. It is therefore difficult to assess time trends or geographic patterns of infection with any confidence. ACCESS is designed to fill the information gaps of passive surveillance. The main aim of ACCESS is to establish a comprehensive surveillance system that will help to evaluate the impact of interventions designed to control a range of STIs and BBVs in Australia and will underpin Australia’s strategic response to STIs and BBVs. Data are regularly collated from the clinical sites and laboratories and used to interpret passive surveillance trends and inform service provision planning.

ADOPT - Evaluation of the Australian Development and Operationalisation of Partner Therapy Project

Katherine Brown

The rate of chlamydia diagnoses in NSW continue to increase annually. Testing and treating sexual partners of patients infected with chlamydia is important to prevent reinfection of the patient and reduce the prevalence of chlamydia in the community. Traditionally, the management of sexual partners of people diagnosed with chlamydia relied on the clinic or patient to ask their partner/s to seek testing and treatment. An alternative strategy of partner management is Patient Delivered Partner Therapy (PDPT) where a clinician provides medication or a prescription for the treatment of chlamydia to an index case (patient) to give their partner/s. PDPT has been shown to be safe and effective. The Australian Development and Operationalisation of Partner Therapy project, ADOPT, will evaluate the implementation of Patient Delivered Partner Therapy (PDPT) in select publicly funded sexual health services and family planning clinics in NSW and will assess a potential PDPT model for the delivery of PDPT in general practice.

The Australian HIV Observational Database (AHOD) Research Program

Katherine Brown

AHOD is an observational cohort study of more than 4,000 HIV positive patients in Australia under routine clinical care. It was established in 1999 to monitor treatment uptake and outcomes. In 2014, AHOD was expanded to include clinical sites in New Zealand. Since its inception, AHOD has provided the best available surveillance data on trends in antiretroviral treatment uptake and use in Australia and has a central role in State and Commonwealth Health Departments planning of HIV care.

BEST at home

Amanda Bates, Susan Furber, Cathy Chittenden, Lisa Franco, Michelle Kershaw, Paul van den Dolder, Cathie Sherrington, Anne Tiedemann, Karen Grinn, Kirsten Howard, Adrian Bauman

Falls are a major and increasing public health issue. This NHMRC funded randomised controlled trial involves a home based exercise program for people aged 65 years and over. The project aims to determine the effectiveness
People’s perceptions of the benefit of the outdoor gym and equipment and ‘Come and Try’ sessions

Karen Tavener-Smith, Susan Furber

In May 2014, Wollongong City Council installed outdoor gym equipment in Nicholson Park in Woonona. Council in partnership with ISLHD Health Promotion Unit, and the Tenants Participation Resource Service ran a series of ‘Come and Try’ sessions in an effort to improve the local community’s physical activity and social interactions, particularly for social housing residents living in the vicinity. Participants were given information on the benefits of undertaking regular cardio-fitness and muscle strengthening activities; and on how to safely use the outdoor gym equipment. The aim of the pilot project was to: explore people’s perceptions of the benefits of using outdoor gym equipment and the “Come and Try” sessions; and to determine whether people, including those living in social housing, will participate in the sessions at the outdoor gym equipment. The findings of the pilot study showed that the “Come and Try” sessions encouraged people to use the outdoor gym equipment by providing instruction on correct use, increasing social opportunities and reducing barriers such as cost and safety concerns. The findings suggested that the project reached low income people and those living in social housing. Evaluations of the program included a survey of outdoor gym equipment users at the park and a six month follow up telephone survey. The ‘Come and Try’ partnership programs continued into 2016/17, with expansion of program to other Council sites where outdoor gym equipment has been installed. The initial research provide valuable information on the program success, which has assisted with advocacy to local Councils for running similar programs at their outdoor gym equipment sites. The latest site was a Gerringong program which was conducted in partnership with Kiama Council.

The Illawarra Gestational Diabetes Follow Up Study

Robert Moses

This large epidemiological study is a two part study. The first phase of the study involved establishing a database of ~2500 eligible women who were diagnosed with GDM between 1991 and 2010. The second phase of the study is to determine the prevalence of type 2 diabetes in these women. There is significant value in determining the prevalence specific to the Illawarra population to adequately provide services and funding for early type 2 diabetes mellitus diagnosis and prevention.
Drug and Alcohol

New Projects

An evaluation of the NSW Involuntary Drug and Alcohol Treatment (IDAT) Program

Alison Ritter, Thu Vuong, Marian Shanahan, Sarah Larney

Involuntary treatment is one of the current compulsory treatment approaches for individuals with severe alcohol and drug dependence in Australia. The treatment aims to provide involuntary care outside of the criminal justice system to individuals with severe drug and alcohol dependence who are at risk of harm to self or others. This is a research project that is being lead by the National Drug and Alcohol Research Centre. It aims to determine the effect of the Involuntary Drug and Alcohol Treatment (IDAT) program on patient outcomes for IDAT patients and in comparison to a control group. The project is a mixed methods evaluation study that involves three study components: process evaluation, outcome evaluation, cost evaluation. The project will include analysis of the IDAT program database, interviews with patients and their carers, in depth interviews with stakeholders, mailed out surveys, observations of staff meetings, and documentary review.

Illawarra/Shoalhaven Performance and Image Enhancing Drugs Project

Cornelia Graf, Kristel Modderman, Naomi Viret

Over recent years the First Step Program (FSP) has seen a sharp increase in people using Performance and Image Enhancing Drugs (PIED). The Drug and Alcohol service is closely monitoring this ‘new’ movement and is looking at adjusting its service delivery to meet the specific needs of this often hard to reach target population. To explore the needs of PIED users in the ISLHD, more research is needed to identify the existing knowledge levels within the PIED user community and to outline knowledge gaps around injecting practices and Blood Bourne Viruses transmission risks to prevent future harm to the health and wellbeing of this client group. To date, the FSP in partnership with the HIV & Related Programs (HARP) Unit has conducted 15 one-to-one or group interviews with a total of 19 participants. It is hoped that the interviews will help to identify specific needs, with the aim to improve its service delivery to the PIED user community within the ISLHD.

Kiama Underage Drinking Project

Sandra Jones, Kelly Andrews

As part of an Australian Research Council (ARC) fellowship, a two year community project, The Kiama Stop Underage Drinking Project (SUAD), was introduced which aimed to reduce alcohol consumption among adolescents through changing social norms surrounding normalisation of adolescent alcohol consumption. The intervention includes a community based social marketing campaign, school and community-based activities and online and environmental parent activities. This research project aims to determine trends in adolescent (12 to 17 years old) alcohol related accidents, injuries and incidents. It will also provide evaluation data to measure the impact of the community intervention to reduce the impact of underage drinking. This project is being led by the Centre for Health and Social Research, Australian Catholic University.
Healthy Mouths Matter
Geetanjali Salwan, Chia-Yun Yeh, Joanne Stankovic, Kelly Skilton, Debbie Lee, Nada Mace, Alex Gagan, Laura Righetto

Shellharbour Hospital (SHH) Mental Health Rehabilitation Unit (MHRU) assists individuals who are voluntarily admitted to acquire skills, resources and support for successful living. Psychiatric disorders can influence optimal oral health. Some psychiatric medications can cause dry mouth which can adversely affect patient oral health. Healthy Mouths Matter is a project that allows voluntary participants from MHRU to have access to the SHH dental clinic to assess, manage and improve their oral health. The project aims to assess the impact of oral health education tailored to the needs of mental health consumers in conjunction with priority access to ISLHD Oral Health Services. The project commenced in October 2015 where introductory oral health education sessions were conducted for staff and consumers of the unit on good oral hygiene habits, how to identify good and bad foods and to dental diseases and their prevention. The oral health status of the participants has been assessed and their oral health needs were addressed. On completion of the treatment, 20 participants were recruited with a total of 146 appointments. There was an Approximal Plaque Index Average Reduction (API) 39.72% indicating a significant improvement in oral hygiene. Sulcular Bleeding Index Average Reduction (SBI) 24.46% indicating an improvement in oral health. Overall improvement in oral health and oral hygiene was observed.

The Community of Practice Research was established as a new local health district service initiative. The community comprises novice and experienced multidisciplinary health researchers. This paper reflects our experience of being Community of Practice Research members and aims to explore the practice development principles aligned to the purpose, progress and outcomes of this community.

The journey is compared to walking a tightrope from the beginning to the end. Success in moving forward is attributed to positive leadership and group dynamics enabling a supportive environment. This environment allowed for different types of learning: new research skills and new understandings about oneself. Competing demands such as fluctuating membership and leadership, and the selection of a large initial project were identified as barriers to the Community of Practice Research. As well as contributing to communities’ shared goals members should identify and make explicit their own learning goals to themselves, the community and their managers. Community of practice meetings should include regular facilitated reflection about the learning that is occurring, the challenges and assumptions being made by the group, and the way forward. A community of practice uses social processes to aid learning and collaboration across disciplines and organisations and therefore has potential to promote local culture change.
New Projects

Deepening our understanding of quality in Australia

Wilf Yeo, Jamal Ghannam, Janaye Fish, Melanie Cruz, Udit Nindra, Luke Freckleton

The DUQuA project aims to assess relationships between quality management and patient outcomes in Australian hospitals. The project is a multi-level cross sectional study with data collection at hospital, care pathway, professional and patient level in 70 hospitals. Data will be collected for three health conditions including stroke, acute myocardial infarction and hip fracture. It is hoped that the research project will help to determine the department and hospital level quality factors that are associated with patient outcomes. Data collection is anticipated to commence in early 2017. The project is being lead by the Australian Institute of Health Innovation.

Investigation of the facilitators and barriers to implementation of the Illawarra Shoalhaven Local Health District Allied Health Clinical Supervision Policy

Sue Fitzpatrick, William Ryan, Rowena Hockings

With the Allied Health Clinical Supervision Policy rolling out across the ISLHD in the last year, an analysis of how Allied Health staff are implementing the policy into their daily routine appears prudent. Identifying the facilitators of the policy, or aspects of the policy that staff find easy and helpful to implement, will allow further development of the face-to-face training sessions and Health Education and Training Institute (HETI) training modules. This will also allow the policy’s implementation across the district to become more effective and staff friendly. Identification of the barriers, or aspects of the policy that staff find difficult to implement into their daily routine, will allow the development of strategies to improve the effectiveness and efficacy of the policy. This project is an observational study which aims to explore the barriers and facilitators that impact ISLHD Allied Health Professionals ability to comply with the Allied Health Clinical Supervision policy. The project aims will be achieved through use of an anonymous online survey.

How does the number of Allied Health Assistants supervised, impact on Allied Health Professional workload in the ISLHD?

Patrick Brown, Rowena Hockings, Sue Fitzpatrick

Allied Health Assistants (AHA) form a part of the health care and social assistance workforce within NSW Health. There is significant potential for this workforce to help meet the challenges posed by workforce shortages and escalating costs. Allied Health Practitioners (AHP) are responsible and accountable when delegating work to the AHA’s. Recently in Australia, supervision guidelines for AHP’s have attempted to improve clinical governance of this workforce. The impact of this increased supervision workload on AHP’s has not been quantified or described in the literature, and may impact of the AHP’s ability to carry their own clinical load, or influence how accepting AHP’s are of AHA roles within their workforce. The aim of this project is to assess the impact of supervising AHA’s, on AHP’s workload. More specifically the project seeks to quantify the number of AHP’s involved in AHA supervision, and secondly, to examine AHA supervision from an AHP perspective.

Improving speech pathologists implementation or recommended practices in acute aphasia management: A pilot cluster randomised controlled trial

Kristen Farrell, Kirstine Shrubsole, Linda Worrall, Emma Power, Denise O’Connor

Aphasia is a chronic communication disability that affects language processing (talking, understanding, reading and writing) after a brain injury, such as a stroke. Despite the availability of Clinical Practice Guidelines to speech pathologists, there is considerable variation in practice for people with aphasia across the continuum of care. For speech pathologists to implement best practice recommendations consistently in acute care they need to change their clinical practice behaviours. Little is known about the effectiveness of behaviour change strategies in speech pathologists providing acute aphasia management. This study will design and test the feasibility, acceptability and potential effectiveness of a tailored implementation strategy to improve speech pathologists uptake of evidence in two areas of practice. Sites will be randomised into an intervention arm and be blinded to their allocation. Ultimately, by providing an intervention targeted at known barriers to speech pathology practice, the researchers hope to close the evidence-practice gaps in order to benefit people with aphasia and their families caregivers.
What difference does a flower make? Does the sunflower tool increase person centred care?

Denise Edgar, Shoko Bunder, Evelyn Jelercic, Joanne Browne

In 2015 and 2016 a few wards within Wollongong Hospital took part in the Agency for Clinical Innovation’s Care of the Confused Hospitalised Older Persons (CHOPs) pilot project. Key principles of the CHOPs program were the partnerships with carers and striving for person centred care. As part of this program the Sunflower tool was implemented, which identifies the person’s name and individualised information about the person and is visual for everyone to view. The CHOPS program was evaluated in its entirety and with an older person focus. This project aims to evaluate if the sunflower tool on its own, supports person centred care and if so for who and how. The project is a mixed methods approach. Data will be collected through audits of the sunflower usage and interviews with staff, patients and carers on their views of the sunflower using a standardised interview format. If the findings are positive the tools would provide a very cost effective means to increasing person centred care.

Ongoing Projects

An investigation of the human dimension characteristics of medical, nursing and allied health staff across the ISLHD

Marianna Milosavljevic, Janaye Fish, Jay Borchard, Amanda Simister, Cecilia Papadakis, Debra Collard, Diane Lovatt, Jorge Sesperez, Linda Wilemsen, Luke Bathe, Marc Aquilina, Nilda Miranda, Paul Winstanley, Sana Khan

This local study will measure the human dimension characteristics of a group of ISLHD workers via a validated survey, and explore what factors are most closely associated with resilience within the ISLHD. Although it would be ideal to measure all staff, due to limited resources this study will focus on the specific groups that can be accessed by the researchers. By investigating this area we hope to highlight the characteristics that define a resilient workforce. This should assist us in developing targeted strategies to help address issues surrounding resilience in the groups studied.
Judy graduated from her Masters in Clinical Psychology in 2000 and began working for Mental Health, ISLHD in 2001. As the senior clinical Psychologist, she currently holds the position of Professional Head (Mental Health), ISLHD. Judy’s early research interests related to the area of Schizophrenia. She has co-authored two articles relating to treatment programs for people with schizophrenia and received an award in 2002 from the Australian Psychological Society for her conference poster presentation on “Living Well: A CBT group program for people with Schizophrenia”, which she had developed and implemented under an Illawarra Area Health Service research grant. Judy is currently in the closing stages of completing her PhD through the University of Wollongong after receiving an Australian Postgraduate Award Scholarship. She explains how this came to fruition.

“As I had Masters in Clinical Psychology, the idea of further study always appealed to me. I approached my current supervisor, Brin Grenyer as he was involved in developing the project through the university called Illawarra born. Illawarra Born is a multi-disciplinary collaborative study involving UoW and ISLHD researchers performing the work at IHMRI. The research team consists of psychologists, doctors, obstetricians, paediatricians, epidemiologists, geneticists and social scientists. The current investigators represent a mix of highly experienced and promising early career researchers, as well as PhD candidates.

My PhD concentrated on the cross generational transmission of attachment through that study, specifically investigating the role of mindfulness and reflective functioning in mediating attachment relationships. That area was very interesting to me from a mental health perspective. I am hoping to submit December 2016!

The journey has been really good; that is the perspective I tried to keep throughout. Any point where I felt overwhelmed, I just thought about focusing one thing at a time. For example, when I had to learn more statistics, I thought this is all I have to think about right now. The learning has been good; I learnt new skills at different times. How I managed to complete my PhD was through a combination of reduced hours and leave without pay so I was able to concentrate on doing my PhD and in the 3rd year I was able to come back full time. I completed the majority of the work in the 3 years. Another strategy that helped was doing PhD by publication; it helped with sectioning my workload and knowing what I was focusing on at that point in time.
“I had this niggling thing in the back of my head, I was always meant to do it (PhD)...it was something I always wanted to do” - Lyndel Hewitt, Senior Rehabilitation Physiotherapist

When it comes to juggling a career, a PhD and a family, Lyndel Hewitt is giving it her best shot! Whilst she started a PhD many years ago, it was the wrong stage of her life as she headed into marriage and motherhood. Early last year an opportunity presented itself to enrol in a PhD, and she jumped at the second chance. Now completing her thesis by compilation, Lyndel will work on conducting five studies and compiling them over the 3 year degree.

Lyndel is a Senior Rehabilitation Physiotherapist, and comes with a wealth of experience spanning over 16 years, including paediatrics. Her passion for paeds research started with a project investigating plagiocephaly, also known as flat head syndrome. Whilst “tummy time” is a common recommendation for parents to use in the treatment of plagiocephaly, there is no strong evidence available to provide concrete advice. Further to this there is no objective way to measure “tummy time”. Current methods are based on subjective measurements such as parent reporting. “We are trying to find a real time device (for measuring “tummy time”)...like a fit bit for a baby.”

With the help from her supervisors at the University of Wollongong, Lyndel identified this as a gap in her clinical practice and set out to establish evidence. Her PhD is based around a behavioural epidemiology framework with five phases: prevalence, measurement, influences, intervention and translation. She aims to establish the prevalence of, and identify factors that influence “tummy time”, as well as conducting a pilot randomised controlled trial to evaluate an intervention to increase “tummy time”.

Lyndel hopes to be able to use the learnings from her PhD, and translate these into her everyday clinical practice. She is grateful to be supported by the Australian Government Research Training Program Scholarship. Although she acknowledges time pressures due to clinical workload as a barrier to conducting research, setting aside pure time and assessing priorities has helped Lyndel manage her clinical and research workloads. “It seems so unattainable, but then you go through it step by step, and you start to think maybe I can do it.”
Research Dinner

The ISLHD Research Dinner was held in June 2016 at City Beach. This venue provided a spectacular vista for the 140 guests in attendance. Each guest was greeted with a Hollywood style reception including a red carpet, a list of guests that read like the “who’s who” of the District and our own version of paparazzi.

The Chief Executive, Margot Mains, opened the evening and reminded us why this dinner has become an important fixture on the annual calendar. This included the very rare opportunity to simply celebrate our research success as a District. Margot also spoke of the many exciting research initiatives such as the Illawarra Health Information Platform (IHIP) which is the most significant investment in research the District has ever made ($5 million investment over five years), the recruitment of the next ISLHD Professor of Nursing, which should be appointed in the next few months and the success of the ISLHD/UoW Joint Scholarship students. It was also a chance to meet other people from across the District and region with a similar interest in research. All this whilst having a fun and relaxing evening.

The special guests at this years’ event included the Pro Vice Chancellor of UoW, Professor Judy Raper; UoW Dean of Medicine, Professor Ian Wilson; Director of ASHRI, Professor Kathy Eagar; Director IHMRI, Professor David Adams; IHMRI

Clinical Director, Professor Leonard Arnolda; Ms Kim Capp, General Manager of South Coast Private Hospital; and Mr David Crowe, Chief Executive of Wollongong Private Hospital. As well as many of the senior executives from across the District.

The highlight of the evening was the entertainment provided by the Research Central team. This included a presentation by the six ISLHD/UoW PhD students. The introduction to their presentations was a wonderful short film called: “2015- A Year to Remember”. For those with a fondness for nostalgia, it was filmed in the in style of the British Pathé films of the 1930’s. The narrator was our own Professor Yeo, a man of many hidden talents! This short film can be viewed here. There was also a baby photo competition aptly named the “Dirty Dozen” which was a chance to see that our fearless leaders were all once very cute babies. There was also a “research runway” which displayed the sizable amount of research projects undertaken throughout the District over the last 12 months. The dinner has become an annual event in the ISLHD research calendar and continues to be warmly received by the executive management and clinical researchers. Our “paparazzo”, namely Steve Heylin, was again on hand to take all the snaps throughout the night.
The Shoalhaven District Memorial Hospital is a regional hospital with an added set of challenges relating to staffing arrangements and isolated practitioners. We have highlighted a number of clinicians from Shoalhaven previously. However, like other clinicians at Shoalhaven, Dr Abraham sees the importance of undertaking research and mentoring medical students that have clinical placements in Nowra.

I originated from the US, and I recall a healthy clinical research culture in American hospitals due to the structure and depth of expertise from those involved in clinical research. Those individuals were always happy to have a chat and assist with research.

I have been a respiratory physician for four years with the service and I believe the key to grow a research culture is collaboration and allocation of resources. I attended a respiratory meeting with the Agency for Clinical Innovation last year and Shoalhaven was chosen as a pilot site for a community acquired pneumonia audit. It is looking at the reviewing the audit tool, report functions and it will be revised if required before it is rolled out across the NSW health districts. It will examine the clinical variation of Community Acquired Pneumonia management. While we are doing this, we also had keen interest from Michael Rennie, a Phase 3 student to undertake a similar project but specifically look at whether smoking may be a risk factor or predictor of severity of community acquired pneumonia. We are looking forward to Michael presenting to the medical team here.

When we asked Michael about his interest, he had the following to add:

In phase 2, we did a number of rotations and and one of those are at Shoalhaven, that is when I met Dr Abraham. It was one of my favourite rotations. You have a small team and you are working with clinicians that you are able to create closer working relationships. This was hard to achieve elsewhere, I can come here and work with Dr Abraham and catch up in the morning and discuss issues and ideas regarding the research project. He has come to see me three times today, and I don’t think that would happen elsewhere. It is a fantastic experience to do research in this setting.
Val is the newly appointed Professor of Nursing Research & Practice Development. She looks forward to engaging nursing and midwifery staff through a number of initiatives to continue growing a research culture within ISLHD. She shared highlights of her research journey with Research Central.

My interest in research began when I was a Clinical Nurse Educator in Melbourne, 25-30 years ago. I wanted to solve a clinical issue regarding medication errors; it is what is now termed confirmation bias. It is when two people are checking the drug and the second person confirms what the first person says. I wanted to know why we continued to make errors even though we had a double checking system in place in the clinical area I worked, which was in paediatrics. The curiosity was to answer the question; “why do we make errors?” So we did an observational study and what we found was a confirmation bias. We developed a process where the second checker had to be independent.

That was one of the earlier times I had a question, so I found myself doing research by accident if you like. I continued to do those smaller research projects, until I formalised my training and did a Master’s Degree of Nursing Research about 20 years ago. I had to do a large project independently and in this study I looked at the experiences of parents when their child went to day surgery. I noticed staff used to say “we have patients that are more ill here, why are these parents concerned? The children are only having day surgery.” If that is the perception of staff, I was interested in the lived experience of the parents. One of the key things I found was that every single parent imagined their child dying during surgery. They went to great lengths to choose a surgeon, but none thought about an anaesthetist. It came as a shock to them when they got to the hospital and that increased their anxiety. The quote that stands out; and this is the beauty of research, you remember the stories. One of the mothers said, “They rip your heart out, when they take your child and it doesn’t go
back in until you see them again.” I thought my goodness; we have no understanding as health professionals what these parents are going through and this research helped us understand that.

I think at the moment, my research is mixed methods. I see the place for quantitative data and measurement that can give people exactness, but the beauty for me comes in the qualitative; the stories behind the numbers. The recent international study we have done is four different types of data across health organisations. When we talked about the value of the data, the staff all loved the graphs, the comparisons, the benchmarks but when we looked into it, it they all made changes to practice based on the stories. To me the stories are what get to the heart; intellectually the numbers are good because you can see improvements or worse. But the stories are the thing that gives us the passion that wants us to do something better or different.

In my new role at ISLHD, there is a lot to be excited about. I think that the main thing in the immediate future is building up the capacity of research across the organisation with nurses and midwives. There is already a lot happening so I think a good foundation has been set but it is about building that up. There will be a number of initiatives for us to engage staff, in perhaps enhancing or learning skills about research by doing research with in conjunction with the unit. We are hoping to recruit staff across the organisation to do that, but we also have a few projects that are ongoing and one international study which is based on the stories. We are recruiting 5 sites in the ISLHD and they are going to be measuring nursing and midwifery key performance indicators through the use of an app. It is quick data, timely about the care that they deliver but it is based on patient and carer experiences. It is not standard data that we receive; it privileges the patient and family voice. The question is around “does using the app make it easy for staff to get quick feedback and can they use that feedback to make changes to practice?” We are quite excited and our partners are in Northern Ireland so they are going to be doing the same study on that site and we will be comparing. This brings an international flavour to the research. People like being part of something bigger than them, their unit, their organisation and that has a value add.
Improving Schizophrenia Treatment: a focus on cognition and the metabolic side-effects of medications
Ilijana Babic, Medical and health science student, UoW

Ilijana has found promising results in her animal behavioural experiments and is currently performing a range of autoradiography and western blot experiments to elucidate the underlying mechanisms behind liraglutide’s potential to prevent cognitive dysfunction and weight gain in an antipsychotic rat model. Additionally, Ilijana has been preparing to undertake a qualitative study on ISLHD clinicians’ perceptions of cognition in schizophrenia.

Impact of cognitive impairment and low health literacy in people with renal disease and strategies to improve patient outcomes
Kelly Lambert
Senior Clinical Dietitian, Wollongong Hospital

2016 was the completion of Kelly’s second year of the PhD. During 2016, she published 2 papers relating to the PhD. Data collection in the form of semi structured interviews was conducted in late 2016 with 27 renal dietitians from Australia and New Zealand and 26 patients with Chronic Kidney Disease (CKD) from the ISLHD. She was invited to conduct a webinar on the topic of cognitive impairment and how it impacts on self-management in patient with CKD. As a result of her PhD work she was approached by Kidney Health Australia to join a working party tasked with revision of all nutrition related publications by the organisation.

Social determinants of mental health and diabetes in Illawarra: A spatial analysis
Ramya Walsan, Medical and health science student, UoW

Ramya has been working on developing a research plan for her research in the last 6 months. Her study investigates the role of neighbourhoods in promoting and buffering health disparities faced by people with serious mental illness and type 2 diabetes. Neighbourhoods are emerging as an important context in public health epidemiology and a sizeable number of studies have established that people who live in poorer socioeconomic neighbourhoods have worse mental and physical health outcomes than people living in affluent areas. Ramya has completed the literature review and is currently working on her research proposal. Ramya presented two concept posters at the World Social Psychiatry Conference in December. She has also published a review article. Ramya hopes to get the ethical approval and start her data collection by June.

Frailty, gait and risk of fall analysis among the elderly
Maryam Ghahramani, Engineering student, UoW

In the last year, Maryam has managed to finish data gathering and data analysis. She has also presented her work at two conferences (both international) and has published a journal paper and two more are under review. Maryam is in the final stages of preparing her thesis, which she is hoping to submit at the end of 2017.
Medical Student Research Program

Medication use in a geriatric population diagnosed with dementia: A quality clinical audit comparing current practice to NHMRC guidelines
Justin Turner, Jan Potter, Warren Rich, Janaye Fish

Development of a comprehensive scoring system to assess obstructive sleep apnea (OSA) severity in children
Hardip Chalal, Stuart Mackay, Terry Sands, Andrew Jones, SueEllen Holmes, Kathryn Weston

Medical Student Perception of Emergency Department Education Based Upon Seniority of Supervisor
Florence Huynh, Wayne Triner, Teresa Treweek, Jay Borchard

Incidence of allergy documentation in surgical patients
Joshua Boom, Margaret Jordan, Natalie Smith Greg Peoples, Jay Borchard

Factors predicting representation and admission in patients with a primary presentation of back pain to the ED
Murray Crowe, Wayne Triner, Kylie Mansfield, Jay Borchard

An exploration of factors associated with improvement in aerobic capacity and completion of a cardiac rehabilitation exercise program
Rachel Bowden, Karumathil Murali, Warren Rich, Kelly Lambert

Are Illawarra kidney transplant recipients discharged from transplant centres too soon? A retrospective analysis of kidney transplant recipients post discharge
Grace Miller, Jane Holt, Coralie Wilson, Kelly Lambert

An exploration of factors associated with improvement in aerobic capacity and completion of a cardiac rehabilitation exercise program
Matthew Lindfield, Anto Tyson, Greg Peoples, Kelly Lambert

A clinical quality audit of vaccination compliance for Hepatitis B, pneumococcus, influenza and pertussis in hemodialysis patients
David Wingert, Jane Holt, Kelly Lambert

Evaluation of the relationship between body mass index and short-term postoperative complications in patients undergoing major colorectal surgery.
Kara Goon, Marianna Milosavljevic, Soni Putnis, Gregory Peoples, Ivana Goluza

Hospital outcomes in current smokers with presentations of adult community-acquired pneumonia
Michael Rennie, Vinu Abraham, Ivana Goluza, Spiros Mlyakis
Translational Research Grant Success

“I really feel being in the local health district we have the responsibility to try as hard as possible to do research that actually can have an impact on policy and practice, and not just end up in a journal article” – Dr Susan Furber

This quote is the driving force behind the research of Dr Susan Furber, Research & Evaluation Manager from the Health Promotion Service, and Dr Geoff Murray, Rehabilitation Staff Specialist at Port Kembla Hospital. Although differing in their discipline and profession, they both have one thing in common: success. Dr Furber and Dr Murray have both been awarded $565,225 and $85,000 in funding, respectively, from the NSW Ministry of Health’s “2016 Translational Research Grants Scheme”. Here are their stories and words of wisdom:

Dr Susan Furber
Over the course of the next 20 years, the number of people in Australia living with type 2 diabetes is estimated to increase from 870,000 to over 2.5 million due to factors such as high rates of overweight and obesity and poor lifestyle behaviours. The aim of the research is to determine the effectiveness of a text message intervention (DTEXT) on lifestyle risk factor modification and self-management for people living with type 2 diabetes. Her randomised controlled trial will be conducted in the Illawarra Shoalhaven and will seek approximately 300 community dwelling participants living with type 2 diabetes. The intervention group will receive mobile phone text messages for 6 months which will provide information and support on physical activity, nutrition, weight, smoking cessation and diabetes self-management. The control group will continue with their standard care, including medication and lifestyle counselling as determined by their doctor. The primary outcome measure will be HbA1c; secondary measures will include physical activity, nutrition, weight, and diabetes management. With the grant, the research team intend to fund one full time and one part time staff members to assist with the project, in addition to computers, statistical packages, accelerometers, promotional materials and administrative support.

Dr Geoff Murray
A substantial number of patients with chronic pain find themselves being prescribed high doses of opioid medications and over time they become tolerant. Eventually, the patients don’t find much relief from their pain. This combined with significant side effects, especially if the dose is large, poses a great burden on the patient and on healthcare. The aim of his research is to explore the effectiveness, including cost effectiveness, of two methods for tapering opioid doses. The first method will be based in the outpatient setting where various strategies with medications will be used to taper participants opioid dose over time, including reassurance and managing withdrawal symptoms. The second method will be based in the inpatient setting, where participants will receive the anaesthetic drug, ketamine, over a 5 day hospital stay, to effectively manage their withdrawal symptoms allowing a much more rapid taper. With the funding, the research team will be able to employ a research assistant 2 days a week to assist with data collection, entry, analysis and ethics. This will be extremely beneficial considering the time factor involved with conducting research.

They also share the following tips for grant success:
- Start your conversations early!
- Have an idea that is feasible and timely.
- Conduct a pilot study to test interest and feasibility is viewed favourably by funding bodies.
- Consider it a job interview. Talk to the funding body to discuss what they are looking for, what things they find important and what they will be specifically seeking.
- Link up with experts in the area. This will increase your competitiveness against those with a great grant track record.
- Seek advice and feedback from those assessing the proposal, your colleagues and those within your department. Try to focus on translational ideas, and engage those who work in the health district in the area.
- Having a really good team gets you across the line. “Tick the boxes and answer the questions” - “The other thing is, don’t give up. If you’ve got a good idea, it’s pretty tough getting funding. Get feedback and try again.”

We would like to congratulate Dr Susan Furber, Dr Geoff Murray and their respective research teams.
Partnerships & Collaborations
IHMRI brings together scientists, clinicians and health professionals from around the region, and around the world. As a not-for-profit registered charity, we strive to understand, treat and prevent disease and illness. We also support clinical research studies and commercial clinical trials to test new treatments, drugs and devices. Diversity is our strength—our researchers come from a range of academic and clinical backgrounds. What binds us together is our desire to improve the health and wellbeing of people living in the Illawarra. While the work of our researchers is locally relevant, it resonates well beyond the borders of our region. Our success springs from our collaborative and multi-disciplinary approach to research. Established in 2008, we are a group of health and medical researchers that dares to venture beyond the limits of our current knowledge.

Let the voyage of discovery begin

IHMRI are here to support health and medical researchers. For more information about how we can help, please email ihmri-research@uow.edu.au or call Bethany Pye-Respondek on 02 4252 8940 or Sally McNeil on 02 4221 4809 (Monday – Friday, 9am – 5pm).

Professor Barbara Meyer and Associate Professor Mitch Byrne investigate if Omega-3 supplementation attenuates aggressive behaviour.
I studied science at the University of New South Wales, completing my honours degree in a laboratory that turned out to be one of the strongest in Australia for research on the nervous system. At the time, I was interested in neuroscience, under the sphere of physiology. After my honours degree I received a Commonwealth Postgraduate Scholarship to undertake a PhD, an opportunity that I eagerly accepted. In 1976, I had my first paper published in Science and the output of my PhD included two papers in Nature and four in the Journal of Physiology.

The more I got involved in research, the more I saw it as a creative profession—like an artist or musician. You have the same challenge of discovering something completely new, that people have never seen before. I found it very creative and original. Fast forward to the present day I now understand the importance of collaboration, as well as individual creativity. My research activities focus on the therapeutic potential of animal venom peptides. In particular, I look at how the analgesic peptides in marine cone snails interact with pain pathways of the nervous system. My goal is to develop an alternative to opioid and morphine-based drugs for pain relief. In the United States, doctors have approval to use venom peptides to treat severe pain, but there are drawbacks. Doctors must administer the drug to patients intravenously and it causes extreme hypotension. I want to develop a new drug that people can take orally and without the side effects. To do this a need to talk to doctors to get clinical trials off the ground.

Due to these experiences, I understand the challenges of translational research. I have seen the importance of strong connections between scientists and clinicians. As a result, I want to develop both a strong research culture within IHMRI and a sense of belonging.

An important lesson I took away from my experience in US medical schools, such as the University of Miami was that the infrastructure is critical. The medical schools were on the hospital campus. This created wonderful connections. Interns spent time in the laboratory conducting research and vice versa. Scientists could connect with the health sector.

In terms of future direction, there are some interesting developments. Our first step is opening a clinical trials unit at The Wollongong Hospital. It is about creating a tangible connection. Another domain we want to improve is community engagement. We would like to relate to a broad community, and thus we aim to have a much greater community focus going forward. In the next five years, I see the future growth of IHMRI in terms of placing basic science researchers alongside clinical researchers, a common building, and to create an awareness of community and patient challenges in the Illawarra-Shoalhaven region.
I am currently the Chief Operating Officer at IHMRI. The role requires a strong understanding of the research of our affiliated researchers, our strengths and weaknesses, and what research strategies we should have moving forward—always with a strong focus on trying to improve collaboration and funding options. Within my remit are the functions of human resources, communications, strategy, finance and the day-to-day management of IHMRI. What drew me to IHMRI was the opportunity to work for an organisation that can make a difference to people’s health and lifestyle. I want to contribute to this cause by providing support and assistance to research that focuses on prevention, treatment and health in our community. I am a local—I have lived in Wollongong for 20 years, and have a diverse background in local and state government. I feel fortunate to serve my local community. It is imperative that scientists and clinicians work together for a number of reasons.

With government funding increasingly focused on practical outcomes, scientists need to direct their research efforts towards major health and medical challenges in our communities. The best way to identify and be aware of these challenges is to speak to clinicians, who consult and treat members of the community every day. In turn, scientists can provide clinicians with the most up-to-date knowledge of disease and illness, information about new breakthroughs and assistance with research projects.

By working together, scientists and clinicians can combine academic insights with practical skills. This combination of energy can lead to improvements in all sorts of areas, from processes of patient care, to clinical trials of new drugs. It is therefore critical that we focus on the right relationships.

The key challenge that we see in the Illawarra is a lack of communication between the basic scientists and clinicians. It takes a long time to build these relationships. However, one thing that will help is a stronger presence in a central location. IHMRI is going to have a clinical trials room at The Wollongong Hospital. That is step one. People will have a common space to start building relationships. It is important for IHMRI and Research Central to help broker connections—to identify key people with similar interests and introduce them. We want to bring them together so they can collaborate on projects and have a better understanding of issues and areas of research interest.

I have grand plans for the next five years. I think it is essential for the next stage of IHMRI’s growth to have a stronger presence at the Hospital. I think a new clinical trials room is a good starting point, but within five years we should have a greater presence in the area, be it in Wollongong or another location. Clinicians and scientists must have space to work together—a common area where they can integrate and collaborate. Having labs in the same location as the Hospital would also be helpful, as this would facilitate better understanding of the work of our scientists. I am so excited to be part of the next stage in IHMRI’s development and look forward to seeing the results of our collaborative spirit.
Potato Farmer to Professor

1975 is known in Australia as the “Year of the Dismissal”. This year is often referred to by many Australians, as the greatest political and constitutional crisis in our history. Yet, at the same time 7,500km away, there was another major political event called the “Chinese Cultural Revolution”.

Professor Xu-Feng Huang was part of that significant historical movement. When most of us are deciding what do after high school, Xu-Feng was faced with three choices: join the army; become a factory worker; or become a farmer. Xu Feng’s first steps into adulthood were literally pushing his wheelbarrow, which contained all his possessions along a dirt road, from his rural village to an even smaller village consisting of around 80 families. This trip took six hours and Xu-Feng still remembers the 30th July, 1975 as the day he arrived, wet and miserable. This day remains firmly etched in his memory.

When recalling those early days he tells of a story which depicts the harsh reality of life on the farm with no running water or power. The work was hard and unforgiving. The young farmhands led a very basic existence with no running water or power and surviving on small, frequent meals consisting of crops grown on their farm.

Each week Xu Feng and his fellow farmers looked forward to their one special meal of rice noodles. One night, under the cover of darkness, they gathered round to eat their much coveted rice noodle meal only to find this meal was far tastier than usual. Xu Feng thought one of the workers must have found some sesame seeds/seasoning that spiced up the meal. They all remarked on the tasty version of rice noodles. Only to find out by candlelight the secret ingredient had been a wok full of ants, who had congregated in the unwashed wok from the previous meal.

Professor Huang is now a well-respected and very successful IHMRI Professor, after his relatively short stint as a sweet potato farmer and also as a general practitioner. His research interests are the neuropathology and neuropharmacology of severe mental disorders, body weight control, and type 2 diabetes. Professor Huang has received funding from the ARC, NHMRC, Diabetes Australia, Schizophrenia Research Institute, AstraZeneca Company of Sweden, Uncle Toby’s and Clover Ltd. He has also been awarded 17 years of NHMRC funding since he joined UOW in 1995, and $7.3M in external research funding.
Analysis of healthcare data has the potential to transform clinical decision making and improve patient centred-practice. The challenge is to integrate disparate health datasets to provide greater insight into the factors that drive patient and community health outcomes. In recognition of this challenge, the Centre for Health Research Illawarra Shoalhaven Population (CHRISP) was established as a partnership between Illawarra Shoalhaven Local Health District and the University of Wollongong. CHRISP seeks to leverage research capacity in the Illawarra Region through the provision of an innovative data linkage system that connects health and medical data for research purposes. CHRISP features a team of talented researchers, data managers and IT experts that help clinicians turn their ideas and research questions into viable and well-designed research projects.

**WHAT IS THE ILLAWARRA HEALTH INFORMATION PLATFORM?**

The Illawarra Health Information Platform (IHIP) is one of CHRISP’s core offerings. IHIP is a data linkage system that enables data from different sources, to be integrated into one dataset for analysis. By building datasets using multiple sources, researchers are able answer bigger questions than previously possible.

Components of IHIP include:
- A non-identifiable databank with data sourced from the Illawarra Shoalhaven Local Health District and potentially other sources
- A health records linkage system
- Research project databases for release to clinicians and other researchers following relevant approvals

**CURRENT PROJECTS**

Clinician / Investigator Driven Projects
- Atherosclerosis Secondary Prevention Study
- ‘Peritonitis as an independent risk factor for cardiovascular events in the peritoneal dialysis population’

ISLHD Priority Projects
- Trend analysis of Frequent Attenders at Illawarra Shoalhaven Emergency Department
- ‘Trends and patterns in unplanned readmissions to Illawarra Shoalhaven hospitals’
- ‘Predicting sub-acute demand using acute activity data’

Student Research Projects
- Medical student – phase 3 research: ‘Quick Sepsis related organ failure assessment compared to systemic inflammatory response syndrome for the recognition of Sepsis in the Emergency Department’

- Masters candidate: ‘The prevalence of hospitalisations resulting from side effects associated with oral anticoagulants’

- PhD candidate: ‘Examining service utilisation and the impact of Dementia identification on patient outcomes: a longitudinal analysis of hospitalization guided by a collaborative process to promote knowledge translation’

- Masters of Public Health student (8 credit point research project) ‘ED presentation and admissions to the Wollongong Hospital during the past 5 years (2011-2016) due to medication misadventures in community dwelling people living with Dementia’

Other Projects
- ‘An evaluation of a strategy designed to increase awareness about High Risk Medicines and its impact on knowledge and awareness among healthcare providers and on reported outcomes’
Associate Professor Judy Mullan was once attending ISLHD wards as a pharmacist. In fact, she spent over 30 years as a hospital, community and an accredited consultant pharmacist. During this time, as many clinicians do, she started asking questions that could be answered through undertaking formalised research. However, there was no avenue to undertake research at the time, which is why she decided to embark on a PhD in her own time. The director of pharmacy was very supportive and encouraged Judy to pursue her PhD while working part time. However, after being the successful recipient of a UOW PhD scholarship, she decided to leave ISLHD and to complete her PhD studies as a full time student. Judy’s PhD entitled ‘To develop and trial a new warfarin education program’ was an education program which specifically targeted patients ‘at risk’ of experiencing warfarin related adverse drug events. These ‘at risk’ patients included the elderly, those with poor health literacy skills, and those from culturally and linguistically diverse backgrounds.

After the completion of her PhD in 2005, Judy set out to return to her clinical work, however an academic position became available in the Faculty of Health and Behavioural Science at UOW and she was encouraged to apply. Following on from this academic appointment, she was appointed as the Academic: Leader for Research and Critical analysis within the new UOW Medical School which commenced in 2007. In addition to writing curriculum and giving lectures to the medical students over the past 10 years, Judy has continued to undertake research in the areas of ‘health literacy’, ‘doctor-patient relationships’, ‘medication misadventures’ and ‘medical education’.

This vast research experience and her desire to improve research capacity among ISLHD clinicians and staff, led her to the role as the Director of CHRISP. One of the key strengths that Judy sees in CHRISP is her team.

“I have an amazing team with lots of expertise: Dr Louise Lago, is an experienced statistician; Dr Victoria Westley-Wise, an experienced epidemiologist; Brendan McAlister is an experienced data integration manager; Dave Webster, is an IT manager and an expert in data linkage, as well as our professional team member Niki Cirillo. Our team can value-add to any research endeavour, we can mentor; supervise, assist with developing appropriate research designs to answer specific research questions, help to access and link relevant data, provide advice about data analysis and assist with dissemination of findings. We have access to this vast dataset (IHIP) which we can use to support researchers wanting to access the data, and maybe even link the data, to answer specific research questions, pending necessary approvals. We especially want to assist research endeavours"}

“One of the reasons I was excited about the role in CHRISP and the Director role was due to the fact that the culture within ISLHD is changing. Clinicians like myself don’t have to quit their positions to get a PhD. I can see that the environment is changing, the atmosphere is changing, and the culture is changing into one which is very accepting of a research culture. This now means that clinicians can keep their substantive positions, while also gaining further research experience and/or qualification; at whatever level they would like. If people want to do a PhD great, if they just want to dip their toe in the water and do a little bit of research for quality improvement purposes- great.”
that will help to improve health outcomes of the Illawarra Shoalhaven residents.”
Judy is keen to point out that they are a new entity.

“Many people are asking us how we are different to this and how we are different to that? Given my experience in assisting with developing new programs, such as the Medical School Research and Critical Analysis program and the Undergraduate Health Sciences program, I know that when you are new, people won’t really understand who and what you are, until you get some runs on the board and projects underway. As part of a partnership between ISLHD and UOW, the CHRISP team has a wonderful opportunity to work collaboratively with the ISLHD/UOW research community and to help improve the health outcomes of Illawarra/Shoalhaven residents. The other important thing to remember is that Margot Mains, ISLHD Chief Executive is the data custodian of the ISLHD data stored in IHIP. We can’t undertake and/or support research, using the IHIP database, without her approval at an executive strategic level. The main point is that we want to work collaboratively and value-add to existing research networks within ISLHD and we are more than happy to assist with research at all levels, from students through to well-known researchers.”

David Webster

Creating solutions for community-based problems

As a graduate of Computer Science from the University of Wollongong, David never anticipated working in such diverse fields as research, health and business. David first worked as a developer for the Department of Psychology at UOW, before starting his own IT business helping local businesses develop and implement management information systems.

He started a position with the Australian Health Services Research Institute (AHSRI) at UOW in 2012. In this position he managed AHSRI’s IT team, which develops and supports software to facilitate national outcomes-focused data collections in public and private services for palliative care, rehabilitation and pain clinics, as well as contributing IT expertise to multi-disciplinary research teams in AHSRI.

David now works at CHRISP and enjoys using his IT skills to address real problems in the community:

“...one thing I like about working here at [CHRISP] is...all our work gets to have impact out there in the real world... and make a real difference in the community... especially when you are a programmer and didn’t know you’d get a chance to do something that’s both enjoyable and meaningful.”

Developing a platform to connect health data

David joined the CHRISP team in 2016, tasked with developing an IT system to connect health data for research – now called the Illawarra Health Information Platform, or IHIP for short. David explains:

“...my first job in CHRISP was to design an IT system that we could use to enable data linkage, which met all of the required ethical standards, in terms of ensuring patient privacy and also clinician privacy. So I was involved in the process of choosing the tools and infrastructure which IHIP uses, and now I’m working with Brendan to actually implement it.”

David has been involved in liaising with ISLHD’s Information Management Unit, which manages the Health Information Exchange (HIE), to ensure that IHIP is able to leverage the extensive work routinely performed by that team in preparing clean, usable health data. IHIP receives de-identified ISLHD health data (for example, information regarding patient admissions and emergency department presentations) from HIE for use in research. This platform is now available for researchers and clinicians who want to connect different sources of health data for research. David supports researchers, clinicians and statisticians to do research using the IHIP platform and welcomes the opportunity to connect with clinicians and stakeholders.
A mind for mathematics

Dr Luise Lago’s career as a statistician kick-started with a degree in mathematics and statistics from the University of Wollongong (UOW). With a passion for numbers, Luise was selected into a competitive cadetship program at the Australian Bureau of Statistics (ABS), where she did further training in statistics and gained experience in survey methodology. Luise’s career progressed to the academic setting in 2004 when she accepted a position at the Centre for Health Service Development, at UOW. In this position, Luise informed the statistical design for numerous projects ranging from NHMRC grants to funding models and state and national classification development.

To fulfil an interest in doing more in-depth statistical work, Luise enrolled in a PhD looking at the imputation of missing data in household surveys. Luise explains:

I was looking at different ways of accounting for the information about household in an imputation model, so rather than just imputing someone’s data based on how old they are, or whether they are male or female, we were looking at other people in the household… if you have other people that vote a certain way, or they smoke, or drink alcohol of a certain level of consumption, that tells you something about the missing information… what we found was that the more highly clustered the variable is, the better the predictive value is, so if variables aren’t highly clustered within a household you don’t get much value by creating a multi-level model accounting for that clustering.

Luise’s mathematical and statistical skillset have seen her collaborate on a range of international projects, with leading academics, publish in high quality journals such as the Lancet Psychiatry and the International Journal of Methods in Psychiatric Research, and national journals such as the Australian & New Zealand Journal of Statistics.

Helping clinicians turn their ideas and research questions into well-designed research projects

Luise’s keen eye for detail and breadth of statistical knowledge makes her perfectly placed to collaborate with ISLHD clinicians who want to make the most of the IHIP platform for research.

In her role at CHRISP Luise will use her statistical knowledge and the scientific literature to help clinicians develop research projects with viable and robust study designs. Luise explains:

There are two types of analysis that we can do... One is longitudinal data analysis, if you have 100 patients and want to look back what happened to them over 15 years it becomes a really rich dataset because you have got lots of variables over time. Or we have talked to people that need data linked and they are doing it in excel. We have powerful software that can do linkage and it can also tell you how high quality the links were...

Luise is interested in connecting with clinicians and is available on email at chrisp@uow.edu.au or phone (02) 4221 3279.
Brendan McAlister

Transforming health data for strategic and operational decision making

Brendan has expertise in using big data for both strategic and operational decision making. In his 22 years’ experience working in the Information Technology field, Brendan has worked for several multinational companies, primarily in an IT support, development and deployment. Brendan then went on to work for ISLHD for 12 years as a Senior Enterprise Report Developer, specialising in Business Intelligence, and the extraction of data from ISLHDs vast data warehouse for managers to use in decision making.

Integrating health data for research

It is this experience in leveraging big data for analytical purposes that places Brendan in good stead to coordinate the data integration activities of the IHIP platform. Outside of importing, storing and reporting on core data, there are many complexities to this work that involves connecting disparate datasets and producing new datasets for clinicians to use in research. Brendan also focuses on engaging with stakeholders to ensure that the data integration process is managed efficiently.

Dr Victoria Westley-Wise, epidemiologist; and professional team member Niki Cirillo make up the other key members of the CHRISP team but were not interviewed at this time.
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