ANNUAL NEPEAN RESEARCH DAY
~ PROGRAM AND ABSTRACTS ~

THURSDAY, 27 OCTOBER 2016

PROUDLY SPONSORED BY:

SYDNEY MEDICAL SCHOOL NEPEAN
LEVEL 2 AUDITORIUM
62 DERBY STREET, KINGSWOOD
9AM TO 3.00PM
Welcome to the 2016 Nepean Research Day. This is an exciting time to be conducting research in the Nepean Blue Mountains Local Health District. This year’s research day aims to focus on the importance of developing a research culture within our institution and to showcase the broad types of research being undertaken in a variety of disciplines. I hope that the research day will promote current research being conducted and encourage more individuals to develop and undertake their own research projects in the future. There is an enormous need for collaboration and networking for many research projects and today would be an excellent time to identify and build links with other researchers. The excitement of discovery and enjoyment obtained from doing research is very addictive and the benefits go far beyond the researcher themselves, it extends to the patient, the local community, and globally around the world. I would like to thank our invited speakers from Western Sydney University who are presenting their interesting translational research on topics very relevant to our community. A special thank you to Nobel Laureate, Professor Barry Marshall who discovered *Helicobacter pylori* (my favourite bug!) which causes stomach ulcers and stomach cancer, for taking the time to talk to us via video-link from Perth. I hope everyone attending has a great time and I look forward to your feedback about the Nepean Research Day.

Dr Guy D. Eslick  
Professor of Cancer Epidemiology and Medical Statistics  
Director of Research, Nepean Blue Mountains Local Health District
KEYNOTE SPEAKERS

Dr Evelyn Smith, Lecturer in Psychology and Head of the Eating Disorders and Obesity Psychology Research Clinic

Dr Evelyn Smith heads the new Eating disorders and Obesity Research Clinic of Western Sydney University, a not-for-profit clinic providing psychological treatment to children, adolescents, and adults with eating disorders or obesity, plus comorbid conditions. She is a lecturer at the School of Social Sciences and Psychology at Western Sydney University and leads the Eating Behaviours Research Program within the Clinical and Health Psychology Research Initiative (CaHPRI). She is currently the Chief Investigator of a randomised controlled trial funded by Ramaciotti Australia to investigate the effectiveness of cognitive remediation therapy for obesity for long-term weight loss, and Chief Investigator of a UWS Women’s Research Fellowship to investigate the efficacy of schema therapy for eating disorders. She is Associate Editor of the journal Clinical Obesity, sister journal of Obesity Reviews.

Dr Marina Kalashnikova, Researcher in Infancy Studies, MARCS BabyLab Academic Leader

BA (Summa Cum Laude) Linguistics, MA Linguistics University of Texas at El Paso, PhD Psychology Lancaster University. Marina joined MARCS in 2013 as a postdoctoral fellow and currently holds the position of Researcher in Infancy Studies and MARCS BabyLab Leader at Western Sydney University. Her work focuses on the projects Seeds of Literacy and HEARing CRC where she investigates perceptual and linguistic development in infants and children who are at risk for developing sensory or cognitive impairments. Her other research interests include early lexical acquisition in monolingual and bilingual infants and the effects of bilingual first language acquisition and early second language learning on the development of linguistic skills, and the advantages that these experiences represent for early socio-cognitive maturation.
In 2005 Barry J. Marshall and J. Robin Warren were awarded the Nobel Prize for Physiology or Medicine in recognition of their 1982 discovery that a bacterium, Helicobacter pylori, causes one of the most common and important diseases of mankind, peptic ulcer disease. Barry Marshall met Robin Warren, a pathologist interested in gastritis, during internal medicine fellowship training at Royal Perth Hospital in 1981. The pair studied the presence of spiral bacteria in association with gastritis. The following year (1982), Helicobacter pylori was cultured for the first time and they developed their hypothesis related to the bacterial cause of peptic ulcer and gastric cancer.

In 1984, while at Fremantle Hospital, Marshall proved that the new germ was harmful in a well-publicised self-administered experiment, in which he drank a culture of H.pylori. Persevering despite widespread skepticism, Marshall also came up with combinations of drugs that killed the H.pylori bacteria and eliminated ulcers permanently.

In addition to its role in ulcers, in 1984 the World Health Organisation recognized H.pylori as the main cause of stomach cancer. Marshall and Warren’s work is acknowledged as the most significant discovery in the history of gastroenterology and is compared to the development of the polio vaccine and the eradication of smallpox.

Affecting 50% of the global population, H.pylori is recognized as the most common chronic infection in the world. “Like a trail of crumbs, the DNA of our Helicobacter pylori can show where we were born and where our ancestors traveled from over the past 60,000 years” says Marshall.

In 1998 Marshall was made a Fellow of the Royal Society. In 2008 he was elected as a Foreign Member of the prestigious US National Academy of Science, an institution that was established in 1863 by President Abraham Lincoln.

Barry was born in Kalgoorlie in 1951 and attended Marist Brothers College in Perth from 1960-68. He completed his undergraduate medical degree at The University of Western Australia in 1974. He is married with four children and four grandchildren and lives in Subiaco, Western Australia.
Acknowledgements

The 2016 Annual Nepean Research Day has been organised by the Academic Department of Surgery at Nepean Hospital.

We would like to thank Maree Yabsley, Administration Officer, Sydney Medical School Nepean for her support in preparing and organizing this event:

In addition, we would like to thank the following for sponsoring the 2016 Annual Nepean Research Day via Sponsorship and Award donations:

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<td>The Charles Perkins Centre (Professor Stephen Simpson)</td>
<td>Douglass Hanly Moir Pathology</td>
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<td>MIPS - Medical Indemnity Protection Society</td>
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<td>NBMLHD Allied Health Primary Community Health</td>
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<td>Nepean Medical Staff Council</td>
<td>OZWAC (Australian Women &amp; Children’s Research Foundation)</td>
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## PROGRAM

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<td>9:00 – 9:05</td>
<td>Opening and Welcome: Kay Hyman, Chief Executive Officer - NBMLHD and Professor Guy Eslick, Director of Research - NBMLHD</td>
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### SESSION 1: CHAIR – A/PROFESSOR STEPHEN FULLER

*Presentation time - 6 minutes, question time - 2 minutes. Total - 8 minutes*

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<td>The prognosis of women diagnosed with breast cancer before, during and after pregnancy: a meta-analysis</td>
<td>Guy Eslick</td>
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<td>9.23 – 9.31</td>
<td>A Smartphone App to assist scalp localization of superficial supratentorial lesions – technical note</td>
<td>Ashraf Dower</td>
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<td>9.32 – 9.40</td>
<td>Providing skin-to-skin contact immediately after a caesarean section</td>
<td>Jeni Stevens</td>
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<td>9.41 – 9.49</td>
<td>Measuring attitudes to child protection: A crucial determinant of reporting behavior.</td>
<td>Rod Hughes</td>
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<td>9.50 – 9.58</td>
<td>Discovery and validation of an influenza-specific host response biomarker in peripheral blood</td>
<td>Fahad Gul</td>
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<td>9.59 – 10.07</td>
<td>Can we identify who might be at risk of death from influenza?</td>
<td>Maryam Shojaei</td>
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<td>10.08 – 10.16</td>
<td>Short chain fatty acids potentiate differentiation of induced human regulatory T cells from naïve fetal T lymphocytes.</td>
<td>Phyllis Hu</td>
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<td>10.26 – 10.34</td>
<td>The oral health status of acute aged care patients on admission and at day seven in two Australian hospitals.</td>
<td>Jenny Gibney</td>
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<td>10.35 – 10.43</td>
<td>Psychological consequences of somatic vaginal birth injuries.</td>
<td>Liz Sinner</td>
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### SESSION 2: CHAIR - PROFESSOR RALPH NANAN

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<td>11.15 – 11.40</td>
<td>Keynote Presentation: The Eating disorders and Obesity Psychology Research Clinic (EDOC) - research and practice.</td>
<td>Dr Evelyn Smith</td>
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<td>11.41 – 12.06</td>
<td><strong>Keynote Presentation</strong>: Early Language Development: Insights from infancy research.</td>
<td>Dr Marina Kalashnikova</td>
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<td>12.07 – 12.15</td>
<td>Consistent licorice ingestion exacerbates hypertension and induces hypokalemia: A systematic review &amp; meta-analysis</td>
<td>Ross Penninkilampi</td>
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<td>12.16 – 12.24</td>
<td>Positron emission Tomography in the diagnosis of colorectal cancer.</td>
<td>Doruk Seyfi</td>
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<td>12.25 – 12.33</td>
<td>Pharmacological agents targeting γsecretase increase risk of cancer and cognitive decline in Alzheimer’s disease patients: A systematic review &amp; meta-analysis.</td>
<td>Ross Penninkilampi</td>
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<td>12.34 – 12.42</td>
<td>A comparison study of the nutrition provision of extremely low birth weight (ELBW) infants in the neonatal intensive care unit setting with international nutrition guidelines</td>
<td>Daniela Gerlach</td>
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<td>12.43 - 12.51</td>
<td>Audit of fluid balance and mortality in sepsis and septic shock</td>
<td>Michael Pittard</td>
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<td>12.52 – 1pm</td>
<td>Improving Hospital in the Home service using a mobile App</td>
<td>Helen Fenech</td>
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<td>1pm – 1.40</td>
<td><strong>Poster Exhibition and Lunch</strong></td>
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**SESSION 3: CHAIR – A/PROF EMILY HIBBERT - ACTING PROFESSOR OF MEDICINE**

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<td>Preconception and antenatal management of primary hypothyroidism by general practitioners</td>
<td>Patrick Gardner</td>
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<td>Association between abdominal ultrasound measurements and anthropometrics for assessment of central (visceral) adiposity measured by MRI</td>
<td>Imad Ben Hmeda</td>
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<td>1.59- 2.07</td>
<td>Results of enhanced gonorrhea surveillance in Western Sydney and Nepean Blue Mountains: Comparative epidemiology</td>
<td>Bradley Forssman</td>
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<td>2.08 – 2.38</td>
<td><strong>Keynote Presentation – Professor Barry Marshall</strong></td>
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<td>2.40 – 2.55</td>
<td>Award of prizes and grants Lucky Door Prize drawn</td>
<td>Professor Guy Eslick</td>
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<td>Professor Guy Eslick</td>
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Prizes

Best Oral Presentation by a Registrar or Resident
Nepean Medical Staff Council

Best Poster Presentation by a Registrar or Resident
Nepean Medical Staff Council

Best Oral Presentation by a Medical Student
Sydney Medical School Nepean

Best Poster Presentation by a Medical Student
Sydney Medical School Nepean

Best Oral or Poster Presentation in the field of Medical Imaging
Medical Imaging - Nepean Hospital

Best Oral or Poster Presentation in the field of Fetal Maternal Medicine
OZWAC – Australian Women & Children’s Research Foundation

Best Oral or Poster Presentation in the field of Allied Health
NBMLHD Allied Health – Primary Community Health

Best Oral or Poster Presentation in Educational Research
Hon. Stuart Ayres MP

Best Oral or Poster Presentation in the field of Nursing & Midwifery
NBMLHD Nursing & Midwifery Services

Best Oral or Poster Presentation on a Charles Perkins Centre Theme
Charles Perkins Centre

Best Oral or Poster Presentation on Community-based Research
Penrith Panthers
ABSTRACTS

Oral Presentations
THE PROGNOSIS OF WOMEN DIAGNOSED WITH BREAST CANCER BEFORE, DURING AND AFTER PREGNANCY: A META-ANALYSIS

Emily K. Hartman, Guy D. Eslick

Objective: Previous meta-analyses have examined the prognosis of women with Pregnancy-associated breast cancer (PABC) as well as pregnancy that follows breast cancer diagnosis. Since then, many additional studies have been performed. We conducted an updated meta-analysis to examine the prognosis for women who become pregnant before, during and after a diagnosis of breast cancer. We also performed analyses on the various subgroups within PABC such as pregnancy and postpartum cases, as well as on time periods postpartum.

Methods: We identified studies that reported on overall (OS) and disease-free survival (DFS) in patients diagnosed with breast cancer during pregnancy or up to 5 years postpartum from four electronic databases. We also identified studies that reported on OS and DFS where pregnancy up to 5 years occurred after a breast cancer diagnosis.

Results: 41 studies met our inclusion criteria (cases = 4 929; controls = 61 041) for pregnancy occurring during or before breast cancer diagnosis. There was an overall increased risk of death amongst patients compared to nonpregnant controls [HR 1.57 95% CI 1.35-1.82]. Sub group analysis indicated poor survival outcomes for those diagnosed either during pregnancy or postpartum (PABC) [HR: 1.46 95% CI 1.17-1.82] as well as those diagnosed during pregnancy alone [HR: 1.47 95% CI 1.04-2.08]. Those diagnosed postpartum had the poorest overall survival [HR:1.79; 95% CI 1.39-2.29]. Similarly, patients with PABC had decreased DFS compared to controls [HR 1.51; 95% CI 1.22-1.88]. Those diagnosed postpartum were the most at risk of disease progression or relapse [HR: 1.86 95% CI 1.17-2.93]. 19 studies met our inclusion criteria (cases =1 829; controls = 21 907) for pregnancy following breast cancer diagnosis. Such women had a significantly reduced risk of death compared to those who did not become pregnant [pHR: 0.63 (95% CI 0.51-0.79. A subgroup analysis to account for the “healthy mother effect” generated similar results [pHR: 0.65 (95% CI 0.52-0.81)].

Conclusion: Pregnancy that occurs before or concurrently with a diagnosis of breast cancer is more likely to result in death and decreased disease-free survival. On the other hand, pregnancy occurring after a breast cancer diagnosis reduces the risk of death.
MANAGEMENT AND OUTCOMES OF HIP FRACTURES COMPARED TO NATIONAL GUIDELINES – THE EXPERIENCE OF A TERTIARY AUSTRALIAN TEACHING HOSPITAL

J. Bellamy, J. Chua, T. Elalingam, Department of Anaesthetics, Nepean Hospital
Email: jchu1782@uni.sydney.edu.au

Introduction: Hip fractures are a significant injury and are associated with substantial morbidity and mortality. The Australian Agency for Clinical Innovation (ACI) published the Minimum Standards for Management of Hip Fracture (MSMHF) in 2014 to assist hospitals in achieving better outcomes for such patients.

Aims: The aim of this study is firstly, to assess the performance of a large Australian tertiary hospital with respect to the ACI MSMHF standards, and secondly, to determine morbidity and mortality outcomes of patients presenting with hip fractures, with analysis of factors that predict such outcomes.

Methods: Following ethics approval, we conducted a retrospective observational study of 270 consecutive adult patients presenting with hip fractures to Nepean Hospital between 2012 and 2013. The main outcome measures were ACI MSMHF quality measures, major complications, and 30-day and one-year mortality rates.

Results: The majority of patients were older than 80 years, female, and presented with multiple comorbidities. 95.4% of patients aged 75 and above received Orthogeriatric clinical management post operatively. 70.7% received regional nerve blocks and 88.1% underwent general anaesthesia. 74.0% underwent surgery under 48 hours from presentation, with 92.2% of surgeries performed within working hours. 8.1% of planned surgeries were rescheduled. The most common postoperative complication was delirium (12.2%), followed by acute renal failure (10.0%), urinary tract infections (8.9%), congestive cardiac failure (5.2%), and pneumonia (4.8%). Mortality rates were 5.2% at 30 days and 24.1% at one year. Factors predictive of 30-day mortality were orthogeris involvement pre-operatively (OR 4.9, 95% CI 1.62 to 14.63), ASA grade (OR 3.2, 95% CI 1.42 to 7.02), recovery stay greater than 2 hours (OR 4.7, 95% CI 1.55 to 14.01), low urine output (OR 8.2, 95% CI 2.45 to 27.34), pneumonia (OR 6.6, 95% CI 1.59 to 27.43), and MET call (OR 6.3, 95% CI 1.77 to 22.54). Factors predictive of 1-year mortality were were ASA grade (OR 2.6, 95% CI 1.67 to 4.14), oliguria (OR 3.2, 95% CI 1.30 to 7.97), pneumonia (OR 8.1, 95% CI 2.40 to 27.30), and delirium (OR 2.7, 95% CI 1.26 to 5.75).

Conclusions: This is the first study we are aware of that quantitatively assesses ACI MSMHF standards together with in-hospital complications and out-of-hospital mortality. To our knowledge, it is also the largest observational study to look at peri-operative outcomes in hip fracture patients. The data collected from the study will enable us to develop and improve our approach to patients admitted with hip fractures, and exercise greater caution with patients having factors that predict mortality.
A SMARTPHONE APP TO ASSIST SCALP LOCALIZATION OF SUPERFICIAL SUPRATENTORIAL LESIONS - TECHNICAL NOTE

Ashraf Dower, Behzad Eftekhar
Department of Neurosurgery, Nepean Hospital, University of Sydney, Sydney, Australia

Background
Neuronavigation is an established technology in neurosurgery. In parts of the world and certain circumstances in which neuronavigation is not easily available or affordable, alternative techniques may be considered.
Objective - An app to assist scalp localization of superficial supratentorial lesions has been introduced, and its accuracy has been compared with established neuronavigation systems.

Methods
Sina is a simple smartphone app that overlaps the transparent patients' computed tomography/magnetic resonance images on the background camera. How to use Sina intraoperatively is described. The app was used for scalp localization of the center of the lesions in 11 patients with supratentorial pathologies <3 cm in longest diameter and <2 cm from the cortex. After localization of the lesion using Sina, the center of the lesion was marked on the scalp using standard neuronavigation systems and the deviations were measured.

Results
Implementation of Sina for intraoperative scalp localization is simple and practical. The center of the lesions localized by Sina was 10.2 ± 2 mm different from localization done by standard neuronavigation systems.

Conclusion
When neuronavigation is not easily available or affordable, Sina can be helpful for scalp localization and preoperative planning of the incision for selected supratentorial pathologies.
Providing Skin-to-Skin Contact Immediately After a Caesarean Section

Jeni Stevens, Professor Hannah Dahlen, Professor Virginia Schmied, Dr Elaine Burns. Western Sydney University. Jennifer.Stevens1@health.nsw.gov.au

Aim:
The aim of this presentation is to reveal the facilitators of implementing skin-to-skin contact in the operating theatre and recovery following a caesarean section. Skin-to-skin contact (SSC) is recommended immediately after a caesarean section if the mother is alert and responsive (World Health Organization & UNICEF, 2009) and is recommended to continue for at least one hour or until after the first breastfeed (UNICEF, 2011).

Method:
Observational ethnographic methods, including video-recording, field notes and interviews, were used to conduct research that aimed to study SSC after caesarean sections. Data was collected for up to two hours after caesarean sections at one site for 21 mothers and their newborns. Interviews were conducted with the same women at six weeks postpartum, to discover their satisfaction with their mother-infant contact at birth. Further interviews were conducted with hospital staff members with the aim to determine their opinion and knowledge about SSC.

Results:
SSC in the operating theatre and recovery provides unique challenges. Staff members can determine ways to overcome barriers making SSC less complicated and safe in the medicalised environment. Recommendations include increasing staff and parent knowledge, writing and implementing a policy, addressing staffing issues and time constraints, improving communication and adjusting the use of equipment.

Conclusion:
Midwifery managers and educators can facilitate SSC by contributing to the preparation of a policy for the operating theatre and recovery and by promoting and educating staff members about the policy. It is beneficial if staff members are proactive in identifying barriers whilst providing SSC in the operating theatre and recovery, and that they discuss ways to overcome these barriers with managers and educators.
MEASURING ATTITUDES TO CHILD PROTECTION: A CRUCIAL DETERMINANT OF REPORTING BEHAVIOUR.

Authors: Daniela Francavilla, Rod Hughes, Andrew Martin, Amanda Thomas
Presenter's Contact Details: Ph: (02) 4751-0100. Email rod.hughes@health.nsw.gov.au
Department: Primary Care and Community Health Services

Aims
Attitudes to child protection are thought to substantially influence the discretion clinicians sometimes exercise over decisions to make a report, notwithstanding the legislative requirements that pertain in NSW. This study sought to develop a valid and reliable measure of attitudes to child protection for use in evaluating the effectiveness of child protection training.

Methods
Trainers developed an initial pool of 26 items, scrutinised for face and content validity. Wording was carefully checked to minimise ambiguity and response bias, and to ensure compatibility with a Likert format. The draft instrument was subject to quantitative analysis using data from a pilot sample of 71 clinical staff who completed face-to-face child protection training. Individual items were assessed for their frequency of endorsement and correlation with total scores. Items which were either too easy or too difficult or which correlated poorly with total scores were deleted. Principal Component Analyses and reliability studies were also undertaken. The final 18 item scale demonstrated good Internal Consistency [Cronbach’s Alpha 0.81] and test-retest reliability [r=0.95].

Results
Two small empirical validation studies were subsequently conducted. Firstly, the scale was administered pre-post to a sample of 54 clinical staff undergoing face-to-face child protection training. The effect size [Cohen’s d = 1.26] was suggestive of a strong effect for the training. In the second study, before and after measures were compared for two small groups [n=8], one of which received training face-to-face and other completed the training on-line. Attitudes improved significantly for the face-to-face group. They also improved for the on-line group, but the latter change was not quite statistically significant. The effect size favouring face-to-face training was moderate [Cohen’s d = 0.39].

Discussion/Conclusion
These results were sufficiently encouraging to warrant commencement of a randomised control study to compare the efficacy of the two methods of training.
DISCOVERY AND VALIDATION OF AN INFLUENZA-SPECIFIC HOST RESPONSE BIOMARKER IN PERIPHERAL BLOOD

Benjamin Tang, Maryam Shojaei, Fahad Gul, Marek Nalos, Stephen Huang, Anthony McLean
Department of Intensive Care Medicine, Nepean Hospital, Sydney, Australia

Background
Gene-expression signatures could improve diagnosis of respiratory virus infection by accurately identifying the immune response underpinning the infection. However, published gene-expression signatures require the measurement of dozens to hundreds of genes, thereby making it difficult to implement them in clinical practice.

Aim
To search for a single-gene biomarker, IFI27, which could achieve a high diagnostic accuracy equivalent to those obtained by multi-gene signatures.

Method
We identified an interferon-derived, IFI27, as a highly influenza specific host response biomarker in the peripheral blood of infected patients. This finding was validated in seven independent cohorts (n=632). In addition, in a mouse model of influenza infection, we confirmed that IFI27 was upregulated by influenza infection in three models of disease severity (mild, moderate and severe). Furthermore, using in vitro experiments, we found that IFI27 upregulation was mediated by the TLR7 pathway in plasmacytoid dendritic cells, antigen-presenting cells that responded to virus rather than bacteria. To further demonstrate clinical utility, we evaluated IFI27 gene expression in a large prospective cohort of patients (n=439) who presented with undifferentiated respiratory illness (aetiology including viral, bacterial, mixed-infection and non-infectious conditions). This validation confirmed that IFI27 could achieve a high diagnostic accuracy equivalent to those obtained by multi-gene signatures.

Conclusion
We discovered IFI27 as a single-gene biomarker for identifying influenza infection with a high diagnostic accuracy equivalent to multi-gene biomarkers. This finding is supported by in vitro and mouse experiments and also evidence of its clinical utility in eight independent cohorts consisting of 1071 subjects.
CAN WE IDENTIFY WHO MIGHT BE AT RISK OF DEATH FROM INFLUENZA?  
IDENTIFICATION OF A BLOOD CANDIDATE BIOMARKER

Shojaei M.1,2, Wang Y. 1,2 McLean A.2, Booth D.1 and Tang B.1,2
1Centre for Immunology and Allergy Research, Westmead Institute for Medical Research, Westmead NSW 2145, Australia
2Nepean Genomic Research Group, Department of Intensive Care Medicine, Nepean Hospital, Penrith NSW 2751, Australia
Email: maryam.shojaei@sydney.edu.au

Aim
Influenza virus continues to be a pathogen of significant interest, as the WHO estimates that annual influenza epidemics cause approximately 5 million cases of serious illness and over 250,000 deaths per year. Currently, there is no reliable way to identify and predict from those who might have been exposed to a flu virus who are at high risk of developing complications from the infection. Here, we measured gene expression level of a marker associated with severe influenza infection. Findings of this project may lead to the development of a biomarker to aid the management of patients with severe influenza infection.

Method
Genome-wide microarray analysis was used to screen for host response biomarker in peripheral blood of confirmed influenza infected subjects, which was later validated in independent cohorts (n=521) by Real-time PCR. To assess which blood cell subsets produce the biomarker, IFI27, we investigated its production in different blood immune cell subsets derived from healthy controls, and infected in vitro with influenza virus.

Result
IFI27 was identified in patients infected with all common strains of influenza virus. In vitro data showed that IFI27 was produced by pDCs (predominantly) and also NK cells. Further in vitro and in vivo validation confirmed that IFI27 expression was unaffected by non-viral conditions such as bacterial sepsis or systemic inflammation.

Conclusion
This work establishes a link between human blood cell subsets, IFI27, and viral infection, and suggests a potential role of IFI27 as an immune biomarker to improve the diagnosis of severe respiratory tract infection. Here, we showed that IFI27 could be act as a distinct biomarker for detection of severe influenza infection. There is a need for further research to help predict who will become sick and possibly die, versus those who will not. Measuring the IFI27 gene-expression level may assist risk stratification of infected patients in future influenza pandemics.
SHORT CHAIN FATTY ACIDS POTENTIATE DIFFERENTIATION OF INDUCED HUMAN REGULATORY T CELLS FROM NAÏVE FETAL T LYMPHOCYTES

Mingjing Hu, Brigitte Nanan, Ralph Nanan
Department of Pediatrics, Nepean Clinical School (mihu9213@uni.sydney.edu.au)

Background & Aim
Regulatory T cells (Tregs) suppress the activation, proliferation and effector functions of other immune cells. This unique ability to control immune responses makes Tregs indispensable for the maintenance of immunological tolerance and the prevention of exaggerated immune responses to various antigens, including the semi-allogeneic fetuses. Dysregulated Treg responses have been linked to a number of diseases, including infections, autoimmune and allergic diseases. Therefore, developing immunotherapies for these diseases might involve induction of Tregs. There is good evidence showing the metabolites of gut commensal microbiome, specifically short chain fatty acids (SCFAs), can potently induce Tregs in the colon as well as systemically. So far these effects have been conclusively demonstrated in mouse models. However, our previous results in human were inconclusive when analyzing adult Treg differentiation. In this study, we looked at the Treg induction with SCFA in naïve fetal T cells derived from cord blood.

Method
In total 12 pregnant women were recruited from July 2015 to September 2016. Cord blood samples were collected and mononuclear cells were isolated. Sorted naïve non-Treg cells (CD4+CD45RO-CD25-CD127hi) were cultured in vitro for 5 days with or without SCFAs, followed by phenotypic and functional analyses of induced Tregs.

Results
Addition of butyrate and propionate, but not acetate, potentiated the induction of Tregs generated from naïve CD4+ lymphocytes of cord blood in vitro. Tregs induced via butyrate and propionate had significantly increased suppressive capacity.

Conclusion
SCFAs can induce functional human Tregs from naïve fetal T cells. These findings mirror the previous reports in the murine system. Most importantly, these results suggest that maternally derived SCFAs and hence maternal diet may have a profound influence on the development of immune system.
THE NEPEAN WIKI: A NOVEL ELECTRONIC RESOURCE FOR CLINICAL ORIENTATION MADE BY JMOS FOR JMOS.

Dr Eric Wenlong Li, Dr Linda Chan, Dr Kedar Madan, Dr Veena Sapre
JMO Unit, Nepean and Blue Mountains Local Health District

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**Aim:** Clinical orientation for JMOs is important, however the ideal strategy for providing orientation is not known. The Nepean Wiki is a novel tool aimed to provide a standardised, up-to-date and readily available clinical orientation resource for JMOs. This study describes the development and implementation process for The Nepean Wiki and reports usage statistics and user satisfaction since implementation.

**Method:** The resource was developed using a ‘wiki’ style online platform, with contribution initially from over 30 Junior Medical Officers (JMOs) with further input from senior doctors as well as allied health staff. Implementation occurred in January 2016. Preliminary user satisfaction and usage statistics were reviewed in April and September 2016 respectively.

**Result:** The website received a total of 7301 views in January, with sustained use through to September 2016, with an average of 109 views daily since implementation. In the preliminary survey (n=15), 100% of respondents agreed or strongly agreed The Nepean Wiki is easy to use, has relevant information, and helped them orientate to their new rotation. 73% of respondents believed it made them more efficient and productive. 87% reported they will continue using the tool, and 80% reported they will help update the contents. Main barrier identified preventing use was failure to recall website address and login details.

**Discussion:** A Wiki platform is advantageous in clinical orientation as it is readily accessible by users anywhere and at any time, thus bypassing the rostering and time limitations faced by JMOs during their work duties. The ease of user interaction with the resource ensures it to be up-to-date and relevant. An effective editorial team is essential in ensuring contents are standardised, drive user input and ensure contents meet editorial policies.

**Conclusion:** The Nepean Wiki was successfully adopted as an innovative resource to facilitate clinical orientation for JMOs at Nepean Hospital.
THE ORAL HEALTH STATUS OF ACUTE AGED CARE PATIENTS ON ADMISSION AND AT DAY SEVEN IN TWO AUSTRALIAN HOSPITALS.

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Background
In the acute hospital setting older patients are likely to be at risk of poor oral hygiene as a result of their acute medical illnesses, delirium and pre-existing medical problems (Browner et al, 2008 & Chalmers, 1996).

If left untreated, poor oral hygiene could increase the risk of aspiration of bacteria from the oral cavity into the lungs and potentially increases the risk of hospital acquired pneumonia (Robertson et al 2013, Yoon et al, 2007 & Langmore et al, 1998).

Previous studies have described the oral health of older inpatients in the acute hospital setting at admission or within a few days of their admission (Ni Chroinin et al, 2016, Danckert et al 2015 & Katsoulis et al, 2012). However, there has not been any study that describe the changes that occur in oral health during patients’ in-hospital stay.

Aim
To determine the oral health status of older patients in acute care wards at admission and after seven days.

Methods
A prospective descriptive study was conducted in two acute tertiary referral hospitals in New South Wales, Australia. Oral health was assessed on admission (within 24 hours) and day 7 using the Oral Health Assessment Tool.

Results
A total of 575 subjects were admitted under the Geriatric teams at the two hospitals. Four hundred and thirty-five (76%) subjects had oral cleanliness (debris) scores in the ‘not healthy’ range with food particles, tartar or plaque evident in at least one area to most areas of the mouth, teeth or dentures. At day seven 206 were reassessed. One hundred and forty-nine subjects (73%) were in the ‘not healthy’ range and of these 127 (62%) had the same score as on admission.

Conclusion
Poor oral health is common in older people admitted to hospital acute care wards and does not improve over a seven-day period.
PSYCHOLOGICAL CONSEQUENCES OF SOMATIC VAGINAL BIRTH INJURIES

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Aims: This qualitative interview study aims to examine women’s experiences of somatic pelvic floor injury and psychological trauma after vaginal birth.

Methods: Women with major pelvic floor injuries were identified from a population of 850 women examined in 2 perinatal imaging studies. Levator ani avulsion (LAM) and obstetric anal sphincter injuries (OASI) were diagnosed by 3D/4D translabial ultrasound 3-6 months after the birth of a first child at term, following an uncomplicated singleton pregnancy. Thematic, purposeful analysis was undertaken. Approval was obtained from the local Human Research Ethics Committee.

Results: 10 themes were identified: 1) Inadequate antenatal education (72.5%); 2) No information on morbidities (90%); 3) Conflicting advice (87.5%); 4) Traumatized partners (52.5%); 5) Long term dyspareunia (67.5%); 6) Nil postnatal assessment (90%); 7) Multiple symptoms of pelvic floor dysfunction (87.5%) 8) ‘Putting up’ with injuries (90%); 9) Symptoms of PTSD (67.5%); 10) Dismissive staff (65%).

Discussion: LAM avulsion and OASI morbidities are more common than generally assumed. Research suggests physical vaginal birth injury is a marker for psychological trauma. Childbirth is universally seen as a predictable and positive life experience. Potential lifelong morbidities affecting 20-30% of primiparae are rarely understood as compromising postnatal psychological health up to and including Posttraumatic stress disorder (PTSD). Anxiety, embarrassment and isolation are consequences of pelvic floor dysfunction and require investigation. Injuries are commonly dismissed as ‘trivial' women's issues.

Conclusions: Mothers suffering from fecal and urinary incontinence, pelvic organ prolapse and sexual dysfunction have reduced quality of life after childbirth- related trauma. They may also endure psychological consequences with symptoms of PTSD. Women face substantial barriers in accessing services that identify and treat somatic and psychological dysfunction. Unrecognized mental health issues reflect a serious public health concern and can lead to significant adverse consequences for women and their families.
Background: There have been numerous case reports of severe adverse events including deaths following chronic licorice ingestion. The aim of the present study was to evaluate the effect of chronic ingestion of licorice on blood pressure, plasma potassium, plasma renin activity, and plasma aldosterone.

Methods: A search of MEDLINE, PubMed, EMBASE, CENTRAL, DARE, CINAHL, and Current Contents Connect was performed from inception through to 29 Jan 2016. Trials that included a treatment group ingesting a product containing at least 100mg of glycyrrhizic acid daily were selected. Pooled mean changes from baseline with 95% confidence intervals were calculated for diastolic blood pressure, systolic blood pressure, plasma potassium, plasma renin activity, and plasma aldosterone using a random effects model. An assessment of dose response was also undertaken.

Results: 18 studies (n=337) were included in the meta-analysis. There was a statistically significant increase in mean systolic blood pressure (5.45mmHg, 95% CI 3.51-7.39) and diastolic blood pressure (3.19mmHg, 95% CI 0.10-6.29) after chronic ingestion of a product containing glycyrrhizic acid. Plasma potassium (-0.33mmol/l, 95% CI -0.42 to 0.23), plasma renin activity (-0.82ng/ml/hr, 95% CI -1.27 to -0.37), and plasma aldosterone (-173.24pmol/l, 95% CI -231.65 to -114.83) were all significantly decreased. A significant correlation was noted between daily dose of glycyrrhizic acid and systolic blood pressure (r²=0.55) and diastolic blood pressure (r²=0.65), but not for the other outcome measures.

Conclusions and Relevance: Chronic licorice ingestion is associated with an increase in blood pressure and a drop in plasma potassium, even at modest doses. This is of particular relevance for individuals with existing cardiovascular disease.
Aim/s: To assess the diagnostic efficacy of PET/CT in the detection of colorectal cancer compared to colonoscopy.

Methods: Ethics approval was obtained prior to data collection. Patients who have had a colonoscopy and PET/CT within 6 months of one another prior to any intervention between the period of August 2014 and August 2015 were selected with the use of Provation and Powerchart software.

The results of each PET/CT and Colonoscopy were tabulated and correlated with histopathology (where biopsies were taken) and the data assessed to determine sensitivity, specificity and an Odds Ratio.

Results: 261 patients were identified in the NBMLHD who underwent both PET/CT and Colonoscopy within 6 months of each other in the assessed time frame. Of these, only 55 were eligible to be included in the study.

The dataset was adjusted for age and gender. Patients who had a colorectal PET/CT scan are ten times more likely to have a positive PET/CT (OR: 10.26, 95% CI: 1.16-96.69; p=0.04) and five times more likely to have a positive colonoscopy (OR: 5.05, 95% CI: 1.09-23.44; p=0.04).

The sensitivity and specificity of colonoscopy in the detection of histologically positive malignancy is 89% (95% CI 66.86-98.70%) and 46.15% (95% CI 19.22-74.87%) respectively. This is contrast to PET/CT, which has a sensitivity and specificity in the detection of histologically positive malignancy of 95.83% (95% CI 78.88-99.89%) and 50% (95% CI 15.70-84.30%).

Discussion: The established role of PET/CT is for assessment of patients who have undergone intervention for colorectal malignancy. PET/CT may be used not only to assess patients undergoing intervention, but as a diagnostic tool in the detection of occult colorectal malignancies.

Conclusion: The results demonstrate that PET/CT is a sensitive and specific diagnostic tool in the detection of colorectal malignancies. It is a non-invasive means of investigation and its use is of particular importance in patients who have high colonoscopic perforation risk.
PHARMACOLOGICAL AGENTS TARGETING $\gamma$-SECRETASE INCREASE RISK OF CANCER AND COGNITIVE DECLINE IN ALZHEIMER’S DISEASE PATIENTS: A SYSTEMATIC REVIEW AND META-ANALYSIS

Ross Penninkilampi, Holly M. Brothers, Guy D. Eslick

Background: Drugs targeting $\gamma$-secretase in Alzheimer’s disease (AD), have failed to demonstrate efficacy in clinical trials. To perform a meta-analysis of randomised controlled trials (RCTs) to evaluate the efficacy and safety of drugs targeting $\gamma$-secretase in AD.

Methods: Ten trials were identified involving 5227 patients using electronic databases and manual review of reference lists. RCTs of at least two weeks duration involving a drug targeting $\gamma$-secretase were eligible. The main outcomes examined were adverse events and cognitive measures (ADAS-cog, MMSE, ADCS-ADL and CDR-sb). A sub-group analysis was performed, excluding the $\gamma$-secretase modulator tarenflurbil, to evaluate the safety and efficacy of $\gamma$-secretase inhibitors only.

Findings: There was an increased risk of adverse events (Odds Ratio (OR) 1·38, 95% CI 1·09-1·73; p=0·01), serious adverse events (OR 1·50, 95% CI 1·22-1·84; p<0·001), and skin cancers (OR 4·77, 95% CI 2·83-8·06; p<0·001). There was significantly increased risk of infections (OR 1·36, 95% CI 1·13-1·63; p<0·001) in the subgroup analysis excluding tarenflurbil. Pooled results also revealed a worsening in ADAS-cog (difference in means 1·33, 95% CI 0·58-2·08; p<0·001) and MMSE (difference in means -0·66, 95% CI -0·96 to 0·35; p<0·001), but not ADCS-ADL or CDR-sb.

Conclusion: The use of $\gamma$-secretase inhibitors is associated with significantly increased risk of serious adverse events including skin cancers, and worsening in cognitive indicators. This evidence indicates that $\gamma$-secretase may not be an appropriate target for clinical treatment of AD.
A COMPARISON STUDY OF THE NUTRITION PROVISION OF EXTREMELY LOW BIRTH WEIGHT (ELBW) INFANTS IN THE NEONATAL INTENSIVE CARE UNIT (NICU) SETTING WITH INTERNATIONAL NUTRITION GUIDELINES

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Aims:
This study aimed to benchmark the nutritional provision to ELBW infants prior to dietetic involvement within the NICU at Nepean Hospital. Comparison to International Nutrition Guidelines were made.

Methods:
A detailed retrospective review was conducted to examine the nutrition provision and growth of all ELBW babies (<1000g) born over an 18-month period (January 2013-June 2014). Neonates were identified using a neonatal database and medical records were used to extract data for analysis.

Results:
36 babies met the study criteria and had records available for examination. Mean gestational age was 26.4 weeks with a mean birth weight of 715g. Although recommended targets to initiate parenteral nutrition (5.49±0.38 hours), parenteral lipids (33.28±1.55 hours) and enteral feeds (49.16±1.38 hours) were met; it took a mean of 20.31±7.15 days to reach full enteral feeds. There was a significant deficit between mean energy the babies’ received over the 4 weeks compared to the Tsang Guidelines (100kcal/day vs 130kcal/kg/day, p<0.0001). On average, babies never reached their protein goal for weeks 1 to 4 (2.95g/kg/day vs ≥3.5g/kg/day, p<0.0001). Babies weight fell from an initial mean Z score of -0.50 at birth to -1.39 at week 4 (p<0.0001). Mean weight gain was approximately 9.6g/kg/day over the 4 weeks versus the recommended 15g/kg/day (p <0.0001).

Conclusions:
Despite initiation of nutritional support within recommended time frames, ELBW babies at the Nepean NICU did not achieve key energy and protein targets when compared with recommended guidelines. This may have negative consequences for their growth and long term health outcomes. It is proposed that a dedicated Neonatal Dietetic service and the implementation of nutrition protocols are important if important nutrition targets are to be achieved in future.
AUDIT OF FLUID BALANCE AND MORTALITY IN SEPSIS AND SEPTIC SHOCK

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Aim
To examine the correlation between positive fluid balance and outcomes (primary: hospital mortality. Secondary: ICU mortality and length of stay, duration of ventilation, need for renal replacement therapy) in patients with sepsis and septic shock.

Methods
Retrospective audit of patient records from August 2012 to May 2015 of patients admitted to intensive care with sepsis. All patients with septic shock were included, in accordance with the most recent definition (Sepsis 3). Exclusion criteria included length of stay <12 hours, duration of vasopressors <6 hours, age <16 and no antibiotics charted. Fluid input and output was collected for first 7 days of admission. Demographic and biochemical data was collected at time of admission.

Results
A total of 286 patients [45% female] with septic shock were included, with an overall hospital mortality of 22%. 69% of patients were mechanically ventilated, and 21.7% required renal replacement therapy. Mean sofa score was 10.4. After adjustment for daily changes, daily fluid balance was higher in hospital non-survivors than survivors [difference = 494 (100, 1613) ml, p = 0.026].

Conclusion
In line with other recently published data, we found a correlation between positive fluid balance and worsened hospital mortality in critically ill patients with sepsis and septic shock.
The Nepean Outreach Service (NOS) includes a large Hospital in the Home (HITH) program catering to a population of nearly 350,000 over about 9000 sq Km in Western Sydney. The service includes antibiotic therapy, wound care and anticoagulation service largely for patients sent home from hospital wards and emergency department. Nurses’ visits aim at administering treatment as well as documentation of progress. Assessments are carried out by different nurses over different visits which has potential implications for continuity of care.

**Aim:** To assess utility of a mobile App for recording patient progress and remote medical reviews through videoconferencing.

**Method:** A mobile App was developed to replace conventional data entry onto paper records and to enable remote medical reviews. Group interviews were conducted between the University of Sydney information and technology (IT) department, NOS and Infectious Diseases (ID) doctors from Nepean Hospital to discuss requirements for the App. The App was then field tested over a period of two months and implemented as a standardised form of documentation and medical review.

**Result:** The mobile nursing App is a software which is loaded onto iPads and a PC that can capture, analyse and share health information. The App had two functions. Patient note function enables recording and review of patient progress notes electronically and the camera function provided an objective measurement tool for cutaneous drug reactions and access device etc. There is also an interactive drawing and photographic function to record wound progress. If a patient is unable to present to the NOS clinic for review due to geographic or social barriers, a nurse can facilitate a videoconference between doctor and patient using the tele-health App. The use of the App has streamlined record keeping, accessibility to hospital records and enabled troubleshooting for minor medical issues without the patient having to return to hospital.

**Conclusion:** The mobile App is an effective tool in delivering continuing health care to patients. It has enabled efficient record keeping, videoconferencing and remote reviews, saving patients time and money to travel to hospital for routing reviews. This has resulted in improved efficiencies and significant savings of patients’ time.
PRECONCEPTION AND ANTENATAL MANAGEMENT OF PRIMARY HYPOTHYROIDISM BY GENERAL PRACTITIONERS

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Aims
1. To determine baseline self-reported practice of general practitioners (GPs) in the Nepean Blue Mountains Local Health District (NBMLHD) in managing maternal hypothyroidism (MH).

2. To determine changes in self-reported management practice of MH by GPs after they receive a brief educational resource (ER) on guideline-based management of MH.

Methods: Baseline survey questionnaires with clinical scenarios on management of MH were mailed to GPs in the NBMLHD. Based on survey results and management guidelines a brief two-page ER on management of MH was developed and mailed to all GPs, who evaluated it. During October 2016 GPs will be resurveyed using a repeat of the baseline survey and results analyzed and compared.

Results (Preliminary): 304 surveys were mailed out with 78 GP responses (26%). 65 surveys (21%) were entirely completed. In a woman with autoimmune thyroid disease, 71% of GPs aimed for TSH within recommended range prior to pregnancy. Only 25% of GPs would appropriately increase thyroxine dose on confirmation of pregnancy. 67% would appropriately check TFTS 4-6 weekly during pregnancy. 92% of GPs would target thyroxine treatment to a TSH within either trimester specific lab ranges or pregnancy specific trimester ranges. Only 12% of GPs believed that GPs are the doctors primarily responsible for management of hypothyroidism in pregnancy.

Discussion: The majority of GPs do not see themselves as being responsible for the management of MH. However, they are usually the first medical practitioner a woman sees on confirmation of pregnancy and for pre-pregnancy counselling. Although GPs were familiar with the TSH targets for treatment in pregnancy, only one quarter would recommend an appropriate increase in thyroxine dose on confirmation of pregnancy in hypothyroid women.

Conclusion: Facilitation of improved GP knowledge of management of MH in women who are contemplating pregnancy or pregnant is needed. It remains to be determined whether a brief ER can improve self-reported management of MH by GPs.
ASSOCIATION BETWEEN ABDOMINAL ULTRASOUND MEASUREMENTS AND ANTHROPOMETRICS FOR ASSESSMENT OF CENTRAL (VISCERAL) ADIPOSITY MEASURED BY MRI

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Aim: Obesity is widely recognised as a serious public health concern. The prevalence of obesity-related cardiovascular diseases has dramatically increased representing a major health burden for developed countries. The risk of obesity-related diseases is strongly associated with central (visceral) adiposity, whereas peripheral adiposity is deemed to be protective. Distribution of central versus peripheral obesity is difficult to assess as standard measures such as the hip-waist ratio and body mass index (BMI) are unreliable. Our aim is to develop a screening tool using simple ultrasound measurements of abdominal subcutaneous thickness (SFT) combined with anthropometric measurements using a regression model to estimate central adiposity.

Methodology: Healthy males and females were recruited at Nepean Hospital. Standard anthropometric measurements including weight, height and BMI were performed. Abdominal subcutaneous fat thickness (SFT) and its component superficial adipose tissue (SSAT), deep adipose tissue (DSAT) and their tissue elasticity measurements were measured using ultrasonography. Regional adiposity distribution was assessed using Magnetic Resonance Imaging (MRI).

Results: A correlation was noted between ultrasound SFT (cm), DSAT (Cm) and SSAT (cm) thickness and MRI SFTm (Cm), SSATm (Cm) and DSATm (Cm) thickness measurements (r =0.9, p-value <0.0001), (r = 0.8, p-value <0.0001) and (r = 0.6, p-value <0.0001) respectively in n=100 subjects. There was a strong positive correlation between weight (Kg) and visceral adipose tissue (VAT) volume (L) (r = 0.70, p-value < 0.0001) compared to BMI and abdominal SFT (Cm). Abdominal SFT, elastography, weight, age and gender were significant predictors for VAT (r=0.77, p-value <0.0001) in the adjusted regression model.

Discussion: This study demonstrated simple cheaper ultrasound measurements of fat correlate well with MRI measures. The combined model of ultrasound (SFT and elastography) with anthropometrics can potentially be utilised for total VAT prediction which is important in the assessment of cardiovascular diseases.
RESULTS OF ENHANCED GONORRHOEA SURVEILLANCE IN WESTERN SYDNEY AND NEPEAN BLUE MOUNTAINS: COMPARATIVE EPIDEMIOLOGY

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Introduction
Gonorrhoea presents a growing public health challenge due to increasing incidence. The characteristics and behaviours of cases however are poorly described. Localised enhanced surveillance can be used to better understand case behaviour at the district level to inform health service delivery, management, and health promotion activities.

Methods
Referring doctors and health professionals of laboratory confirmed cases of gonorrhoea in Western Sydney and Nepean Blue Mountains Local Health Districts were sent an enhanced surveillance form between 1 August 2013 and 31 March 2016.

Results
Of the 1836 forms sent, 1410 (76.8%) returned enhanced surveillance forms. The majority (79.8%) of cases resided in Western Sydney. 73.3% of all notifications were male (n=1438). Of these, 32.3% identified as men who have sex with men (MSM). MSM most commonly presented at sexual health clinics (77.8%) for asymptomatic screening (48.3%). 35.8% (n=478) of males identified as heterosexual and 34.4% (n=495) had no reported status. Females accounted for 21.4% (n=393) of all notifications. Females were more likely to present for contact tracing (21.3%) or screening (35.4%) compared to heterosexual males (3.4% and 5.1% respectively), however most presented due to symptoms (43.3%). Furthermore, cases aged 19 and under were more likely to be female. Heterosexual males most commonly presented to a GP (84.8%) with symptoms (91.5%). Both MSM (81.2%) and heterosexual males (79.7%) reported casual partners as the most likely source of infection compared to females, who more commonly reported regular partners (57.4%).

Conclusion
Our report has identified varying characteristics and testing behaviours of notified gonorrhoea cases between MSM, heterosexual males and females within the Western Sydney and Nepean Blue Mountains Local Health Districts. Our report will assist in targeting health promotion messaging and service delivery towards these local at risk groups accordingly.
ABSTRACTS

Poster Presentations
CMRF-56+ BLOOD DENDRITIC CELLS LOADED WITH mRNA INDUCE EFFECTIVE ANTIGEN-SPECIFIC CYTOTOXIC T LYMPHOCYTE RESPONSES


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NB: This study was conducted by Dendritic Cell Research at the ANZAC Research Institute in completion of my Honours degree in Cell Pathology.

Aim: To isolate CMRF-56+ blood dendritic cell (BDC) from healthy venesections, mature and prime them with anti-prostate cancer in vitro transcribed (IVT) mRNA to elicit antigen-specific autologous cytotoxic T lymphocyte (CTL) responses.

Methods: Blood dendritic cells (BDCs) were isolated via a single-step CMRF-56+ magnetic immunoselection of overnight-cultured peripheral blood mononuclear cells. CMRF-56+ BDCs were activated with GM-CSF and transfected with IVT-mRNA coding for Wilms’ tumour antigen 1 (WT-1 mRNA) by electroporation. Maturation and transfection of BDCs was confirmed by immunophenotyping. Mature WT-1-presenting CMRF-56+ BDCs were co-cultured with CMRF-56+ T cells for seven days to develop anti-WT-1 CTLs. CTL function was assessed by WT-1126-134 dextramer-positive clonal expansion, intracellular interferon γ (IFN-γ) production and CD107a expression. Additionally, preliminary assessments of the synergy with anti-PD-1 (Nivolumab; BMS-936558) were conducted.

Results: CMRF-56+ BDCs were enriched from PBMCs by a factor of 29.2 (1.03% to 30.2%), along with monocytes and B lymphocytes. The BDC population isolated was heterogeneous, containing mostly CD1c+ and CD141+ myeloid BDCs, and CD16+ myeloid and plasmacytoid BDCs to a lesser extent. Anti-WT-1 expanded CTLs showed increased CD107a expression, yet seemingly unchanged WT-1126-134 dextramer-positive clones and intracellular IFN-γ production. Additionally, anti-PD-1 was found to augment IFN-γ production by FMP58-66 peptide-pulsed CTLs only in the presence of FMP-transfected BDCs.

Discussion: CMRF-56+ immunoselection of PBMCs proved an efficient method to isolate a heterogeneous BDC population in a single-step. Even in WT-1-naïve healthy venesections, the increased CD107a expression suggested matured WT-1-transfected CMRF-56+ BDCs induced CTL cytotoxicity. Further assessment of synergy between CMRF-56+ BDC vaccination and checkpoint inhibition is warranted. The immune tolerance to WT-1 in healthy volunteers may explain difficulties in observing WT-1-specific CTL expansions and IFN-γ production. We expect combination with anti-PD1 to overcome the activation threshold, and potentiate this further in patients.
CONTACT TRACING FOR GONORRHOEA AND CHLAMYDIA BY GENERAL PRACTITIONERS IN NEPEAN BLUE MOUNTAINS LOCAL HEALTH DISTRICT

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Introduction:
Sexually transmissible infections (STIs) are increasing across New South Wales (NSW); the majority being diagnosed by general practitioners (GPs). Contact tracing is essential to STI prevention and control and is the responsibility of the diagnosing clinician. Previous research shows that GPs are poorly skilled or resourced to effectively undertake this activity.

Methods:
For a three-month period in 2015, a letter and questionnaire were sent to GPs diagnosing newly notified cases of chlamydia and gonorrhoea. Information was gathered regarding contact tracing initiation and type (patient referral vs provider referral); how far back in time contacts were traced; and, numbers of sexual partners identified, contacted, tested and treated.

Results:
Of 206 questionnaires sent, 160 were returned (response rate 77.7%), the majority for chlamydia notifications. Contact tracing was commenced for 71.9% (115/160), with a higher proportion for chlamydia (73%) than gonorrhoea (58%); all apart from two cases were patient-initiated. Sexual partners were traced back from three days to two years for chlamydia, and two weeks to six months for gonorrhoea. For chlamydia, 40% of cases were traced for the recommended previous six months, whereas only 25% of gonorrhoea cases were traced back for the recommended two months. In 28% of cases, GPs did not know how many sexual partners their patients had, with 35% of GPs not knowing how many partners were contacted, and 48% not knowing how many were tested and treated. Stated barriers to contact tracing included: overseas acquisition; unable to recall the patient; patient refused; patient referred elsewhere; patient unable to contact partners; and, patient presented as contact.

Conclusion:
There appear to be varying levels of skill and knowledge of contact tracing for chlamydia and gonorrhoea. Collaborative work should be undertaken to address common barriers, and develop innovative clinical software tools to assist GPs in undertaking this essential activity.
PERINEAL TALC USE IS ASSOCIATED WITH AN INCREASED RISK OF OVARIAN CANCER: A SYSTEMATIC REVIEW AND META-ANALYSIS

Ross Penninkilampi, Guy D. Eslick

Background: For over three decades, it has been posited that there is an association between perineal talc use and the incidence of ovarian cancer.

Methods: We performed a meta-analysis of observational studies to evaluate the association between perineal talc use and risk of ovarian cancer. 30 trials involving 17035 cases of ovarian cancer were identified using electronic databases and manual review of reference lists. The association with ovarian cancer was analysed for any perineal talc use, long-term (>10 year) talc use, use on a diaphragm, and use on a sanitary napkin.

Results: The use of perineal talc was also examined for association with the different types of ovarian cancer. Any perineal talc use was associated with an increased risk of ovarian cancer (OR=1.33, 95%CI 1.25-1.41), but not use on a diaphragm or sanitary napkins. Long term use was associated with an increased risk of smaller magnitude (OR=1.26, 95%CI 1.12-1.41).

Conclusions: Talc use was associated with an increased risk of serious and endometrioid cancers, but not mucinous or clear cell cancers. There is a clear association between perineal talc use and ovarian cancer, though the magnitude of the increased risk is small. Whether the relationship is causative remains uncertain.
RETROSPECTIVE ANALYSIS OF SUBJECTIVE AND OBJECTIVE CARDIOVASCULAR OUTCOMES POST PERCUTANEOUS CORONARY INTERVENTION IN PATIENTS RECEIVING PRASUGREL VERSUS TICAGRELOR

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Aim: P2Y12-receptor antagonists target platelet activity, with prasugrel being a pro-drug and ticagrelor being a direct agent. We sought to retrospectively assess cardiovascular outcomes post percutaneous coronary intervention (PCI) in patients receiving prasugrel versus ticagrelor.

Methods: Patients receiving PCI from July to December 2014 were assessed by phone post-procedure. They were asked if they felt the procedure clearly made a big difference to their health, if puncture-site bruising or chest pain was experienced post-procedure, and if medical review or hospitalisation occurred for a cardiac condition post-procedure.

Results: 18 of 39 patients (46%) on prasugrel versus 16 of 26 patients (61%) on ticagrelor reported post-procedure puncture-site bruising. Femoral approach was taken in 8 of 39 patients (21%) on prasugrel, with 7 experiencing bruising and 1 developing a retroperitoneal bleed. 9 of 26 patients (35%) on ticagrelor had femoral approach, with 5 experiencing bruising. 29 of 39 patients (74%) on prasugrel versus 16 of 26 patients (61%) on ticagrelor felt the procedure made a difference to their health. 8 of 39 patients (21%) on prasugrel versus 7 of 26 patients (27%) on ticagrelor experienced chest pain post-procedure. 8 of 39 patients (21%) on prasugrel versus 9 of 26 patients (35%) on ticagrelor sought medical attention post-procedure, with 4 of 39 patients (10%) on prasugrel versus 1 of 26 patients (4%) on ticagrelor requiring hospital admission for a cardiac condition post-procedure.

Discussion: Puncture-site bruising may be more prevalent in the ticagrelor group, reflecting greater potency. Dyspnoea, which is a known short term side-effect of ticagrelor, may be responsible for an apparent reduced rate of post-procedural satisfaction with this drug. Whilst this analysis has revealed an apparent greater proportion in the prasugrel group requiring hospital admission post-procedure, further study needs to be performed in a prospective, randomised-controlled trial to assess outcomes for either agent.
IMPROVING THE QUALITY OF FOOD ITEMS PROVIDED TO SATELLITE HAEMODIALYSIS PATIENTS

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Malnutrition is common in haemodialysis (HD) patients. HD patients require a high protein, low sodium, low potassium and low phosphate diet. The appropriateness of the food items provided to HD outpatients at both Penrith Community Dialysis Centre and Nepean Inpatient Haemodialysis Unit in line with the HD diet requirements required review.

**Aim:** To improve the appropriateness and nutritional quality of food items provided to haemodialysis patients that is in line with ACI haemodialysis (HD) therapeutic diet specifications.

**Method:** An analysis of the nutrient composition of current food items provided to HD patients was conducted and compared to the ACI HD therapeutic diet specifications which informed recommendations for improvements to the food supply. This was followed by the implementation of a revised sandwich menu, which met all nutritional requirements of the ACI diet specifications. The new sandwich menu was evaluated for acceptability from a patient perspective (n=80).

**Results:** Analysis of the original food items revealed limited high protein sandwich varieties with the ham sandwiches more than doubling the recommended sodium content. Ham sandwiches are also a source of inorganic phosphate, a form readily absorbed by the body and a lower source of dietary protein. The revised menu now offers five sandwich varieties that are high protein; low sodium, phosphate and potassium and meet the ACI HD diet specifications. Patient satisfaction surveys demonstrated the diversity of patient preference among the HD population. Eighty two per cent of patients felt there was adequate variety of sandwich varieties offered on the new menu with 80% rating the quality of the new sandwiches as good or excellent.

**Conclusion:** HD patients have specialised nutritional requirements and food items provided need to be regularly reviewed to ensure in line with most recent available evidence. For menu changes to be successful they need to be evaluated to ensure acceptability and palatability by the patient population.
SPONTANEOUS FORMATION OF AN ARTERIOVENOUS FISTULA PRODUCED BY A RUPTURED ANTERIOR COMMUNICATING ARTERY ANEURYSM

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In this report, the authors present a case of an anterior communicating artery aneurysm rupturing into its accompanying vein causing an arteriovenous fistula and subsequent subarachnoid haemorrhage. The patient was an 86-year-old woman with sudden onset headache and aneurysmal subarachnoid haemorrhage (SAH) originating from a previously diagnosed anterior communicating artery (ACoA) aneurysm. Digital subtraction angiogram (DSA) showed a low flow fistula at the site of the aneurysm rupture to the adjacent vein. As far as the authors know, this is the only known example of an aneurysm rupture into a vein resulting in a fistula. Potential explanations are discussed.
AN UPDATE ON THE APPLICABILITY AND COST EFFECTIVENESS OF PHARMACOGENOMICS IN STROKE WITH AN AUSTRALIAN FOCUS

Johnson, Kate; Haque, Sameen. Shaffi, Mohamed.

There has been great fervor in recent decades regarding drug-gene association studies, with hopes to personalize medicine and thus, predict responsiveness to therapy and prevent adverse drug reactions. Stroke is a major cause of death and disability, but many of the treatments, namely antiplatelets, warfarin, statins and antihypertensives, come at significant risk. We have conducted a literature review to provide an update on the clinical applicability of pharmacogenomics for these drugs, with a focus on the Australian context. Firstly, abundant research suggests the VKORC1 and CYP2C9 polymorphisms contribute significantly to warfarin maintenance dose and that algorithms incorporating these mutations increase time in the therapeutic range in the first 90 days of therapy. However, these algorithms are highly race specific, thus presenting unique problems for a diverse country like Australia. Moreover, a clear link between pharmacogenetic guided dosing and a reduction in adverse events has not been demonstrated. Similarly, clopidogrel is used for stroke prevention. Research suggests that the CYP2C19 loss of function mutation renders clopidogrel ineffective. Given these mutations are present in 60% plus of south east Asians, this is highly pertinent to stroke management in Australia. Finally, a number of mutations have been studied with regards statins and antihypertensives, with the most promising being SLCO1B1 and links to myositis with simvastatin. Thus this review looks at the current barriers to implementation of pharmacogenetics to stroke therapy within the Australian context.
VARIANT 1623 A-G SNP (rs180195) IN THE PROMOTER OF THYROGLOBULIN GENE ASSOCIATED WITH AUTOIMMUNE THYROID DISEASE BUT NOT WITH THYROID OPHTHALMOPATHY.

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The Thyroid eye disorder is presumed to begin in the thyroid since the great majority of patients with Graves’ ophthalmopathy (GO) have active thyroid inflammation, ie, thyroiditis, at the time they develop eye signs. Thus, a logical hypothesis for the orbital reaction is that thyroid antigens are released in the context of a thyroiditis and travel (“home”) to the orbital tissues where they bind to various cell types and are targeted by autoantibodies and/or sensitized T cells, leading to orbital inflammation. This is the working hypothesis for most groups working on ophthalmopathy and has been well studied for the TSHr, but the possible role of the other major thyroid antigen, thyroglobulin (Tg), has been largely ignored.

Our studies over recent years have focused on some new ideas concerning the pathogenesis of thyroid-associated ophthalmopathy (Graves eye disease). We showed that levels of serum thyroglobulin, a protein made by thyroid follicular cells, is elevated in Graves patients with ophthalmopathy (Graves ophthalmopathy [GO]), suggesting that its release in the context of thyroid inflammation may lead to orbital inflammation, as has been suggested by us and others in the past.

Interestingly, we have also shown, in genetic studies, that variant 1623 A-G SNP (rs180195) in the promoter of Thyroglobulin gene in a cohort of 529 patients and control ($P = 0.034$) is a marker for thyroid autoimmunity, but not the ophthalmopathy, supporting the notion that the thyroid and orbital disorders are not part of the same disease (i.e. “Graves disease”, “Hashimoto disease”). We present detail genotypic studies leading to identification of pathogenic Novel variant 1623 A-G SNP (rs180195) in the promoter of Thyroglobulin gene associated with autoimmune thyroid disorder.
USING INTRAVENOUS ADENOSINE AS A USEFUL METHOD TO COMPARE TRUE EFFECTIVE BIVENTRICULAR PACING IN RESPONDERS AND NON-RESPONDERS TO CARDIAC RESYNCHRONISATION THERAPY

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Aim: We aim to evaluate the efficacy and safety of establishing insufficient percentage of biventricular pacing by administration of intravenous adenosine. Then comparing the rate of insufficient percentage of biventricular pacing (<100%) amongst the groups of patients who are responders versus non-responders to cardiac resynchronisation therapy (CRT).

Methods: This will be a single centre, prospective, cohort study. 71 consecutive patients with implanted cardiac resynchronisation devices between July 2006 and November 2015 were enrolled. Patients underwent the adenosine trial at least 12 months post CRT device implantation to determine effective biventricular pacing percentage. This was compared with the recorded percentage of biventricular pacing reported during device interrogation. Correlation was made between response to CRT therapy and percentage of effective biventricular pacing.

Results: Preliminary results of 5 patients demonstrate that symptomatic adenosine administration was successful in identifying true effective biventricular paced beats. This has allowed us to identify fusion beats. Two patients were non responders to CRT. Their device interrogation revealed 97% and 99% biventricular pacing respectively. Post adenosine trial, 94% and 80% true effective biventricular pacing was established respectively. One patient was a responder to CRT and device interrogation revealed 98.8% biventricular pacing and 95% true effective biventricular pacing was established post adenosine trial. One patient did not have a symptomatic response to adenosine and therefore true effective biventricular pacing beats were difficult to establish. One patient was classed as a non-responder to CRT with device interrogation revealing 99.8% biventricular pacing and >99% pacing post adenosine trial was established. This patient had many medical co-morbidities that may have been a cause of his poor response to CRT.

Conclusion: Preliminary data suggests that symptomatic adenosine administration is successful in identifying true effective biventricular paced beats which may be overestimated by CRT device interrogation. Correlation with response to CRT has not yet been established.
BREAST MILK FORTIFICATION IN PRETERM INFANTS

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Aim: While there is consensus that breast milk should be fortified in preterm infants, there are still significant variations in fortification practices amongst neonatologists. This survey investigated the variations in breast milk fortification protocols adopted by the neonatologists in tertiary neonatal intensive care units (NICUs) across New South Wales.

Methods: An online survey containing ten questions covering the important aspects of breast milk fortification was e-mailed to 47 neonatologists working in tertiary NICUs across New South Wales.

Results: Of the 47 survey recipients, 33 (70%) were completed. 63% of respondents had a fortification protocol. Less than 32-weeks gestational age and birthweight less than 1800 g were the two most common criteria to initiate fortification. Majority (53%) initiated fortification when more than 150 mL/kg/day of enteral feeds were tolerated. Target enteral energy intake was 130-139 kcal/kg/day for 59% of respondents and 120-129 kcal/kg/day for 34% of respondents. Target protein intake showed variation from 3.0 to 4.4 g/kg/day. Hydrolysed milk protein was preferred in 63% and full molecule protein in the rest. 61% started with partial fortification and then increased it to full fortification while the remaining started with full fortification. Amount of fortification was mostly adjusted based on baby's growth rate (66%). 77% reported that fortification was stopped when babies were discharged or fully breastfed.

Discussion: Significant variations still exists in clinical practice. Current fortification practices are based more on past experience and adjustments are made in accordance to baby’s growth rate. Many respondents also indicated that the approach to fortification is often individualised.

Conclusion: Challenges remain in translating evidence-based and consensus recommendations to protocols in order to standardise clinical practice.
Cohort Study to Prove the Safety of Early Discharge in High-Sensitivity-Troponin I Negative Chest Pain Patients

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Chest pain and suspected acute coronary syndrome is a common presentation to the emergency department and often results in hospital admission or a prolonged emergency stay, putting a strain on health resources. There is therefore a need to achieve a balance between utilization of resources and ensuring a serious cardiac event is not missed. There is now a significant body of evidence to demonstrate that high sensitivity troponin results correlate with short and long term mortality. This data is useful in predicting who can be safely discharged from the emergency department when suspecting acute coronary syndrome (ACS).

Aims We aim to show that discharge of patients who are low or intermediate risk, with early assessment in an ambulatory angina assessment clinic, will improve resource utilization whilst still providing a safe and effective service.

Methods This will be a prospective cohort study that will include all patients referred to the Ambulatory Angina Assessment Clinic from the Nepean Hospital Emergency Department. Emergency medical staff will utilize the newly implemented chest pain pathway in conjunction with high sensitivity troponin testing (at 0 and 3 hours), serial ECG recordings and the presence of ongoing symptoms. If a patient is determined to be low or intermediate risk and appropriate for outpatient investigation, the medical officer will complete a referral form which will be picked up by the Cardiology Advanced Trainee the next business day. At the Ambulatory Angina Assessment Clinic, the cardiology advanced trainee will reassess the patient and discuss further need for investigations for ACS which may include a non-invasive strategy, coronary angiography or no investigation at all. Outcomes will be measured at 30 days post enrolment through hospital electronic records and a brief phone questionnaire.

The results of this study are in the process of being analysed and will be presented at the Annual Nepean Research Day.
COMMUNICATION DURING PERIPHERAL INTRAVENOUS CENTRAL CATHETER (PICC) INSERTION

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Background and Study Aims
Good communication is essential for optimal patient care, yet there is little communication research in the context of intensive care medicine. This is despite many ICU patients being conscious when undergoing potentially painful procedures. The placebo effect is well-recognised, whereas the impact of the nocebo effect, whereby a communication can result in negative effects for the patient is less well established in clinical practice. This study aims to identify whether such communications are routinely used during an elective ICU procedure - Peripheral Intravenous Central Catheter (PICC) insertion.

Methods
This single centre, prospective, observational trial involved obtaining LHREC approval and informed consent from proceduralists and those patients scheduled to receive a PICC line as part of the Nepean ICU Inpatient PICC Service. We plan to include 100 PICC procedures where communications between proceduralist and patient are video and audio recorded. Placebo and nocebo communications are identified from the audio transcripts independently by two researchers and then analysed for concordance. Descriptive statistics are used to present the types of communications identified. Patients also complete post procedural pain scores to determine correlations between different types of communication and the patient experience of procedural pain.

Results
As of 18 September 2016 we have recruited proceduralists for five procedures. Preliminary findings are to be presented.

Discussion
This is the first study to investigate the use of procedural communications in an ICU setting. Previous research in other settings have shown that (nocebo) words can hurt. The potential implications for current practice are significant. If it is demonstrated that nocebo communications, with the potential to increase pain and anxiety, are being used during routine ICU procedures, this could raise awareness of the importance of word choice and guide future research during routine and emergency ICU procedures.
IFI27 DISCRIMINATES BETWEEN INFLUENZA AND BACTERIAL INFECTIONS IN SYMPTOMATIC PATIENTS: A TRANSLATIONAL STUDY OF GENE-EXPRESSION BIOMARKER

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Background
Gene-expression signatures could improve diagnosis of respiratory virus infection by accurately identifying the immune response underpinning the infection. However, published gene-expression signatures require the measurement of dozens to hundreds of genes, thereby making it difficult to implement them in clinical practice. To overcome this translational barrier, we searched for a single-gene biomarker of respiratory virus infection and we validated its clinical utility in eight independent cohorts consisting of 1071 subjects.

Methods and Findings
We identified a single-gene biomarker, IFI27, which could discriminate between influenza and bacterial infection. In vitro studies showed that IFI27 was upregulated by TLR7 in plasmacytoid dendritic cells, antigen-presenting cells that responded to influenza virus rather than bacteria. In vivo studies showed similar findings; IFI27 was highly expressed in influenza patients but not in bacterial infection (discovery cohorts, n=111). In phase I validation (n=521), IFI27 upregulation was confirmed in influenza patients in four independent cohorts. In phase II validation, in a large cohort of patients with undifferentiated respiratory illness (n=439), IFI27 showed 88% accuracy in identifying influenza infection among all etiologies (viral, bacterial, mixed infection and non-infectious conditions) and 90% specificity in discriminating between influenza and bacterial infections.

Conclusion
IFI27 could be a useful biomarker to assist clinical decision in choosing between anti-viral and antibiotic treatment. This discovery represents a significant step forward in overcoming limitations of previously published multi-gene biomarkers and it facilitates the implementation of molecular testing in clinical practice.
REVERSAL IN ORDER OF VENTRICULAR FILLING ASSOCIATED WITH INCREASED MORTALITY IN SEPTIC PATIENTS

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Introduction: Under normal conditions the right ventricle fills before the left ventricle. Reversal in this order of cardiac filling is associated with diastolic heart failure with increased left atrial pressure and has been linked to poor outcomes in heart failure. We sought to evaluate the association of outcomes in sepsis and fluid balance vs the change in the timing difference in LV to RV filling from an echo done on day 1 vs day 3.

Methods: Single centre, observational trial involving 46 patients with severe sepsis or septic shock. Patients were prospectively imaged by transthoracic echocardiography on day 1 and 3 from admission to the ICU for conventional measures as well as the time interval between the onset of left and right ventricular filling.

Results: An increase in the reversal of right to left onset of ventricular filling over time had a significant association with mortality and morbidity: including increased ICU stay, SOFA score and ongoing need for respiratory and circulatory support. Day 3 interventricular filling delay and change in the interventricular filling delay had a weakly significant association with a positive fluid balance on day 3 of ICU admission.

Conclusion: Ventricular filling reversal and delay was associated with increased mortality in septic patients, which we hypothesize, may be due to ventricular filling delay acting as a surrogate for left atrial pressure. Further studies using invasive reference methods for left atrial pressures may be warranted.

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EXPERIENCE WITH OUTPATIENT PARENTERAL ANTIBIOTIC THERAPY (OPAT) IN A SUBURBAN TERTIARY REFERRAL CENTRE IN AUSTRALIA

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Aim: To evaluate outpatient parenteral antibiotic therapy (OPAT) in a suburban centre, using a local electronic database.

Method: Data were retrieved from a prospectively maintained electronic database which included information on patient demographics, clinical diagnosis, microbiology, antimicrobial therapy and complications. Data were analysed using descriptive statistics.

Results: 3435 referrals for OPAT were made between Jan 2004 and June 2014; there was a 7.8% increase between 2004 and 2014. Most referrals came from the emergency department (49%) and hospital wards (28%). Infections were community acquired in 85.5%; 25289 antibiotic days were generated. Median age was 51.6 years. Commonest cause for referral included skin and soft tissue infections [SSTIs (61.2%)], followed by Bone and Joint Infections [BJIs (15.3%)]. Methicillin Sensitive Staphylococcus Aureus (MSSA) was commonest organism identified. Modes of therapy included both intravenous push through peripheral cannula and 24 hour infusions via a peripherally inserted central catheter (PICC). 36 different intravenous antibiotics were used, Cephazolin was the commonest (66.8%); 3.2% required more than one agent. Treatment related complications occurred in 3.8% including line occlusion, aseptic thrombophlebitis and a drug reaction.

Conclusion: OPAT is a safe and effective service with increasing uptake by the hospital over the years. It was particularly useful for keeping patients with SSTIs and BJIs out of hospital.

Dr Eric Li is a Resident Medical Officer at Nepean Hospital in New South Wales, Australia. He obtained qualification in Bachelor of Pharmacy at The University of Sydney, before completing his medical degree at the same institution. From pharmacy he began developing his passion for infectious diseases, with interest in ensuring antimicrobial stewardship both in the hospital and in the community. At Nepean Hospital he has participated actively in clinical governance, including being a member of the Antimicrobial Stewardship Committee. He hopes to join the Basic Physician Training program next year, with further plans of advanced training in Infectious Diseases.
INCREASING SCHOOL HUMAN PAPILLOMAVIRUS VACCINATION COMPLETION RATES WITH SHORT MESSAGE SERVICE TO PARENTS.

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Aim: Cervical cancer is the third most commonly diagnosed gynaecological cancer in Australian women, and is almost always due to human papillomavirus (HPV) infection. Since 2007, New South Wales (NSW) Health, through Public Health Units, has offered HPV vaccinations to Year 7 students as a school-based immunisation program. The completion rate for HPV immunisation in Nepean Blue Mountain Local Health District (NBMLHD) has historically been lower than the target of 75%. This study is to assess if short message service (SMS) reminders will increase completion rates for school-based HPV immunisation in NBMLHD.

Methods: This is an interventional cluster randomised controlled trial of all Year 7 students whose parents consented for them to be immunised in 46 high schools in NBMLHD. The schools were randomised to intervention and control arms using Microsoft Excel. Parents of students in the intervention arm are sent an SMS reminder the day before vaccination clinics. Students who have had all three doses of HPV vaccine will be counted towards the completion rate. The difference in completion rates between the control and intervention groups will be tested using two-proportion z-test. To date, only two doses of HPV vaccine have been offered.

Results: In the intervention schools, 1514 students consented for vaccination out of an enrolment of 2064 (73%). In the control schools, 2227 out of 2935 students consented (75%). Interim analysis after second dose of vaccine has not shown a statistically significant difference between coverage in intervention (1412/1514, 93%) and control arms (2042/2227, 92%, p=0.077).

Conclusion: This intervention has yet to demonstrate a statistically significant impact on vaccination uptake. This may be due to illness-related absences on vaccination days, moving schools, or deciding to see general practitioners for vaccination. Concurrent immunisation promotion activities may also have diluted the intervention effect.
MEDICAL STUDENT PERCEPTION OF THEIR LEARNING DURING THE CRITICAL CARE PROGRAM OF SYDNEY MEDICAL SCHOOL, NEPEAN.

Sarah Whereat, Dr Graham Hendry, Prof A McLean

Introduction: Basic airway management is an essential skill (1) in medical graduates. However airway management is identified as poorly managed in clinical practice by new graduates (2) (3), with new graduates indicating that they lack confidence to managing ‘airways’.

Aim: This study focused on medical student learning of basic airway management skills while exploring student perceptions of their learning in the context of the Critical Care Medicine Rotation. The aim to understand what aspects of the program assisted in their learning with blended learning used to enhance student learning opportunities in this context.

Study design: The mixed methods design included a combination of pre and post testing of theory and practical skills knowledge using written, simulation, clinical assessments and focus groups.

Study results: The study demonstrated qualitatively that students gained appropriate basic airway skills to manage patients in the clinical setting, with focus group discussion providing valuable understanding of their learning. Discussion: The deliberate use of focused practice and assessment throughout the rotation was new innovation and identified a valuable method to assist with student learning in this environment. The main themes arising were ‘Active learning’, ‘Goal setting’, ‘Peer continuum’ and ‘Conflict’. Core features of student learning from these themes include, students needing to observe all processes as a stage before interactive participation. Another important aspects of student learning included questioning, being questioned and being able to teach back to close the loop. Students identified that ‘Conflict’ with curriculum requirements, a major problem, these requirements restricting the students’ ability to gain appropriate clinical experience.

Discussion /Conclusion: While the current program was found to be effective for student learning, opportunities for improvement exist to enhance current modalities and practice. Student perceptions of their learning correlate with qualitative data providing valuable understanding of medical student learning in this environment.
BASIC CRITICAL CARE ECHOCARDIOGRAPHY: HOW MANY STUDIES EQUATE TO COMPETENCY? A PILOT STUDY USING HIGH FIDELITY ECHOCARDIOGRAPHY SIMULATION

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Background
Assessment of competence in basic critical care echocardiography is complex. Competency not only relies on imaging accuracy, but also interpretation and appropriate management decisions. The experience to achieve these skills, real-time, is likely more than required for imaging accuracy alone. We aimed to assess the feasibility of using simulation to assess number of studies required to attain competency in basic critical care echocardiography.

Methods
Prospective pilot study recruiting trainees at various degrees of experience in basic critical care echocardiography using experts as reference standard. We used high fidelity simulation to assess speed and accuracy using total time taken, total position difference and total angle difference across the basic acoustic windows. Interpretation and clinical application skills were assessed using a clinical scenario. ‘Cut off’ values for number of studies required for competency were estimated.

Results
27 trainees and 8 experts were included. The subcostal view was achieved quickest by trainees (median 23s IQR 19-37). 89% of trainees didn’t achieve accuracy across all views. 81% achieved accuracy with the parasternal long axis and the least accurate was the parasternal short axis (44% of trainees). 15 studies was estimated to be required number of studies to achieve competency in accurate imaging. 40 and 50 studies were required for competency in correct interpretation and management respectively.

Discussion
Use of echocardiography simulation to determine competency in basic critical care echocardiography is feasible. Competency in image acquisition appears to be achieved with less experience than correct interpretation and correct management decisions. Further studies are required.
CORRELATION OF ARTERIAL STIFFNESS ESTIMATES (COASe) IN END STAGE RENAL DISEASE PATIENTS ON HAEMODIALYSIS BY APPLANATION TONOMETRY AND MODIFIED BRACHIAL CUFF

Authors: Jason Diep, Louise Ward, Bhadran Bose

Aim: To correlate between the estimates of central pressure and arterial stiffness by applanation tonometry (SphygmoCor CP) and modified brachial cuff (SphygmoCor XCEL), in patients with end-stage renal disease (ESRD) receiving haemodialysis.

Background: Indices of arterial wall stiffness measured by applanation tonometry, such as the augmentation index (Aix), are surrogates of central arterial pressures that independently predict all-cause and cardiovascular mortality in patients with ESRD on haemodialysis. In healthy patients, data generated by a novel brachial cuff technique correlates well to those by applanation tonometry, whilst also being less operator-dependent. However, this consistency has not been evaluated in ESRD patients on haemodialysis.

Methods: This dual-centre study was conducted at the Nepean In-centre Dialysis Unit and Penrith Community Dialysis Centre. Thirty-six ESRD patients across both units had indices of arterial wall stiffness measured by applanation tonometry and brachial cuff, both immediately pre-haemodialysis and post-haemodialysis. Data generated were compared using linear regression and paired t-test analysis, generating a correlation gradient (m) between the two devices.

Results: Aix measurement both pre-haemodialysis (m=0.99, p=0.005) and post-haemodialysis (m=1.01, p=0.001) displayed excellent correlation between devices. Other indices of arterial wall stiffness displayed good correlation pre-haemodialysis; including central aortic mean blood pressure (m=0.84, p<0.001), central systolic blood pressure (m=0.84, p<0.001), and central diastolic blood pressure (m=0.98, p<0.001). There was less correlation post-haemodialysis for central aortic mean blood pressure (m=0.49, p=0.003), central systolic blood pressure (m=0.53, p<0.001), and central diastolic blood pressure (m=0.47, p=0.021).

Conclusions: Our study demonstrates that applanation tonometry and modified brachial cuff are comparable in measuring indices of arterial wall stiffness in ESRD patients pre-haemodialysis but not post-haemodialysis.
Aim
To investigate the impact of insulin use in women with GDM on the need for resuscitation of infants after caesarean delivery.

Methods
A study of women with single pregnancies who are on insulin for GDM undergoing labor between 2005 and 2014 at Nepean Hospital. We studied the impact of insulin on infant resuscitation rates postpartum.

Results
2207 women with mean age of 31.15 (SD = 5.63) years and mean gestational period of 38.31 (SD = 2.22) weeks were recruited into the study. Women of infants who had resuscitation had higher BMI, lower gravidity, higher parity, and less insulin use (26.31% vs. 33.88%, p < 0.001). Infants that require resuscitation also had a lower gestational age, lower APGAR (5 minutes), lower birth weight, length and head circumference at birth. 697 (31.58%) women received insulin treatment for GDM. On multivariate analysis, women with GDM treated with insulin (OR = 0.609, CI = 0.490 to 0.755, p < 0.001), gestational age (OR = 0.816, CI = 0.779 to 0.856, p < 0.001), 5-minutes APGAR score (OR = 0.579, CI = 0.485 to 0.690, p < 0.001), emergency caesarean (OR = 2.345, CI = 1.834 to 2.998, p < 0.001) and elective caesarean (OR = 1.643, CI = 1.301 to 2.075, p < 0.001) independently predicted incidence of resuscitation.

Conclusion
The findings suggest a relationship between insulin use and reduced resuscitation rates of infants born from mothers with GDM. Further studies investigating the role, dosage, and criteria for insulin use in women with GDM are needed.
PROMOTING PROFESSIONALISM: USING SIMULATION TO DEVELOP CRITICAL REFLECTION.

Dr Andrew Stuart Lane, Nepean Clinical School, Sydney Medical School

Aims and Background: Mistakes involving the prescribing of medications are common. Open disclosure is a policy stating doctors should apologise for errors, discussing them with the harmed parties. Many junior doctors take part in open disclosure without any formal training or experience. Simulation is a training and feedback method in which learners practice tasks and processes in lifelike circumstances. However, how do participants of simulation make sense and utilise their educational experience?

Methods: We conducted a Phenomenological study of medical students who participated in a simulation session based on open disclosure after medication error. Eight medical students were selected using purposive and criterion-based sampling. They underwent four immersive mannequin simulations followed by focus-group discussions. Follow up occurred during their intern year with face-to-face semi-structured interviews illuminating their interpretation of the experience. The data was analysed using Interpretative Phenomenological Analysis, identifying three super-ordinate themes.

Results: The superordinate-theme labelled ‘Reflecting on simulation’ had three themes which described how medical students reflected on simulation over time. ‘Learning of value’ described how their initial reflection – the debrief was metacognitive in nature, moving towards mindfulness through the session. ‘Reflection of value’ described their current reflection - highlighting the need to go beyond the descriptive, aligning with Jarvis’ theory. ‘Professionalism’ described their future cognition - participants aligned future reflection with colleagues and practice demonstrating ‘belongingness’.

Discussion and conclusions: Medical students often lacked important elements in their cognitive frames, demonstrating conscious incompetence associated with rationalisation: they were aware of their mistakes but framed them as something beyond their practice. Their cognitive frames also demonstrated unconscious incompetence associated with cognitive dissonance: they were not aware of their mistake but felt something didn’t make sense. The simulation provided psychological safety promoting ‘risk taking’, developing a growth mindset and cognitive resilience resonating with Dweck’s theory. Simulation enabled the students to achieve outcomes that were not ‘non-learning’, resonating with Jarvis’s theory. A learning model developed from the data suggested the presence of a cognitive frame which was labelled ‘readiness to apologise’. This learning model was linked to the competency framework, along with inherent and future cognition and abilities. ‘Readiness to apologise’ meant that the interns were; aware of the need to apologise; aware of the rationale to apologise; and aware of the want to apologise. This resonated with the theory of intellectual humility. The learning-model demonstrated that current understanding of the competency framework needs to be revisited, as it does not take into account; context of the task being learned; regressing directly from unconscious competence to unconscious incompetence; not all learners start at unconscious incompetence. Mentorship and guidance by educators is required to motivate and inspire learners to develop cognition and abilities to maintain appropriate reflection and professional development, ensuring learners reflect with the right people, at the right time, in the right manner.
ANTENATAL PREPARATION FOR CHILDBIRTH. AN OBSERVATIONAL STUDY

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Aim: Antenatal education aims to address parental concerns around childbirth. It may also represent an opportunity to facilitate a sense of control and empowerment. We aim to observe the types of communication and information provided by midwifery educators during routine antenatal classes for expectant parents. We then plan to classify the language structures used, to identify aspects of communication utilised during the session.

Methods: This observational study of antenatal education involves a single tertiary referral centre for maternity care in NSW.

We plan to video and audio record parental antenatal education classes. The communications utilised by educators will then be transcribed by two researchers independently. Language structures will by identified and, classified as previously described in a labour epidural insertion setting. This includes: information statements, commands, story-telling and metaphor, listening and acceptance, utilisation, reframing, and positive / negative suggestion.
Concordance of the classified phrases will be calculated and any disagreements in category referred to a third researcher. Descriptive statistics will be used for baseline data and types of statements utilised.

Results: Preliminary findings will be presented.

Discussion: This study is likely to have important implications for the future delivery of antenatal education and the use of language more generally in midwifery practice. We hope to identify aspects of communication that may be identified as being particularly helpful and language that may be less so. The categories of phrases used may provide insights in how future training of health care professionals can improve the delivery of antenatal information. There is also potential to further expand this study to investigate how information is delivered within various other settings such as the antenatal clinic, birth unit and postnatal ward.

We expect our findings to provide information to improve communication in a way that optimises the birth experiences of expectant parents.
AN 11-COLOR FLOW CYTOMETRY PANEL TO ASSESS THE ABSOLUTE NUMBER OF LYMPHOCYTE, MONOCYTE and DENDRITIC CELL IN HUMAN WHOLE BLOOD

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Aim: To develop a 11-color flow cytometry panel for assessing the absolute number of different immune cell populations in human whole blood

Methods: Peripheral venous blood was collected into tubes containing anticoagulant heparin. Total white blood cells were counted using Sysmex XT-1800i automated hematology analyzer (Sysmex Corporation, Hyogo, Japan) for calculation of absolute number. 200µl of human blood were incubated with a premixed antibody cocktail for 30min at 4°C in the dark, which was followed by erythrocyte lysis for 10min at room temperature in the dark. After lysis, samples were washed once with phosphate buffered saline (PBS) containing 0.5% bovine serum albumin (BSA) and resuspended in PBS before analyzing on BD LSRII Flow Cytometer (BD Biosciences, San Jose, CA). Flow cytometry standard (FCS) files were analyzed using FlowJo software V.10.0.8 to determine the percentage of each cell population. Absolute numbers of different cell populations (peripheral blood lymphocytes, monocytes, and dendritic cells (DCs)) were calculated by multiplying the total white blood cell count with the total percentage of each cell population.

Results: Using this panel, we are able to detect T lymphocyte (CD3+CD4+/−CD8+/−), NK cell (CD3−CD56bright/dim), B cell (CD19+), monocyte (HLADR+CD14+/−CD16+/−) and DC subsets: myeloid DC1 (mDC1) (CD3−CD19−CD14−CD56−HLADR+CD1c−CD303−), mDC2 (CD3−CD19−CD14−CD56−HLADR+CD141+CD303−) and plasmacytoid DC (pDC) (CD3−CD19−CD14−CD56−HLADR+CD303+CD1c+) in human whole blood.

Discussion and conclusion: This 11-color flow cytometry panel allows us to analyze all the immune cell populations simultaneously, which is critical in understanding the roles and interactions of different immune cells in different disease settings. And we are particularly interested in investigating the importance of different immune cells in influenza virus infection by comparing the number of cells in normal versus influenza infected individuals.
SCREENING THE SECOND TRIMESTER FETAL HEART IN WOMEN WITH AN INCREASED BODY MASS INDEX USING THREE-DIMENSIONAL VOLUME SWEEP

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Aims
To determine
1) Percentage of fetal cardiac anatomy visualised using three-dimensional volume sweeps
2) Agreement between raters in cohort of women with BMI > 30kg/m²

Methods
Cross sectional study of 40 consecutive women attending the department for their routine second trimester fetal anatomy scan. Scans and 3D volume sweeps were performed by 2 experienced sonographers. 2 experienced raters interpreted the 3D data based on ISUOG practice guidelines for screening the fetal heart. A total of 40 women were needed to estimate the detection rate with a 95% confidence interval of maximum width +/- 15%.

Results
Gestational age ranged from 18 weeks 1 day to 22 weeks. Body mass index (BMI) ranged from 30.5 – 54.3 kg/m². Estimated time for volume acquisition was approximately 60 seconds however 2D acquisition time ranged from 2 minutes 30 seconds to 25 minutes. Majority (82.5%) of the volume acquisitions were made in the axial anterior lateral view. Both examiners detected the stomach, cardiac situs, 4 chamber heart filling 1/3 of chest and on the left side of the chest as well as cardiac axis in 100% of examinations. Visualisation of the outflow tracts was associated with the initial plane of acquisition with consistently poorer visualisation of the RVOT, bifurcation, confluence and 3 vessel view if good visualisation of LVOT was obtained (90 – 92.5%).

Conclusions
Consistent identification of all views of the fetal heart was not achieved using the simple algorithm described by Weissmann-Brenner et al in women with a BMI > 30 kg/m².
IMPACT OF DEDICATED ORTHOPAEDIC TRAUMA THEATRE ON HIP FRACTURE PATIENTS

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Hip fractures are an increasingly common presentation to emergency departments, and expediting their treatment may contribute to improved outcomes. A dedicated orthopaedic trauma theatre (DOTT) can provide benefits to both the patient and hospital.

Aim
Our study tested the hypothesis that DOTT shortens time-to-theatre, operating time, length of admission and the proportion of cases done on weekends.

Methods
We conducted a retrospective analysis of medical records from a 21-month period prior to, and after, the establishment of a DOTT, extracting demographic and admission data. All patients were acute proximal femoral fractures presenting to the emergency department, requiring operative fixation or arthroplasty. Hip dislocations, periprosthetic fractures, delayed diagnoses (made outside ED) and inpatient fractures were excluded. Patients from both groups who waited over 10 days to reach theatre were reviewed to ensure they reached inclusion criteria. We compared a group of pre-DOTT (276 cases) and post-DOTT (287 cases) patients. The average age of patients in both groups was 79 and 78yrs respectively, with similar gender mix. Operative fixation was performed in 57.2% of patients in the pre-DOTT group and 51.2% of patients in the DOTT group.

Results
Time to surgery was reduced by 5.8h (51.5 v 45.7h), however no significant difference was observed (p=0.15). The proportion of cases being completed within the 48h target was increased (63.0 v 70.4%, p=0.065). Total length of stay was reduced by 1.6 days (20.2 v 18.5d, p=0.30). The proportion of cases performed on the weekend was reduced from 29.4% v 22.3% (p=0.079). There was a significant reduction in operating time (88.9 v 78.9 mins, p=0.002).

Conclusion
Our results support the establishment of dedicated orthopaedic trauma theatre to trauma hospitals to improve outcomes for patients with hip fractures.
DIFFERENTIAL EXPRESSION OF Fcε RECEPTOR ON CIRCULATING PRECURSOR MAST CELLS BETWEEN ATOPIC AND NON-ATOPIC INDIVIDUALS

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Aims
To analyse the frequency and phenotype of circulating mast cells progenitors between non-atopic controls and egg allergic patients.

Methods
Peripheral blood mononuclear cells were obtained from children with clinically confirmed egg allergy (n=8) and non-atopic healthy controls (n=10). Multi-parametric flow cytometry was used to characterise mast cell progenitors with a panel of fluorescently conjugated monoclonal antibodies. Cells were also sorted and stained with Wright-Giemsa. Non-parametric Mann-Whitney tests were used to detect statistical differences between the two groups.

Results
A clearly distinct small population of IgE⁺CD19⁻ cells was detected by flow cytometry, which was confined within the lymphocyte gate. These cells also expressed FcεRⅠα, c-Kit, CRTH2 and CD38 and were negative for CD14, CD20, CD21, CD23 and CD56. In contrast to IgE⁺CD19⁺ B cells, which were either distinctively positive for λ or κ immunoglobulin light chain, IgE⁺CD19⁻ cells were all double positive for λ and κ. The frequency of this subset varied between individuals but was not statistically different between the groups. However, the density of cell surface IgE was significantly higher in the allergic group compared to non-atopic controls. Cell stains revealed that IgE⁺CD19⁻ cells morphologically resembled mast cells with abundant small cytoplasmic granules.

Conclusion
These findings suggest that circulating mast cell precursors in peripheral blood may differentially express the FcεRI receptor in atopic and non-atopic individuals. A correlation with clinical severity is warranted in future studies to analyse the predictive value of this subset in food allergies.
REMOTE FROZEN SECTION EXAMINATION OF PARATHYROIDECTOMY SPECIMENS BY TELEPATHOLOGY USING MIKROSCAN D2 AND APERIO LV1: A VALIDATION STUDY.

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4. Nepean Hospital
5. The University of Sydney and the Mann Whitney Institute

Aims: To validate two robotic telepathology (RT) systems (Aperio LV1 and Mikroscan D2) for parathyroid frozen section diagnosis by comparing the diagnostic accuracy and slide interpretation time of the two RT systems with in-house microscopy.

Methods: Three pathology services in Sydney (Austpath Laboratories, SWAPS and ICPMR) each submitted 20 consecutive parathyroidectomy cases with frozen section specimens to the study. This resulted in a total of 60 cases, with 84 slides. Three pathologists (EC, LS, and SC) interpreted these cases; first with the Aperio LV1 system, then with the Mikroscan D2 system and finally with in-house microscopy. Each pathologist had a 2 week washout period between the three systems. The histotechnologist recorded the diagnoses and the times taken to arrive at the diagnosis.

Results: Aperio LV1 had a slightly higher rate of concordant diagnoses with in-house microscopy compared to Mikroscan D2 for pathologists EC (92.9% vs 90.5%) and LS (95.2% vs 94.7%). We recorded a lower rate of concordant diagnoses for pathologists SC/MF with Aperio LV1 compared to Mikroscan D2 (79.8% vs 88.1%). Average slide interpretation time was 35.9 seconds for in-house microscopy, 94.4 seconds for Aperio LV1 and 232.5 seconds for Mikroscan D2.

Discussion: The lower rate of concordant diagnoses for pathologists SC/MF may be due to inter-observer variability in addition to inter-method variability, as SC interpreted the slide set with in-house microscopy and Mikroscan D2, while MF completed the slide set with Aperio LV1. Palely stained slides may account for some discordant diagnoses. Our rate of concordant diagnoses and slide interpretation time are similar to previously published studies using non-parathyroid specimens.

Conclusions: RT with Aperio LV1 and Mikroscan D2 for parathyroid frozen section interpretation has a high rate of concordant diagnoses compared with in-house microscopy. Slide interpretation times with these two RT systems are longer than in-house interpretation but less for Aperio LV1 compared with Mikroscan D2.
CEMENTED VERSUS CEMENTLESS BIPOLAR HEMIARTHRROPLASTY RETROSPECTIVE EVALUATION

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Introduction & aims
The use of Arthroplasty in management of femoral neck fracture in elderly population is a generally favoured because of better functional outcome and reduced revision rate. Bipolar hemiarthroplasty was developed to avoid the high acetabular wear noted with monopolar prostheses. Also Bipolar prostheses have shown better functional outcome compared to monopolar ones.

Non cemented prostheses avoid the potential risk of cement in elderly patients, have shorter implantation time and less cost. In our study, we looked into all the bipolar hemiarthroplasties done in our institution over 5 years’ period to find the differences between cemented and non-cemented prostheses in terms of complications and outcome.

Method
We reviewed all bipolar hemiarthroplasties done in our institution between 2005-2010. Patients' charts were reviewed and data were collected including patient demographic data, co morbidities, length of stay, complications, discharge destination and procedure data. We contacted birth and death registry to record out of hospital mortality rate. Data was tabulated and analysed using logistic regression analysis and two sample T test.

Results
206 hemiarthroplasties were done over 5 years (140 non cemented vs. 66 cemented). Mean age was 79 for the non-cemented group vs. 81 for the cemented group. Minimum follow up was 31 months. Acute coronary syndrome and Pneumonia were significantly higher in the cemented group (P value was 0.027 and 0.002 respectively). Pulmonary embolism and DVT were higher also in the cemented group.

Conclusions
Non cemented bipolar hemiarthroplasty showed less complications rate versus the cemented bipolar options with shorter time to perform and cheaper cost.
COST-BENEFIT ANALYSIS FOR THE USE OF TRANSVAGINAL ULTRASOUND TO AVOID LAPAROSCOPY IN WOMEN WITH MINIMAL ENDOMETRIOSIS DISEASE.

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Objective: 15% of women who present to a gynaecology clinic have chronic pelvic pain (CPP). Up to 56% of this group will not have underlying pouch of Douglas obliteration, endometriomata or deep infiltrating endometriosis (DIE) when scheduled for routine diagnostic laparoscopy. We aim to estimate the costs of a general gynaecologist’s conventional surgical approach (model 1) vs medical management following an ultrasound assessment by an expert in DIE diagnosis (model 2) to women with CPP.

Methods: We compared two models of care: (1) a conventional model whereby general gynaecologists seeing women with suspected endometriosis proceed directly to diagnostic laparoscopy without a detailed transvaginal ultrasound (TVS) by an expert in DIE assessment and (2) an approach whereby general gynaecologists order a detailed TVS by an expert in DIE assessment and having excluded complex disease do not proceed to laparoscopy but rather insert a Mirena IUS. The costs to the public health system for consultation, ultrasound and various surgical interventions for endometriosis were retrieved from New South Wales Ministry of Health: consultation $A225, detailed ultrasound $A500, diagnostic laparoscopy $A2,541, insertion of Mirena IUS $A255. Calculations of the cost of treating non-complex disease were performed and compared for both clinical pathways.

Results: For an outpatient gynaecology unit that reviews 1000 new consultations annually, 15% (150/1000) women would present with CPP. Of these 56% (84/150) women would not have underlying POD obliteration with complex endometriosis. With model 1 the cost of treating each non-complex case is $A2,992, whereas for model (2) $A1,430. This means that there is a cost saving of $A1,562 per case or $A131,208 annually.

Conclusions: The modern approach to minimal endometriosis using transvaginal ultrasound will lead to a significant cost saving of $A1,562 per case, or $A131,208 per year.

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ACCURACY OF DIFFERENT IMAGING TECHNIQUES TO ASSESS POD OBLITERATION: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Objective: Pouch of Douglas (POD) obliteration in women with potential endometriosis will warrant referral to a specialized endosurgery unit. Advanced laparoscopic skills are required to manage women with complex endometriosis and underlying POD obliteration. Imaging modalities such as transvaginal ultrasound (TVS) and magnetic resonance imaging (MRI) have been utilized to pre-operatively predict POD obliteration. The purpose of this meta-analysis is to assess the performance of these imaging modalities in the prediction of POD obliteration.

Methodology: This was a systematic review conducted in accordance with the PRISMA statement. We searched MEDLINE, Embase, PubMed and Google scholar from database inception to March 2016. Studies included compared imaging prediction of POD obliteration with laparoscopic gold standard confirmation with at least 10 affected and 10 unaffected participants were considered eligible.

Results: The electronic searches retrieved 3881 records. We excluded 3780 by reading titles/abstracts and more 82 after reading the full text as they were clearly not eligible. Regarding the other 19 records we excluded more 1 record because it evaluated the same population of other included study and more 8 records because they were related to studies that included less than 10 affected/unaffected women. We included 10 studies in the meta-analysis, four evaluating MRI and the other six evaluating TVS. The main results are summarized on Table 1.

<table>
<thead>
<tr>
<th>Studies</th>
<th>N</th>
<th>Affected</th>
<th>Sens.</th>
<th>95%CI</th>
<th>Heterogeneity</th>
<th>Spec.</th>
<th>95%CI</th>
<th>Heterogeneity</th>
</tr>
</thead>
<tbody>
<tr>
<td>MRI</td>
<td>4</td>
<td>296</td>
<td>121</td>
<td>84%</td>
<td>74-94%</td>
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<td>93%</td>
<td>86-99%</td>
</tr>
<tr>
<td>TVS</td>
<td>6</td>
<td>759</td>
<td>224</td>
<td>87%</td>
<td>78-96%</td>
<td>Very high</td>
<td>96%</td>
<td>93-98%</td>
</tr>
</tbody>
</table>

Conclusion: MRI and TVS demonstrated high sensitivity and specificity to diagnose POD obliteration. As TVS is more readily available and cost less this should be the first line diagnostic tool for the women with suspected POD obliteration.

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