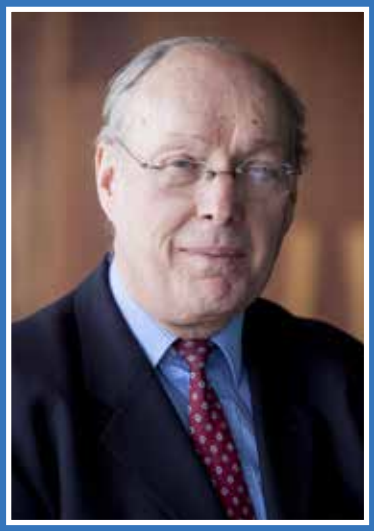
Canberra Health
Annual Research Meeting

Celebrating Health Research
in the Canberra Region




PROGRAM

Canberra Hospital Auditorium

August 11th – 14th, 2015

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WELCOME FROM SIMON CORBELL MLA – MINISTER FOR HEALTH

I welcome all participants to the Canberra Health Annual Research Meeting, or CHARM.

Many institutions from the Canberra region are represented, and I am pleased to see that submissions to the conference continue to be of a high standard. The meeting is in receipt of significant sponsorship this year, another very healthy sign that the territory is a major hub for learning and the development of knowledge for the benefit of all.

CHARM really does give us something to celebrate.

I acknowledge the ACT Health Research Office for the planning and delivery of this meeting, and thank the scientific review committee in particular, for their contribution to CHARM, and ongoing commitment to the research.

Thank you too, on behalf of the ACT Government, to all our sponsors for their generous support.

Simon Corbell MLA
Minister for Health

Australian National University

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DiscoverQuick

CHARM 2015 TIMETABLE

Tuesday 11 August	
9.00	REGISTRATION
9.15	CHARM Opening Dr Chris Bourke
9.30	General Health Research
9.40	
9.50	
10.00	AbstrACT- Prof Brenda Happell Nursing Research Update
10.30	Morning Tea
10.50	General Health Research
11.00	
11.10	
11.20	
11.30	
11.40	
12.00	Prof Colin Masters New Technologies for the Diagnosis and Treatment of Alzheimer's Disease
13.00	Lunch
13.40	Translational Research
13.50	
14.00	
14.10	
14.20	
14.30	
14.40	
14.50	
15.00	Afternoon tea
15.15	Ethics Workshop

Wednesday 12 August	
9.00	REGISTRATION
9.10	General Health Research
9.20	
9.30	
9.40	
9.50	
10.00	AbstrACT – Prof Ross Hannan – Update Cancer Research in the ACT
10.30	Morning Tea
10.45	Smart Leasing
10.50	Nutrition and Diabetes Research
11.00	
11.10	
11.20	
11.30	
11.40	
12.00	Prof Katherine Samaras Trimming the fat on Australia's obesity epidemic
13.00	Lunch
13.40	Allied Health and Nursing Research
13.50	
14.00	
14.10	Ethics for Alied Health and Nursing
14.30	Allied Health and Nursing Research
14.40	
14.50	
15.00	Afternoon tea
15.20	Allied Health and Nursing Research
15.30	
15.40	
15.50	
16.00	
16.10	
16.20	

Thursday 13 August	
9.00	REGISTRATION
0.38	Musculoskeletal Research
9.20	
9.30	
9.40	
9.50	
10.00	AbstrACT- Prof Tim Snedon – 3D Printing, the Future of Medicine.
10.30	Morning Tea
10.50	General Health Research
11.00	
11.10	
11.20	
11.30	
11.40	
11.50	
12.00	Prof Mark Hutchinson How understanding why you feel sick has implications for disease states
13.00	Lunch
13.45	Intellectual Property
13.50	General Medicine
14.00	
14.10	Ethics for Clinicians
14.30	Translational Research
14.40	
14.50	
15.00	
15.10	
15.20	
15.30	
15.40	
15.50	
16.00	
16.10	BREAK
16.30	Poster Viewing Event – Wine and canapés evening

Friday 14 August	
9.00	REGISTRATION
9.10	General Health Research
9.20	
9.30	
9.40	
9.50	
10.00	AbstrACT – Prof KM Schulte – Surgery Research
10.30	Morning Tea
10.50	Paediatrics and NICU Research
11.00	
11.10	
11.20	
11.30	
11.40	
12.00	Prof Ingrid Scheffer AO FAA FAHMS – Novel Epilepsy Syndromes
13.00	Close
18.30	Close of Conference Dinner, The Lobby Restaurant, Parkes, ACT

KEYNOTE SPEAKERS

PROFESSOR INGRID SCHEFFER *AO FAA FAHMS*

NOVEL EPILEPSY SYNDROMES

Professor Scheffer, Winner of 2015 Prime Minister's Prize for Science, Chair of Paediatric Neurology Research, Departments of Medicine and Paediatrics, The University of Melbourne, Austin Health and Royal Children's Hospital, Melbourne who will be speaking about her research in Epilepsy and paediatric neurology.

Professor Scheffer is a paediatric neurologist and Professor at the University of Melbourne and Florey Institute of Neuroscience and Mental Health. Professor Scheffer is helping to transform the diagnosis and treatment of epilepsy, a brain disorder characterized by seizures and other symptoms that can be extremely disruptive to the lives of the 50 million people affected by it.

She has described several new forms of epilepsy and her research group was the first to uncover a gene for epilepsy and subsequently, many of the genes now known to be implicated. These revolutionary findings have improved diagnosis, counselling and treatments for many patients and may lead to the development of new therapies.

Professor Scheffer and Professor Samuel Berkovic were awarded the 2014 Prime Minister's Prize for Science for their long-standing partnership on cracking the genetics of epilepsy. They have received many separate awards and prizes for their work – but this is the first time they have been recognised together. The scientific pair wrote a piece titled "The genetics of epilepsy: bringing hope to families" for The Conversation.

Professor Scheffer's work has resulted in major paradigm shifts in epilepsy syndromology and classification over many years. Her work has formed the essential basis for successful gene discovery, her larger collaborative group being the leaders in epilepsy gene identification for 18 years when they discovered the first epilepsy associated gene. This body of work has resulted in insights into the biology of seizures.

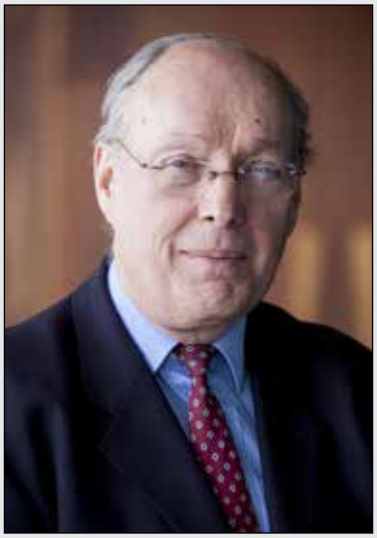
Professor Scheffer and her colleagues have described a range of novel epilepsy syndromes beginning in infancy, childhood and adult life. Her work has meant that children and adults with sodium channel disorders such as Dravet syndrome and related epilepsies are diagnosed earlier and treated appropriately, improving long term outcomes. Her recent work on Epilepsy limited to Females with Mental Retardation is changing the way family histories are interpreted and will benefit affected women and transmitting men by improving genetic counselling. She has expanded the understanding of the spectrum of epilepsies associated with glucose transporter deficiency, which carries major treatment implications. Her work is important as it has changed our concepts of the underlying neurobiology of genetic epilepsies.

In 2012, Professor Scheffer was awarded the L'Oréal-UNESCO Laureate for Women in Science for the Asia-Pacific Region. In the past Professor Scheffer received the 2007 American Epilepsy Society Research Recognition Award and the 2009 Eric Susman Prize from the Royal Australasian College Of Physicians. She has served the International League Against Epilepsy in many capacities and held the Chair of the ILAE Commission for Classification and Terminology from 2009 until 2013. The ILAE presented her with the Ambassador for Epilepsy award in 2013 and in the same year, she received the Emil Becker Award for an outstanding contribution to child neurology, the Australian Neuroscience Medallion and the prestigious national prize, the GlaxoSmithKline Award for Research Excellence.

In 2014, Professor Scheffer was elected a fellow of the Australian Academy of Science and an Officer of the Order of Australia (AO) in the Queen's Birthday Honours List for "distinguished service to medicine in the field of paediatric neurology as a clinician, academic and mentor, and to research into the identification of epilepsy syndromes and genes.

Professor Scheffer's goal is to 'make a major difference to patients and families through science'.

PROFESSOR COLIN MASTERS



NEW TECHNOLOGIES FOR THE DIAGNOSIS AND TREATMENT OF ALZHEIMER'S DISEASE

Senior Deputy Director, The Florey Institute
Laureate Professor, The University on Melbourne

Professor Colin Masters' work over the last 35 years is widely acknowledged as having a major influence on Alzheimer's disease research world-wide. Professor Masters' research has focused on Alzheimer's disease and other neurodegenerative diseases including Parkinson and Creutzfeldt-Jakob diseases.

His research in Alzheimer's disease has been focused on the structure, function and processing of the amyloid precursor protein of Alzheimer's disease. Most significantly, Professor Masters work on identifying genetic and environmental factors relevant to the metabolism of the amyloid precursor protein and the biogenesis of the amyloid.

Professor Masters has worked collaboratively with Konrad Beyreuther and discovered the proteolytic neuronal origin of the A-beta amyloid protein which causes Alzheimer's disease.

This work has led to the continued development of diagnostics and therapeutic strategies.

Professor Masters will be speaking on the latest technologies that provide early diagnosis of Alzheimer's disease.

PROFESSOR KATHERINE SAMARAS

TRIMMING THE FAT ON AUSTRALIA'S OBESITY EPIDEMIC – THE CLINICAL ART AND SCIENCE OF DODGING THE BULLET

Professor Katherine Samaras is a senior staff specialist in the Department of Endocrinology at St Vincent's Hospital and Laboratory Head in Adipose Tissue Biology at the Garvan Institute of Medical Research. She is a Professor of Medicine at the University of NSW and Notre Dame University.

Professor Samaras has established multidisciplinary obesity services at St Vincent's Campus over the last decade, which provide supervised and supported weight loss for complicated obesity, including those with severe heart failure rejected from heart-lung transplantation due to obesity and a dedicated obesity service for people with severe mental illness. The latter has resulted in obesity prevention programs and cardiometabolic algorithms that have been adopted internationally.

Professor Samaras' research has focused on adipose tissue, including gene expression studies, epigenetic studies and studies examining the effects of bariatric surgery.

Professor Samaras' areas of research interest include:

- Diabetes and obesity and their impact on human health, including cardiovascular health, ageing and cognition
- The mechanisms of insulin resistance, how it promotes diabetes and how it is reversed
- Metabolic syndrome
- Endocrine complications of HIV-infection and its treatment

PROFESSOR MARK HUTCHINSON

HOW UNDERSTANDING WHY YOU FEEL SICK HAS IMPLICATIONS FOR DISEASE STATES RANGING FROM CHRONIC PAIN TO DRUG ADDICTION

Professor Hutchinson is an ARC Australian Research Fellow and is the Director of the ARC Centre of Excellence in Nanoscale BioPhotonics (CNBP) and a Professor within the School of Medical Sciences at the University of Adelaide.

Professor Hutchinson returned to the University of Adelaide in 2009 as an NHMRC CJ Martin Research Fellow, and established the Neuroimmunopharmacology research laboratory. From 2005 to 2009 Mark worked in the world leading laboratory of Prof Linda Watkins in the Center for Neuroscience at the University of Colorado at Boulder. Here he pioneered with Prof Watkins the research which has led to the discovery of novel drug activity at innate immune receptors. Mark's research has implicated the brain immune-like cells in the action of drugs of dependence and the negative side effects of pain treatments.

Professor Hutchinson will explain some of the breakthrough discoveries that have been made in this area in recent years, highlighting how understanding why you feel sick has implications for disease states ranging from chronic pain to drug addiction. Additionally, Prof Hutchinson will discuss the opportunities that these developments in basic science have for clinical practice just over the horizon.

The CNBP for which Professor Hutchinson is the Director has a mission to "Discover new approaches to measure nano-scale dynamic phenomena in living systems".

DAILY TIMETABLE

Tuesday 11 August		
9:00	REGISTRATION	
9:15	CHARM OPENING DR CHRIS BOURKE	
	General Health Research Session	
9:30	Dr Raghavendra R. Parige	Intrauterine Exposure to Methadone and Neonatal Abstinence Syndrome - A Retrospective Study at The Canberra Hospital
9:40	Kushani Marshall	Comparing the effects of sun exposure and vitamin D supplementation: the Sun Exposure and Vitamin D Supplementation (SEDS) Study
9:50	Drew Richardson	Alcohol Harm In ED Sanapshot 2014
10:00	ABSTRACT – PROF BRENDA HAPPELL NURSING RESEARCH UPDATE	
10:30	MORNING TEA	
	Aged Care Research Session	
10:50	Richard Singer	Chronic Kidney Disease and Sleep Apnoea
11:00	Katherine Fenton	Improving Patient Flow on the Adult Mental Health Unit, Canberra Hospital: A Pilot Study for Project Venturi
11:10	Harry Irving	Is paracetamol over-prescribed in elderly hospitalised patients?
11:20	Dawei huang	Trends in orthogeriatric admissions in the Canberra Hospital the 21st Century (2005–2014)
11:30	Jason Potas	Reproducible surface potentials in the dorsal column nuclei evoked from peripheral nerves: hope for "bionic touch"
11:40	Elinor Hortle	A Role for AMP Deaminase in Malaria Resistance
12:00	PROF COLIN MASTERS – NEW TECHNOLOGIES FOR THE DIAGNOSIS AND TREATMENT OF ALZHEIMER'S DISEASE	
13:00	LUNCH	
	Transaltional Research Session	
13:50	Dipti Talaulikar	A Novel Ultra-Deep Sequencing Method for Tracking of Driver Mutations Identifies the MYD88 L265P Mutation in Early Haemopoeitcic Precursors in Diffuse Large B Cell Lymphoma
14:00	Nilisha Fernando	Can the broad spectrum chemokine inhibitor NR58-3.14.3 protect the retina from light-induced degeneration?
14:10	Christina Carroll	Novel Immunotherapy using Complete Freund's Adjuvant
14:20	Rachel W. Li	Innovative SrP Conversion Coated Magnesium for Future Osteogenic Implants
14:30	Yingxi Chen	High incidence of hospitalization due to infectious gastroenteritis in older people associated with poor self-rated health
14:40	Claire O'Brien	Comparative Genomics of the Crohn's Disease-Associated Adherent, Invasive Escherichia coli
14:50	Sarita Dhounchak	Rescue of beta cells by heparan sulfate (HS) replacement in Type 2 diabetes (T2D)
15:00	AFTERNOON TEA	
15:15	Ethics Workshop	
16:15	Finish	

Wednesday 12 August		
9:00	REGISTRATION	
	General Health Research Session	
9:10	Megan Nutt	Developing a contextually appropriate Cancer Survivorship and Wellness Model of Care
9:20	Dr Penney Upton	The Wellbeing in Wounds Inventory (WOWI): A New Way to Measure Outcomes for Patients with Chronic Wounds
9:30	Hamed Shahnam	Utility of commonly available clinical parameters for predicting concurrent chemoradiotherapy toxicity following treatment of stage III non-small cell lung cancer.
9:40	Madeleine Neill	Prognostic impact and landscape of MLL2 mutations in DLBCL
9:50	Louisa Lobigs	Derivation of a Marker of Plasma Volume Shifts Through Longitudinal Serum Biomarker Analysis
10:00	ABSTRACT – PROF ROSS HANNAN - UPATE CANCER RESEARCH IN THE ACT	
10:30	MORNING TEA	
10:45	SMART LEASING	
	Nutrition and Diabetes Research Session	
10:50	Benjamin Loel	Multifocal pupillographic objective perimetry elucidates patterns of visual changes according to severity of diabetic retinopathy in type 2 diabetes
11:00	Lachlan Cormick	The diagnostic accuracy of visual stimuli in multifocal pupillographic objective perimetry (mfPOP) for detection of early-stage diabetic retinopathy
11:10	Viviane Delghingaro-Augusto	Profound hyperinsulinaemia and diabetes in the high-fat fed NOD.B10 foz/foz mouse: a consequence of failure of islet □-cell compensation?
11:20	Evi Arfianti	JNK1 deficiency attenuates liver tumour development promoted by atherogenic diet-induced obesity
11:30	Danielle Medek	Rising CO2 threatens worldwide dietary protein intake
11:40	Alison Lancaster	Keeping Young People with Diabetes Engaged with Specialist Services
12:00	PROF KATHERINE SAMARAS – TRIMMING THE FAT ON AUSTRALIA'S OBESITY EPIDEMIC	
13:00	LUNCH	
	Allied Health and Nursing Research Session	
13:40	Daniel Coase	A Quality Improvement Initiative: Increasing Interpreter Use in a Health Setting
13:50	NIcola Palfrey	Improving the assessment and treatment of adversity and trauma within the Child and Adolescent Mental Health Service.
14:00	Corinne Coulter	Rehabilitation after elective total hip replacement : a randomised controlled trial
14:10	ETHICS FOR ALLIED HEALTH AND NURSING	
14:30	Joelie Parker	Specialised exercise programs for patients with chronic kidney disease: is Australia delivering best practice?
14:40	Vince Marzano	Early active mobilisation in severe community acquired pneumonia hastens weaning from mechanical ventilation and decreases ICU length of stay: A case study
14:50	Florian Wertenauer	Does effective Dialectical Behavioural Therapy for Adolescents (DBT-A) lead to a reduction in hospital presentations in adolescents with emotional dysregulation?
15:00	AFTERNOON TEA	
	Allied Health and Nursing Research Session	
15:20	Najmeh Alyasin	Same Day Discharge Post Radial Approach PCI: A New Practice and A Pilot Study At The Canberra Hospital
15:30	Ian Bull	Enabling Point of Use Capture of Health Devices Consumables and Implantables
15:40	Cherie Wells	Treating chronic low back pain with Pilates exercise: A clinical practice guideline
15:50	Nicole Freene	Allied Health's Role in Primary Prevention of Cardiovascular Disease: A Feasibility Study
16:00	Margaret Broom	A prospective comparative study of staff and parent activity in Open plan or two cot NICU
16:10	Bernie Bissett	Can we see the future for intensive care patients? Reliability and Utility of the Acute Care Index of Function in ICU.
16:20	Ayano Nakayama	Evidence of effectiveness of a fracture liaison service to reduce re-fracture rates
16:30	Finish	

Thursday 13 August		
9:00	REGISTRATION	
	Musculoskeletal Research Session	
9:10	Sue Fick	"Be a dad, don't be mum's assistant": A critical perspective of fathering discourses
9:20	Prof. Paul Smith	iFracture: an Intelligent Fracture Database
9:30	Paritosh Zad	Mechanical Low back pain and Imaging.
9:40	John Au	Anatomical Variations of the Levator Scapulae Muscle – a MR Imaging Study
9:50	Matthew Lim	Dynamic Pelvic Tilt: Can it be Measured with Accelerometry
10:00	ABSTRACT – PROF TIM SNEDON – 3D PRINTING, THE FUTURE OF MEDICINE	
10:30	MORNING TEA	
	General Health Research Session	
10:50	Andrew Griffin	The Prevalence of Musculoskeletal Injury in Australian Paddle Sports.
11:00	Diana Perriman	Supercable Fatigue Testing for Simulated Femoral Fracture
11:10	Shaun Zhai	Can a stroke unit be both life saving and cost saving? - Calvary Stroke Study
11:20	Dr Joseph Do Woong Choi	Cinacalcet associated acute potassium rise associated with hypocalcaemia after parathyroidectomy for renal hyperparathyroidism.
11:30	Sharon Pok	Cholesterol in high fat diet contributes to accelerated liver carcinogenesis
11:40	Sebastian Kurscheid	Trisomy of chromosome 7 and CpG island methylation in HOXA10 are associated with aberrant expression of a stem cell related HOX gene signature in glioblastoma
12:00	PROF MARK HUTCHINSON – HOW UNDERSTANDING WHY YOU FEEL SICK HAS IMPLICATIONS FOR DISEASE STATES	
13:00	LUNCH	
13:45	Intellectual Property	
	General Medicine Session	
13:50	Sara Hamdani	Invasive Mould Epidemiology in an Australian Haematology Unit 2010-2014
14:00	Benjamin Wagstaff	Delayed Passage of Meconium is Associated with Chronic Constipation at All Gestational Ages
14:10	ETHICS FOR CLINICIANS	
	Translational Research Session	
14:30	Elizabeth da Silva	Kidney disease impairs follicular helper T cell activation after vaccination
14:40	Nishank Shah	Docking the B0AT: Identification of Novel Amino Acid Transport Inhibitors
14:50	Christine Shu Mei Lee	Pyrosequencing Assay to Measure DNA Methylation in Clinical Samples of Breast Cancer
15:00	Auvro Mridha	MCC950 a selective inhibitor of NLRP3 inflammasome prevents inflammatory recruitment and fibrotic progression in experimental non-alcoholic steatohepatitis.
15:10	Fahrettin Haczeyni	Obeticholic Acid Improves Adipose/Metabolic Dysfunction and Liver Histology in Mouse Models of Non-alcoholic Fatty Liver Disease
15:20	Song Chen	A framework for numerical simulation of bone remodelling at cellular level
15:30	Cindy Eunhee	Autosomal dominant B cell deficiency with alopecia due to a mutation in NFKB2 that results in unprocessable p100
15:40	Katrina Randall	Role of DOCK8 in thymic TREG development
15:50	Jeffrey Looi	Corpus Callosum Morphometry and Regional Cortical Thickness in the Alzheimer's Disease Neuroimaging Initiative
16:00	Jackie Pratt	The effects of direct oral anticoagulants in the laboratory
16:10	BREAK	
16:30	POSTER VIEWING EVENT – WINE AND CANAPES EVENING	
18:00	Finish	

Friday 14 August		
9:00	REGISTRATION	
	General Health Research Session	
9:10	Charles Palmer	A Novel Approach To Credentialing Health Data As An Integrity Measure
9:20	Nicole Maitin-Casalis	The protective effect of advanced age on post-ERCP pancreatitis and unplanned hospitalisation
9:30	Jane Desborough	The impact of nursing care on the quality of care in general practice
9:40	Miranda Sherley	Should we screen women for rectal chlamydia?
9:50	Danny Hills	In harm's way: The impact of workplace aggression in Australian clinical medical practice
10:00	ABSTRACT – PROF KM SCHULTE – SURGERY RESEARCH	
10:30	MORNING TEA	
	Paediatrics and NICU Research Session	
10:50	LongHai Jin	Timely administration of appropriate antimicrobials in Medical Emergency Team (MET) situations for sepsis in a tertiary hospital: Implications for antimicrobial stewardship
11:00	Mara Matic	Do maternal hypertensive disorders in pregnancy increase respiratory support requirements, risk of CLD and poorer neurodevelopmental outcome in neonates born less than 29 weeks gestation?
11:10	Russell McGoldrick	Tongue tie (TT) in newborns at the Centenary Hospital, Canberra: Follow-up at 2 weeks following TT division.
11:20	Hazel Carlisle	Do neonates >29<32 weeks need Growth and Development Clinic follow up? A retrospective audit
11:30	G Parsons	Exploring parent and staff perceptions of the FiCare Program
11:40	Joshua Chu-Tan	670 nm Light Therapy: Mechanism and Effect on Oxidative Stress and Cell Death in the Light-induced Model of Retinal Degeneration
12:00	PROF INGRID SCHEFFER OA FAA FAHMS – NOVEL EPILEPSY SYNDROMES	
13:00	CLOSE	
18:30	CLOSE OF CONFERENCE DINNER, THE LOBBY RESTAURANT, PARKES ACT	
11pm	Finish	

Canberra Health
Annual Research Meeting

ORAL PRESENTATIONS

1. Intrauterine Exposure to Methadone and Neonatal Abstinence Syndrome – A Retrospective Study at Canberra Hospital

Raghavendra R. Parige[1], Bruce Shadbolt[2], Carey Flynn[3], Rebecca Reay[3]

[1]Alcohol and Drug Services, ACT Health, [2]Epidemiology & IT, ACT Health, ANU Medical School, [3]Academic Unit of Psychiatry and Addiction Medicine

Email: raj.parige@act.gov.au

Introduction: Methadone is the gold standard treatment for opioid dependent pregnant women. However, it is associated with a risk of neonatal abstinence syndrome (NAS). The primary aim of this study is to examine the relationship between maternal methadone dose at the time of delivery and incidence of NAS requiring treatment.

Methods: This is a retrospective study of pregnant women on methadone treatment and their babies (N=119) who were delivered between 2001 and 2011. Neonates were divided into two study groups based on mother's methadone daily dose at delivery (7.5 – 50 mg; 50 -170 mg) and were compared. A modified Finnegan score was used to monitor the neonates for NAS.

Results: Receiver operating characteristic (ROC) curve was used to determine the cut off for low dose and high dose groups. Logistical regression model showed a significant four-fold increase in incidence of NAS in the high dose exposure group (p=.001).

Conclusion: We found a significant positive correlation between maternal methadone dose and NAS in this study. We also came to the conclusion that the watershed dose of methadone for NAS is 50 mg. Infants exposed to more than 50 mg of maternal methadone dose in intra-uterine life are four times more likely to develop NAS compared to exposure less than 50 mg.

2. Comparing the Effects of Sun Exposure and Vitamin D Supplementation: The Sun Exposure and Vitamin D Supplementation (SEDS) Study

Kushani S Marshall[1], Robyn M Lucas[1], Emily C Wilford[1], Dharshyani Thangarajah[1], Fan Xiang[1], Laura J King[1], Ashwin Swaminathan[2], SEDS Investigator Team

[1]National Centre for Epidemiology and Population Health, Research School of Population Health, ANU College of Medicine, Biology and Environment, Australian National University, ACT, [2] Canberra Hospital, ACT

Email: kushani.marshall@anu.edu.au

Introduction: Vitamin D insufficiency may be a risk factor for a range of diseases. However, the optimal strategies to achieve and maintain vitamin D adequacy (sun exposure, vitamin D supplementation or a combination of both), and whether sun exposure itself has benefits beyond initiating synthesis of vitamin D, remain unclear.

Methods: The Sun Exposure and Vitamin D Supplementation (SEDS) Study is an Australia wide, multi-centre, randomised controlled trial of two different daily doses of vitamin D supplementation, and placebo, in conjunction with guidance on two different patterns of sun exposure.

Results: The SEDS Study is currently recruiting 1000 participants from across Australia and aims to compare the effectiveness of sun exposure and vitamin D supplementation for the management of vitamin D insufficiency, and to test whether these management strategies differentially affect markers of immune and cardio-metabolic function.

Conclusion: This presentation will discuss considerations informing the study design as well as the challenges and lessons learned regarding recruitment, data collection, and retention of participants within the setting of a non-institutionalized adult study population. We will particularly focus on the broad range of strategies used to engage and maintain relationships with referring medical practitioners within busy general practice environments and address issues related to participant self-referral.

3. Alcohol Harm in ED Snapshot 2014

Drew Richardson[1], Diana Egerton-Warburton[2], Angela Wadsworth[3], Daniel Fatovich[4], Andrew Gosbell[3] [1]ANU Medical School, ACT, [2]Monash Medical Centre, VIC, [3]Australasian College for Emergency Medicine, VIC, [4]University of Western Australia, WA

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Introduction: Alcohol is a recognised precipitant of preventable harm and ED workload. This study aimed to describe the point prevalence of Alcohol related presentations in Australasian EDs.

Methods: Telephone, fax and email survey of all ACEM accredited EDs except specialist paediatric centres at 2:00am local time on Saturday 6 December 2014

Results: 114 (79%) of 144 eligible EDs responded. 287/2281 patients (12.6%, 95%CI 11.3- 14.0) in Australian EDs and 57/415 (13.7%, 10.6-17.5) patients in New Zealand EDs were considered to have presented due to alcohol. The distribution skewed left, with 0-13 such patients identified per ED and a prevalence of 0-100% with a median of 10%. Amongst EDs with 10 or more patients present the prevalence was 0-48%, highest in NT and WA, lowest in Victoria and Tasmania. Prevalence was highest in major referral hospitals (14.2%); followed by regional referral hospitals (13.1%) then urban district (10.9%) but these differences did not reach statistical significance.

Conclusions: Alcohol is a major contributor to ED workload at around 1 in 7 ED patients at survey time. There were slightly more presentations due to alcohol in New Zealand and slightly less in Australia than the equivalent 2013 survey, possibly due to the weather.

4. Chronic Kidney Disease and Sleep Apnoea

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Introduction: Sleep apnoea is common in severe chronic kidney disease but risk factors are poorly characterised and there are no validated screening tools.

Methods: Patients with estimated glomerular filtration rate ≤30mL/min were included in the study. After giving consent, they completed standard risk/sleepiness questionnaires and a disease specific quality of life survey (KDQOL-SF). Total body water and spirometry was measured, followed by an ApneaLink™ screening test and multi-channel polysomnography.

Results: Sleep apnoea was present in 55 out of the 57 participants. Sleep apnoea was severe in 66% of haemodialysis and 54% of non-dialysis participants, with 11 participants having central sleep apnoea. A single participant had isolated central sleep apnoea. ApneaLink™ underestimated sleep apnoea severity (Figure 1). Neither total body water corrected for body size, expiratory volumes, subjective sleepiness nor overall symptom scores were associated with sleep apnoea severity.

Conclusions: Severe sleep apnoea is common in patients with chronic kidney disease and because of this it was not possible to validate the ApneaLink™ device as a screening tool. The high prevalence suggests screening is unlikely to be helpful in this population. Sleep apnoea severity was not associated with quality of life or sleepiness scores and was unrelated to total body water corrected for body size.

5. Improving Patient Flow on the Adult Mental Health Unit, Canberra Hospital: A Pilot Study for Project Venturi

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Introduction: Due to increasing demands on the health care system's limited resources, many hospitals are working to improve patient flow, thereby increasing their effective capacity. Best available evidence on improving patient flow may be applied to Canberra Hospital's acute psychiatric units once relevant barriers to flow are identified.

Methods: This audit uses a multi-method design (combining focus groups, audits of flow in mental health units and retrospective data analysis on a cross-section of patients) to investigate current patterns of patient flow and barriers to discharge through Canberra Hospital Mental Health Assessment & Adult Mental Health Units, and factors associated with increased length of stay.

Results: Mean length of stay for MHAU and AMHU was 8.45 hours and 15 days respectively. Multiple factors were associated with an increased length of stay including patient factors, certain hospital processes, and limited availability of community services.

Conclusions: These findings inform recommendations on improving patient flow and future research to support increases in available funding, staffing and resources.

6. Is Paracetamol Over-Prescribed in Elderly Hospitalised Patients?

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Introduction: Liver toxicity from chronic paracetamol use can occur in patients that are elderly, malnourished, have underlying liver disease or consume excessive alcohol. This study aimed to quantify the prevalence of paracetamol use and risk factors for toxicity amongst an elderly hospitalized patient population.

Methods: We undertook a retrospective chart review of elderly patients (≥75 years) admitted to the Acute and General Medicine Service (AGMS) at Canberra Hospital in 2014. We collected data relating to the prescription and dosing of paracetamol, risk factors for toxicity and evidence of abnormal liver function tests.

Results: Of 296 evaluable elderly patients admitted to AGMS in 2014, 244 (82.4%) were prescribed paracetamol. Of the 177 (59.8%) patients prescribed regular paracetamol, 86/177 (48.6%) had at least one known risk factor for liver toxicity in addition to older age. Malnutrition was the most prevalent additional risk factor for paracetamol toxicity. Paracetamol prescription was not changed for the majority of patients with abnormal liver function tests at baseline or had developed during the admission.

Conclusion: There is a high prevalence of paracetamol prescription in elderly hospitalized patients including with additional risk factors for liver toxicity. The clinical implications of this finding warrants further investigation.

7. Trends in Orthogeriatric Admissions in Canberra Hospital in the 21st Century (2005–2014)

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Introduction: As the population ages, geriatric patients will inevitably represent a growing trauma cohort with greater risks and higher complication rates. However, the increasing demand for orthogeriatric services has not been explored. To present trends in age-, sex-, care type-specific rates and outcomes of orthogeriatric admissions between 2005 and 2014 in Canberra Hospital.

Methods: Data on all adult orthopaedics admissions from 2005 to 2014 were obtained from Canberra Hospital electronic medical records and analysed as annual percentage changes.

Results: Between 2005 and 2014 the absolute number of adult orthopaedic admissions has increased from 3182 to 4324 (+35.9%). Similarly, the absolute number of orthogeriatric admissions in this period has increased by 37.3% (from 978 to 1343), and the proportion of elderly patients (>60 years) among all adult orthopaedic patients has remained constant, on average at 44.5% (range 43% – 46%). Acute-care-types in the elderly have increased by 48% (from 779 to 1156). The male to female ratio (M: F) in the aged <60 years was 2:1, whereas in the orthogeriatric population it was approximately1:2 with a marked increase in the proportion of old-old females during the study period. The M:F was 1:1.5 in aged 60-74, 1:2.3 in aged 75-84 and 1:3.0 in aged>85 in 2005 – 2007, and 1:1.5, 1:2.5 and 1:3.5, respectively, in 2012 – 2014. Compared to 2005, both the mean length of hospital stay (LOS, 6.6±10.9 [SD] vs. 5.9±10.2 days, p=0.152) and in-hospital mortality (2.15% vs.1.94%) showed a tendency to decline, indicating the efficacy from cooperation between orthopaedic surgery and geriatrics.

Conclusion: In the last decade the annual number of orthogeratric patients increased almost by 40% with a significant prevalence of women, especially in the oldest group. Despite this trend, LOS and mortality did not change significantly emphasising the importance benefits of interdisciplinary orthogeriatric co-management.

8. Reproducible Surface Potentials in the Dorsal Column Nuclei Evoked from Peripheral Nerves: Hope For "Bionic Touch"

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Introduction: The dorsal column nuclei (DCN) in the brainstem acquire sensory information from the entire body before sending it to the thalamus and, subsequently, the cortex for conscious perception of sensation. Our aims were to: 1) classify signals recorded from the surface of the DCN; 2) demonstrate reproducibility of signal features.

Methods: We recorded electrical activity from the DCN, evoked from single electrical pulses applied to the sural and peroneal nerves of 8 week old, urethane anaesthetised male Wistar rats.

Results: Correlation coefficients of intra-animal signal comparisons ranged from 0.67 to 0.69, and inter-animal correlation coefficients ranged from 0.66 to 0.69, indicating strong reproducibility of electrical responses within and among animals. More events were evoked from the peroneal nerve (15-55 ms post stimulus) compared to the sural nerve ($p < 0.01$), but not between the left/right "like" nerves. Clustering of event latencies confirmed these findings.

Conclusion: Understanding how sensory information is processed in the DCN could inform the development of a sensory neural prosthesis capable of recording sensory information from the periphery and artificially reproducing it in the DCN. Such a strategy may one day restore sensory perception to sufferers of spinal cord injury.

9. A Role for AMP Deaminase in Malaria Resistance

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Introduction: There is strong evidence that host genetic polymorphisms can convey malaria resistance. Most of the known mutations cause alterations to red blood cell (RBC) cytoskeletal proteins, membrane proteins or hemoglobin. Here we aim to uncover novel host factors involved in malaria resistance.

Methods: We identified a mutant mouse line Ampd3MRI49372, generated by ENU mutagenesis. This line carries a dominant, gain of function mutation in AMP deaminase which results in dramatically increased red cell turnover; RBCs from homozygous mutants were found to have a half-life of just 2 days, compared to 18 days for wildtype. We infected these mice with the rodent malaria P. chabaudi in order to determine if activation of AMPD3 results in malaria resistance.

Results: When infected with P. chabaudi, Ampd3MRI49372 proved extremely resistant, with both homozygous and heterozygous mutants showing a dramatic increase in survival, by 100% and 60% respectively. We propose that this resistance is mediated by the short RBC halflife.

Conclusion: This study provides the first evidence that a mutation in Ampd3 can lead to malaria resistance in mice, and shows that balanced host purine metabolism is essential for supporting the growth of Plasmodium spp within RBCs.

10. A Novel Ultra-Deep Sequencing Method for Tracking of Driver Mutations Identifies the Myd88 L265p Mutation in Early Haemopoietic Precursors in Diffuse Large B Cell Lymphoma

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Introduction: More than 30% of patients with diffuse large B-cell lymphoma (DLBCL) fail standard chemo immunotherapy, indicating a gap in our understanding of the pathogenesis. While genome sequencing has identified somatic mutations in genes such as MYD88 in the activated B-cell (ABC) subtype of DLBCL, the exact point in ontogeny where these mutations arise is currently not known.

Methods/Results: In an initial cohort of 45 DLBCL samples, we have identified 8 cases with MYD88 mutations, including 5 with the MYD88 L265P mutation. These cases have been studied using a novel 'ultra-deep sequencing' assay to identify the putative cell in which the mutation arises. By the addition of nucleotide barcodes during the PCR amplification process, we have eliminated processing and sequencing errors, and for the first time, have identified variable cellular origin of the gain-of-function MYD88 mutations (> 0.01%). Single cell sorting has been used to establish that the positive results are not due to contamination with lymphoma cells.

Conclusions: Novel custom sequencing approaches have demonstrated for the first time globally, that the MYD88 mutation arises earlier in ontogeny in normal haemopoietic precursors in patients with DLBCL, potentially accounting for treatment failure and acting as a reservoir for future relapse.

11. Can the Broad Spectrum Chemokine Inhibitor NR58-3.14.3 Protect the Retina from Light-Induced Degeneration?

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Introduction: The increased expression of a multitude of chemokines can lead to the progression of age-related macular degeneration (AMD). Chemokines provide directional cues for microglia/monocyte recruitment into the damaged retina, and may exacerbate cell death. Here, we investigate whether the broad spectrum chemokine inhibitor (BSCI) NR58-3.14.3 can reduce deleterious microglia/monocyte recruitment in a model of dry AMD.

Methods: Sprague-Dawley adult rat eyes were intravitreally injected with either 200µg BSCI or a PBS control. Animals were placed into light damage (1000lux for 24hrs). Tissue was collected for analysis both immediately (0 days) and 7 days after light damage. TUNEL was used to assay cell death, IBA-1 immunohistochemistry to label microglia/monocytes, and qPCR to analyse gene expression changes.

Results: BSCI, administered at 200µg, was safe and persisted in the retina until 7 days after light damage. BSCI inhibited microglia/monocyte recruitment into the photoreceptor layer ($p<0.05$) and reduced photoreceptor death at 0 and 7 days after light damage ($p<0.05$). BSCI also reduced the expression of Ccl3, Ccl4 and IL-6 at 0 days ($p<0.05$), which are chemokine and pro-inflammatory cytokine genes associated with microglia/monocyte recruitment.

Conclusion: BSCI reduces microglia/monocyte recruitment and photoreceptor death in a model of dry AMD, and has therapeutic potential for use against retinal degeneration.

12. Novel Immunotherapy using Complete Freund's Adjuvant

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Introduction: The field of cancer immunotherapy aims to modulate immune responses to enhance tumour destruction. The aim of this project is to investigate the efficacy of an immunotherapeutic cancer vaccine. The hypothesis is that injecting a strong immunostimulant intratumourally can induce an anti-tumour immune response (Fahrer, 2012).

Methods: Mice were injected subcutaneously with tumour cells and treated when tumours reached 5 mm in diameter. Mice received either a single intratumoural injection of CFA emulsified in PBS, or just PBS for control mice. Intratumoural infiltrates were collected by fine-needle aspiration, and analyzed by flow cytometry.

Results: We observed that intratumoural CFA treatment of P815 mastocytomas resulted in a statistically significant survival increases (p-value 0.0002, p-value 0.0229, respectively). In the P815 model, responding CFA mice had increased levels of intratumoural neutrophils. Treatment was found to be unsuccessful in the CT26 colorectal cancer model, and FNA analysis showed no infiltration of tumours by neutrophils.

CFA treatment was found to be a promising candidate for use as a simple and inexpensive cancer vaccine, and leads to an infiltration of neutrophils.

13. Innovative SrP Conversion Coated Magnesium for Future Osteogenic Implants

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Introduction: Understanding interactions among biomaterials and bone cells is critical for successful biomaterial engineering. This study reports strontium phosphate (SrP) conversion coated magnesium (Mg) promotes osteoblasts (OBs) and inhibits osteoclasts (OCs).

Methods: OCs were induced from human PBMCs using macrophage colony stimulating factors (m-csf) and receptor activators. OBs generated from human trabecular bone were co-cultured with OCs before exposed to SrP-Mg alloy extract. The post-degradation effect of SrP-Mg alloy on the interactions of OBs and OCs were assessed through OB and/or OC specific markers and scanning electronic microscopy.

Results: Differentiation of the OCs was decreased in the co-cultured OB-OC when exposed to SrP-Mg alloy extract. These may be caused by the SrP conversion coating, which effectively controlled the early rapid degradation rate of Mg. The SrP-Mg alloy displayed a dramatic increase in OBs proliferation and this proliferation may be a result of the bioactive ions (Sr) from the coating into aqueous environment. Furthermore, OBs cultured with SrP-Mg showed significant higher expression levels of osteocalcin.

Conclusion: The SrP conversion coated Mg alloy promoted OBs differentiation but decreased OCs activity. This coating technique may be applied to the development of future orthopaedic implant.

14. High Incidence of Hospitalisation due to Infectious Gastroenteritis in Older People Associated with Poor Self-Rated Health

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Introduction: Infectious gastroenteritis is an important cause of morbidity in adults. We aimed to estimate the incidence and risk factors for gastroenteritis-related hospitalisations in older adults.

Methods: The 45 and Up Study is a large-scale Australian prospective study of adult's aged ≥45 years (mean 62.7 years) at recruitment in 2006–8. Self-reported information from 265,440 participants were linked to hospitalisation data. We estimated the incidence of hospitalisation for infectious gastroenteritis and calculated hazard ratios (HR) using Cox regression, adjusting for sociodemographic, health and behavioural variables, with age as the underlying time variable.

Results: There were 6,077 incident infectious gastroenteritis admissions over 1,111,000 person-years. Incidence increased exponentially with increasing age; from 2.4 per 1,000 (95%CI 2.2-2.5) in 45-54 years old to 9.5 per 1,000 (95%CI 9.2-9.8) in those aged ≥65 years. After adjustment, infectious gastroenteritis hospitalisation was significantly more common in those reporting proton pump inhibitors use (HR 1.6, 95%CI 1.5-1.7), and those with poorer self-rated health (HR 4.2, 95%CI 3.6-4.9).

Conclusions: Infectious gastroenteritis results in hospitalisation of approximately 1% of people ≥65 years old annually. Hospitalisation in the elderly is costly and prevention with supportive care should be a public health priority.

15. Comparative Genomics of the Crohn's Disease-Associated Adherent, Invasive Escherichia coli

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Introduction: Adherent-invasive E. coli (AIEC) are a leading candidate bacterial trigger of Crohn's disease. Phenotypic testing is the only way to identify these strains, therefore the aim of this study was to identify a common molecular property of the AIEC phenotype.

Methods: The whole genomes of 41 E. coli strains, isolated from 19 patients and 17 controls, were sequenced using an Illumina HiSeq 2000. Genomes were assembled and annotated, and R was used to detect genes more frequent/unique to AIEC strains. Harvest was used to build core-genome phylogenies and detect SNPs. Adherence/invasion assays were conducted using I-407 epithelial cells, survival/replication assays using THP-1 macrophage cell lines. Cytokine secretion (TNF-α and IL-6) was measured using ELISA.

Results: 12/41 (7 patient, 5 control) strains displayed the AIEC phenotype. The AIEC strains were scattered throughout the phylogenetic tree and we did not identify a gene or SNP in common to all, or the majority of, AIEC isolates. Cytokine secretion did not differ between AIEC and non-AIEC strains.

Conclusion: Comparative genomic analysis of AIEC and non-AIEC strains failed to detect a molecular property exclusive to the AIEC phenotype. Our results indicate that multiple sets of genes, and/or regulatory differences, contribute to the AIEC phenotype.

16. Rescue of Beta Cells by Heparan Sulfate (HS) Replacement in Type 2 Diabetes (T2D)

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Introduction: HS, a complex sugar, is synthesised onto HSPG core proteins and is essential for islet beta cell survival. Our previous studies showed a significant loss of HS and HSPG core proteins in islets of T2D-prone db/db mice by 6 weeks of age, compared to wildtype (wt) controls. This study investigated whether HS replacement can prevent T2D beta cell death in vitro.

Methods: The blood glucose (bg) of wt and db/db donor mice was measured using a glucometer. Wt and db/db islets were isolated from donor pancreases by digestion with collagenase P and dispersed into single-cell suspensions using Accutase. The beta cells were cultured in the presence or absence of heparin (50µg/ml) for 2 days and beta cell viability was analysed by flow cytometry using Calcein (Cal) and propidium iodide (PI).

Results: After culture with heparin, wt beta cells showed a 3.6-3.8-fold increase in viable Cal+PI- beta cells, compared to untreated controls. Heparin-treated beta cells from donors with bg<10mmol/L, bg=10-15mmol/L and bg>15mmol/L showed a significant 2.6-2.8-fold, 1.8-3-fold and 1.7-fold increase, respectively, in viability compared to controls.

Conclusions: HS replacement can preserve the viability of beta cells from normoglycaemic and mildly hyperglycaemic (bg<15mmol/L) db/db mice without extensive beta cell failure.

17. Developing a Contextually Appropriate Cancer Survivorship and Wellness Model of Care

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Introduction: The Canberra Region Cancer Centre (CRCC) is the primary adult tertiary referral hub for cancer diagnosis and treatment in the ACT and South East New South Wales. A significant part of the vision of CRCC in providing integrated and contextually appropriate cancer care involves implementing a Cancer Survivorship Model of Care.

Methods: This project engaged and consulted with local consumers and service providers to help inform priorities in establishing this model of care. The researchers devised survey tools based on current issues in cancer survivorship research. These tools were widely distributed to consumers (people who have had a diagnosis of cancer and carers) and clinicians.

Results: Emerging themes include managing the psychosocial impact, adjusting to altered roles and expectations, and living with an unknown future. Findings show information on the disease, treatment and side effects is more helpful in the early stages of the cancer trajectory, whereas there is continual need for psychosocial information and support throughout.

Conclusion: This project helps us better understand the physical, emotional and practical support needs of cancer consumers; and the need for coordination of resources and support from a clinician perspective. A model of care is being developed from the information gathered.

18. The Wellbeing in Wounds Inventory (WOWI): A New Way to Measure Outcomes for Patients with Chronic Wounds

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Introduction: In wound care, outcome measures such as health related quality of life usually follow a deficit model. We argue that more attention should be given to the asset model of wellbeing in order to optimise and improve patient outcomes. In order to facilitate this refocusing of outcomes, we have developed the Wellbeing in Wounds Inventory (WOWI). The aim of this study was to establish the psychometric properties of this unique measure.

Methods: A standard iterative process for developing health measurement scales was employed: factor analysis was used to refine questionnaire structure, and the psychometric properties of the resulting questionnaire were then tested.

Results: Items loaded onto two subscales, Personal Resources and Wound Worries. Internal consistency was good for both subscales (Cronbach's α=0.93 and 0.82 respectively) and the Total Scale score (α=0.91). Good test-retest reliability was established for all scales (ICC>0.60). The Wound Worries subscale was also highly responsive to changes in wound health (RR=0.78). All scale scores significantly differentiated between respondents with poor, moderate or good health status, with better health status being associated with fewer Wound Worries and more Personal Resources.

Conclusion: The WOWI is a valid and reliable measure of well-being in chronic wound patients.

19. Utility of Commonly Available Clinical Parameters for Predicting Concurrent Chemoradiotherapy Toxicity Following Treatment of Stage III Non-Small Cell Lung Cancer

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Introduction: Concurrent chemoradiotherapy is employed for treating unresectable stage III non-small-cell lung cancer (NSCLC) but causes toxicities. Primary aim was to identify patient parameters that may predict treatment-related toxicities. Secondary aim was to investigate hospitalisation rate, overall survival and whether toxicities could predict overall-survival.

Methods: Ten year retrospective clinical audit of stage III NSCLC patients treated with concurrent chemoradiotherapy. Baseline patient demographic, haematological and biochemical parameters, as well as chemoradiotherapy data were collected. Binary logistic multi-regression analysis was performed to identify baseline parameters associated with toxicity. Log-rank test was performed to identify toxicities associated with overall survival. Kaplan-Meier analysis was performed to assess overall survival.

Results: Study included 50 patients (72% male, mean participant age of 62). Prevalent toxicities were anaemia (86%) and neutropenia (69%). Patient demographic and renal function parameters predicted toxicity. Prognostic factors demonstrated most consistent association with thrombocytopenia. Prognostic factors were; patient demographic ($p=0.04$), cancer history ($p=0.014$), renal ($p=0.002$) and blood parameters ($p=0.028$). Median survival was 44 months and blood transfusion predicted poorer survival ($p=0.013$).

Conclusion: Clinical parameters may identify stage III NSCLC patients at risk of developing concurrent chemoradiotherapy toxicities. Blood transfusion during treatment may be associated with poorer patient survival.

20. Prognostic Impact and Landscape of MLL2 Mutations in DLBCL

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Introduction: Diffuse large B-cell lymphoma (DLBCL) accounts for up to 37% of the 3500 cases of Non-Hodgkin's lymphoma (NHL) diagnosed in Australia annually. A pilot study by our unit identified 18 distinct single nucleotide variants (SNVs) affecting the gene MLL2 in 20/46 patients (46%) with histologically-confirmed DLBCL. We aim to resolve the potential prognostic significance of these mutations taking into account predicted damaging effects.

Methods: Bioinformatic analysis of the 18 SNVs observed in the pilot cohort was conducted and those indicated highly likely to be deleterious were screened for by Sanger sequencing in an expanded cohort (n=19). Prognostic significance was determined using time-to-death data.

Results: Of the 18 SNVs observed, 5 were predicted to be highly deleterious. None of these 5 mutations were re-observed in the expanded cohort. Data analysis was limited by numbers; however we observed a significantly decreased median time-to-death in the deleterious mutation cohort vs total cohort (0.45 vs 1.61 years).

Conclusions: Mutation of the gene MLL2 is a common feature of DLBCL, though the functional significance of the majority of mutations remains unclear. More data is needed to assess the role of MLL2 as a prognostic tool.

21. Derivation of a Marker of Plasma Volume Shifts Through Longitudinal Serum Biomarker Analysis

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Due to the intellectual property contained within this presentation an abstract will not be printed.

22. Multifocal Pupillographic Objective Perimetry Elucidates Patterns of Visual Changes According to Severity of Diabetic Retinopathy in Type 2 Diabetes

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Introduction: Changes in retinal responses to light are detectable before visible evidence of non-proliferative diabetic retinopathy (NPDR), and may be predictive of disease progression. We investigated whether the assessment of visual function utilizing three multifocal pupillographic objective perimetry (mfPOP) stimuli would be able to discriminate severity of NPDR among people with type 2 diabetes (T2D).

Methods: Severity of NPDR was determined with fundus photography using the Early Treatment of Diabetic Retinopathy Study scoring system. Pupillary responses of 35 diabetic patients and 20 normal subjects were measured using three mfPOP stimuli.

Results: Diabetic subjects without NPDR exhibited hypersensitive response amplitudes compared to controls ($p<0.05$), which were more evident towards the peripheral retina. Subjects with moderate NPDR exhibited reduced amplitudes across the retina for all stimuli. Response delays were greater in diabetic subjects without NPDR for yellow stimuli compared to controls ($p<0.05$), and became further delayed with disease severity.

Conclusions: Loss of hypersensitivity beyond the macula may be prognostic of retinopathic progression in T2D. MfPOP responses are delayed in T2D in the absence of retinopathic changes on fundus photographs, and correspond with disease severity. Yellow wide stimuli appear more useful due to the peripheral bias of early visual changes in T2D.

23. The Diagnostic Accuracy of Visual Stimuli in Multifocal Pupillographic Objective Perimetry (mfPOP) for Detection of Early-Stage Diabetic Retinopathy

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Introduction: Multifocal pupillographic objective perimetry (mfPOP) is a functional eye test, which has potential use in detecting early-stage diabetic retinopathy (DR). The aim of this study was to determine which of three different mfPOP stimulus protocols had the greatest diagnostic power in detecting early-stage DR in type 2 diabetes (T2D) subjects.

Methods: Thirty-five T2D subjects with varying levels of non-proliferative DR (NPDR) and twenty age-matched controls were tested using three different mfPOP stimuli, varying in eccentricity and colour. The protocols tested pupil responses to stimuli at 44 regions per eye, measuring amplitude and time to peak contraction of the pupil. The diagnostic power of mfPOP was determined by receiver operator characteristics (ROC).

Results: Analysis showed that the Macular protocol consistently had the greatest diagnostic accuracy in detecting severity of early-stage DR, achieving an ROC area under the curve (AUC) of 100% ± 0 (mean ± SE). High ROC-AUC values were achieved when comparing controls to diabetics without DR with a maximum of 89.67% ± 3.21.

Conclusion: mfPOP has good diagnostic accuracy for detecting early-stage DR and may become a useful test in providing clinical information for the diagnosis and staging of early-stage DR.

24. Profound Hyperinsulinaemia and Diabetes in the High-Fat Fed NOD.B10 foz/foz Mouse: A Consequence of Failure of Islet b-cell Compensation?

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The metabolic phenotype of obese *Alms1* mutant (foz/foz) mice varies according to genetic background. Female NOD.B10 foz/foz mice fed a high-fat (HF) diet for 24-weeks develop hyperglycaemia, severe hyperinsulinaemia, adipose dysfunction and non-alcoholic steatohepatitis. Conversely, HF-fed Balb/c foz/foz mice develop obesity only. We hypothesized that beta-cell dysfunction is an early event in HF-fed NOD.B10 foz/foz mice. Female foz/foz and wild-type mice of both strains were fed chow or HF-diets. Body weight, glucose tolerance and plasma insulin, proinsulin and C-peptide levels were assessed. Pancreas (for histology) or islets (for insulin secretion and electron microscopy (EM)) were harvested. After 8-weeks on diet, in addition to severe glucose intolerance the HF-fed NOD.B10 foz/foz compared to Balb/c counterpart mice were profoundly hyperinsulinaemic (55.8±0.1 vs 5.4±1.4 ng/ml) with a high insulin/C-peptide, but a normal proinsulin/C-peptide ratio. Islet beta-cell mass and in-vitro glucose-stimulated insulin responses were similar between the HF-fed foz/foz mice groups. Furthermore, EM of HF-fed NOD.B10 foz/foz mice showed absence of beta-cell degranulation, but an increased ratio of immature/mature insulin granules. In conclusion, rather than "beta-cell failure" as a cause of the diabetes in the HF-fed NOD.B10 foz/foz mice, we suspect defects in the quality and/or dynamics, including the clearance, of the insulin secreted.

25. JNK1 Deficiency Attenuates Liver Tumour Development Promoted By Atherogenic Diet-Induced Obesity

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Introduction: We have previously reported enhanced HCC development in mouse models of genetic and atherogenic (Ath) diet-induced obesity.1,2 A striking finding in these models is JNK1 activation both tumours and surrounding fatty liver. Aim: To test whether JNK1 signalling is essential for diet-related accelerated HCC development.

Methods: Male Jnk1-/- and Wt littermates were injected with DEN (10mg/kg i.p.) at 12-15 days of age, controls with vehicle (saline). At 6 wks of age, mice were fed either Ath diet (high sucrose, high fat, 0.2% cholesterol) or standard chow until 32 wks of age. Intraperitoneal glucose tolerance test was performed at wk 30.

Results: Ath feeding induced obesity in both Jnk1-/- and Wt mice, but did not alter adipose mass, blood glucose levels nor glucose tolerance. While Ath diet increased liver tumour development in both DEN-treated Jnk1-/- and Wt compared to chow diet-matched mice (86% vs.50% and 100% vs. 67%, respectively), Ath-fed Jnk1-/- mice developed far fewer and much smaller tumours compared to Ath-fed Wt mice, indicating substantially reduced tumour burden.

Conclusions: Ath diet increases DEN-induced liver tumour development in mice and ablation of JNK1 remarkably attenuates HCC development resulting in decreased tumour incidence, size and number.

26. Rising CO2 Threatens Worldwide Dietary Protein Intake

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Introduction: When grown under elevated atmospheric CO_2 concentrations (eCO_2), plant protein content decreases. Under eCO_2, human dietary protein intake is therefore likely to decrease. We aimed to estimate global current and future protein intake, and risk of protein deficiency as defined by intake below the estimated average requirement (EAR).

Methods: We estimated current national average protein intakes from food balance sheets (FBS), and intake distribution from the GINI coefficient. We used demographic data to calculate the EAR. We performed a meta analysis of eCO_2 effects on the protein content of the edible portions of crops, and translated this to change in protein intake based on the FBS.

Results: Globally, an estimated 823 (609-1102) million people are currently at risk of protein deficiency. Rice, wheat, and barley protein contents decreased by 7.5%-14.04% when grown under eCO_2. Worldwide, an additional 152 (127-174) million people may be at risk of protein deficiency under eCO_2 by 2050, including 57 (36-74) million people in India.

Conclusion: Rising CO_2 threatens the adequacy of global protein intake. Rising CO_2 may widen the disparity in protein intake, with vegetarian diets most affected. Decreased dietary protein may increase the risk of cardiovascular disease.

27. Keeping Young People with Diabetes Engaged with Specialist Services

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Introduction: Disengagement from specialist services often occurs when young people (YP) with diabetes transition from paediatric to adult services, placing them at increased acute and chronic complication risk. The ACT Health diabetes transition service, which provides multidisciplinary care, aims to support transition. Key performance indicators (KPIs) were implemented to keep YP engaged with specialist services.

Methods: KPIs were monitored quarterly using reports from existing patient management and emergency department information systems and a paediatric diabetes data base. The KPIs include fail to attend (FTA) rates, patients overdue for a clinic visit (>4 months) and nil follow up with a diabetes health professional (HP) after a diabetes related emergency department (ED) presentation. Strategies were employed to reduce DNA rates and to re-engage YP.

Results: Data for six quarters are presented. FTA rates averaged 16% (n=90 of 575 appointments); between 16 and 30 YP per quarter were found to be overdue; and 7% (n=3 of 44) of ED presentations did not follow up with a diabetes HP.

Conclusion: KPIs and strategies were identified to decrease disengagement, reducing risk for acute and chronic diabetes complications. A network of Australian diabetes services committed to adolescent care is needed, to ensure diabetes care does not diminish during this period, when YP are on the move for study and work.

28. A Quality Improvement Initiative: Increasing Interpreter Use in a Health Setting

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Introduction: A Multicultural Health Policy Unit was established by ACT Health in July 2013 to facilitate improved organisational responsiveness to the needs of people from culturally and linguistically diverse (CALD) backgrounds. An immediate priority was to increase interpreter use across the organisation in response to potential adverse outcomes reported in local and international research, and concerns from stakeholders about interpreter use in ACT Health.

Methods: A comprehensive strategy was developed to disseminate the evidence for and the importance of the use of professional interpreters in a health service. Analysis revealed a range of process barriers to the engagement of interpreters, which were removed. Resources and training in working with interpreters were developed.

Results: Analysis of data over eight quarters, to be presented in a table, indicated significant increase from baseline.In the third quarter (financial year 2014/15) there was a decrease in bookings. The reasons are not yet clear, but some of the promotional mechanisms used previously were not available in this quarter.

Conclusion: Educational and promotional strategies, together with appropriate processes that remove barriers to ease of access for staff, can improve interpreter use but must be ongoing and sustained.

29. Improving the Assessment and Treatment of Adversity and Trauma within the Child and Adolescent Mental Health Service

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Introduction: Childhood trauma and family adversity increases vulnerability to significant mental health problems. However, there is little data regarding the nature and prevalence of trauma experiences of Child and Adolescent Mental Health Service (CAMHS) clients. ACT CAMHS and the Academic Unit of Psychiatry and Addiction Medicine developed a research and training program to improve the recognition and treatment of trauma amongst young people and their families seeking help from CAMHS

Methods: The research program includes an embedded research study: 151 children & adolescents and their parents were surveyed about their recent and lifetime experiences of trauma and adversity. Three methods were used to collect this data: a young persons' questionnaire, parent questionnaire and a clinician interview.

Results: CAMHS clients were more likely to have experienced multiple adversities than single adversities. Also, the majority of parents surveyed had their own trauma experiences, and their children were more likely also have experienced trauma ($p<0.01$). The results of the research led to enhancements in the assessment and treatment processes for families receiving mental health services.

Conclusion: Ideally research and training should be embedded within clinical setting. This paper will discuss the challenges and benefits of conducting and implementing a trauma informed program within a clinical service.

30. Rehabilitation after Elective Total Hip Replacement – A Randomised Controlled Trial

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Introduction: Supervised physiotherapy exercise programs after hip replacement are more common than home exercise programs. The aim of this RCT was to determine the effect of supervised versus unsupervised programs on patient outcomes following total hip replacement.

Methods: An RCT was performed of 98 unilateral hip replacement patients. Following discharge home, a supervised rehabilitation group completed four weekly circuit exercise classes supervised by a physiotherapist. An unsupervised group was provided instructions to continue their exercise program at home with phone support. Western Ontario and McMasters University Osteoarthritis Index (WOMAC), Short form 36 (SF-36) and Timed Up and Go test (TUG) were the outcome measures completed. Linear mixed models analyses were used to compare outcomes between the two groups.

Results: WOMAC scores improved by 9.5 points in the supervised group (95% CI 16.65 to 28.55) versus 6.7 points in the unsupervised group (95% CI 16.52 to 29.70). This difference was neither statistically nor clinically significant ($p = 0.628$; MCID =8 points; 95%CI-6.75 to 5.73). SF-36 and TUG scores also demonstrated improvements over time, with no between group differences.

Conclusion: Rehabilitation outcomes post total hip replacement were similar clinically and statistically whether the rehabilitation was supervised or not.

31. Specialised Exercise Programs for Patients with Chronic Kidney Disease: Is Australia Delivering Best Practice?

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Introduction: Exercise provides significant functional, metabolic and psychological benefit for patient with Chronic Kidney Disease (CKD)[1]. Attending regular dialysis restricts participation thereby requiring innovative approaches to exercise. The prevalence of specialised exercise programs for people with CKD in Australia and how these programs are most commonly delivered was reviewed.

Methods: A cross-sectional observational study of Australian dialysis centres was undertaken in October 2014. A purpose-specific survey was designed, approved and distributed (electronically and paper-based) to all dialysis centres (n= 186) sourcing contact details from Kidney Health Australia website. Demographics, presence of specialised exercise programs and where relevant, the structure of the program (intradialytic, group-based or individualised), duration and exercise prescription, were recorded.

Results: The survey response rate was 59% (109/186). Responses comprised of metropolitan (32%), regional (59%) and remote (9%) centres. The main findings were only 8% (n = 9) of dialysis centres provide specialised exercise therapy to patients with CKD. These centres were primarily regional (n = 6). Facilities provided intradialytic programs (n = 5), group sessions (n = 2) and individual supervised programs (n = 2), on average for 11-12 weeks. Training programs usually combined aerobic and resistance training (67%).

Conclusion: Very few dialysis units in Australia currently provide specialised exercise programs for people with CKD.

32. Early Active Mobilisation in Severe Community Acquired Pneumonia Hastens Weaning from Mechanical Ventilation and Decreases ICU Length of Stay: A Case Study

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Introduction: Patients with respiratory failure requiring intubation and mechanical ventilation in intensive care (ICU) are commonly managed with sedation and bed rest. This case study presents how early mobilisation and minimal sedation leads to improved respiratory function and reduced mechanical ventilation time.

Method: A 41-year-old male with obstructive sleep apnoea admitted to ICU (APACHE III = 28) with hypoxic respiratory failure from bilateral pneumonia requiring intubation and ventilation day 2. The patient was managed with low dose propofol and fentanyl to achieve Richmond Agitation and Sedation Score of +1. On day 3, the patient ambulated 80 meters on a portable ventilator with one nurse and two physiotherapists.

Results: Prior to mobilising, patient was ventilated with Pressure Support (PS) 14 and Positive End Expiratory Pressure (PEEP) 14, Fraction Inspired Oxygen (FiO_2) 35% with Partial Pressure of Oxygen (PaO_2) 78. Post mobilisation, ventilation was rapidly weaned to PS 6 PEEP 6 FiO_2 30% and PaO_2 104, and successfully extubated 20 hours post intervention. Total ICU length of stay (LOS) was 6 days, with 3 days mechanically ventilated.

Conclusion: Patients with acute respiratory failure can be safely mobilised while intubated and ventilated decreasing total ventilation time and reducing ICU LOS.

33. Does Effective Dialectical Behavioural Therapy for Adolescents (DBT-A) Lead to a Reduction in Hospital Presentations in Adolescents with Emotion Dysregulation?

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Introduction: This study investigates outcomes for adolescents with emotion dysregulation, self-harm, and suicidal behaviors undergoing Dialectical Behaviour Therapy for Adolescents (DBT-A).

Methods: DBT-A is a 20-week outpatient psychotherapy focusing on skills for emotion regulation, interpersonal relationships, distress tolerance and mindfulness. Emergency department presentations and hospital admissions and psychometric measures pre and post intervention were analysed.

Results: Between 2010 and 2014, 62 adolescents commenced the DBT-A program and 49 (79%) completed all components. ED presentations reduced from 81 (1.31 per patient) in the year prior to DBT-A to 30 (0.48 per patient) in the year after finishing DBT-A. Days admitted to hospital went down from 159 (2.56 days per patient) to 36 (0.58 days per patient). There was a consistent pattern of statistically significant improvements (ps < 0.01) in all measures collected. Total scores dropped from 9% (anxiety; MASC) to 33% (Beck Depression Inventory-II) from pre to post intervention. The number of critical items endorsed in the Suicidal Ideation Questionnaire reduced by 69% during treatment.

Conclusions: Significant improvements were observed during the intervention. This went hand in hand with a significant improvement in psychometric measures. Interestingly, there is no statistical association between the two, which warrants further investigation.

34. Same Day Discharge Post Radial Approach PCI: A New Practice and a Pilot Study at Canberra Hospital

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Introduction: A review of the literature indicates same day discharge safety post radial approach PCI following a collaborative approach by clinicians. A same day discharge post radial approach PCI was established at Canberra Hospital (TCH) in 2014 and put into a trial in 2015.

Objective: The pilot study sought to assess the saftey of same day discharge in elective patients undergoing radial approach PCI who were discharged 6 hours post procedure. The potential benefits of this new practice for selected patients are earlier discharge and greater comfort.

Methods: A pilot study is being conducted reporting outcomes of patients discharged on the same day post radial approach PCI using a questionnaire specifically designed for this study. Patients are contacted on the following day after discharge to answer 6 questions regarding complications, pain, sleep quality, level of comfort and preferred access site for future procedures. Demographic data are also included in the study

Conclusion: When appropriately selected, with strict adherence to the set discharge program, same day discharge post radial approach PCI is safe. In addition, TCH may be able to improve resource utilization.

35. Enabling Point of Use Capture of Health Devices, Consumables and Implantables

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Introduction: The uses of Global Trade Item Numbers (GTINs) on retail grocery items supports efficient supply chain management from the supplier manufacture to the point of sale. In health the uptake and use of GTINs on health devices, consumables and implantables the use of GTINs outside of supply warehouses has not been so pervasive. This study examined the consumables used by the Angiosuite during the period July 2013 to July 2014 that included 500 products with a value of $500,000. The key objectives of the study were; to determine the proportion of items that have a GTIN barcode applied; the quality of the data in the Product Inventory and Control System (PICS); to assess the data requirements of ACT Health used to manage the supply and procurement of medical supplies; and, to estimate impacts on increased revenue through the improved collection consumable and implant usage data in angiosuite procedure records.

Methods: Product usage data at the point of care was captured during medical procedures in the Angiosuite and linked to the patient medical record number for later analysis.

Results: 16,375 scans were made over the period of the study and it was established that 262 products (52%) had a GTIN applied from the manufacturer. 141 Records were identified where no point of use GTIN was matched in either the PICS database or the National Product Catalogue. Only 85 products did not have a GTIN attached to the product. Subsequent to the study a demonstrable improvement in the revenue from compensable and private patients undergoing angiosuite procedures was noted but more work is required to demonstrate a direct link to this study.

Conclusion: The study has demonstrated that the automated capture of health devices, consumables and implantables identification is relatively simple to incorporate into clinical workflows and practices enabling capabilities for improvements to activity based costing of medical procedures and improved costed recovery through billing private and compensable patient episodes of care.

36. Treating Chronic Low Back Pain with Pilates Exercise: A Clinical Practice Guideline

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Introduction: Pilates exercise is recommended to people with chronic low back pain because of its emphasis on activating stabilising muscles of the lower back. Its efficacy, though, is debated, and it is unclear how it is best prescribed.

Methods: A guideline was developed from a systematic review of research evidence. Recommendations were generated by the synthesis of findings from papers representing the highest level and quality of evidence available. Recommendations were graded using a modified Grading of Recommendations Assessment, Development, and Evaluation system. The guideline was externally reviewed and adjusted prior to completion.

Results: Recommendations were developed from 33 papers. Pilates exercise may offer superior benefits to usual care and physical activity (Grade C), and at least equivalent benefits when compared to other treatments (Grade B). Supervised and individualised sessions for 30-60 minutes, twice per week for 3-6 months are recommended, along with use of specialised equipment and home exercises (Grade F). People may benefit if they have poor body awareness and maladaptive motor patterns (Grade F).

Conclusion: This guideline provides a weak recommendation for using Pilates exercise to treat people with chronic low back pain. Recommendations should be cautiously applied due to research being limited in amount and quality.

37. Allied Health's Role in Primary Prevention of Cardiovascular Disease: A Feasibility Study

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Introduction: The objective of this study was to investigate the role and feasibility of allied health professionals in the primary prevention of cardiovascular disease (CVD). The National Heart Foundation (NHF) recommends absolute CVD risk calculation to occur in persons 45 years and over, to minimize CVD events and maximize cardiovascular health. Recently promising evidence has suggested allied health professionals may be beneficial in assessing CVD risk1.

Methods: Three physiotherapy students ran the Heart Health Clinic over one day at the University of Canberra. Patient particulars were collected, as well as, blood lipid, blood pressure and waist circumference measurements. Results were entered into the Australian absolute CVD risk calculator (www.cvdcheck.org.au). A copy of results was provided to clients, along with a letter to their general practitioner and NHF endorsed materials on CVD and cardiovascular health.

Results: Key results include:

- 4 out of 25 participants (16%) were identified at a moderate/high risk,
- Overall feedback was positive,
- No adverse events occurred.

Conclusion: Results from the trial indicate, allied health professionals may be beneficial as an adjunct in the primary prevention of CVD by running risk-screening assessments. Involving allied health professionals in CVD risk screening may combat barriers, such as time, accessibility and cost. Further research should be conducted within different socioeconomic groups, to assess suitability, safety and further corroborate results.

38. A Prospective Comparative Study of Staff and Parent Activity in Open Plan or Two Cot NICU

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Introduction: In 2012 the Canberra NICU relocated from an open plan (OP) to a two cot (TC) design. A prospective comparative study was undertaken to evaluate the impact of TC design on staff and parent activity.

Method: To assess staff activity observational studies were completed over a 180 minute period on 15 nurses and 60 parent diaries were completed in both NICUs. One way ANOVA was used to generate group comparisons. A p-value of < 0.05 was considered statistically significant. Results are reported in minutes.

Results: Parents spend significantly more time with their babies in the TC design compared to OP (329±17,229±18, $p<0.001$, respectively) with significant increases in time engaged in Kangaroo Care (70±12, 10±5, $p<0.001$), expressing breast milk (61±8, 20±4, $p<0.001$) and caring for their baby (50±4, 29±4, $p<0.001$). The TC design did not reduce the time spent by staff providing direct care to neonates (96±26, 95±27, $p=0.09$). Significant increases in staff activity in TC included: communication with other staff (38±18, 21±19, $p=0.018$) and paperwork (27±11, 16±14, $p=0.026$).

Conclusion: TC design provides an environment that enables parents to spend more time engaged in caring and bonding with their baby. The new design does not significantly reduce the time staff spend providing direct neonatal care, with main impact related to communication and paperwork.

39. Can We See the Future For Intensive Care Patients? Reliability and Utility of the Acute Care Index of Function in ICU

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Introduction: Accurate and reliable measures of physical function are required to describe the recovery trajectory of ICU survivors. The objectives of this study were to establish the inter-rater reliability of the Acute Care Index of Function (ACIF) tool in a heterogeneous intensive care unit (ICU) population, describe its relationship to the ICU Mobility Scale (IMS) and determine whether ACIF scores have predictive utility.

Methods: Prospective observational study in a tertiary ICU. ACIF was recorded independently by 2 physiotherapists across a convenience sample of 100 assessments. ACIF and IMS scores were recorded concurrently, and ACIF was also recorded at ICU discharge.

Results: Inter-rater reliability of total ACIF scores was very strong (ICC = 0.94), and ACIF scores strongly correlated with IMS scores (Pearson's r = 0.84, p = 0.01). ACIF at ICU discharge had strong discrimination for predicting discharge destination (area under ROC = 0.79, 95% CI 0.64 – 0.89) with an ACIF score of < 0.40 predicting hospital discharge to a destination other than home (sensitivity 0.78).

Conclusion: The ACIF has excellent inter-rater reliability in ICU patients and is strongly correlated with the IMS. ACIF scores at ICU discharge predict the likelihood of discharge home compared to another facility.

40. Evidence of Effectiveness of a Fracture Liaison Service to Reduce Re-Fracture Rates

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Introduction: Fracture liaison services (FLS) actively identify patients with minimal trauma fractures (MTF). A number of reviews have shown FLS increase investigation and treatment of osteoporosis; very few have looked at re-fracture outcomes.

Methods: All patients aged ≥ 50 years, presenting with a MTF July-Dec 2010, in the Emergency Department of a tertiary hospital with and without a FLS were included. Baseline characteristics and MTFs in a 3 year follow up period were recorded. Mortality was confirmed through New South Wales Birth and Death registry.

Results: Over 3 years, 63/515 (12%) patients at the FLS hospital and 70/416 (17%) patients at the non-FLS hospital had a MTF re-fracture. There was a ~30% reduction in rate of any re-fracture at the FLS hospital (HR 0.67, CI 0.47-0.95, p-value 0.025) and a ~40% reduction in major re-fractures (hip, spine, femur, pelvis or humorus) (HR 0.59, CI 0.39-0.90, p-value 0.013).

Conclusion: During the study period there was a ~30% reduction in any re-fractures and a ~40% reduction in major re-fractures at the FLS hospital compared with a similar non-FLS hospital.

41. "Be A Dad, Don't Be Mum's Assistant": A Critical Perspective of Fathering Discourses

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Introduction: Research suggests children's health and wellbeing are positively influenced by stronger father engagement. Numerous social and policy contexts impact upon fathers' engagement. We critique popular discourses around fathering, including predominant models of fathers' engagement that focus on direct and indirect care.

Method: Using data from two discrete research studies – the first conducted with fathers predominantly resident in the UK who have taken on a primary caregiving role for their children, and the second with fathers of young children living in Australia – we explore how particular discourses of fathering influence ways of engaging with children.

Results: We suggest that dominant discourses of fathering restrict the ways in which fathers engage with their children. These discourses may in turn normalise non-engagement with children, with implications for the health and wellbeing of children.

Conclusion: Given the changing policy landscape on fathering engagement, and the suggested impact on family health and wellbeing, a more critical reading of key discourses is needed.

42. iFracture: An Intelligent Fracture Database

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Introduction: Information technology (IT) is essential to organisational efficiency in healthcare. iFracture is an intelligent fracture database designed to support continuous clinical practice improvement in orthopaedic trauma management. We present the latest iteration of this complex project which represents a quantum leap in healthcare IT design.

Method: The design of iFracture is based on a complex methodological ensemble. It applies a suit of scientific-based, cross-disciplinary methodologies such as 1) information system design science methodology, 2) scientific methodology, 3) artificial intelligence, 4) industry strength software engineering methodologies, and 4) new generation internet technologies to the fields of Orthopaedic domain.

Results: The Dr-Entry sub-system of iFracture has been used in Canberra Hospital since August 2014. Feedback survey was conducted on Nov 2014. Based on formal and informal feedbacks, a series of new-version releases are taking place. The most recent update is the implementation of the mobile version of iFracture.

Conclusions: iFracture aims to provide a new generation system that effectively addresses the existing gap in the healthcare, specifically Orthopaedics. It offers a scientific-based, intelligent and optimised framework for a continuous patient care improvement journey. It seeks to bring clinical research, new knowledge discovery, continuous quality improvement, and evidence-based medicine into everyday clinical practice.

43. Mechanical Low Back Pain and Imaging

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Introduction: Mechanical lower back pain (LBP) is a common disorder affecting 80% of Australians at some point in their lives. Authorities caution against ordering spinal imaging unless clinical "red flags" are present indicating potentially serious underlying disease (e.g. weight loss, fever, trauma, neurological signs). This study reviews the incidence of spinal imaging for patients with mechanical LBP.

Methods: We conducted a retrospective chart review of patients admitted to Canberra Hospital (TCH) in 2014 with a discharge diagnosis of mechanical LBP. We collated demographic and clinical information, particularly related to "red flags" and imaging tests ordered.

Results: 227 patients were admitted with mechanical LBP to TCH in 2014: Emergency Medical Unit (73.1%), Rheumatology (18.0%), General Medicine (8.3%). In a preliminary analysis of the first 22 patients in this series, 12/22 patients (55.5%) had no red flag documented. Nine (75%) of these 12 patients were ordered spinal imaging: X-ray (100%); CT (33%), MRI (16%). No significant abnormality was detected on imaging in patients without red flags.

Conclusion: Our preliminary analysis shows a high proportion of patients admitted with mechanical LBP without features suggesting serious underlying disease had spinal imaging ordered. A hospital based protocol standardising management of these patients may be warranted.

44. Anatomical Variations of the Levator Scapulae Muscle – a MR Imaging Study

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Introduction: Anatomical variations of the levator scapulae muscle are scarcely described in the current literature. However, knowledge of levator scapulae morphology is important in radiology and head and neck surgery. Furthermore, variations of this muscle may give rise to myofascial pain and can have management implications in patients with cervical dystonia. The objective of this study was to explore the anatomical variations of the levator scapulae.

Methods: 37 participants were recruited and each subject's cervical spine was scanned using a T1-weighted 3 Tesla MR-scanner. The levator scapulae was identified attaching between the C1-C4 transverse processes and the scapula superior angle and the variations present were recorded.

Results: Anatomical variations were identified in 16 subjects. In 10 subjects, the levator scapulae had an accessory attachment unilaterally to either the serratus anterior or serratus posterior superior or to the first/second rib. 6 subjects had bilateral accessory attachments to either the serratus anterior, serratus posterior superior, or both.

Conclusion: Considerable variations in the levator scapulae were evident in this cohort. This study's findings have implications for the interpretation of cervical spine MRI in radiology. Also, there are further implications in head and neck surgery, and the management of myofascial neck pain and cervical dystonia.

45. Dynamic Pelvic Tilt: Can it be Measured with Accelerometry?

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Introduction: The position of the acetabular component is an important risk factor for dislocation after total hip replacement. Because pelvic tilt changes the orientation of the acetabulum, measurement of pelvic tilt in the patient in vivo should be an important factor in pre-surgical planning. This study evaluated the validity of a skin-mounted accelerometer dynamic pelvic tilt measurement.

Methods: An accelerometer customized to measure tilt relative to gravity was validated in two ways. First, accelerometer measurements were compared against known tilt on a pelvic model. Five repeated sets of measurements were made in19 positions to assess accuracy and repeatability. Second, a cadaveric section was x-rayed at five angles of tilt to assess agreement between accelerometric measurements of tilt compared to measurements of sacral-slope from lateral x-ray.

Results: When compared to the pelvic model the maximum absolute error of the accelerometer was 5.4^0. The relative measurements of pelvic tilt from the accelerometer agreed with sacral slope measurements to within two degrees.

Conclusion: The use of an accelerometer mounted over the sacrum, reliably measured relative pelvic tilt within a clinically acceptable degree of accuracy. This method could therefore be used as a pre-surgical screening tool to identify patients with hyper-mobile pelvises' who may need alternative prosthetic choices.

46. The Prevalence of Musculoskeletal Injury in Australian Paddle Sports

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Introduction: Kayak racing is evolving with the introduction of open ocean ski racing and stand-up paddle boards (SUP). Musculoskeletal Injury surveys have been conducted for ultra-marathon events but not for other racing formats. The aim of this study was to compare the incidence of musculoskeletal injury and influential factors between paddling disciplines.

Methods: Competitors from Australian races between October 2014 and April 2015 were surveyed. Prior to each race, competitors completed a questionnaire investigating athlete morphology, equipment and its set up, training loads, training environment and paddling related injuries over the past five years.

Results: Of the 583 competitors surveyed the most frequent injuries were shoulder (31%) and low back (23.5%).Prevalence of shoulder injury was highest in racing-kayak (K1) paddlers (40.5%). Lumbar spine injury was highest in SUP (33.3%). There was an association between low back and shoulder injuries (OR=2.2 [1.5-3.2]; p<0001). The average training distance per week was highest for K1 (60km).

Discussion: The prevalence of shoulder injury in paddling sports is high, especially in K1 competitors who reported high training distances. There were no differences between ski and K1 competitors in terms of injury profile. SUP paddlers were more at risk of lumbar spine injury.

47. Supercable Fatigue Testing for Simulated Femoral Fracture

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Introduction: Periprosthetic fractures are often complicated by poor bone quality which can compromise plate and screw fixation. Steel-cerclage cables can provide additional support but are prone to fretting and fraying. Supercables were designed to overcome these problems. In this study fatigue testing was used to compare supercables with screws and steel cables.

Method: Composite femur samples with simulated mid-shaft fracture were repaired with screws, Supercables, and stainless-steel cerclage-cables. All were subjected to 10,000 cycles of compression-compression fatigue testing. The deformation of the full femur, the vertical and horizontal movements between the fracture surfaces and the dislocation of the cables from their initial positions were measured at intervals of 1000 cycles.

Results: Screw fixation was the most stable with least displacement (0.56mm after 10000cycles compared to 1.00 for steel cables and 1.30 for Supercables). The Supercable fixation demonstrated 'bedding in' with a rate of 1.08mm/1000 cycles during bedding in and 0.023mm/1000 cycles after. Supercables slipped less than steel cables. Scoring was evident only on bones fixed with steel cables.

Conclusions: Although the elasticity of the Supercables allowed greater movement, after bedding in the movement at the fracture site was consistent with micro-movement recommended for osteosynthesis and enhanced fracture repair. Cable slippage was also reduced.

48. Can a Stroke Unit be Both Life Saving and Cost Saving? – Calvary Stroke Study

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Introduction: Stroke is one of the leading causes of disability and mortality. There is robust evidence to show that a stroke unit improves long term clinical outcomes. Literature on the cost analysis of a stroke unit is lacking. The objective of this study was to assess the performance and analyse the cost effectiveness of a stroke unit.

Methods: We conducted an observational study comparing the acute stroke patient care in a 6-month period before and after the establishment of an acute stroke unit at Calvary Hospital in 2013-2014.

Results: In the post stroke unit period there was significant improvement in key indicators of stroke care. Door to computed tomography (CT) time was faster (73 vs. 128 minutes, p=0.016) resulting in more thrombolytic treatment. Adherence to guideline investigations was higher. The percentage of best medical therapy improved and more timely allied health input was noted. The mortality on discharge was lower in the post stroke unit group (9.3% vs. 13.8%). Length of stay was significantly reduced by 7.9 days (Confidence Interval 4.1-11.6).

Conclusion: This study has confirmed that the establishment of a stroke unit not only improves treatment outcome but also shortens hospital stay, thereby being cost effective and cost saving.

49. Cinacalcet Associated Acute Potassium Rise Associated With Hypocalcaemia After Parathyroidectomy For Renal Hyperparathyroidism

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Introduction: An impression that patients with prior treatment with cinacalcet and undergoing parathyoridectomy for renal hyperparathyroidism had greater acute hyperkalaemia and hypocalcaemia intraoperatively/postoperatively day 0 prompted this study.

Methods: A single institution study was performed between January 1993 and September 2014. Seventeen patients were on cinacalcet prior to parathyroidectomy, whilst 105 patients were controls. Perioperative biochemical and histological variables were compared, in particular, intraoperative and postoperative potassium and corrected calcium.

Results: 82.35% of the cinacalcet group recorded an intraoperative or postoperative day 0 potassium value ≥6.00mmol/L compared to 1.52% in the controls (P<0.001). 76.47% of cinacalcet patients had a potassium rise of ≥1mmol/L from preoperative value compared to 10.61% (P<0.001). This was correlated with greater median percentage rise of potassium from preoperative value in the cinacalcet group (36.88% vs. 11.77%, P<0.001). Cinacalcet patients also had greater degree of hypocalcaemia at postoperative day 0 (2.05 ± 0.27 vs. 2.31 ± 0.28 mmol/L, (P< 0.01)) and greater need for IV calcium (94.12% vs. 43.81%, (P < 0.001)) compared to controls.

Conclusions: This is the first report of acute rise in potassium seen in the intraoperative/postoperative day 0 periods following parathyroidecotmy in patients on cinacalcet for renal hyperparathyroidism. This was correlated with greater degree of hypocalcaemia and greater need for intravenous calcium in the study group. The authors propose that intracellular potassium may mobilize out of cells due to hypocalcaemia to maintain extracellular electrical neutrality. Clinicians should be alert to biochemical anomalies to prevent morbidity and mortality.

50. Cholesterol in High Fat Diet Contributes to Accelerated Liver Carcinogenesis

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Introduction: Obesity and non-alcoholic fatty liver disease are risk factors for hepatocellular carcinoma (HCC). While dietary and genetic obesity have been associated with accelerated HCC experimentally, the roles of macronutrients remain unclear. Aim: To determine the effects of dietary sugar, saturated-fat and cholesterol on hepatocarcinogenesis.

Methods: Two-week-old C57BL/6J male mice injected diethylnitrosamine (5mg/kg, i.p.) were fed one of the four diets: chow (NC), high sucrose (HS), high saturated-fat (HSF), or combined HS/HSF/cholesterol (Atherogenic, Ath) from weeks 6-32. HCCs and surrounding dysplastic liver were analysed.

Results: At 32wks, 90% of Ath-fed mice developed HCC, in contrast to 60% and 80% in animals fed HS and HSF diets respectively. Ath-fed mice developed non-alcoholic steatohepatitis (NASH), whilst HSF-fed and HS-fed mice showed hepatic simple steatosis. Ath-fed mice exhibited liver oxidant stress evident by increased Nrf1, sod3 and phosphorylated c-Jun. Proliferative markers, PCNA, cyclin D1, cyclin E/cdk2 were enhanced in HCCs and dysplastic liver in Ath-fed mice. Whilst p53 was markedly induced in HCCs from Ath and HSF-fed mice, expression of p21 remained unaltered.

Conclusion: High dietary cholesterol intake with SF accelerates hepatocarcinogenesis to a greater extent than HSF or HS alone. Cholesterol-related NASH induces oxidative stress and increases proliferative drive in hepatocytes.

51. Trisomy of Chromosome 7 and Cpg Island Methylation in HOXA10 are Associated with Aberrant Expression of a Stem Cell Related HOX Gene Signature in Glioblastoma

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Introduction: We previously reported a stem cell related HOX gene signature associated with resistance to chemo-radiotherapy (TMZ/RT-TMZ) in glioblastoma. However, underlying mechanisms triggering over expression remain mostly elusive. Interestingly, HOX genes are neither involved in the developing brain, nor expressed in normal brain, suggestive of an acquired gene expression signature during gliomagenesis.

Methods: We combined gene expression, DNA methylation, copy-number variation and clinical data to perform an integrative analysis of more than 150 clinical GBM samples.

Results: We observed more pronounced DNA methylation across the HOXA locus on chromosome 7 as compared to non-tumoral brain (Human methylation 450K BeadChip Illumina; 59 glioblastoma, 5 non-tumoral brain samples), which was highly correlated with expression of the HOX signature. We identified differentially methylated CpGs located in the promoter region of the HOXA10 locus exerting the strongest mean negative correlation between methylation and expression of the whole HOX-signature. The observed correlation was validated in an independent data-set from TCGA.

Conclusion: Taken together, we hypothesize that over expression of the stem-cell related HOX signature is triggered by gain of trisomy 7 and escape from compensatory DNA methylation at positions controlling the effect of enhanced gene dose on expression.

52. Invasive Mould Epidemiology in an Australian Haematology Unit 2010-2014

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Introduction: The Australian epidemiology of invasive mould infections in the haematology setting is unknown. This information may influence prophylactic choices in Australia and inform baseline incidence rates that are specific to the Australian setting.

The aim of this study was to determine the epidemiology of invasive mould infections as defined by the modified European Organisation for Research and Treatment of Cancer/Mycoses Study Group

(EORTC/MSG) criteria in an Australian haematology (non-allograft) unit between 2010 and 2014

Methods: All haematology patients prescribed therapeutic antifungals were assessed for causative mould species and type of diagnosis of invasive mould infection. EORTC/MSG guidelines were used to classify cases into proven, probable or possible fungal infections. Cases were stratified by a diagnosis of acute myeloid leukemia, acute lymphocytic leukaemia and other lymphoproliferative malignancies.

Results: 64.7% of total cases had Aspergillus species implicated as the causative organism. The remainder constituted non-Aspergillus species, with the Mucor group implicated in 23.5% of all cases. 83% of patients with an invasive mould infection were on prophylaxis and 21% of these patients had non-Aspergillus species implicated as the causative organism.

Conclusion: High rates of non-Aspergillus infections were identified despite prophylaxis and many are traditionally resistant to posaconazole. It is important to study local epidemiological patterns to ensure local choices for anti-fungal prophylaxis and empiric therapy cover the expected pathogens.

53. Delayed Passage of Meconium is Associated with Chronic Constipation at All Gestational Ages

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Introduction: This paper aimed to describe the normal timing of the first passage of meconium in neonates across a range of gestational ages. Secondly, this paper aimed to retrospectively compare the time to pass meconium in children with chronic constipation versus the normal population. This paper hypothesised that children with chronic constipation would exhibit delays in passage of meconium compared with the normal population.

Methods: Data was collected via retrospective chart review. To describe the normal population, data was collected for all births at Canberra Hospital between 2000-2002. To describe the constipation group, similar data was collected for children with a diagnosis of chronic constipation from Canberra Hospital constipation clinic.

Results: A total of 669 charts were included in the control group, compared with 110 for the constipation group. Gestational ages ranged from 24 weeks to 42 weeks. Time to first meconium was longer in earlier gestational ages ($p<0.05$), lower birth weights. Children with chronic constipation were longer to pass meconium across all gestational ages. Comparing the constipation group with the normal population, children who went on to develop chronic constipation experienced significantly longer times to first meconium when born at 37 weeks or older ($p<0.005$), however preterm babies did not reach statistical significance.

Conclusion: Meconium passage is more delayed with earlier gestational ages. Children who experience chronic constipation have longer delays to passage of first meconium, which suggests that they may have an inborn error present at birth. Our next challenge is to understand the mechanism of this inheritance.

54. Kidney Disease Impairs Follicular Helper T Cell Activation after Vaccination

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Introduction: Chronic kidney disease (CKD) is associated with an increased risk of hepatitis B infection and impaired seroconversion to hepatitis B vaccination (HBV). Studies examining augmented vaccine schedules to enhance seroconversion have so far been inconclusive. Furthermore, the defects underlying impaired immunity in CKD have not yet been identified.

Methods: We studied serological and cellular responses to recombinant HBV in patients with CKD to identify a defect in vaccine-induced cellular responses that could account for impaired seroconversion in CKD and clarify the effects of an augmented vaccine dose schedule. We compared these results with responses to seasonal influenza vaccination.

Results: We found a clear benefit in rates and magnitude of seroconversion following an augmented 40mg dose schedule in CKD, which permitted comparison of responders and non-responders. Serological non-responders in CKD exhibited reduction in CXCR3+CCR6- cells as a proportion of CXCR5+ memory T cells at baseline. Unlike influenza vaccination, HBV vaccination elicited a poor plasmablast response. Both vaccinations induced activation within the CXCR3+CCR6- CCR7- subset of circulating T follicular helper cells, although this response was impaired in CKD after hepatitis B vaccine.

Conclusion: Our data suggest that CKD confers a specific T cell defect that contributes to the impaired seroconversion to HBV.

55. Docking the B0AT: Identification of Novel Amino Acid Transport Inhibitors

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Introduction: Mice lacking B0AT1, an intestinal neutral amino acid uptake transporter, were found to be resilient to obesity and type II diabetes (T2D), while retaining high insulin sensitivity and a normal glucose metabolism. Accordingly, pharmacological inhibition of B0AT1 is expected to reproduce this metabolic phenotype, and may ultimately provide a route to treating T2D.

Methods: Here, we used computational docking studies in the screening of approximately 14,000 compounds to identify potential inhibitors of B0AT1. Of these, 78 compounds were validated on a cell-line over-expressing human B0AT1 using fluorescence and radio-labelled uptake assays. In addition, we used molecular dynamics (MD) simulations to evaluate docking as a virtual screening tool.

Results: Of the 78 tested compounds, we identified 27 novel inhibitors of B0AT1, the most potent of which had an IC50 of 60μM. Our MD simulations suggest that due to the inability of docking programs to treat the receptor protein as a realistic flexible macromolecule, and their inability to account for access routes to a binding site, false positive binders can be identified.

Conclusion: Docking performs significantly better than random or manual compound selection based on substrate similarity, making it valuable in the discovery of novel targeted inhibitors. We anticipate inhibitors discovered here to be a novel foundation for the treatment of T2D.

56. Pyrosequencing Assay to Measure DNA Methylation in Clinical Samples of Breast Cancer

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Introduction: Long interspersed nuclear element-1 or LINE-1 is a mobile genetic element capable of making copies of itself and integrating into random sites throughout the genome via retrotransposition. It can modify the human genome through insertions, inversions, deletions and recombination events. Consequently, these active LINE-1s can potentially induce genomic instability by creating DNA double-stranded breaks and chromosomal rearrangements. Therefore, LINE-1 promoter is heavily methylated in normal cells to repress LINE-1 activity. Conversely, lower methylation levels of LINE-1 have been observed in cancer cells.

This study explores LINE-1 promoter DNA methylation in clinical samples of various stages of breast cancer and its association with clinicopathological characteristics of patients.

Methods: Pyrosequencing assay of bisulphite-converted DNA isolated from formalin-fixed paraffin-embedded samples of breast tissues was performed to measure DNA methylation levels across seven CpG sites within the LINE-1 promoter.

Results: Differences in LINE-1 DNA methylation level between normal and tumour samples are statistically significant ($p<0.05$). LINE-1 promoter methylation level is not correlated with its protein expression. Hypomethylation of LINE-1 promoter is associated with better survival outcome among invasive breast cancer patients ($p=0.029$).

Conclusion: Contradictory findings between the present study and previous research suggest that various mechanisms may exist to regulate LINE-1 expression.

57. MCC950 A Selective Inhibitor of NLRP3 Inflammasome Prevents Inflammatory Recruitment and Fibrotic Progression in Experimental Non-Alcoholic Steatohepatitis

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Introduction: NOD-like receptor protein (NLRP)-3 inflammasome activation is central to liver inflammation, injury and fibrosis in non-alcoholic steatohepatitis (NASH), for which there is no approved therapy. We reported MCC950 as a selective NLRP3 inhibitor [Nat Med 2015; 21:248]. Here we tested whether MCC950 reduces hepatocellular injury, inflammation and fibrosis in murine NASH.

Methods: Alms1 mutated (foz/foz) mice fed 0.2%-cholesterol atherogenic diet for 16weeks to induce obesity, diabetes and NASH [J Lipid Res. 2015; 56:277], then administered MCC950 (peri-oral: 20mg/kg/day) until 24weeks (n=10-13/group). To dissect effect of MCC950 in cholesterol lipotoxicity, IL-1 release in bone-marrow macrophages (BMM) was determined in response to cholesterol crystal exposure.

Results: In vehicle-treated foz/foz mice, serum ALT rose (572±60U/L) at 24week, and declined (309±54U/L, $p<0.01$) in MCC950-treated foz/foz mice. Livers showed severe NASH in vehicle group, whereas with MCC950 no inflammation was perceptible. Liver IL-1 caspase-1 activation and fibrosis were diminished with MCC950 treatment. Cholesterol crystals released IL-1 from (BMM) and Kupffer cells in dose-dependent manner; MCC950 (10nM) abrogated such release.

Conclusions: MCC950, a potent and selective NLRP3 inflammasome inhibitor, prevents inflammation, injury and fibrosis in experimental NASH. These effects could be explained by abrogation of cholesterol crystal-induced NLRP3 activation. Targeting NLRP3 is a logical new direction in NASH pharmacotherapy

58. Obeticholic Acid Improves Adipose/Metabolic Dysfunction and Liver Histology in Mouse Models of Non-alcoholic Fatty Liver Disease

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Introduction: The farnesoid X receptor (FXR) agonist obeticholic acid (OCA) was recently shown to improve NAFLD activity score in patients, but the protective mechanism remains unresolved due to the complex associations between fatty liver, adipose function and glucose metabolism.

Methods: We studied the effects of OCA on multiple adipose depots, metabolic indices and liver histology in mouse models of NAFLD.

Results: Atherogenic diet (23% fat, 0.2% cholesterol)-fed wildtype mice develop mild NASH whereas foz/foz (appetite-dysregulated, obese/diabetic) mice develop severe NASH. As in humans in FLINT study, OCA reduced body weight in wildtype, but not in foz/foz mice. Post-prandial blood glucose was increased with atherogenic feeding and foz/foz mutation; OCA corrected this effect in wildtype mice. Liver mass and steatosis were significantly improved in OCA-treated wildtype mice, but partially in foz/foz mice. Adipose morphometry were improved with OCA treatment in wildtype (partially in foz/foz) mice. OCA caused a macrophage switch to anti-inflammatory phenotype in wildtype mice adipose stromal vascular fractions, but pro-inflammatory macrophages remained abundant in foz/foz mice.

Conclusion: In conclusion, OCA significantly improved glucose intolerance, visceral adiposity and liver histology in wildtype mice fed a NAFLD/NASH-generating diet, but in foz/foz mice with severer metabolic phenotype, OCA mildly reversed NASH pathology.

59. A Framework for Numerical Simulation of Bone Remodelling at Cellular Level

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Introduction: Numerical simulation of bone remodelling is expected to help medical research to predict long-term disease and provide theoretical foundation for continuously developed physical therapy such as electromagnetic bone healing device. However, difficulties in transformation from biological knowledge to mathematical modelling prevent the development of numerical simulation of bone remodelling process.

Methods: Co-culture of osteoblasts (OBs) and osteoclasts (OCs); flow cytometry; finite-difference time-domain.

Results: The built framework is capable of explaining cellular behaviour of OBs and OCs after pulsed electromagnetic fields (PEMFs) treatment. Based on this framework, we can achieve a quick numerical simulation to predict the change of OBs and OCs coupling factors with spatial and temporal variables.

Conclusion: We propose a framework from the point view of physics to explain the basic coupling mechanism of OBs and OCs in bone remodelling and to establish a linkage between biological knowledge in bone remodelling and numerical simulation.

60. Autosomal Dominant B Cell Deficiency with Alopecia Due to a Mutation in NFKB2 that Results in Unprocessable P100

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Most genetic defects that arrest B cell development in the bone marrow present early in life with agammaglobulinemia, while incomplete antibody deficiency is usually associated with circulating B cells. We established a large national cohort of patients with primary antibody deficiency and aimed to characterise novel defects in order to obtain a better understanding of the signals required for human B cell development, maintenance and differentiation.

Here, we describe an individual with complete B cell deficiency. Two of her three offspring exhibited a similar B cell phenotype. All exhibited hypogammaglobulinaemia and alopecia areata. We identified a novel heterozygous mutation in NFKB2 (D865G) by whole exome sequencing of the proband, and in each affected individual. p100 encoded by NFKB2D865G is poorly processed in vitro and in the proband after CD40L stimulation. We found this to be due to a failure of p100 phosphorylation. Remarkably unprocessable p100 exhibits IkB like activity, which serves to sequester p65 in the cytoplasm. In other words, the immune deficiency appears to arise from disruption of both canonical and non-canonical NF-kB pathways.

The cellular phenotype is remarkable for discordance between the severity of immunoglobulin and B cells deficiencies, which appears to be accounted for by differences in signals required for B cell survival, and terminal differentiation to plasmablasts. These findings could be informative for novel therapeutic approaches to B cell mediated diseases, as well as understanding this new form of immunodeficiency.

61. Role of DOCK8 in Thymic TREG Development

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Introduction: DOCK8 immune deficiency is a rare and devastating primary immunodeficiency characterised by susceptibility to cutaneous viral infections, recurrent sinopulmonary infections, eczema and allergic disease. There are conflicting reports as to whether there is a numerical deficit in circulating regulatory T cells (TREG) in patients with DOCK8 immunodeficiency. We therefore wanted to investigate this further in a mouse model of the disease.

Methods: TREG cells in spleen, blood and thymus of wildtype and DOCK8 mutant mice were identified by flow cytometry. In vitro cell co-culture was used to determine the suppressive activity of these cells.

Results: In mice, loss of DOCK8 does not affect the percentage of CD4 T cells that are FoxP3 positive in the blood and it appears that these cells have normal suppressor activity in in vitro assays. In mice, the predominant defect seen is a cell intrinsic decrease of FoxP3 positive TREG in the thymus and this defect becomes apparent in the CD4 single positive population prior to the expression of the FoxP3 transcription factor, using novel markers tracking TREG development in the thymus.

Conclusion: DOCK8 deficiency has differential effects on the TREG in mice and humans and this may be responsible for the differential manifestation of allergic disease.

62. Corpus Callosum Morphometry and Regional Cortical Thickness in the Alzheimer's Disease Neuroimaging Initiative

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Introduction: We evaluated associations between corpus callosum (CC) morphometry and cortical gray matter thickness in older adults.

Methods: We analyzed 834 individuals from the Alzheimer's Disease Neuroimaging Initiative (ADNI) (age: 75 +/- 7 years; n=479 women, n=355 men; education: 15.5 +/- 3.0 years; n=230 controls, n=406 with mild cognitive impairment (MCI), n=198 AD). Participants received a high-resolution1.5T, T1-weighted structural MRI brain scan.

We calculated mean cortical thickness for brain lobes (frontal, occipital, parietal, temporal), and the cingulate gyrus using Freesurfer software.

As in Figure 1, we delineated the edges of the mid-sagittal CC in 100 equidistant segments and segment length was measured as a numerical representation of CC morphometry. For each lobar region, we tested the association of mean cortical thickness with CC morphometry. Correction for multiple comparisons was performed with false discovery rate (FDR). Only significant results are presented.

Results: As in Figure 2, Mid-sagittal CC thickness followed a gradient between groups such that controls>MCI>AD.

As in Figure 3, frontal gray matter thickness was significantly associated with the anterior-mid regions of the CC for AD and the majority of the CC in MCI.

Conclusions: These results demonstrate that CC and cortical measures are associated and generally follow the pattern of known anatomical connections.

63. The Effects of Direct Oral Anticoagulants in the Laboratory

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Introduction: The direct oral anticoagulants (DOAC) do not need routine monitoring. However there are situations where the levels of these drugs may need to be measured and their effect on coagulation tests known. The study aimed to assess the effects of dabigatran (direct thrombin inhibitor) and rivaroxaban (direct factor Xa inhibitor) on routine and specialised coagulation tests.

Method: Volunteers taking dabigatran or rivaroxaban were recruited. Coagulation tests performed included prothrombin time (PT), activated partial thromboplastin time (APTT), fibrinogen, thrombin clotting time (TCT), factor VIII, antithrombin, protein C, protein S and dilute Russell's viper venom time (dRVVT).

Results: On dabigatran drug levels varied from 0 to 368ng/mL. The PT ranged from 12 to 22 seconds (mean 15sec, P<0.0001), APTT 24 – 92 seconds (52sec, P<0.0001), TCT 18 – >250sec (212sec, P<0.0001). On rivaroxaban drug levels varied from 0 to 484ng/mL. The PT ranged from 11 to 30 sec (mean 17sec, P<0.0001), APTT 28 – 52 sec (38sec, P<0.0001).), antithrombin 54-158% (118%, P= 0.0308).

Factor VIII and dRVVT showed significant differences with both drugs. Protein C and protein S levels showed no significant differences from the control group with both drugs.

Conclusions: Routine coagulation tests show a variable response to the presence of dabigatran and rivaroxaban. Some specialised coagulation tests are affected by the presence of dabigatran and rivaroxaban. Care should be taken in interpreting the results of coagulation tests in the presence of the direct oral anticoagulants.

64. A Novel Approach to Credentialing Health Data as an Integrity Measure

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Introduction: Public health management is becoming increasingly complex and diverse as medical science introduces new processes and techniques that are driven by aging populations and advancing clinical technology. There are two key drivers evident in health care information usage; clinical services and population health.

Information integrity describes the level of trust that a set of information presents.

Method: The method is based on Design Science. The complexity associated with integrity level assessment is that the source data is often sourced from many disparate data stores that can and do exhibit different levels of data quality, security and transformation rules.

Results: Given that perceptions of data quality and associated transformation varies across different information consumers, there is a clear need for a facility that shows the integrity level of information set, thus allowing consumers to modify their decision-making processes as they see fit.

This paper describes a novel credentialing method as an architecture that can be applied to the clinical-to-patient data transformation process as a series of assessable points offering a structured integrity statement accompanying each report.

Conclusion: The benefits this approach offers are significant in that clinical decision-making is enhanced by presenting patient-centric data to practitioners as an overall information integrity score for the completed information set.

65. The Protective Effect of Advanced Age on Post-ERCP Pancreatitis and Unplanned Hospitalisation

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Introduction: As the median age of Australia's population rises, endoscopic retrograde cholangiopancreatography (ERCP) is becoming increasingly used in the elderly. However, ERCP remains associated with serious complications including post-ERCP pancreatitis (PEP), which often necessitate unplanned hospital admission. Whilst previous research has demonstrated a protective effect of age against PEP, inconsistencies have arisen in recent studies. In addition to age, post-ERCP complication rates have been previously shown to be affected by various factors including longer procedure duration and high-risk indications.

Aims: To investigate the rates of PEP and unplanned hospital admission or prolongation of hospital stay (UHAP) across age-groups and their relation to procedure duration and indication.

Methods: Prospective analysis of 1284 consecutive ERCPs on patients aged 20–101 years performed at a tertiary referral centre.

Results: Advanced age (>80 years) was associated with a significantly lower risk of both PEP ($p=0.02$) and UHAP ($p< 0.05$) compared to patients aged 50-79 years. Rates of PEP and UHAP differed significantly according to indication ($p< 0.01$) and longer procedure duration similarly increased the risk of both complications ($p<0.01$). However, there were no significant differences between age-groups in terms of the proportion of patients with 'high-risk' indications. Importantly, age remained a significant negative predictor of PEP even after adjusting for procedure duration ($p = 0.04$).

66. The Impact of Nursing Care on the Quality of Care in General Practice

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Introduction: Evidence of benefits that nurses can have for general practice organisations is reassuring; however, it is essential to establish whether this care is resulting in improved patient outcomes. This study examined relationships between general practice and nurse consultation characteristics and patient satisfaction and enablement.

Methods: A mixed methods study examined a cross-section of patients from 21 general practices in the Australian Capital Territory. Surveys were distributed to 1665 patients who received nursing care between September 2013 and March 2014. Multilevel modelling was used to analyse these data. Grounded theory underpinned interviews with staff and patients from these same practices.

Results: Data from a total of 678 surveys and 48 interviews were analysed. We identified a clearly defined central process that optimised these quality outcomes: Developing a positive patient experience with nurses in general practice: an integrated model of patient satisfaction and enablement. Characteristics significantly associated with these outcomes were integral to this process.

Conclusions: In line with a patient-centred model of health care, this theoretical model provides insight into how these key quality outcomes can be optimised for patients consulting with nurses in general practice.

67. Should We Screen Women For Rectal Chlamydia?

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Introduction: Chlamydia is the most common notifiable Sexually Transmissible Infection (STI) in Australia1. The management of rectal chlamydia differs from that of urethral/cervical chlamydia[2]. Current guidelines recommend rectal-screening for women with rectal symptoms or reporting anal intercourse only[2], but international studies have reported a prevalence of rectal chlamydia in women of up to 21% 3-12.

Methods: We offered rectal chlamydia Nucleic Acid Amplification Testing (NAAT) to all women attending Canberra Sexual Health Centre (CSHC) from Nov 2013-June 2014 who: (1) Had symptoms of chlamydia or PID. (2) Presented as a contact of chlamydia. (3) Attended for follow-up after a positive urine chlamydia screen.

Results: 57% (32/56) had positive rectal specimens13. There was no association with anal sex or rectal symptoms13. There was a strong association ($p<0.000$) with urethral/cervical chlamydia13.

Conclusion: A lack of rectal-screening in Australia may be resulting in the under diagnosis and under treatment of chlamydia, and resultant persistent infection, reproductive tract re-infection, transmission and complications. The high prevalence of rectal chlamydia found raises important questions: Should we screen women for rectal chlamydia? Should we routinely offer women diagnosed with chlamydia treatment that effectively treats rectal infection? What is the most effective treatment for rectal chlamydia in women?

68. In Harm's Way: The Impact of Workplace Aggression in Australian Clinical Medical Practice

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Introduction: The first nation-wide study of workplace aggression experienced by Australian medical practitioners was undertaken to address the limited body of evidence on the prevalence, prevention, predictors and impact of workplace aggression in clinical medical practice.

Methods: Over 9000 clinicians responded to items on exposure to verbal or written and physical aggression in the previous 12 months, and other personal, work and well-being factors. Descriptive and multivariate analyses determined the prevalence and associates of workplace aggression, as well as associations between exposure to aggression and clinician well-being and workforce participation intentions.

Results: Overall, 70.6% reported exposure to verbal or written aggression and 32.3% reported exposure to physical aggression in the previous 12 months. Workplace aggression was negatively associated with intrinsic job satisfaction, satisfaction with life and self-rated health, and positively associated with intentions to leave patient care in the next five years. External aggression was associated intentions to reduce clinical workload and internal aggression was associated with intentions to leave medicine altogether in the next five years.

Conclusions: Workplace aggression is a significant work health and safety, and public health concern that may lead to ongoing challenges in recruiting and retaining medical clinicians, and ensuring ongoing access to medical care.

69. Timely Administration of Appropriate Antimicrobials in Medical Emergency Team (MET) Situations for Sepsis in a Tertiary Hospital: Implications for Antimicrobial Stewardship

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Introduction: Medical Emergency Team (MET) response is critical in minimising morbidity and mortality of hospitalised patients. This study assessed timeliness and appropriateness of antimicrobials use in MET situations for sepsis.

Methods: This prospective analysis included patients ≥ 18 years old who commenced antimicrobials for sepsis during MET calls over a six-week period. Timeliness of antimicrobial initiation was graded as timely or delayed based on whether its administration was within or after the 'golden hour' of MET call. Appropriateness of antimicrobial selection was graded as Appropriate, Suboptimal, Inadequate or Not assessable using the National Antimicrobial Prescribing Survey criteria. Rates of possible and actual antimicrobial optimisation episodes within 72 hrs post-MET were calculated. Proportions of optimisation episodes occurring with Infectious Diseases (ID) involvement were determined.

Results: The median and average times to antimicrobial initiation at MET were 81 and 120 mins. 37% of patients received timely antimicrobial initiation. Suboptimal or Inadequate antimicrobial selection occurred in 47% of patients at MET. Continuation of Suboptimal therapies post-MET was common. Antimicrobial optimisation was possible in 58% of patients but only 55% of these occurred. 66% of the optimisation episodes had ID involvement.

Conclusion: Complexity of MET situations may contribute to delayed and inappropriate antimicrobial use. ID involvement should be regularly sought to optimise antimicrobial therapies.

70. Do Maternal Hypertensive Disorders in Pregnancy Increase Respiratory Support Requirements, Risk of CLD and Poorer Neurodevelopmental Outcome in Neonates Born Less than 29 Weeks Gestation?

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Introduction: Fetal alveolar and neural growth is dependent on appropriate vascular development. Given the antiangiogenic environment in preeclampsia, the aims of this study were to assess whether maternal hypertensive disorders in pregnancy result in higher respiratory requirements, risk of chronic lung disease and poorer neurodevelopmental outcome in <29- week premature neonates.

Methods: Multi-centre retrospective cohort study, within a geographically defined area in Australia, served by a network of 10 NICUs, of infants <29 weeks gestational age, admitted to NICUs between 1998-2004.

Results: 2549 mothers and infants were included in the study; 379 (14.9%) mothers had hypertensive disease of pregnancy. Follow up data was obtained for 1473 (57.8%) infants at 2-3 years. Multivariate analysis showed that hypertensive disease of pregnancy was not significant for the development of CLD in this cohort (OR 1.103, 95% CI 0.845-1.441). Multivariate analysis of long- term neurodevelopmental data showed no significant difference in outcomes with or without exposure to maternal hypertensive disease.

Conclusions: Maternal hypertensive disorder in pregnancy does not increase the risk of chronic lung disease or long-term neurodevelopmental complications in infants born <29 weeks gestation.

71. Tongue Tie (TT) in Newborns at the Centenary Hospital, Canberra: Follow-Up At 2 Weeks Following TT Division.

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Introduction: Division of TT improves the breastfeeding experience, including decreased nipple pain and more efficient attachment. As little follow-up has occurred for babies who require TT division (1), we aimed to contact mothers of babies at 1-2 weeks following TT division.

Methods: The study included mothers and babies attending the TT clinic from 1st July 2013 to 31st June 2014. We used a telephone survey to assess their breastfeeding experience post-TT division. Other data collected included gestational age (GA), birth weight (BWt), gender, age at time of TT division, and post TT division complications.

Results: 184/193(95.3%) babies that presented at the clinic had their TT divided. Their GA, BWt and male:female ratio were 39.3±1.6weeks, 3.47±0.55Kg, and 123:70(63.7% male) respectively. Mean age of TT division was 9.5±4.9days. Mothers contacted were 117/184(63.5%) at a mean baby's age of 20.6±5.9days (11.3±5.7days post-TT division). While 77/117(65.8%) of mother/baby dyads had needed to supplement feeding with expressed breast milk or formula at some stage, 108/117(92.3%) were breastfeeding at follow-up. Additionally, 88/117(75.2%) felt decreased pain after division.

Conclusion: TT division is a low-risk procedure that is effective in improving short-term breastfeeding outcomes. It is now necessary to continue this follow-up over a longer period.

72. Do Neonates >29<32 Weeks Need Growth and Development Clinic Follow Up? A Retrospective Audit

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Introduction: Most NICUs conduct Growth and Development Clinics (GDC) for very preterm infants <29 weeks, currently the Canberra NICU GDC provides follow up for neonates <32 weeks or <1500gms at 3 years. To evaluate GDC criteria a review of GDC attendee's neurodevelopment outcomes was undertaken.

Method: A retrospective audit of GDC attendee's outcomes at 3 years <32 weeks or <1500gms was completed. Analysis included 36 month Bayleys Neurodevelopmental Assessment Scores (BNAS) ("normal" mean 100, SD 15), and Neurosensory Motor Developmental Assessment Score (NMDAS) on infants 30-32wks or <1500gms (normal<9) at 12 months. Results were stratified into three categories : <28wks, <30wks and <32wks or <1500gms

Results: Between January 2013 to July 2014, 81/136(60%) infants attended GDC. No significant difference (ns) was seen between three gestational categories' when comparing developmental scores: cognitive (97.0, 96.6, 97.6, p=0.816 respectively) language (102.7, 100.4, 103.6, p=0.602) motor (98.1, 100.0, and 97.7 p=0.708). Further analysis of the 30-32wks or <1500gms gestation category highlighted an association between 12 month NMDAS (>9) and 36 month BNAS (<100).

Conclusion: These results highlight the need for GDC 12 month follow-up for preterm neonates >29 < 32wks or <1500gms. Three year GDC may not be necessary if the NMDSA is <9 at 12 months reducing infants requiring follow-up.

73. Exploring Parent and Staff Perceptions of the FiCare Program

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Background: Family Integrated Care (FiCare) is an international randomized controlled trial (RCT) developed at Mount Sinai Hospital. It assesses if making parents an integral part of their baby's care improves neonatal outcomes and parental experiences. The RCT was launched in the Canberra NICU August 2015. Evaluating parent and staff perceptions is not part of the RCT, yet six months post introduction we wanted to evaluate the program.

Methods: To explore parent and staff perceptions of the FiCare program, focus groups (FG) were held. An independent facilitator guided the FG using a question template developed by the research team. The conversations were audio taped and then transcribed. Thematic content analysis was done on FG transcripts.

Results: Parents and staff gave positive feedback on the features of FiCare: participating at rounds, skills and knowledge checklist, group education sessions. Parent's perceived FiCare enhanced parental confidence and role attainment, and improved parent-parent and parent-staff communication. Staff surmised that nurses working with FiCare families performed less hands-on care and spent more time educating and supporting parents. Staff also highlighted the need for ongoing staff education to ensure the program's continued success.

Conclusions: FiCare has a positive effect on parent's experience, improving communication and collaboration with staff.

74. 670 nm Light Therapy: Mechanism and Effect on Oxidative Stress and Cell Death in the Light-induced Model of Retinal Degeneration

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Introduction: 670nm light has been shown to protect against retinal degeneration through an unknown mechanism. We used in vitro and in vivo models of retinal degenerations to explore the protective mechanism and dosage requirement of 670nm light-therapy in a model of retinal degeneration.

Methods: In vivo, Sprague-Dawley (SD) rats were treated with 9, 18, 36 or 90 J/cm2 of 670nm light for 5 days before exposure to varying intensities (750, 1000 or 1500 lux) of damaging white light for 24hrs. TUNEL and immunohistochemistry (8-OHg) were used to assess cell death and oxidative stress. In vitro, 661W photoreceptor cells were treated with 670nm light before exposure to white light. Mitochondrial respiration was evaluated using the Seahorse XFe96 Analyzer.

Results: In vivo, lower light intensities of damaging light, required lower doses of 670nm light-therapy to reduce TUNEL and oxidative stress. While at higher intensities of damaging light, the highest dose of 670nm light produced an effect ($P<0.05$). In vitro, the Seahorse revealed an increase in spare respiratory capacity in treated light-damaged cells ($P<0.05$).

Conclusion: 670nm light has the potential to be an effective, non-invasive and inexpensive form of therapy. Our results show the importance of dosage choice as well as alleviate some questions surrounding the mechanism.

NOTES

Canberra Health
Annual Research Meeting

POSTER PRESENTATIONS

1. Can Teaching about Clinical Audit in General Practice Setting Improve Understanding of Clinical Audit of Both Students and GP Supervisors?

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Introduction: The ANU Medical School has recently reviewed its teaching of clinical audit project (CAP) of 3rd year medical students. The plan is that in future, clinical audit projects will be supervised by GP supervisors during clinical attachments in a model adapted from the University of Notre Dame (UND), Western Australia (WA). This program is being piloted as a "proof of concept" with a small number of GP supervisors supervising GP registrars.

Methods/approach: An educational module with reference to online resources and a handbook has been developed with the help of UND, WA. This is being piloted in general practices in June and July. GP supervisors and registrars will be tested on knowledge and sense of efficacy in conducting clinical audit prior to and at the end of the pilot. Participant's experience and their comments on effectiveness of educational resources will also be recorded on completion of project.

Results/findings: The pilot will be conducted in the next few months and initial results will be presented at the meeting.

Discussion: It is hoped that supervising a CAP for medical students is an effective way to improve the knowledge and utilisation of clinical audit in general practice.

2. Welcome to the Slippery Slope – the Use of Genetic Reproductive Technologies Beyond Disease Traits

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Until now reproductive selection in Australia, and the application of eugenics, was limited to the highly regulated area of pre-implantation genetic diagnosis (PGD), the screening and selection of embryos against disease prior to implantation in an in vitro fertilisation (IVF) cycle. With fast approaching technological advances, the area of reproductive selection will move beyond the scope of current guidelines to allow free reign for health professionals, and other interested parties. This study aimed to gain an understanding of views held by Australian fertility specialist practitioner's on the current guidelines, and on the coming climate whereby reproductive selection may be allowed beyond disease, for gender and other non-disease traits. The practitioners interviewed, on the basis of ethical issues commonly identified in the contentious eugenics debate, highlighted the importance of guidelines to protect against non-disease trait, and to some degree gender, selection, calling for new regulation in the field of reproductive technology.

3. Is the Incidence of Down Syndrome (DS) Hirschsprung Disease (HSCR) Changing in the Era of Antenatal Diagnosis and Readily Available Termination?

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Introduction: Anecdotal reports suggest that some major congenital problems of paediatric surgical importance are becoming less common owing to the increasing frequency of antenatal diagnosis and subsequent abortion. We wondered whether the frequency of DS in HSCR would have changed over the last 50 years, as not only antenatal diagnosis became more widely available, but as major congenital heart disease became more effectively treatable. The aim was therefore to document the incidence of HSCR, and DS/HSCR in New South Wales and the ACT over 55 years.

Method: We reviewed incidence data of HSCR and DS/HSCR by retrospective case note review and / or hospital statistical records for the last 55 years. National and New South Wales birthrates were obtained from Australian bureau of statistics data.

Results: There were altogether 921 HSCR children born in NSW and the ACT from 1960. Out of this group, 72 had DS. 365 children were born with HSCR in the first 20 years (20 with DS), and 468 in the last 20 years of the time period (40 with DS). There is no significant difference in the proportions of DS in the first 20 years compared with the last 20 years ($p = 0.1050$ Fisher exact test).

Conclusion: The availability of antenatal diagnosis and easily available abortion seems to have made little difference to the relative incidence of DS/HSCR. compared to HSCR.

4. The Domesticated Human: More Evidence for Reduced Autonomic Activity in Human Hirschsprung Disease (HSCR)

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Introduction: The spotting lethal rat (sl) is an animal model of Hirschsprung's disease in humans. We have previously shown that adrenal weight, catecholamine excretion, and BSL vary by genotype in the sl rat. This study looked for similar hormonal changes in human HSCR.

To test the hypothesis that urinary catecholamine excretion in human HSCR would parallel that in the sl rat.

Method: Human HSCR patients were contacted and clinical data recorded. They were then asked to give a morning urine sample. This sample was analysed for catecholamine to creatinine ratio using HPLC. These results were compared with published normals.

Results: There were 31 human patients (5 females) with an average age of 8.7 years. Excretion of catecholamines declined significantly with age, and for all three analytes the Hirschsprung disease curve fell below the control curve, although adrenaline was the most significant ($p < 0.05$ for all age groups).

Conclusion: Last year we demonstrated reduced BSL in the sl rat consistent with our previous finding of reduced catecholamine excretion in that animal. Finding a similar pattern of reduced catecholamine excretion in human Hirschsprung patients adds to the evidence for diffuse autonomic effects in HSCR, which may in certain circumstances be clinically important.

5. A Survey of the Bereavement Support Services Offered by the ACT and Surrounding NSW, and Utilised by Families Who Have Experienced a Perinatal Loss

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Aim: To describe the types of bereavement services utilised by families in the Australian Capital Territory (ACT) and surrounding New South Wales (NSW) who have experienced a perinatal loss, and to evaluate whether these services have met their needs.

Methods: All women who experienced a perinatal loss between 1.1.09 and 31.12.12 from the ACT Perinatal Mortality Database were sent a survey consisting of the modified Perinatal Post Traumatic Stress Disorder (PTSD) questionnaire, items addressing use of bereavement services, and the Inventory of Complicated Grief. Respondents also provided free-text comments.

Results: The survey had a 34% response rate; 75% had a perinatal PTSD score indicating the need for support from mental health services and 75% accessed services. The lowest and highest quartile of PTSD scores were least and most likely to access SKACT services respectively. 45% of surveyed women used SKACT, accessing counseling (90%), support groups (50%), playgroups (15%), and the helpline (10%). 57% of women surveyed accessed non-SKACT services. 68% met the criteria for complicated grief. Women argued for training of hospital staff in grief, and for referral to bereavement services to be offered on more occasions post discharge from the hospital.

Conclusions: This study indicated that following a perinatal loss, a high proportion of women had high PTSD scores and complicated grief and utilised local bereavement services. Our findings support the continuation of current support services with modifications that may potentially improve recovery following a perinatal loss.

6. Staff Evaluation of a Decisional Balance Tool Designed to Improve Patient Outcomes

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Introduction: A Decisional Balance Tool was implemented in the Exercise Physiology Department. The tool is utilised during initial assessments and aims to assist staff in goal setting discussions, treatment planning, exercise prescription and behaviour change discussions.

Aims:

- To determine whether the tool assists staff in goal setting discussions.
- To establish whether the tool assists treatment planning and exercise prescription.
- To assess whether staff believe the tool facilitates behaviour change and optimises patient centred care.

Methods: Staff and students within the Exercise Physiology Department completed a survey to assess the perceived value of the tool. Results were analysed to evaluate the tool's usefulness.

Results:

- 75% 'agreed' that the tool is easy to use and 25% 'somewhat agreed'
- 87.5% 'agreed' that the tool assists with goal setting
- 87.5% also 'agreed' that the tool assists behaviour change discussions
- 62.5% 'agreed' that the tool assists with exercise prescription
- 75% 'agreed' that the tool assists with treatment planning
- All responders (100%) 'somewhat agreed' that patients respond well to the tool
- Varied results were found when asked whether they believe the tool helps patients achieve their behaviour change goals
- All responders (100%) 'agreed' that the tool assists in the delivery of patient centred care

Conclusion: Results indicate that the Decisional Balance Tool assists with goal setting and behaviour change discussions. Staff indicated that the tool is easy to use, assists with exercise prescription, treatment planning and the delivery of patient centred care.

A limitation of the evaluation is that it is only designed for individuals who are identified as needing to make a lifestyle change.

7. Audit of Obstetric Anal Sphincter Injuries in Canberra Hospital: Incidence, Associated Risk Factors and the Role of an Episiotomy

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Introduction: Women undergoing vaginal delivery may experience third- or fourth-degree perineal tears. In some cases, an episiotomy is performed as a preventative measure. There is currently limited evidence regarding episiotomy effectiveness in preventing third- and fourth-degree tears (collectively called obstetric anal sphincter injuries (OASIS)). This study sought to audit the incidence of OASIS within Canberra Hospital from 1 November 2012 to 31 October 2013, and determine the effect of an episiotomy on OASIS incidence.

Methods: Patient records were collected and analysed using SPSS, V22. The incidence of OASIS in women with and without an episiotomy were determined, and risk factors identified using cross tabulation, Fisher's Exact Tests, and logistic regression.

Results: A total of 2323 women underwent vaginal delivery, and 5.3% and 0.3% experienced third- and fourth-degree tears respectively. Risk factors were primiparity, Asian heritage, body mass index <18.5, epidural and instrument-assisted delivery. No OASIS occurred in Australian Indigenous women. An episiotomy was protective when adjusted for parity, maternal country of birth and mode of delivery.

Conclusion: This study found an episiotomy protected against OASIS in the examined population, more than halving the tearing odds after adjustment for parity, maternal country of birth and mode of delivery. Several risk factors were identified, and findings suggest Indigenous heritage may protect against OASIS.

8. Sclerosing Angiomatoid Nodular Transformation of Spleen (SNAT) – Case Report and Literature Review

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Introduction: Sclerosing angiomatoid nodular transformation (SANT) of the spleen is a rare benign vascular lesion of spleen of unknown aetiology.

Case History: A 74 year old female presented with a 6-month history of iron deficiency anaemia and raised C-reactive protein. A full body CT scan showed an exophytic mass involving the anterior pole of the spleen measuring up to 6cm in maximum dimension. No other abnormalities or relevant past history was noted. The clinical differential diagnoses were lymphoma or metastatic tumour, and thus a splenectomy was performed.

Macroscopically, the spleen showed a well-demarcated tumour with red-brown nodules and central speckled area of fibrosis. The histology revealed a lesion composed of complex slit- like vascular spaces interspersed with spindle to ovoid cells and numerous inflammatory cells. On immunohistochemistry, all the nodules expressed CD31, CD34, SMA and CD30. EBER and IgG4 stains were negative. The lesion was finally diagnosed as a SNAT.

Discussion: SNAT is thought to be a reactive process rather than a true neoplasm. They may represent the final common pathway of a variety of splenic lesions including inflammatory pseudotumours. SANT may be related to IgG4 disease or EBV virus. They show up-regulation of CD30 with respect to normal spleen. Splenectomy is usually the standard curative treatment.

9. Introducing New Guidelines for Gay Men: How a Clinical Audit Raised Awareness for Sexually Transmitted Infection (STI) Testing at Canberra Sexual Health Centre

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Introduction: In 2014 increasing Sexually Transmitted Infections (STI) and Human Immunovirus (HIV) diagnoses in ACT coincided with revised Australian testing guidelines for men who have sex with men (MSM). In response, an evidence-informed clinical audit was developed within Canberra Sexual Health Centre (CSHC) with the aim of improving staff knowledge and compliance to the new guidelines.

Methods: A baseline audit was attended to determine compliance to the revised guidelines. An education program and changes to documentation and staff orientation were implemented. A post implementation audit was conducted.

Results: Eighty-three asymptomatic MSM clinical notes were audited in April 2014. Eight of eighteen criteria showed low compliance. In August 2014, following introduction of strategies to improve compliance, 88 clinical notes were audited. Fifteen of sixteen criteria showed improvement in compliance. For example high-risk MSM with documented advice to have three monthly screens improved from 80% to 100% whilst low-risk MSM with documented advice to have three monthly screens improved from 40 to 81%.

Conclusion: The clinical audit improved CSHC's compliance with national STI and HIV guidelines and is an important first step in early diagnosis, allowing for early treatment and contact tracing.

10. Effect of Antacid Use in Preterm Infants on Incidence of Late Sepsis, Necrotising Enterocolitis and Mortality

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Introduction: Antacids are often prescribed to preterm infants due to misdiagnosis of gastro-oesophageal reflux. This suppresses gastric acidity a major defence mechanism against infection. This study aims to determine if ranitidine and omeprazole use in neonate's ≤32weeks is associated with increased risk of late sepsis, necrotising enterocolitis (NEC) and mortality.

Methods: Retrospective analysis was conducted on neonate's ≤32weeks gestation, born and admitted into the Neonatal Intensive Care Unit at Canberra Hospital during January 2008 to December 2012. Information regarding late sepsis, NEC, mortality, ranitidine/omeprazole use and other neonatal/hospital factors were collected for each neonate.

Results: 622 neonates were evaluated, 72 received ranitidine and/or omeprazole and 550 had not. There were no statistically significant differences in incidence of total late sepsis (OR 1.3, CI 0.8-2.4, p 0.305), NEC (OR 0.6, CI 0.1-2.4, p 0.562), or mortality (OR 0.6, CI 0.1-2.5, p 0.760) between the two groups. After adjusting for significant differences in neonatal and hospital factors, risk of total late sepsis was significantly lower in those that received ranitidine/omeprazole (OR 0.5, CI 0.3-0.9, p 0.029).

Conclusions: Ranitidine and Omeprazole use in preterm infant's ≤32weeks may not be associated with an increased risk of infection, NEC and mortality.

11. A Diagnostic Dilemma: Half-blinded by a String of Beads

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Introduction: Fibromuscular dysplasia (FMD) is an uncommon, segmental, non-atherosclerotic arterial disease of unknown aetiology. Patients may present with non-specific symptoms causing diagnostic difficulty, as we demonstrate in this case of recurrent, multiple, posterior circulation ischaemic strokes, eventually diagnosed to be due to FMD by digital subtraction angiography (DSA).

Case Description: A 57 year old woman presented three times with visual symptoms within a two-month period. Each time magnetic resonance imaging (MRI) revealed multiple acute infarcts in bilateral occipital lobes and the right cerebellum. Investigations did not detect any thromboembolic disease, thrombophilic state or autoimmune disorders. Computed tomography angiography (CTA) and later magnetic resonance angiography (MRA) failed to demonstrate any vascular pathology. DSA, performed to look for cerebral vasculitis, demonstrated a saw-tooth contour of the right vertebral (V1) segment suggestive of FMD. This lesion was deemed unsuitable for endovascular intervention due to its location. Unfortunately, despite warfarin and anti-platelet therapy she sustained further strokes.

Discussion: Our patient with FMD illustrates an unusual cause of ischaemic stroke. While CTA and MRA have replaced DSA in many situations, our case emphasises the need, even in the era of non-invasive imaging, for DSA in certain clinical contexts. Lastly, this case highlights the potentially challenging aspect of treating FMD, especially when medical therapies fail.

12. Teaching Palliative Care to Physiotherapy Students – Creating a Safe Space for Sharing Using 'Voice Thread'

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Introduction: Physiotherapy students learn about Palliative Care in their pre-clinical semester, as many students will encounter patients with life-limiting illnesses on clinical placements. However, in traditional face-to-face tutorials in 2014, few students actively contributed to classroom discussions about death and dying. In 2015 we explored whether an online platform would allow more students to engage in meaningful discussion and authentically share their reflections on Palliative Care material.

Methods: Using the 'Voice Thread' program, we designed an online asynchronous tutorial experience that complemented lecture material. Groups of 9 – 12 students uploaded individual comments (video, audio or text) in response to prompt slides. The activity was evaluated through an anonymous end-of-semester written survey.

Results: 43 students (100%) participated in Voice Thread tutorials. More than 90% of students found Voice Thread easy or very easy to use. 100% of students found Voice Thread useful for learning about Palliative Care, with 72% finding it very useful or extremely useful. 72% of students preferred online tutorials for Palliative Care, compared to 20% who would have preferred face-to-face. Qualitative analysis revealed themes of vulnerability, comfort and safety.

Conclusion: Most physiotherapy students prefer sharing online when dealing with the sensitive topics of death, dying and Palliative Care.

13. Patient's Perspectives and Experiences of Living with Systemic Sclerosis – A review of Qualitative Studies

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Introduction: Systemic sclerosis is a progressive multisystem autoimmune disease characterised by fibrosis and vasculopathy. Whilst the clinical manifestations are well known, the impact of the disease and treatment on the patient's identity, relationships, functioning and mental well-being are less known.

Methods: MEDLINE, Embase, PsycINFO, CINAHL, and dissertation databases were searched to October 2014. Thematic synthesis was used for analysis.

Results: We included 25 studies involving 453 patients. 6 themes were identified: distressing appearance transformation (disturbing facial changes, stigmatising sickness, unrecognisable self); palpable physical limitations (bodily restrictions, pervasive exhaustion, frustrating mind-body disconnect); social impairment (breaking intimacy, struggling to fulfil family responsibilities, maintaining work, losing independence); navigating uncertainty (diagnostic ambiguity, medically fending for oneself, unpredictable course of illness); alone and misunderstood (living with a rare illness, fearful avoidance of fellow sufferers, withdrawing from the world, lacking empathy from others); and gratitude and optimism (adapting to change and accepting limitations, taking a positive spin, cautious hoping, empowering relationships).

Conclusion: Systemic sclerosis is a rare, disfiguring and unpredictable illness, which undermines patients' sense of certainty and control, self-image, identity and daily functioning. Patient-centred care that encompasses strategies to promote self-esteem, resilience and self-efficacy may help to improve health and quality of life outcomes.

14. Mindfulness – How it Can Help Cancer Patients and Family Carers

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Introduction: Mindfulness is a practice that has its origin in Buddhist meditative discipline and has now entered contemporary society in a wide variety of fields including: neuroscience, education, business and health care. Many research studies show the benefits of regular mindfulness practice, particularly when used as a stress management strategy for people with a range of chronic diseases, including cancer. The poster describes how the Cancer Psychosocial Service has applied mindfulness principles and research outcomes to provide cancer patients and their family care givers an innovative and effective therapy that helps them adjust to and manage the emotional, social and physical impact a cancer diagnosis and treatment has on their lives. The poster explains how this has been done by the inclusion of mindfulness based interventions in individual counselling and the development of two group programs – Mindful Moments: a skills based mindfulness group run in the community health setting for adult patients at any stage in the cancer journey and Mindful Carers: a mindfulness based drop-in group run in the hospital for family carers of cancer patients. The poster defines mindfulness, how it works and its benefits, based on current neuroscience research.

Methods: The poster format outlines, through text, images diagrams and quotes from clients the two mindfulness group programs designed, implemented and evaluated by the Cancer Psychosocial Service. It gives information about the rationale for the groups, the group work method, and the engagement of participants.

Results: A brief discussion is presented of the evaluation and feedback process achieved through pre and post group surveys, measuring the effectiveness of the group programs.

Conclusion: The evaluation results of both group programs demonstrate the effectiveness and benefits for the client group.

15. Patient Enablement in the Primary Heath Care Setting

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Introduction: To review how enablement is conceptualised and practiced in primary healthcare (PHC) and to explore the factors that influence patient enablement.

Methods: A narrative, integrative literature review was undertaken.

Results: 24 articles relating to enablement in PHC were identified and 3 literature reviews, 4 qualitative studies and 17 quantitative studies were included in the analysis. The majority of research on enablement was carried out among General Practitioners. The concept of enablement is defined as an outcome measure of quality in the PHC setting. Two randomized controlled trials (asthma and diabetes) suggest enablement is linked to better outcomes for patients. Primary factors influencing enablement were open communication style, the degree to which the practitioner is patient centred and longer consultations. Other factors associated with enablement were the nature of the presenting health issue, general state of health, ethnicity, socio-economic status and the patient's coping strategies and degree of independence. The association between enablement and patients 'expectations and satisfaction is less clear.

Conclusions: Further research into how much patients are enabled by a wider range of health care providers is needed. Additional qualitative research would provide a deeper understanding of the attributes of enablement in the primary health care setting.

16. "Medulloblastoma with Extracranial metastases": A case report and review of the literature

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Clinical Presentation: A 21 year old male presented with pterygoid space abscess and trismus. Two years ago he had a history of medulloblastoma, which was treated with surgery and radiotherapy. The jaw fluid was aspirated and sent for cytological examination.

Cytological Findings: The preparations from the pterygoid fluid were highly cellular and showed single discohesive malignant cells with pleomorphic nuclei, irregular nuclear membrane and variable amount of eosinophilic cytoplasm. Occasional binucelated and multinucleated cells were noted. There was no specific glandular or squamoid differentiation evident. This was reported as a metastatic tumour consistent with known history of medulloblastoma.

Follow-up studies: The 2011 the cerebellar tumour was reported as a classical nodular medulloblastoma. In 2013, the jaw biopsy was reported as extracranial metastases of medulloblastoma. The subsequent jaw aspiration showed more anaplastic/pleomorphic malignant tumour, which in conjunction with history was compatible with metastatic medulloblastoma.

In 2014 he subsequently had lung wedge resection, which showed multifocal tumour, composed of pleomorphic and bizarre shaped nuclei, prominent nucleoli and abundant eosinophilic cytoplasm. Some cells showed rhabdoid-like features. The tumour cells expressed CD56 and NSE and did not express GFAP or cytokeratin. This was reported a large cell anaplastic medulloblastoma.

The jaw aspirate cytology had similar cytomorphological features as lung metastases.

Discussion: This is a rare case of medulloblastoma with extracranial metastases, which amazingly highlights morphological correlation between cytology and histology. The extracranial metastases show more anaplastic features but express same immunoprofile as the primary tumour.

It is a well-known fact that extracranial metastasis of primary brain tumour is an unusual occurrence. Approximately 200 cases of extracranial metastases of medulloblastoma have been reported in the literature in patients of all ages with primary brain tumour 1. The literature demonstrates the following order of organ involvement: bone (58-97%), lymph node (11-42%), liver (3-38%) and lungs (3-17%) 2. The pathogenesis of these extracranial metastases is not clearly understood.

17. Falls History in Patients of the Obesity Management Service

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Introduction: Falls history has been regularly reported by clients with class III Obesity attending the Obesity Management Service (OMS). The literature provides inconsistent findings between the associations of class III obesity and falls. In 2015 the OMS began to record falls history for all patients attending the service with the aim of investigating the number of patients who have a history of falls.

Methods: A clinical audit has been conducted to determine the number of patients seen between January and May 2015 who have reported a history of falls.

Results: Between January and May 2015, 60 patients were seen (21 male and 39 female), with an average age of 47.0 (range 19-71) and BMI of 50.4 (range 34.4-100.9). Of these 60 patients, 20 (33.3%) reported a history of a falls.

Conclusion: OMS staff identified that OMS patients were reporting a high rate of falls and this clinical audit confirmed this theory. The service will continue to screen for falls to determine if this pattern continues. In order to reduce falls, further investigation into the cause of falls in patients with class III obesity is required.

18. Introduction of Community Care Allied Health Assistant Clinics

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Introduction: Demand for physiotherapy services is steadily increasing. The Service sought to improve utilisation of qualified Allied Health Assistants (AHA) and physiotherapists by introducing AHA clinics to provide review appointments, between physiotherapist follow up.

Methods:

- Literature review to scope AHA roles in other jurisdictions.
- Review of Australian Physiotherapy Association position statement on assistant scope of practice.
- Education for staff on roles, practice scope and appropriate referrals.
- Business rules, referral criteria and pathway developed. Clinics set up.
- Focus groups with AHA's and physiotherapists.
- Telephone surveys conducted with patients.

Results: 71 occasions of service provided in 6 months, equating to 35.5 hours which physiotherapists used for more complex patients and new assessments.

Episode of care reduced from 150.9 days to 98.6 days = 34%.

AHA's reported increased job satisfaction and structure to their roles. Physiotherapists were more confident that exercises were performed regularly, giving them more time for more complex casework.

Nil issues reported through patient feedback. Comments included: "They helped me understand what to do" and; "They reinforced what I was doing".

AHA Review clinics increased from 2 to 4 due to success of project.

Conclusion: AHA clinics benefit staff and patients, providing more frequent reviews and reduced episode of care.

19. Advanced Allied Health Assistants: An Emerging Workforce – How Far Have We Come?

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Introduction: Advanced Allied Health Assistants: an Emerging Workforce is a body of work being implemented by the Chief Allied Health Office (CAHO) in collaboration with allied health managers and the workforce policy and planning section. It is time to reflect and review on "how far we have come?" since the initial scoping in phase 1 (2012) and the implementation plan in phase 2 (2013/14) as we prepare for measuring the impact of our actions in phase 3 (2015/16)

Method: The success measures will be reported against the recommendations on using a simple maturity model, a process that provides opportunity to reflect on development performance and identify improvements. The scale is 1 = no progress, 2= in progress and 3= 80% or more implemented

Results:

- **Recommendation One**
  Further develop the AHA clinical governance structure. Rating =3.
  Evidence "The Supervision and Delegation Framework for Allied Health Assistants: a guide to governance in the ACT" was launched September 2014 and rolled out through a series of workshops to allied health staff.
- **Recommendation Two**
  Develop, implement and evaluate advanced AHA roles across ACT services. Rating = 2
  Evidence The industrial classification for AHAs was approved in the Support Services Enterprise Bargaining Agreement in November 2014 and this introduced the AHA1 (trainee), AHA2 (full scope role) and AHA3 (advanced role) career pathway. There is now approximately 10% of the workforce in AHA3 positions across the jurisdiction with more ready to transition.
- **Recommendation Three**
  Continue to develop the education and training packages available to the ACT AHA workforce. Rating =2
  Evidence The AHA network was developed to provide knowledge-sharing, connection with others and to stimulate innovation and best practice work. It is now a sustainable and embedded activity available to the AHA workforce across the ACT. The CAHO has been involved in the review and release of the 2016 Health Training package, which will include the Social Work AHA competency. The CAHO has sponsored 6 ACT Health staff to achieve the certificate IV AHA qualification in 2015.
- **Recommendation Four**
  Facilitate and support further research into the effectiveness of the allied health assistant role. Rating = 2
  Evidence An article, based on the initial project, Advanced Allied Health Assistants: an Emerging Workforce has been accepted for publication in the Australian Health Review. The QI activity and appraisal of "The AHA Network" has been conducted and has resulted in a real improvement in the competence and confidence of the AHA workforce. A case study series is due to commence that outlines the impact of AHA roles across Canberra Hospital and Health Services.

Conclusion: To ask, "how far have we come?" in developing the AHA workforce – The answer is "A LONG WAY. ...and we are heading in the right direction!" Phase 3 of the Advanced Allied Health Assistants: an Emerging Workforce implementation plan is looking promising and will demonstrate that development of AHA roles contributes to effective workforce reform in ACT Health.

20. Public Health Response to the Risk of a Measles Outbreak in a Small Correctional Facility, ACT

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In November 2013 the ACT Justice Health Service was advised of a measles outbreak in Queensland prisons.

Measles serology was added to the pathology request for induction bloods for prison entrants into the Alexander Maconochie Centre.

Compliance with the offer of entry blood borne viruses and sexually transmitted infections is approximately 60%.

Where susceptibility to measles was demonstrated, measles-mumps-rubella (MMR) vaccine was offered.

Approximately 12 months after the screening and immunisation program was initiated, the list of all persons in custody on a single day (13 January 2015) was obtained, and the pathology results of every person was assessed for:

- Immune status; and
- Immunisation status (if initially screened susceptible).

We present the results of this pre-emptive public health initiative, and discuss the implications for public health practice in the ACT and beyond.

21. The Effectiveness of Meatal Cleaning with Antiseptics for the Prevention of Urinary Traction Infection: Protocol for a Systematic Review and Meta-Analysis

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Introduction: Catheter associated urinary tract infections are one of the most frequent health care associated infections, with around 80% of urinary tract infections (UTI) associated with in dwelling catheters (IDC).

Mixed evidence provides a strong rationale to undertake a systematic review and evaluate the effectiveness of antiseptics for meatal cleaning prior to IDC insertion and during IDC meatal care.

Methods: The systematic review and meta-analysis will be conducted in three stages.

Stage 1: Electronic database and reference lists searching of studies. 1981 is chosen as the cut-off as this is when seminal work was conducted. Identification and assessment of studies against inclusion and exclusion criteria.

Stage 2: Assessment of quality and risk of bias using the Cochrane Collaboration's risk of bias tool.

Stage 3: Narrative synthesis and meta-analysis of findings from identified papers.

Outcomes: Outcomes to be measured: Differences in rates of UTI between intervention groups 48 hours after commencement of intervention. Development of a UTI within 48 hours of a catheter being in place is consistent with definitions from the Centres for Disease Control and Prevention.

Conclusion: Clear synthesis of evidence for antiseptic cleaning of periurethral area during IDC use can inform health care infection and control guidelines.

22. The Therapeutic Potential of Glutathione Transferase M2-derived Peptides to Treat Heart Failure Through Cardiac Ryanodine Receptor Ca2+ Channel Inhibition

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Introduction: Sarcoplasmic reticulum (SR) Ca^{2+} release through the cardiac ryanodine receptor (RyR2) is an essential step of cardiac excitation-contraction coupling. Excess Ca^{2+} release due to overactive RyR2 can cause fatal arrhythmia leading to cardiac arrest. The carboxy terminal domain of glutathione transferase M2 protein (GSTM2C) specifically inhibits RyR2 activity. Our aim was to improve this inhibition and assess the therapeutic potential of GSTM2C based peptides to treat Ca^{2+} release-based heart failure.

Methods: We generated several mutants of GSTM2C and assessed their ability to inhibit RyR2 in vitro using caffeine-induced SR Ca^{2+} release and single channel bilayer assays. Flow cytometry, confocal and video microscopy with field stimulation were used to assess the ability of these mutants to efficiently translocate into the cell and alter the Ca^{2+} cycling and contractions in enzymatically isolated adult mouse cardiomyocytes.

Results: Several GSTM2C mutants showed significantly greater in vitro RyR2 inhibition compared to the wild type GSTM2C. These mutants entered adult mouse cardiomyocytes and significantly reduced their SR Ca^{2+} release rate and their contractions and also increased their SR Ca^{2+} re-uptake rate.

Conclusion: These observations enhance the potential of GSTM2C as the basis for a novel therapeutic agent to treat Ca^{2+} release-based cardiac disorders.

23. Improving Access to Physiotherapy for Pregnant Women with Lower Back and Pelvic Pain

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Introduction: Many pregnant women suffer lower back and pelvic pain (LB&PP), which is amenable to physiotherapy. In March and April 2014 the average wait time for a new physiotherapy appointment for pregnant women with LB&PP was 32 days, an increase of 50% from August 2013. The objective of our Quality Improvement project was to reduce waiting times below 14 days.

Methods: Musculoskeletal assessment and triage (MAT) small group sessions were introduced as the primary physiotherapy contact in August 2014. The session included limited musculoskeletal assessment, interactive exercise therapy, education and an individualised self-management program. To evaluate this approach, average waiting times for new appointments were compared from August 2013, March and April 2014 and March and April 2015. Women's self-management knowledge was also audited at initial appointments or via phone.

Results: The average wait time in 2015 was 7.5 days, a reduction of 81% on 2014 and 54% on 2013 data. After attending MAT 85% of women did not re-present for an individual appointment. Of these women, 66% did not require ongoing assistance, as they were self-managing effectively.

Conclusion: Access to physiotherapy treatment for pregnant women with LB&PP improved substantially with the introduction of a small group session.

24. Retrospective Audit of Anaphylaxis Management in the Emergency Department at Canberra Hospital

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Introduction: There is an increase in allergy and risk of anaphylaxis in the community. Anaphylaxis is a life-threatening condition and appropriate medical management is critical to favourable patient outcomes. The aim of this project was to audit the degree of adherence to anaphylaxis treatment guidelines in acute management of anaphylaxis in the Emergency Department (ED) at Canberra Hospital (TCH).

Methods: A retrospective clinical audit was carried out. All anaphylaxis cases in the ED at TCH from June 2011 to June 2013 were identified. The Clinical Record Information System was used to obtain relevant clinical information for each case.

Results: For 43% of patients audited some aspect of their management in ED fell outside the anaphylaxis treatment guidelines. Seven percent of patients did not receive adrenaline and 28% of patients were given sedating antihistamines. Sixty-five percent of patients eligible for an adrenaline autoinjector were discharged with the prescription and 27% of patients were referred to an allergy specialist.

Conclusion: Intramuscular adrenaline is the first line emergency treatment for anaphylaxis. Patient discharge management in ED is critical in long-term risk reduction of anaphylaxis. This study highlights the need for ongoing education to improve anaphylaxis management in the Emergency Department.

25. Canberra Hospital Cardiology Outpatients "Patient Experience Survey"

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Introduction: Patient experience is defined as "the sum of all interactions, shaped by an organisation's culture, that influence's patient perceptions across the continuum of care". Gauging the patient experience with a 'patient experience survey' (PES) is an important measure to determine patient's perceptions of the quality of care provided.

Methods: 300 patients were sampled in sequential order at time of presentation over a two-week period. Participants completed a survey of 10 questions regarding their experience. Results were analysed using an online SurveyMonkey database.

Results: Patient response rate was 79.3%, 35% female 65% male. 72% of participants were aged 55 or over. Response rates for individual PES items ranged from 74-99%. Participants indicated they were seen on time or within 10min of their scheduled appointment 67% of the time. 75% of participants indicated they felt actively involved in the decisions made about their health care and 74% felt they had a clear understanding of their condition and where they were headed. The average overall experience rating was 8.7/10.

Conclusion: The results of the PES demonstrate the passion and commitment of Cardiac Health Professionals to ensuring a positive patient experience. Future work will elucidate the experience of a more diverse patient group including those from a non-English speaking background and allow targeted patient experience enhancement strategies.

26. GLP-1 Analogue Liraglutide may Attenuate Severity of Pancreatic Inflammation caused by High Dietary Iron with High Fat (HF) Feeding in Sprague-Dawley Rats

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Introduction: Dietary high-fat (HF) and high-iron (HI) are synergistic in causing inflammatory islet injury and pancreatitis in Sprague-Dawley (SD) rats. We aimed to determine if intermittent liraglutide treatment, through its anti-inflammatory properties, could prevent this pancreatic pathology.

Methods: From 5 to 14 weeks of age male SD rats were fed HF-diet with HI (500 mg/kg carbonyl iron) and were treated subcutaneously with liraglutide (0.6 mg/kg) or 0.9% saline three times a week. Body weight, food intake and non-fasting blood glucose were measured fortnightly. A glucose tolerance test was performed at 13 weeks of age and tissues, including pancreas, were harvested one week later for histological analysis.

Results: Liraglutide therapy significantly reduced food intake and weight gain (30% lower), which was associated with reduced epididymal fat mass ($p<0.01$). Improved glucose tolerance compared to saline treated was observed (AUC 1576 ± 143 vs. 2091 ± 134, respectively; $p<0.05$). Severe inflammatory islet injury and pancreatitis were observed in, respectively, 1/6 and 2/6 of the saline treated rats. Milder degrees of pancreatic inflammation were not prevented by liraglutide.

Conclusion: Liraglutide prevents obesity in the HF-HI treated rats, may reduce occurrence of severe pancreatitis, but does not completely prevent the exocrine and endocrine pancreatic injury.

27. Thoracoscopic Plication of Diaphragmatic Hernia in a Pregnant Woman – Case Report and Literature Review

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Introduction: Eventration of the diaphragm during pregnancy is rare and a potentially life threatening condition to the mother and fetus. We report a case of thoracoscopic plication of right-sided phrenic eventration in a second trimester primigravida with discussion of surgical strategy and literature review.

Methods: A 25 year old healthy primigravida with no past medical history presented to the emergency department with 3-day duration of acute respiratory distress. On examination she was in mild respiratory distress and stable vital signs. After adequate resuscitation, she underwent diagnostic workup, which revealed right phrenic eventration. The fetal heart sounds and movements were noted to be normal. The eventration was repaired with nil complications to the mother and fetus.

Results: The immediate postoperative ultrasound showed adequate expansion of the lung and she went on deliver a healthy child 4 months later by cesarean section. Repeat chest X-Ray and pulmonary function test in the postpartum period were noted to be normal.

Conclusion: Diaphragmatic hernia is a rare cause of antepartum dyspnea. Nevertheless, recognition of this entity is crucial given the reported 10% maternal and 13% fetal mortality rates associated with diaphragmatic rupture. Thoracoscopic plication of diaphragmatic eventration has not been reported in a pregnant woman to our knowledge and can be considered a feasible alternative to thoracotomy or laparoscopic repair during pregnancy to minimise morbidity and mortality. Successful management requires a multidisciplinary approach involving knowledgeable obstetricians, radiologists, and surgeons experienced in minimally invasive thoracic surgery.

28. Investigating the Role of Transmembrane Helices 6 & 12 in Coupling ATP Hydrolysis and Drug Transport in ABCB1

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Introduction: The mechanism by which drug transport and ATP hydrolysis are coupled in ABCB1 is a point of controversy. Previous studies have implicated both transmembrane helix six and twelve (TM6 & 12) as mediators of bioenergetic coupling in ABCB1. The present investigation is an analysis of the role of TM6 & 12 in the coordination of conformational change between transmembrane domains (TMDs) and nucleotide binding (NBDs).

Methods: Site-directed mutagenesis was used on the cysteine-less isoform to introduce pairs of cysteine residues to a series of positions on the two helices. ATPase assays were used to measure the maximal activity and affinity for drugs of the mutants and Cysless. Coumarin malemide binding assays were employed to quantify accessibility of introduced cysteines.

Results: Nine double mutants, with one cysteine residue on TM6 and one on TM12 were generated. Native response to nicardipine and vinblastine was confirmed for the novel mutants. Binding of fluorescent probe coumarin malemide was measured to confirm high accessibility of all introduced cysteine residues to small hydrophobic thiol reactive probes.

Conclusion: These results confirm the double mutant isoforms to be viable for distance assignments between the varying points on TM6&12 via the use of homobifunctional methanethiosulfonate reagents and the attachment of MTSL probes for EPR.

29. A Single Centre Experience of Transient Global Amnesia (TGA) with Characteristic Diffusion Weighted Imaging (DWI) Changes

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Introduction: Transient global amnesia (TGA) is a transient amnestic syndrome, manifesting as anterograde memory loss and no focal neurological deficits on examination. Characteristic punctate high-signal intensity lesions in the hippocampus on diffusion-weighted imaging (DWI) have been reported in variable frequencies. Differential diagnoses of TGA include stroke and it is important to make these distinctions as immediate management and prognosis significantly defer. We retrospectively reviewed the TGA cases from our unit and reviewed their MRI findings to see if there were any factors that helped with the diagnosis.

Cases: We identified 4 patients admitted to the Calvary Hospital stroke unit from March 2013 to Dec 2014. Case 1 was a 61 year old male with no significant past medical history who had acute onset of anterograde amnesia and confusion associated with nausea and 2 episodes of fainting and no focal neurological deficits on examination. MRI on day 1 showed 2 foci of DWI hyper intensity in the left hippocampus. Case 2 was a 65 year old male with multiple vascular risk factors, who had acute onset of anterograde and retrograde amnesia without other symptoms. Neurological examination was normal and MRI on day 1 showed a DWI hyper intensity in the left hippocampus. Case 3 was a 62 year old female with a background of Meniere's disease, migraine and hypertension, who presented with sudden onset of anterograde and retrograde amnesia. Examination showed horizontal nystagmus, otherwise no other focal deficits. MRI on day 2 revealed a 5mm focus of DWI hyper intensity in the left hippocampus. Case 4 was a 63 year old female with no significant past medical history, who had acute onset of anterograde amnesia while at work. Examination was normal and MRI on day 2 showed a 4.5mm focus of DWI hyper intensity in the left hippocampus. MR imaging was done on a 3-T Phillips Ingenia Digital using conventional routine stroke protocol including for clinical DWI (b = 1,000 s/mm^2, 4-mm slice thickness).

Discussion: Even though episodes of TGA have a relatively unique clinical presentation and diagnosis can often be made based solely on the clinical symptoms, DWI represents a highly specific diagnostic tool in the context of TGA. However, standard clinical DWI often fails to detect the small characteristic hippocampal lesions. Modified DWI protocols for TGA (b = 3000 s/mm^2, 3 – mm slice thickness) at day 3 have been reported to increase detection rates to 88%. Our series shows that the characteristic punctate DWI lesions of TGA can be detected with even conventional stroke MRI protocols within 48 hours of symptom onset. Our cases demonstrate that MRI in TGA patients have an important role in excluding other diagnoses and should be considered even in patients presenting with classical symptoms.

30. A Single Centre Experience of "MRI Negative Stroke"

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Introduction: Diffusion-weighted MRI (DWI) is the best modality for detecting acute ischemia with a reported sensitivity of 98.8%. Recent studies demonstrated that a significant proportion of stroke patients with minor deficits had negative DWI. We retrospectively analysed our stroke patients who had no evidence of acute ischemia on DWI.

Cases: We identified 4 patients admitted to the Calvary Hospital stroke unit between April 2014 and January 2015. Case 1 was a 77 year old male with left hemiparesis and sensory neglect and baseline NIHHS of 10 who was thrombolysed. His 24 hours NIHSS was 3 but his DWI did not show an acute infarct but he ultimately required nursing home placement. Case 2 was a 94 year old male with dysarthria, dysphagia and left facial droop and baseline NIHSS of 2. Despite normal DWI at 24 hours, he required nasogastric tube feeding initially and his 3 months modified Rankin score was 2. Case 3 was a 75 year old male with dysphasia and right hemiparesis. Initial NIHSS was 4 and DWI on day 3 was normal and he needed inpatient rehabilitation. Case 4 was a 78 year old male with right hemiparesis and NIHSS of 7. DWI on day 4 was normal and he went to a nursing home.

Discussion: All our patients had significant and persistent deficits despite a negative DWI. Further research and consensus is required to define the diagnosis of 'MRI negative stroke', as distinct from a transient ischaemic attack.

31. Callosal Thickness Progressively Changes in Huntington's Disease: 30 Month IMAGE-HD Data

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Introduction: The corpus callosum, the major interhemispheric commissure, has received very little attention in Huntington's disease, yet provides a unique opportunity to investigate more widespread neurodegeneration in this disease. In this study, we investigated callosal thickness across different stages of Huntington's disease using a novel method of estimating mid-sagittal thickness profiles, and sought to correlate these changes with functional outcomes.

Methods: A fully automated pipeline was used to generate a thickness profile for each mid-sagittal corpus callosum. Thickness profiles were compared between groups and longitudinally at 100 nodes along the length of the callosum. Correlations were performed between thickness profiles at each of the nodes with clinical and neurocognitive outcomes.

Results: Participants with symptomatic Huntington's disease showed significant reductions in callosal thickness compared to controls and to presymptomatic individuals, and also showed significant decreases in callosal thickness over time. After controlling for multiple comparisons there were no significant major correlations between regional callosal thickness and clinical or neurocognitive outcomes.

Conclusions: The corpus callosum is not impacted early in the Huntington's disease process but becomes affected after symptom onset, highlighting the spread of neurodegeneration in other structures. Potentially, callosal thickness may be a proxy biomarker for more complex homotopic cortical regions.

32. Chronic Lung Disease in Preterm Babies <29 Weeks: Developmental Outcomes at 2-3 Years

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Background: Chronic lung disease (CLD) in extremely premature babies (PBs) is less severe since prenatal steroids and surfactant treatment are common practice. We hypothesised that PBs<29 weeks gestational age (GA) with CLD should have improved developmental outcomes.

Methods: We reviewed developmental outcomes at 2-3 years corrected age in PBs<29 weeks GA at two perinatal centres' from 2007-2009. CLD was defined as an oxygen requirement at 36 weeks. Data were analysed using general linear models (SPSS).

Results: We assessed 113 of 147 (76.9%) eligible PBs at 2-3 years corrected age. 25/113 (21.1%) PBs developed CLD, and their GA and birth weight (BW) were significantly lower than those who did not develop CLD (25.3±1.3 Vs 26.9±1.1 [weeks mean±SD] p<0.0001 and 787±154 Vs 989±226, [grams] p<0.0001, respectively). There was no significant difference in gender (M:F 13:12 Vs 40:48, ns). After adjusting for GA, BW and gender, PBs with CLD had significantly poorer developmental scores: (Cognitive: 89.4±11.7 Vs 95.3±10.5, p=0.02; Language: 88.1±13.6 Vs 96.2±13.5 p=0.01; Motor: 84.5±16.1 Vs 96.3±11.3 p=0.007; respectively).

Conclusions: While respiratory outcomes have improved in PBs with CLD, their developmental outcomes remain poorer than those PBs that do not develop CLD.

33. Altered T Cell Populations in the Fetal Thymus and Spleen in Pre-eclampsia: A Cohort Study

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Introduction: Pre-eclampsia is incompletely understood, however, maternal immune rejection of the fetus is a well-supported theory. In particular, maternal T cell studies have shown a reduction in regulatory T cells in pre-eclampsia, and a shift towards a pro-inflammatory state. Morphologic change of the fetal thymus, a primary center for T cell differentiation, has also been described, even preceding clinical disease. This might indicate a fetal role in disease pathogenesis, although histologic examination of T cell subsets in pre-eclamptic fetuses has not been performed. The aim of this study was to investigate thymic and splenic T cell subsets in pre-eclamptic fetuses. We hypothesized that pre-eclampsia would be linked to altered T cell populations, in both thymus and spleen.

Methods: This was a cohort study, with tissue collected from deceased fetuses at The Children's Hospital at Westmead (Sydney Australia), and Canberra Hospital (Canberra, Australia). Six fetuses born to pre-eclampsia were included, with 7 fetuses in the control group. Immunohistochemistry techniques analysed FoxP3+, CD4+ and CD8+ T cell subsets, in fetal thymus and spleen. Each T cell subset was compared between groups using an exact interpretation of the Cochrane Armitage test for trend.

Results: FoxP3+ regulatory T cells were significantly reduced in the thymus (p=0.02) and spleen (p=0.02) of fetuses born to pre-eclampsia, versus controls. In both thymus and spleen, CD8+ T cells were also decreased in pre-eclamptic fetuses, versus controls (p=0.04 and p=0.004, respectively). Conversely, CD4+ T cells were comparable between groups in both thymus and spleen.

Conclusion: Pre-eclampsia is associated with an altered T cell profile in the fetal thymus and spleen. Altered fetal immune function might contribute to disease pathogenesis.

34. Validation of Evidence-Based Screening Instruments to Identify Safe and Unsafe Older Drivers: The Driving, Safety, Ageing and Health (DASH) Study

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Introduction: Mandatory license review for older adults requires clinicians to identify and refer at-risk drivers for further assessment. However, few reliable and valid screening methods are available to clinicians. We will compare available screening tools to validate them against on-road assessment, and driving behaviour over 24 months.

Method: Using a multi-site, prospective design, 650 adults aged over 65 years will be recruited from community and clinical samples (e.g., driver assessment clinics, optometrists, GPs) based in the ACT and Brisbane. Participant performance on commonly used screening tools (e.g., Mini-Mental Status-Exam, Visual acuity, DriveSafe/DriveAware, OT-DORA Maze) will be compared to performance on a standardised OT-administered driving assessment, and self-reported crashes over the ensuing 24 months.

Results: We present validity data for MMSE and Visual acuity relative to on-road testing (Pass/Fail) for the ACT sample. The MMSE had poor agreement with on-road test results (cut-off of 24: Cohen's κ =0.06, sensitivity 5%; cut-off of 27: κ =0.11, sensitivity 17%). Visual acuity below 20/40 (logMAR<0.30) also failed to predict on-road results (k=-0.027, sensitivity =1.67%).

Conclusions: The MMSE and visual acuity are not valid indicators of older driver risk. Once complete, the study will provide independent data on the validity of other available driver screening tools.

35. Review of Australian Hospital Birth Admission of Women with Rheumatic Heart Disease (RHD)

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Introduction: RHD is a disease of paradox in Australia. Whilst overall rare, Aboriginal and Torres Strait Islander peoples have among the highest rates of RHD in the world. The objective was to review hospital births of women with RHD (RHD-P) in selected Australian jurisdictions from 2004/05 to 2009/10, and determine trends over time.

Methods: Records of hospital births for women aged 15-44 with a diagnosis of RHD during 2004/05 to 2009/10 in selected Australian jurisdictions. Hospital separations with ICD10-AM code 'Z37' were counted as hospital births. Rheumatic heart disease was defined as ICD10-AM code 'I05'-'I09'.

Results: The report demonstrates the disproportionate number of Aboriginal and/or Torres Strait Islander women with RHD, particularly in Northern Territory (NT) where 94% of women with RHD-P are Indigenous. It is highly likely that Indigenous status is under-reported. Whilst rare (overall estimated rate of 4.5 per 10,000 births), RDH-P rates varied markedly from 1.3 per 10,000 births (Victoria) to 99 per 10,000 births in NT. Rates of RHD-P among Indigenous women in NT were 54 times that of the overall rate in Australia. Numbers reported declined from 2004/05 (n=151) to 2009/10 (n=90), an overall decrease of 34%, with 40% decrease in NT. However, a recent review of acute rheumatic fever (ARF)/RHD in the NT showed evidence of a reduction in recurrence rate of ARF by 9%/year since 1997, but no decrease in incidence of RHD.

Conclusion: It is inconclusive whether the reported downward trend in RHD-P represents a true decline, or is an artefact due to overall small numbers and probable under-reporting. The results reinforce the importance of an ANZ study of RHD-P, with nearly 300 sites reporting.

36. Antimicrobial Use and Gram-Negative Resistance: Is Total Hospital or ICU-Specific Use Responsible for Hospital-Associated Gram-Negative Resistance Development in Hospital?

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Introduction: Total hospital antimicrobial use is associated with gram-negative resistance. Antimicrobial usage in specific high use units such as the intensive care unit (ICU) can confound usage rates. This study aims to assess if high use units such as ICU or rest of hospital (ROH) antibiotic use is more commonly associated with total hospital resistance.

Methods: Antibiotic resistance and usage trends (stratified by ROH and ICU) were developed based on susceptibility profiles for all Enterobacteriaceae hospital-associated bacteraemias and pharmacy antimicrobial usage data between 2009-2014. Kappa correlations between all resistance and usage combinations were performed. All kappa correlations >0.7 were assessed for their statistical significance ($p<0.05$).

Results: ICU and ROH antibiotic usage was associated with antimicrobial resistance six and four times respectively. The associations within groups were diverse by resistance class. Total ICU cephalosporin use was commonly associated with resistance whilst ampicillin use in ICU was negatively correlated with extended spectrum beta-lactamase inhibitor resistance. ICU piperacillin/tazobactam (PTZ) use was correlated with PTZ resistance but failed to reach significance ($p=0.07$).

Conclusions: Analyses that assess total hospital antimicrobial use only will fail to assess the diverse specific unit drivers of hospital antimicrobial resistance. Identifying these drivers is important for unit specific interventions to limit antimicrobial resistance.

37. Teaching Evidence Based Practice to Undergraduate Nurses: Who Should Deliver the Message and How?

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Introduction: Competency in evidence-based practice (EBP) is a requirement for graduate nurses. However there has been little research into the impact of approaches to undergraduate teaching on graduates' application of EBP. We explored two factors, which may have important consequences for student learning:

- The EBP profiles of clinical and academic faculty
- Teaching delivery methods (embedded or modular)

Methods: Clinical and academic faculty completed the Evidence-Based Practice Questionnaire, a validated measure of practice, attitudes, and knowledge/skills in EBP. Two groups of students following different curriculum approaches completed the student version of this questionnaire at the start and on completion of their studies.

Results: Academic and clinical faculty did not differ in attitudes and use of EBP. However, academic staff scored significantly higher on knowledge/skills ($m=5.7$, $sd=0.6$) than clinical faculty ($m=5.2$, $sd=1.0$); $t(51.6)=3.4$, $p=0.001$. Student use, attitudes and knowledge of EBP increased over time irrespective of teaching method. However, students following an embedded curriculum were significantly better at retrieving the evidence ($F=5.01(1,77)$, $p=0.03$).

Conclusion: Although academic faculty have better knowledge of EBP than their clinical counterparts, both faculty view EBP positively and use it frequently. However, embedding teaching of EBP may be more effective than taking a modular approach.

38. What are Health Practitioners' Current Beliefs on Chronic Pain? A Pilot Study of Physiotherapists and Occupational Therapists.

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Introduction: To identify current beliefs physiotherapists and occupational therapists have regarding patients with chronic pain. Beliefs about pain could potentially influence physiotherapists' and occupational therapists' behaviour, such as the choice of treatment strategy or advice given to patients (Dawkin, 2004).

Methods: An interprofessional group of students from the University of Canberra (UC) developed an anonymous survey based on the literature and in consultation with UC academic staff. The survey consisted of four components: demographics, stereotypes, exposure and intervention. Participants were recruited via email and face-to-face request to complete the online survey. Canberra Hospital, ACT community health physiotherapy and occupational therapy departments and five other private practices received the email invite to complete the survey.

Results:

- 20 physiotherapists and 8 occupational therapists participated voluntarily in the survey.
- 18 (64%) had undertaken additional training for the management of chronic pain in the last year, whilst six (21%) have completed a form of training within the last 2-3 years.
- A large portion of health practitioners reported using education (n=24, 85.71%) and exercise prescription (n=20, 71.43%) as treatment interventions. Similarly, 19 had selected they would refer the patient elsewhere (67.86%).

Conclusion: Three interventions have been proposed to address the identified misconceptions health practitioners have about chronic pain patients. Future research is planned to test these interventions.

Daykin AR, Richardson B. Physiotherapists' pain beliefs and their influence on the management of patients with chronic low back pain. Spine. 2004;29(7):783-95.

39. Abnormal Electrophysiological Motor Responses in Huntington's Disease: Evidence of Premanifest Compensation

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Introduction: Huntington's disease (HD) causes progressive motor dysfunction through characteristic atrophy. Neural changes begin in premanifest stages yet individuals are able to maintain a high degree of function, suggesting involvement of supportive processing during motor performance. We used electroencephalography (EEG) to investigate integrity of motor processing (Readiness Potential; RP), premotor processing and sensorimotor integration (Contingent Negative Variation; CNV).

Methods: We assessed neural activity associated with motor preparation and processing in 20 premanifest (pre-HD), 14 symptomatic HD (symp-HD), and 17 healthy controls. Participants performed sequential tapping within two experimental paradigms (simple tapping; Go/No-Go). RP and CNV potentials were calculated separately for each group.

Results: Motor components and behavioural measures did not distinguish pre-HD from controls. Compared to controls and pre-HD, symp-HD demonstrated significantly reduced relative amplitude and latency of the RP, whereas controls and pre-HD did not differ. However, early CNV was found to significantly differ between control and pre-HD groups, due to enhanced early CNV in pre-HD.

Conclusions: Results suggest atypical activation during preparatory processing in pre-HD. The increased activation during this early stage of the disease may reflect ancillary processing in the form of recruitment of additional neural resources for adequate motor preparation, despite atrophic disruption to structure and circuitry.

40. Essentially, Do We Care? Auditing Essential Care at Canberra Hospital

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Introduction: Three United Kingdom reviews showed a lack of essential care in hospitals and revealed cultures that did not support staff to provide good care. Essential care was audited at Canberra Hospital in February 2014.

Methods: Grey and academic literature published between 2004 and 2014 was reviewed, synthesised and combined with the audit results to inform recommendations concerning essential care auditing at Canberra Hospital, congruent with the National Safety and Quality Health Service Standards.

Results: 20 relevant articles were found. 10 of the 14 domains of essential care described by Kitson were documented as performed during the audit. No documentation was found for four domains: Elimination; Personal cleansing, dressing; Rest, sleep and Expressing sexuality.

Recommendations were that three of the four unaudited domains are added to current audits or audited separately; the fourth domain (Expressing sexuality), not be audited until a valid tool can be located/developed; and methods are indentified to enable patients with low English language literacy/significant cognitive impairment to participate in the auditing process.

Conclusion: While Canberra Hospital staff provide essential in most domains, there is room for improvement, particularly in respect to the documenting of essential care. These findings support ongoing auditing of essential care.

41. Evaluation of Canberra Hospital Tissue Viability Unit's Program for Advanced Practice Wound Nursing

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Introduction: Advanced Practice Nursing (APN) improves access to high quality care. Canberra Hospital Tissue Viability Unit has established a professional development program in APN using the validated M-Strong Model as a framework. This innovative program is the first of its kind in Australia, pioneering a foundation for APN in wound care. We aimed to evaluate:

- The strengths and weaknesses of the program
- The impact of program participation on nursing practice

Methods: Five Clinical Nurse Consultants who had completed the program participated in a focus group, conducted by an independent research team from the University of Canberra.

Results: Thematic analysis identified a number of strengths of the program including 'mentoring and leadership', 'support networks' and 'structure and resources'. Weaknesses were few, but included 'establishing systems and processes' and 'data collection'. The program was seen to have enormous benefits for changing practice including: 'refocusing of care', 'patient-centred care and wellness' 'commitment to industry standards', 'leadership and communication skills' and 'evidence-based practice'.

Conclusion: The results suggest that the skills and knowledge built by the program influence participant's daily practice, increasing confidence and expertise in the field. Program strengths outweigh weaknesses, many of which have been resolved, as the program has evolved.

42. Implementation and Validation of an Automated Slide Scanning System to Improve Quality and Throughput in a Cytogenetics Laboratory

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Introduction: In the face of a growing number of specimens to process and staff shortages, the cytogenetics department looked to change work practices in order to overcome these challenges. The Metafer automated slide scanning system was introduced to scan through stained slides and capture digital images of all metaphases present. From there analysts were able to use the existing Metasystems chromosome analysis platform to conduct their investigations. Following the implementation of this system, a NATA assessment found it necessary to conduct a formal verification of the slide scanner to be performed retrospectively.

Results: The major benefit of the slide scanning system was evident in reduced turn-around times for sample processing. Furthermore, the NATA mandated verification was able to demonstrate that in addition to increased sample throughput, the scanning system enabled better abnormality detection rates.

Conclusion: An automated slide scanning system is a vital timesaving utility. Analysts are free to attend to other work while the scanner performs its programmed run, and digitized images allow several users to simultaneously view, manipulate and annotate any given patient file. A 20 case verification of the scanning system was able to show an increase in the detection rate of abnormalities that had not been observed at the time of analysis with conventional microscopy.

43. Work-Time for Health: Qualitative Analysis of Workplace Health Promotion

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Introduction: The World Health Organisation as well as national agencies is encouraging workplaces to provide health-promoting activities for their workers. However, the potential for workplace health promotion to improve the health of workers is not being realised due to low workplace uptake and low worker participation.

Methods: We aimed to explore reasons for low participation in workplace health promotion in small and medium-sized businesses in the region of Canberra, Australia.

Managers and workers in a variety of positions were asked their experience of participating (or not) in health promoting activities in their workplace. In-depth interviews (n=44) were conducted in 10 workplaces that had at least attempted to implement some workplace health promotion. Interviews were analysed thematically.

Results: Casual workers were often excluded from participation. The time and monetary costs of health promotion were considered differently by managers and staff, although both agree that time costs were more difficult to resolve than financial costs.

A conceptual model illustrating the tensions between the financial and temporal considerations of managers and workers regarding workplace health promotion will be presented.

Conclusion: We found that activities offered in paid-work-time had highest participation; these were considered costly to business, but most acceptable to workers.

44. The Interplay of ER Stress and Autophagy Associates with the Development of Helicobacter-Induced Precancerous Disease in Mice

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Introduction: Helicobacter–induced gastric cancer (GC) develops through well-recognised pathological stages of chronic gastritis, intestinal metaplasia and dysplasia. We have previously shown that Helicobacter-induced metaplasia and cancers in humans and in mouse models exhibit profound induction of the endoplasmic reticulum (ER) stress response. The aim of this work was to determine the mechanism behind the ER stress response during Helicobacter–induced GC in mice.

Methods: Wild type C57Bl/6 mice were infected with H. felis or BHI control for 5-15 months. AGS gastric cancer cells were infected in vitro with H. pylori for 24 h. Repression of CHOP was performed by siRNA. Protein expression was analyzed using Western blot and immunofluorescence.

Results: Both early stage H.felis infection in Bl/6 and in vitro infections of AGS induced profound eIF2α phosphorylation and CHOP expression. Upon disease progression, the XBP-1_S/$p58^{IPK}$ cascade was activated and the autophagic markers LC3II and p62 were highly expressed in H.felis-infected gastric tissues at 15 months post infection. The autophagic markers LC3 and p62 were highly expressed in chief cells and the ER stress induced protein p58 was present in both chief and gastric epithelial cells in Helicobacter-infected mice. Knockdown of Helicobacter-induced CHOP in AGS cells suppressed the expression of LC3II and p62.

Conclusion: We show that activation of ER stress is an early and durable response to chronic Helicobacter infection and is accompanied by defective autophagy. These findings, together with our previous findings, establish the ER stress response as a candidate carcinogenic pathway that precedes chronic inflammation and metaplasia.

45. De-Prescribing in a Transitional Care Unit

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Introduction: Transitional Therapy and Care Programme (TTCP) is an up to 12 weeks therapy and support for older people after a hospital stay aimed at recuperating the decline in which the patients had in the hospital.

Potentially inappropriate medications (PIMs) prescribing in elderly patients is a fairly common issue and is associated with an increased risk of morbidity, adverse drug events and exploitation of health care resources.

Methods: By using the STOPP/START criteria, medication lists in older adults in the facility were assessed for PIMs. “My Medicine list” (Figure 1.0) was given to every patient to help themselves understand their own medications better and to be aware of any changes in their medications during TTCP stay where the physicians will be working and discussing with them about the changes before the de-prescribing process. The PIMs will slowly be weaned off and any withdrawal effects will be monitored and recorded over the next few days. The entire outcome will be documented using the “De-prescribing list” (Figure 2.0).

Results: In term of demographic of clients admitted into TTCP, there are 25 female clients and 5 male clients and majority of them are >85 years old. Polypharmacy (>4 medications) has been identified in all the clients. By using the STOPP/START criteria, PIMs were identified and it showed analgesia and other group of medications were the majority of them. De-prescribing task had been started and the most percentages of PIM category which has been ceased was other group of medications and anti-depressant, modified dose has been done to mostly analgesia medications and some new medications has been added for anti-hypertensive group. Data comparison was done using paired T-test, showing that the mean number of total medications before and after the de-prescribing process. Mean number of total medications pre de-prescribing showed a value of 10.87 while for post de-prescribing it has reduced to 10.20. The p value is 0.0049 ($p<0.05$), which showed that there is a significant difference. There is no reported adverse side effect due to cessation of the PIMs and all the patients were benefited from ceasing the PIMs.

Conclusion: PIMs are not necessary and by stopping them, it can reduce the risk of morbidity, adverse drug events and exploitation of health care resources.

46. No Culture in these Parts...A Case of Multisystemic Whipple's Disease

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Introduction: Whipple's Disease (WD) is a rare infection that has protean, multisystemic clinical manifestations.

Case: We describe the case of a 35 year old gentleman who presented with an acute episode of expressive dysphasia. On examination, he had a right-sided hemiplegia and a murmur consistent with aortic regurgitation. Magnetic Resonance Imaging of his brain revealed an acute middle cerebral artery territory infarct and a Transthoracic Echocardiogram showed a mobile mass on his aortic valve. Multiple blood cultures and serological testing for culture negative endocarditis were unremarkable. He proceeded to have mitral and aortic cardiac valve replacement surgery and valve tissue was negative on cultures. Molecular 16s ribosomal ribonucleic acid (RNA) sequencing performed on aortic and mitral valve tissues indicated the presence of Tropheryma whipplei.

Conclusion: A diagnosis of Whipple's endocarditis with cerebral nervous system (CNS) lesions either from septic emboli or from primary CNS Whipple's was made on this gentleman. This case illustrates the importance of molecular diagnostics in the management of culture negative endocarditis.

47. Radiotherapy for Tumour-Related Significant or Life-Threatening Haemorrhage

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Introduction: Tumour-related haemorrhage is an oncological emergency for a significant minority of cancer patients. Radiotherapy has an established role in managing this condition but may be underutilised, as non-oncologists are not aware of its efficacy. The aim of this study is to document the efficacy of radiotherapy in controlling life-threatening or significant bleeding in cancer patients treated at the Radiation Oncology Department at Canberra Hospital.

Methods: We retrospectively assessed the medical records of all patients treated urgently with radiotherapy for cancer-related bleeding over 5 years (July 2009 to June 2014).

Results: Twenty-one patients were included in the study. Indications for radiotherapy included haemoptysis (9 patients, 43%), PV bleeding (3 patients), GI bleeding (3 patients) and haematuria (3 patients). Fifteen patients required transfusion of at least two units of blood prior to radiotherapy.

Two-thirds of patients (14/21) achieved documented resolution of their bleeding following radiotherapy, with half clinically responding within 48 hrs of the first radiotherapy fraction. One patient died from massive haemoptysis the day after commencing radiotherapy, two had documented ongoing bleeding at 1-2 weeks despite radiotherapy, and bleeding outcomes for another 4 patients were not documented.

Conclusion: Radiotherapy is an effective treatment modality for life-threatening cancer-related haemorrhage.

48. The Development of a MR Atlas for the Cervical Spine Musculature

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Introduction: The anatomy of the cervical spine muscles visible on axial MR images is poorly described in the current literature. However, accurate identification of individual muscles is important. It forms the basis of teaching and learning cervical spine cross-sectional anatomy. Also, certain cervical spine conditions, for example whiplash associated disorders, are associated with morphological changes in the muscles on MR scans. The objective of this project was to devise the first reference MR atlas of cervical spine muscles to guide clinicians, researchers and students in the accurate identification of these muscles when using cross-sectional imaging.

Methods: An axial T1-weighted MR image from a healthy 25 year-old male was acquired (TE/TR times of 15/957 milliseconds; slice thickness 4 mm with no inter-slice gap) using a 3 Tesla MR scanner (Siemens, Erlangen, Germany).

Results: All 27 cervical spine muscles were identified and outlined on every MR image.

Conclusion: The first comprehensive MR reference atlas of cervical spine muscles has been created to enhance the teaching and learning of the complex arrangement and spatial relationships of these muscles. This will provide the basis for the accurate identification of these muscles in clinical radiology and research of patients with neck pain, disability and muscle diseases.

49. Perforated Jejunal Diverticular: A Rare Surgical Emergency

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Introduction: Jejunal diverticula are a rare entity with incidence being less than 0.5%. Patients often are asymptomatic, but can present with non-specific abdominal pain with an even smaller proportion presenting acutely with perforation being the least commonly reported complication. This can prove to be a diagnostic challenge, often missed on both radiological and endoscopic investigation. It is associated with high morbidity and mortality particularly in the elderly.

Case report: We report a case of an 86 year old who presented with a two-day history of generalised abdominal pain and vomiting. An erect abdominal x-ray showed multiple fluid levels and pneumoperitoneum. She underwent an emergency explorative laparotomy and operative findings revealed widespread diverticular of the jejunum with a diverticular perforation and faecal contamination. Peritoneal lavage and resection of the diseased segment followed by primary anastomosis was performed. She went on to make a full recovery and was discharged home.

Conclusion: Jejunal diverticular disease when presented acutely in the elderly can be associated with significant morbidity and mortality. It remains a diagnostic challenge to the surgeon. Surgery remains the treatment of choice for acute presentations.

50. Large Bowel Malignancy Presenting As Colonic Intussusception

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Introduction: Bowel intussusception in adults is a rare condition, but can present as bowel obstruction. The lead point is documented as malignant in approximately 60-80% of cases, with the classical 'target sign' on abdominal CT being pathognomonic.

Case report: We report a case of a 38 year old male who presented to the Emergency Department with a 6-day history of bleeding per-rectum, constipation, lower abdominal pain, distension, nausea and vomiting without prior symptoms. He had a significant past medical history of malignancy having been diagnosed with leukaemia and meningioma as a child. Abdominal examination revealed a tense, tender abdomen without signs of peritonism. A computed tomography (CT) scan confirmed an intussusception of the descending colon, seen as a 'target sign'. He proceeded to a laparotomy and intraoperatively, the splenic flexure was found to have intussuscepted into the distal segment of the descending colon and the lead point was unable to be reduced. He went on to have a left hemicolectomy and primary anastomosis. Post-operative period being uneventful, he recovered and was discharged home.

Conclusion: Bowel intussusception is rare in adults and accounts for a minority of bowel obstructions, with a 'target sign' on abdominal CT being pathognomonic. Many prove to be malignant, even in young patients thus operative management with en bloc resection should be considered in the first instance.

51. Agenesis of Iliac Veins: A Rare Cause of Deep Vein Thrombosis

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Introduction: Iliac vein agenesis is a rare entity with very few cases reported in the literature. Usually patients are asymptomatic from this anatomical variant however this predisposes them to developing deep vein thrombosis.

Case report: We report a case of 45 year old male who presented to the Emergency Department with a 2-day history of worsening right leg pain, swelling and erythema. On examination, there was marked swelling and redness up to the level of the knee and was tender and warm to touch. He was initially treated for cellulitis with intravenous antibiotics but showed no clinical improvement. An ultrasound doppler of his right leg revealed a deep vein thrombosis in the common femoral vein extending distally to the popliteal vein, tibioperoneal trunk and medial gastrocnemius vein. He subsequently had a computed tomography (CT) scan which revealed agenesis of his right iliac veins. Drainage was through collateral vessels in the anterior abdominal wall in the lower pelvis. He was anticoagulated and discharged home after showing clinical improvement.

Conclusion: Iliac vein agenesis is a rare anatomical variant, which will predispose the patient to developing deep vein thrombosis. Anticoagulation and follow-up imaging is important in the management of these patients.

52. Sweet Movements: HONK if you're Hemiballismus

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Introduction: Hemiballismus is thought to be due to abnormal activity in the basal ganglia and, while it is most commonly caused by structural disorders such as stroke, it has been described as a manifestation of diabetic hyperosmolar non-ketotic state (HNK). We present a case of 63 year-old lady whose initial diagnosis of stroke was subsequently revised to HNK on the basis of further imaging.

Case Report: A 63 year-old female presented to her GP with a sudden onset of left sided hemiballismus associated with a headache. An MRI performed 5 days later demonstrated high signal on diffusion-weighted imaging (DWI) in the medial lentiform nucleus with accompanying T1 hyperintensity. These changes were interpreted as a stroke with haemorrhagic transformation.

Deterioration in the patient's condition lead to a second MRI performed 12 days later demonstrating T2 hyperintensity without restricted diffusion involving the right globus pallidus. These findings were thought to be consistent with HNK rather than stroke or haemorrhage.

Conclusion: Distinguishing HNK-induced from stroke-induced hemiballismus is important in determining immediate management and short-term prognosis. However, MRI by itself does not always differentiate HNK-related changes in the basal ganglia from those of stroke reliably. This case also illustrates why blood sugar must be checked early.

53. Impact of Intensive Care Registrar Experience on the Duration of Medical Emergency Team Call

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Introduction: Duration of Medical Emergency Team (MET) calls is quite variable. The role of the MET leader in duration of MET calls has not been reviewed. We sought to see if the experience of the registrar had any influence on the duration of MET calls.

Methods: Adult patients at Canberra Hospital who experienced a MET call from January – June 2013 were included. Data was collected regarding the experience of the MET team leader, duration of MET call and time needed to transfer the patient to Intensive Care Unit (ICU) from MET calls.

Results: We analysed 630 MET calls. There was a significant difference in the duration of MET calls between the experienced and inexperienced groups, 63 vs. 79 min (<0.001). Time to transfer a patient to ICU from a MET call was significantly shorter in the inexperienced group in the presence of Senior Registrar/ Consultant (p=0.041). There was a trend towards increased mortality as the duration of MET call increased.

Conclusion: Experience of the MET leader influences the duration of the MET call and the time needed to transfer a patient to ICU from that call. These should be taken in to consideration when rostering registrars for MET services.

54. PREPact.net – An Online Communication and Educational Tool for Physicians and Trainees in the ACT

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Introduction: The PREPact.net website was launched in March 2014 to promote educational and training resources and to facilitate communication between physicians, physician (PREP) trainees and support staff in the ACT. This review assesses the effectiveness and overall use of the site.

Methods: Relevant metrics were measured via the website's administrative functions and Google Analytics™

Results: As of June 2015, there were 176 registered members (Basic Physician Trainees (64.7%), Advanced Trainees (14.2%), Physicians (18.2%), support staff (2.8%)). Daily website users and number of sessions viewed has increased steadily over time. Users access the site primarily via a desktop computer (78.9%), mobile phone (11.1%) or tablet (10.1%). There have been 250 posts (Clinical (44%), News Flash (34%), Journal Club (15%), Teaching resources (7%)). "Clinical Question of the Week" posts attract the most 'hits' and comments. 64 trainee appointments were made (since November 2014) via the "Book-a-Physician" module. Approximately 35% of fortnightly-sent newsletters are confirmed opened (although likely an underestimate of the actual number read).

Conclusion: The PREPact.net site is a unique, interactive educational and communication tool for the ACT physician community. Evidence of increasing website use and interaction supports the usefulness of this resource for members and acceptance by the physician community.

55. Enteral and Oral Nutrition Product Review

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Introduction: A review of the enteral nutrition and oral nutritional supplements was undertaken.

Methods: Products applicable to the patient cohorts of Canberra Hospital were determined using an evidence-based approach. The first step taken in the review was to determine the nutrition requirements to be met by enteral and oral nutrition products, with eleven nutrition specifications derived. The composition details of all enteral and oral nutrition products available from the medical nutrition companies were collated to allow comparison of products. This information was used to determine the products that met the required nutrition specifications. Consideration to the product options available within each of the nutrition specifications was made.

Results: Determination was made of products that were to be used at Canberra Hospital with the rationale for product choice. An accompanying support document for Dietitians was developed containing product composition information outlining applicability of products to nutritional requirements and indications for product use.

Conclusion: Implementation of the nutrition product review recommendations with the introduction of the new enteral feeds and oral nutritional supplements occurring from May 2015.

56. Accuracy of Pre-test Prediction of Liver Stiffness in a New Transient Elastography (Fibroscan ®) Service

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Introduction: Transient elastography (TE; Fibroscan®) non-invasively uses ultrasound waves to measure liver stiffness. Results correlate with fibrosis stage/cirrhosis in chronic hepatitis and influence patient outcomes/ clinical management. Technical failure rates >10% were reported in earlier series; most failures attributable to obesity. We determined technical success of a new Fibroscan service, and accuracy of clinician prediction of likelihood of advanced hepatic fibrosis.

Methods: Feb2013-Aug2014, 1,017 patients underwent Fibroscan examination, with access to a large (XL) probe. A database was assembled from information in the Fibroscan Request Forms (clinical/laboratory variables; clinician-determined pre-test probability of advanced fibrosis) and liver stiffness results. Success rate and descriptive statistical analyses were conducted.

Results: Diagnoses included hepatitis C (38%), NAFLD (27%), and hepatitis B (18%). Technical success was 98.2%. Among physician-predicted cases with low probability of advanced fibrosis, Fibroscan liver stiffness agreed in 48% (most others were minor increases). In those predicted high probability, 60% were confirmed by liver stiffness. Of cases with Fibroscan measured low, indeterminate, or high liver stiffness, 70%, 34%, and 59% had been accurately predicted by clinicians.

Discussion/conclusion: With technical innovations and appropriate training/supervision, a new Fibroscan service can achieve excellent technical success. Clinicians recognise patients with high liver stiffness (likely cirrhosis) fairly well, but a proportion of cases with low pre-test prediction have high liver stiffness, indicating that TE may play a key role in screening patients with liver disease for cirrhosis. Further analysis is refining the key indices that predict liver fibrosis by Fibroscan.

57. Maternal Obesity: Broaching Weight with Sensitivity

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Introduction: In pregnancy and birthing, there are significant medical complications for women and their foetus when BMI is >30kg/m2. In 2013, approximately 280 women birthing at Canberra Hospital (CH) had a BMI >35kg/m^2.

NHMRC Clinical Practice Guidelines recommend weighing pregnant women at their initial antenatal appointment to assess clinical risk. Weight can be a sensitive issue, and many health workers find it difficult to broach the subject with clients. Therefore clients may not be identified as at risk, provided with advice or referred to appropriate services.

Methods: A single education session was delivered to health professionals working within ACT Health. An evaluation was conducted utilising pre and post questionnaires.

Results: Thirty-seven participants attended the education session. There was an increase in knowledge of relevant guidelines (18% to 81%), recommended weight gain (18% to 91%), appropriate resources (45% to 100%), and nutrition referral pathways (18% to 91%) following the session. Confidence of participants to broach weight with clients increased (64% to 91%).

Conclusion: The majority of health professionals working with pregnant women were unaware of guidelines and recommendations for identifying excess weight in pregnancy. The in-service increased their awareness and provided tools to broach weight with clients. Further programs and resources will be developed to address this knowledge gap among health professionals in the ACT.

58. Investigating the Feasibility of a Multidisciplinary Lower Limb joint Replacement Pre- Rehabilitation Program: A Pilot Study of Patient Perspectives

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Introduction: The objective of this pilot study was to investigate the appropriateness of implementing a pre surgical rehabilitation intervention by students. Understanding the patients' perspectives is important to guide implementation of innovative interventions that are consistent with the literature. The project was approved by the Calvary Health Care Human Research Ethics Committee (9-2015) and by cross-institutional approval granted by the University of Canberra Human Research Ethics Committee (Calvary 9-2015).

Methods: An interprofessional group of students from the University of Canberra (UC) developed an anonymous survey based on the literature and in consultation with UC academic and orthopaedic staff from Calvary Hospital. The survey was distributed to patients attending pre-admission education sessions over 3 consecutive weeks on the 4th, 11th and 18th May 2015.

Results:

- Eight patients participated voluntarily in the survey.
- 50 % of patients were interested in participating Pre-Rehabilitation class and 50 % of patients were not interested in participating Pre-Rehabilitation class.
- Reasons for not being interested were timing, cost, distance from home and not seeing the benefit of a class.

Conclusion: In general, the small sample surveyed neither support or refutes the need for a Pre-Rehabilitation class. Future work is planned to broaden the survey sample to include more participants.

59. CAPA: Cognitive and Psychosocial Assessment of Mechanically Ventilated Intensive Care Patients: Does an Experience of Delirium Make a Difference?

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Introduction: We aim to assess the effect of development of delirium on cognitive and psychosocial function following mechanical ventilation in ICU at three separate time points: at ICU discharge, at six and 12 months after discharge.

Methods: We are recruiting 200 ICU patients who are ventilated for more than 24 hours. Half of the cohort is recruited in the ICU of Canberra Hospital, and the other half in the ICU of Prince of Wales Hospital in Sydney. We used standardized clinical assessment scales to determine whether patients are suffering from delirium.

The Mini Mental State Examination (MMSE) is administered at the time of patient ICU discharge, with follow up assessments as follows:

Six months: the Telephone Interview for Cognitive Status, TICS; and the Impact of Events Scale, IES-R.

12 months: TICS, IES-R and the Informant Questionnaire on Cognitive Decline in the Elderly (IQCODE).

Results: We estimate the reductions expected in MMSE and calculated that, at a type-I error rate of 5% (alpha 0.05), we could achieve an 80% power to find the clinically significant difference of 2 points with 80% power if we included minimum of 81 patients in each group (delirious/not delirious). This study is in progress, so we present preliminary data.

Conclusions: We are investigating whether development of delirium in ICU results in a long term cognitive changes that may impact on psychosocial function.

60. Exploring Self-Efficacy in GPs Managing Patient Obesity

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Introduction: General practitioners (GPs) are commonly approached by patients for assistance in losing weight. Weight management forms an important role in the management of many chronic diseases. Self-efficacy is the perception that people have of their ability to perform the actions necessary to achieve a desired outcome. Self-efficacy may predict a person's willingness to persevere with action in that area. This research aimed to explore GP's sense of self-efficacy in obesity management in primary care.

Methods: Twelve GPs recruited to deliver a pilot of an obesity management program participated in semi-structured interviews. A self-efficacy questionnaire adapted from previously validated tools was administered at the start of the interviews and used to prompt discussion. Interpretive analysis based on phenomenology was performed on the interview transcripts.

Results: A predominant theme was the GP's experience of framing failure in terms of patient weight loss outcomes. Other factors GPs identified as influencing their confidence in managing patient obesity included: perception of one's skills or knowledge level, presence or absence of a structured therapeutic approach, and perception of patient challenges in weight loss.

Conclusion: This exploration of GP self-efficacy in managing obesity identified factors that may strengthen GP confidence, and these could be added to future interventions.

61. Using in situ RNA Labelling to Identify Individual RNA Molecules in Breast Cancer

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Introduction: Genetic alterations contribute to the development of breast cancer, however single gene mutations or combinations of mutations are not always sufficient to cause disease; instead other genomic events are also required. Loss of heterozygosity (LOH) of cancer-associated genes is a common mechanism in carcinogenesis, including breast cancer. The same effect can be achieved by what is effectively RNA loss of heterozygosity or monoallelic expression (MAE).

Methods: We used a previously published, novel in situ labelling and detection technique to examine tissue sections and cell lines for the presence of MAE, detecting either the proline or arginine alleles of the codon 72 polymorphism in exon 4 of the TP53 gene.

Results: We are able to show that this method is very specific for detecting the different alleles, despite being only a single DNA base change. Furthermore, immunohistochemistry method, together with DNA and cDNA sequencing, reveals that monoallelic gene expression exists in breast cancer.

Conclusion: MAE exists to some degree in breast cancer at the TP53 locus, however more extensive study is required to determine the full extent and the correlation with clinical outcome.

62. Video Fluoroscopy Swallowing Studies: Speech Pathology and Medical Imaging Student Tutorial

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Introduction: A successful interactive tutorial in Video Fluoroscopy Swallowing Studies (VFSS) has been developed focusing on interactive learning to develop patient centred care, team building and inter-professional communication skills. Students introduce their respective professional roles and responsibilities by engaging each other in an open forum of questions and answers.

Patients with brain injuries or having suffered a stroke undergo a VFSS for diagnosing dysphagia and functional or structural abnormalities of the pharynx and oesophagus.

Video Fluoroscopy provides information on swallowing function allowing the swallow to be viewed in real time and help identify correct treatment techniques.

Methods: Professional goals are shared including:

- Increase awareness of multidisciplinary roles in VFSS
- Increase awareness of radiation safety and dose
- Increase knowledge of the VFSS procedure
- Improve collaborative problem solving with a case study

In addition students identifying head and neck anatomy on an x-ray quiz.

Results: Radiography students have increased awareness of the range of different food and fluid consistencies used, identifying structures and muscle function in the mouth and the throat during swallowing. The importance and significance of swallowing functions is also discussed with emphasis on specific swallowing techniques and patient positioning/posture.

Speech Pathology students have increased awareness of radiation safety and dose, the components of the fluoroscopy machine, and discuss the contrast media used in the procedure.

Conclusion: Inter-professional education is fundamental in learning to work effectively in a multidisciplinary team. The tutorial provides students with an understanding of the technique and applications of VFSS, and promotes shared decision-making and positive working relationships. It has contributed to improving the effectiveness of the procedure and ultimately patient care.

63. The Sun Exposure and Vitamin D Supplementation (SEDS) Study

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Introduction: Adults in Australia are at high risk of skin cancer, but vitamin D insufficiency is also common. Finding a balance for optimal sun exposure is challenging because there is limited evidence for the management of mild vitamin D insufficiency and it is uncertain whether sun exposure itself has beneficial effects beyond vitamin D synthesis.

Methods: The Sun Exposure and Vitamin D Supplementation (SEDS) Study is a nation-wide, clinical trial of 1000 participants randomised to one of four study arms. Participants receive one of two different daily doses of vitamin D supplementation or placebo, in conjunction with guidance on two different patterns of sun exposure over twelve months.

Results: The SEDS Study is currently recruiting participants from across Australia. The study aims to determine the effectiveness of sun exposure compared to vitamin D supplementation for the management of vitamin D insufficiency. The study also aims to test whether these management strategies differentially affect markers of immune and cardio-metabolic function.

Conclusion: This poster describes the methods and outlines challenges encountered during the conduct of the study, particularly related to participant recruitment. The SEDS Study has significant public health implications for the development of evidence-informed sun exposure advice and the management of mild vitamin D insufficiency.

64. Multiple Placental Chorangiomas: A Rare Cause of Unexpected Fetal Death in Utero

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Case report: A 31 year old woman, G2P0, had fetal death in utero diagnosed at 38 weeks gestation at her routine antenatal appointment. Labour was induced; a stillborn baby girl was delivered.

Consent for a full post mortem examination was given by parents.

At the post mortem examination, the baby showed signs of intrauterine growth restriction, chronic hypoxia and congestive cardiac failure identified, but was otherwise normal.

The placenta was small, with multiple firm cream and red circumscribed lesions involving 60-70% of the entire placental disc volume. Microscopically, these lesions were chorangiomas. Furthermore, there were multiple foci of chronic villitis of unknown etiology.

Discussion: Chorangiomas are analogous to haemangiomas in other parts of the body, are observed rarely in placentas and develop after the first trimester. Small chorangiomas are of little clinical significance, but larger or multiple chorangiomas may be clinically significant, functioning essentially as an arteriovenous shunt, and sequester fetal red blood cells and platelets. High output cardiac failure may eventuate with associated intrauterine growth restriction, hydrops fetalis, and fetal death.

In this case there were two major placental insults, together causing compromised fetal-placental circulation, and compromised fetal and placental growth. The terminal events were likely fetal anaemia, hydrops and congestive cardiac failure.

65. Childhood Obesity in the ACT: "School Kids Intervention Program (SKIP)"

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Introduction: One in four primary school aged children in the ACT is overweight or obese. The 2011-12 Obesity Redesign Project identified there was no integrated, specialist-led multidisciplinary service, no public psychology services and limited exercise physiology services for children with obesity in the ACT. Based on best practice, the School Kids Intervention Program (SKIP) is designed to provide an integrated, family-centred, multidisciplinary service for children aged 4 to 12 years with overweight or obesity.

Methods: Data on referral numbers, referral source, occasions of service, wait list numbers and known high risk demographics was collected between February and May 2015.

Results: SKIP has received 27 referrals from paediatricians (52%), general practitioners (4%), health professionals (15%), schools (7%) and families (22%). The service has seen 10 families and registered 84 occasions of service. There are currently 16 families on the waiting list. Of total referrals, 19% of families are known to Care and Protection Services, 11% identify as Aboriginal and Torres Strait Islander and 33% are from a Culturally and Linguistically Diverse background.

Conclusion: Preliminary data indicates management of childhood obesity is reaching the targeted demographic within the ACT. The demand for a childhood obesity management service is already exceeding available resources. Further research is required to demonstrate future demand and service effectiveness.

66. An Evaluation of Clinical Placements for Nursing and Midwifery Students: the Good, the Bad and the Gaps

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Introduction: Nursing and Midwifery students from 10 tertiary institutions undertake clinical placements in ACT Health facilities each year. In 2014 an evaluation was undertaken to determine the level of satisfaction with the learning experiences offered and identify areas for improvement.

Method: All nursing and midwifery students were sent a questionnaire following their final clinical placement. This comprised seven questions, four 5-point Likert scales and three open-ended questions. Data from 2013-2014 were collated and evaluated using Excel.

Results: Students, Registered Nurse and Enrolled Nurses responded to the survey. The majority reported: being very satisfied with the orientation they received; that their learning objectives had been met; that the placement assisted in integrating their university based learning with the workplace. Additionally they were very satisfied with the support they received from ACT Health staff. Positive and negative comments were elicited using open-ended questions. Open-ended responses ranged from positive statements to constructive criticisms.

Conclusion: This evaluation demonstrated that the majority of students view primary health care clinical placements positively. Areas for improvement included providing greater opportunities to develop clinical skills and more training of preceptors in managing students and their questions.

67. Prevention of DNA Contamination during Forensic Medical Examinations in a Clinical Forensic Medical Service: A Best Practice Implementation Project

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Introduction: Contamination of forensic specimens negatively affects cases presented in court. The aim of this project was to identify best practice DNA decontamination practices and audit ACT Health clinical forensic medical service compliance with these practices.

Methods: A baseline audit was conducted using the Joanna Briggs Institute's audit program Practical Application of Clinical Evidence System (PACES). Areas of non-compliance were identified and an education package devised and administered before practices were reaudited.

Results: 24 audit criteria were identified from the grey and published literature. At the baseline audit (10 examinations) 100% compliance was achieved for 20/24 (83%) criteria, while compliance rates were 65%, 65%, 75% and 90% for the remaining 4 audit criteria. The post education audit (10 examinations) demonstrated 100% compliance in the same 20 criteria and improvement to 85% and 100% in 2 (scrubs over under, not outer, wear; using bleach post examination to denature DNA on examination couch) of the 4 remaining criteria; the remaining 2 criteria (ensuring all DNA is removed form taps before and after examinations) showed no change.

Conclusions: Compliance with DNA decontamination best practice criteria in our service was high and improved following education sessions. This audit will now be audited annually.

68. This abstract has been withdrawn

69. Haemodynamic Characterization of 300 Day Old NOD B10 foz/foz Mice

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Introduction: Obesity and diabetes are major risk factors for heart attack and are associated with hypertension, cardiac hypertrophy and cardiomyopathy. The present study investigated haemodynamic parameters and cardiac weight of fat Aussie (foz/foz) mice (obese and diabetic) studied on a mixed (NOD & B10) background.

Methods: Blood pressure (BP) was measured by tail-cuff and carotid artery catheterization in 300 day old male and female foz/foz and age matched WT mice (n=10-11 in each group). Cardiac size and function was measured by echocardiogram. Results are expressed as mean±SEM.

Results: BP was higher in foz/foz mice than WT (e.g. 130±3 vs. 117±3 mmHg, P<0.05, male). This trend was consistent in tail cuff and carotid artery catheterization. Left ventricular (LV) dP/dt, a marker for cardiac contractility, was increased in foz/foz mice (10047±653 mmHg/s) compared to WT in female mice (6673±931 mmHg/s). LV end-diastolic diameter (e.g. 4.18±0.11 vs. 3.75±0.14 mm, P<0.05, male) and cardiac output (e.g. 26.1 ±1.1 vs. 17.3±1.1 ml/min, P<0.05, male) were increased in foz/foz mice. LV wall was thicker in foz/foz than WT mice.

Conclusion: foz/foz mice develop hypertension, cardiac enlargement and hypertrophy, together with increased cardiac contractility indicating that this is a good model for cardiovascular complications of diabetes.

70. An Astrocytically Difficult Case

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Introduction: The presence of oligoclonal bands (OCBs) in cerebrospinal fluid (CSF) is most commonly associated with intrathecal inflammatory diseases, however can occasionally be associated with neoplastic disease. We present a case where our initial, but ultimately mistaken, diagnosis and treatment were partly guided by the presence of intrathecal oligoclonal bands.

Clinical History: A 47 year old man presented with progressive neurological deficits following a viral illness. On examination, he had an ataxic gait, upper motor neuron signs, tongue deviation and right periorbital sensory loss. A pre-admission MRI scan showed multiple discontiguous, non contrast-enhancing hyperintensities. The lesions were not FDG-avid on Positron Emission Tomography. Lumbar puncture revealed unmatched OCBs, with negative flow cytometry and cytology. Extensive serological investigations were negative. The results appeared to reflect an immune-mediated process, and he was given a presumptive diagnosis of acute disseminated encephalomyelitis (ADEM).

Medical therapy was initially pursued given the high-risk location for biopsy. His symptoms improved on high-dose intravenous immunoglobulin (IVIg), however the response was not sustained. Further IVIg was unhelpful, and plasmapheresis was also ineffective. Ultimately, brain biopsy showed WHO Grade III Astrocytoma.

Discussion: This case illustrates the potential difficulty distinguishing inflammatory disorders from neoplastic processes in the CNS. It also serves as a reminder that unmatched oligoclonal bands in the CSF can occur in the context of an underlying neoplastic process.

71. Complementing Conventional Karyotyping with Microarray

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Introduction: Conventional karyotyping is the gold standard for diagnosis of cytogenetic abnormalities in haematological malignancies. However, conventional techniques are prone to limitations, including, dependence on culture growth and metaphase quality; the requirement for malignant cell proliferation; and relatively lower resolution. These issues may be overcome using array-based techniques, which can detect aberrations at sub-microscopic resolution. Single Nucleotide Polymorphism (SNP) microarray is not dependent on success of cell cultures and mitotic index, and may be used to detect copy number variants and loss of heterozygosity. SNP microarray provides opportunity to detect additional abnormalities that may be unidentifiable in conventional processes, which has significance in diagnosis and prognosis of haematological malignancies.

Method: Bone marrow aspirate from two patients was processed using both conventional karyotyping and SNP microarray, and a comparison of findings is presented.

Results: In Case 1, SNP microarray detected the same, as well as additional abnormalities as those identified in the conventional karyotype. However, in Case 2, SNP microarray did not identify a low level clonal evolution that was detectable in the conventional karyotype.

Conclusion: Complementing conventional cytogenetics with SNP microarray has the potential to increase abnormality rates in haematological malignancies and should be utilised in order to provide a comprehensive cytogenetic service.

72. NODk Mice Develop Obesity, Hyperinsulinaemia and Severe Hyperglycaemia when Fed a High Fat Diet without Evidence of Loss of Beta-Cell Mass

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Introduction: Unlike NOD mice, NODk mice do not develop autoimmune diabetes due to a protective MHC H2k (Idd 1 locus). We aimed to determine if NODk mice have a non-immune islet beta-cell defect by stressing them with a high-fat diet.

Method: Male NODk and control B10.Br and Balb/c mice (n=6-11 mice per group) were fed chow or high-fat (HF) diets from 4 weeks of age for 10 (short-term) and 20 weeks (long-term). Body weight and blood glucose were measured fortnightly. Intraperitoneal glucose tolerance tests were performed at 13 (short-term) and 23 weeks of age (long-term). At sacrifice, the pancreas was harvested for histological assessment.

Results: HF-fed NODk mice developed diet-induced obesity, profound hyperinsulinaemia and diabetes by 13 weeks of age. B10.Br mice had poor glucose tolerance, but did not develop severe hyperinsulinaemia or progress onto diabetes. Balb/c mice maintained excellent glucose tolerance on both diets. Preliminary analyses of the pancreas histology does not indicate that diabetes in the HF-fed NODk mice is related to insulitis or loss of islet beta-cell mass.

Conclusion: Underlying non-immune islet susceptibility factors may contribute to the propensity of NOD mice to type 1 diabetes and HF-fed NODk mice to type 2 diabetes.

73. Safe 2 Sleep: An Update

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Introduction: A study conducted at Canberra Hospital in 2013 demonstrated that 76% of patients reported poor sleep. The aim of the Safe 2 Sleep project is to implement the study recommendations. Here we will present progress made in 2014-15.

Methods: The study findings, and published literature, were used to determine appropriate interventions that were implemented in the clinical, educational and infrastructure areas.

Results: Since 2014, noise awareness devices (Yacker Trackers) and decibel monitors have been deployed and evaluated in 8 clinical areas. A consumer panel has been formed. A Patient Information leaflet concerning the importance of sleep has been written and reviewed by clinical staff and healthcare consumers. Comfort packs, including eye masks, earplugs and the Patient Information leaflet, have been developed. Ongoing funding is being sought for these. Education sessions, concerning sleep physiology and the impact of sleep deprivation on physical and mental health, have been delivered to day and night duty staff. All refurbishment and new building plans will include infrastructure strategies to encourage sleep. A stakeholder meeting is scheduled to further support and sustain these interventions.

Conclusions: Significant progress has been made in implementing recommendations and awareness of the importance of sleep raised among staff and patients.

74. Renal Dysfunction in Elderly Hospitalised Medical Patients: Types, Prevalence, Clinical Characteristics and Relation to Short-Term Outcomes

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Introduction: The prevalence and clinical significance of renal dysfunction in hospitalised elderly patients is not well defined. Aim of this study is to investigate the prevalence, types, clinical features, and short-term outcomes of renal dysfunction, chronic and acute, in elderly patients admitted to the acute care of the elderly (ACE) unit in Canberra Hospital.

Methods: In cross-sectional study of 585 consecutive elderly (≥ 60 years) patients (mean age 85.7 ± 6.9 years, 36.4% female) admitted to ACE unit during 12-month period (1st January – 31st December 2014) data on demographics, causes of admission, comorbidities, laboratory parameters, medications used, and short-term clinical outcomes were collected. Glomerular filtration rate (eGFR) was estimated by MDRD equation and CKD stage was assessed. Acute kidney injury (AKI) was defined and classified into stages based on increased baseline serum creatinine according to Kidney Disease Improving Global Outcomes (KDIGO) criteria.

Results: The distribution of CKD from stage I to stage V was as follows: 2.7%, 41.2%, 41.9%, 10.1%, and 4.1%. For further analysis the patients were divided into three groups: group I (CKD stage I-II, GFR ≥60 ml/min/1.73m2, n=257 [43.9%], mean eGFR 74.5±9.0 ml/min/1.73m2), group II (CKD stage III, GFR 30-59 ml/min/1.73m2, n=245 [41.9%], mean eGFR 44.1±8.5 ml/min/1.73m2) and group III (CKD stage IV-V, GFR <30 ml/min/1.73m2, n=83 [14.2%], mean eGFR 18.6±6.9 ml/min/1.73m2). There was a male predominance in all groups (65.3%, 62.8% and 60.2% for group I, II and III, respectively). With increasing stages of CKD the mean age of patients (84.0±7.3 years, 87.2±6.4 years, 86.8±5.7 years), the prevalence of hypertension (70.8%, 75.9% and 84.3%), coronary artery disease (18.3%, 35.9% and 36.1%), congestive heart failure (10.5%, 21.6% and 30.1%), anaemia (42.8%, 51.0%, 61.4%), hyperparathyrodisim (29.4%, 48.1%, 68.8%), hypoalbuminaemia (18.8%, 21.5%, 34.5%), metabolic acidosis (38.9%, 53.1%, 65.1%), use of loop diuretics (15.5%, 35.9%, 53.0%) and anti-platelet drugs (37.4%, 51.0%, 43.4%) as well as the incidence of hypotension on admission (SBP <90 mmHg, 3.5%, 6.1%, 13.3%) increased significantly (p for trend <0.05 in all cases). Acute kidney injury was observed in 12.6% patients (in 1%, 16.5%, 35.8% in groups I, II and III, respectively). Higher stages of CKD were associated with poorer outcome, especially, developing myocardial injury with troponinI rise (60%, 78.9%, 88.2%, for group I, II and III respectively, p<0.05) and in-hospital death (7.0%, 12.2% and 22.9% for group I, II and III respectively, p<0.001), while the mean length of hospital stay and 3-month readmission rate were similar.

Conclusion: CKD stage ≥III accounts for 56.1% of hospitalised elderly medical patients and is associated with hypertension, coronary artery disease, congestive heart failure, anaemia, hyperparathyrodisim, hypoalbuminaemia and acute kidney injury (on admission), myocardial injury and in-hospital mortality. Specific strategies are urgently needed to promote early detection, prevention and appropriate treatment of renal impairment in the ageing population.

75. Wot's in a Name: Dementia, Delirium and Depression (Apologies to CJ Dennis – Songs of a Sentimental Bloke)

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Introduction: Common causes of cognitive impairment of older persons include dementia and delirium, which are associated with adverse outcomes when they are hospitalised. In addition, depression and/or delirium can accompany long-standing dementia and confuse the clinical picture. This project was undertaken to understand clinicians' use of descriptive terminology for documenting recognised altered cognition in older people in an acute care setting, and whether steps were taken to assess and manage delirium, depression and dementia.

Methods: A retrospective audit of 139 medical records of patients admitted to 11A during January – March 2014 was undertaken by the use of CRIS.

Results: 63% (n=87) patients were identified as having impaired cognition. 47% (n=66) were assessed using various Cognitive Assessment Tools (CATs) for delirium, depression and dementia. 30% (n=42) had a diagnosis of delirium, 6% (n=8) dementia and 2 had depression.

It was unclear how CATs assisted with clinical management. Various descriptors including confusion, agitation, irritability, altered cognition and disorientation were used for 65% (n= 91) of patients. 15% (n=21) patients did not have a diagnosis that explained their impairment.

Conclusion: It is essential older people with cognitive impairment are accurately diagnosed to reduce clinical confusion and inappropriate management. CATs should be used to assist this process and provide information to guide management of delirium, depression and dementia.

76. Team Nursing Revisited

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Introduction: Finding the right model of nursing care is essential for patients, nurses and hospitals. Due to changes in the nursing workforce, growing demand, increasing acuity, changing technology and decreasing length of stay, the Patient Allocation model of nursing care, implemented in the 1970s, may no longer meet patients', nurses or organisational needs.

Methods: A rapid review of the academic and grey literature published between 2009 and 2014 was conducted to synthesise the available evidence on the benefits of, and requirements for, Team Nursing.

Results: 27 relevant documents were included. Patient benefits included greater safety (e.g. reduced medication errors, incidences of missed care), satisfaction with care and contact with nurses. Benefits for nurses and hospitals included improved job satisfaction, reductions in absenteeism, increased workforce retention, improved intra and inter professional relationships, fairer distribution of work, accommodation of variable skill mix and improved supervision of, and support for, student and new graduates. To work well, the model required senior staff with good clinical leadership skills, adequate team supervision and a focus on communication.

Conclusion: Team Nursing has many benefits and its implementation is encouraged particularly when the nursing team consists predominantly of less experienced nurse and senior staff have support to develop clinical leadership skills.

77. Iron Status in Acute Care Elderly Patients: Relation to Co-Morbidity and Short-Term Outcomes

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Introduction: Limited data are available on iron status in elderly hospitalised patients. Aims of this study is to assess the main parameters of iron metabolism and their associations with clinical characteristics and short-term outcomes in patients admitted to the acute care of the elderly (ACE) unit in Canberra Hospital.

Methods: A cross-sectional study involving 337 patients aged ≥ 60 years (mean age 85.8 ±6.9 [SD] years, 61.7% females) admitted to the ACE unit in 2014. Data on serum iron, ferritin and transferrin concentrations, transferrin saturation (TSAT) as well as parameters from routine blood tests, socio-demographic and clinical characteristics, causes of admission, medications, and outcomes were analysed. The WHO definition of anaemia (for males haemoglobin (Hb) < 130 g/L, for females Hb < 120 g/L) was used.

Results: On admission 182 (54.0%) patients had anaemia, 229 (67.9%) had TSAT < 18%, but only 9 (2.7%) had ferritin< 20µg/L, and 81(24.0%) subjects had elevated ferritin (> 370 µg /L). We categorised our patients into four groups: group 1 (ferritin < 370 µg /L and TSAT > 18%, n=76 [22.6%,]), group 2 (ferritin < 370 µg /L and TSAT < 18%, n=180 [53.4%]), group 3 (ferritin > 370 µg /L and TSAT < 18%, n=14.5[14.5%]), and group 4 (ferritin > 370 µg /L TSAT >18%, n=32[9.5%]). Group 1 represents normal iron status, group 2 – absolute iron deficiency, group 3 – functional iron deficiency and group 4 – an elevation of serum ferritin caused by inflammatory or metabolic disorders. Patients in both group 2 and 3, comparing with group 1, have significantly lower levels of haemoglobin (115.5±20.2, 118.4±20.0 vs. 128.5±16.8 g/L, respectively), MCH (29.0±4.3, 29.7±2.2 vs. 31.3±2.4 pg), iron (5.3±2.9, 4.6±2.4 vs. 13.9±6.3 µmol/L), albumin (35.4±4.4, 34.0±5.2 vs. 37.2±4.4 g/L) and a higher incidence of anaemia (60.6%, 59.2% vs. 35.5%), as well as higher neutrophil count (8.9±5.5, 9.9±5.4 vs. 6.6±3.9 x10×9/L), CRP (92.9±85.4, 128.7±95.8 vs. 51.2±75.9 mg/L) and a longer length of hospital stay (8.0±6.2, 9.4±7.4 vs. 6.2±4.9 days). Comparing to group 2, patients in group 3 more often had falls (18.3% vs. 32.7%), venous thromboembolism (1.1% vs. 8.2%), and a higher in-hospital death rate (3.9% vs. 16.3%). Only 11.3% of patients (9.4% in group 2 and 24.5% in group 3) received iron supplementation at the time of admission.

Conclusions: In hospitalised acute care elderly patients, iron deficiency is very common (even among non-anaemic patients), and associated with poorer outcomes but often not treated. Assessing and correcting iron status regardless of haemoglobin level as standard of care may improve outcomes for these complex patients.

78. Genetic Specification Of Human Neutrophil Alloantigen 2a (CD177)

Expression And Variation

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Abstract: Alloantibodies to neutrophil antigens including CD177 (HNA-2) are responsible for transfusion-related acute lung injury and alloimmune neutropenia. They arise when individuals are immunised with polymorphic neutrophil antigens. The risk is greatest in people that lack expression of HNAs. 1-10% of human fail to express CD177 (CD177null), others vary at the extent of CD177 expression. Here we report a catalogue of CD177 single nucleotide variants from deep sequencing. We identified a novel stop codon in CD177null individuals arising from a single base substitution in exon 7. CD177null phenotype arises when exon 7 of CD177 is supplied entirely by the CD177 pseudogene (CD177P1). Individuals in whom three out of four copies of exon 7 are derived from CD177P1 in the two bi-allelic loci have larger proportions of CD177- subset and express lower levels of CD177 in overall neutrophils, in comparison to the dominant population with two CD177 reference alleles. Most significantly, transcripts derived from both reference and null alleles were detected, though at low level, in CD177- neutrophils from individuals with one CD177 allele partially replaced by CD177P1. These findings resolve the basis of CD177null and CD177- expression, and identify a method for screening for individuals at risk of CD177 isoimmunisation.

79. One-Stop Urokinase Thrombolysis Technique for Thrombosed Dialysis Access: High Patency Rates After Four Year Follow Up

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Introduction: To calculate patency rates for fistulas and grafts treated utilising urokinase alone and no mechanical thrombectomy devices, and to compare these results with published data so as to compare the efficacy of our method with the published international literature.

Methods: Medical records of patients in whom malfunctioning fistulas and grafts treated within our department were reviewed, yielding 105 fistulas and 39 grafts. An estimation of patency rates, as defined by recognised standards, was then performed using the Kaplan-Meier method and an assessment of predictors of patency was made using a Cox proportional hazards model. These results were then compared with the available published data.

Results: The 105 native fistulas yielded SIRTAC PP, PAP and SP rates at 48 months of 20%, 63% and 79%. The 39 grafts yielded SIRTAC PP, PAP and SP rates at 24 months of 15%, 26% and 83% respectively. NAVAC 48 month SP rates (date of fistula creation rather than first intervention to date of abandonment) for native fistulas and grafts was 82% and 80% respectively.

Conclusion: Malfunctioning upper limb haemodialysis access' in which thrombosis was treated at one sitting using a combination of urokinase, skin massage/balloon maceration, and aspiration demonstrate high patency rates compared to large published series2, 3,4 including those in which tissue plasminogen activator and/or mechanical thrombectomy devices were utilised. We believe that our results may reflect the extent of clot clearance with this method.

80. Interprofessional Learning for Physiotherapy Students – Making it a Reality in Intensive Care

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Introduction: Interprofessional learning (IPL) is a cornerstone of modern multidisciplinary healthcare. Early exposure of students to expert clinicians in an authentic clinical environment may foster respect and understanding of the roles of other professionals. This study evaluated pre-clinical physiotherapy students' experiences of being immersed in a multidisciplinary ICU environment.

Methods: 53 students in the Physiotherapy course at University of Canberra attended an optional 3 hour visit to ICU at Canberra Hospital over 2 days. Students were assigned to a single nurse for the duration of the visit, but also witnessed medical rounds, interventions and procedures. Experiences were evaluated through an anonymous written survey.

Results: Student survey completion was 90%. All students found the ICU visit useful in enhancing their knowledge through IPL, with 96% describing the experience as 'very useful' or 'extremely useful'. 100% of students agreed that IPL is important for physiotherapy students. Qualitative analysis revealed themes of enhanced respect for ICU nurses' knowledge and skills, as well as better understanding of the high quality interprofessional communication and teamwork required in ICU.

Conclusion: IPL is valuable for pre-clinical physiotherapy students in ICU and should continue as a feature of the curriculum to better prepare students for the clinical world.

81. Assessment of an Early Warning Score to Detect Deteriorating Neonates

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Introduction: No early warning system to facilitate early recognition of patient deterioration was available for well neonates at Canberra Hospital and Health Services (CHHS). This study aimed to develop and assess a newborn risk assessment and Neonatal Early Warning Score (NEWS).

Method: A pre and post intervention study was conducted at CHHS. The intervention was implementation of a newborn risk assessment and NEWS. Participants included all term babies born at the CHHS within the study period.

Results: The newborn risk assessment was completed frequently (75.8%) and accurately (89.4%). Vital signs were recorded regularly and total NEWS calculations were mostly correct (88%). Post intervention, more babies received complete observations (92% vs. 30%), more healthy babies received appropriate observations (48% vs. 12%), the time between observations and transfer to higher care decreased (17 minutes vs. 647 minutes) and fewer babies were admitted to the NICU and SCN (12% vs. 18%).

Conclusions: This study supports the use of the newborn risk assessment and NEWS. The newborn risk assessment and NEWS charts were used correctly and their implementation was associated with a greater number of healthy babies receiving appropriate observations, more timely review of babies and fewer admissions to higher care.

82. Spiroindolone-Induced Swelling of Plasmodium Falciparum-Infected Human Erythrocytes

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The spiroindolones, a promising new class of antimalarials (Rottman et al., 2010), disrupt ion homeostasis in the intraerythrocytic parasite Plasmodium falciparum. It has been proposed that this disruption results from inhibition of a putative plasma membrane Na+ efflux pump, PfATP4 (Spillman et al., 2013). Here we show that on addition of a spiroindolone to parasites isolated from their host erythrocytes there is a Na+-dependent increase in parasite volume over the course of 15 minutes. The timescale matches that on which the perturbations of Na+ homeostasis occur as measured previously by Spillman et al. (2013). We have quantified Na+ influx on addition of a spiroindolone to isolated parasites and have found that the degree of swelling is consistent with the net influx of Na+ into the parasite imposing an osmotic burden that is accompanied by the passive influx of water. On addition of a spiroindolone to intact parasitised erythrocytes there is, as for isolated parasites, a progressive swelling of the infected cell. The rate and magnitude of the swelling is similar to that seen for isolated parasites. This raises the possibility that swelling of the infected erythrocyte plays a role in the rapid clearance of these cells under in vivo conditions.

83. Zic3 is a Novel, In Vivo Inhibitor of B-Catenin/TCF Mediated Transcription

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Introduction: During murine gastrulation, the canonical Wnt/β-catenin pathway plays a vital role in the formation of the primitive streak, the progression of gastrulation and tissue patterning along the anterior-posterior axis. A genetic screen for mutations that affect embryogenesis identified a mouse strain, katun (Ka), wherein mutant embryos exhibit incompletely penetrant phenotypes of partial (posterior) axis duplications and anterior truncation. Both phenotypes are redolent of elevated canonical Wnt signalling and analysis of Ka embryos reveals ectopic expression of direct targets of Wnt/β-catenin mediated transcription in the forebrain of mutant embryos. The katun mice carry a nonsense mutation in the zinc finger of the cerebellum 3 (Zic3) gene that generates a null allele. This gene is a member of the Zic family of transcriptional regulators and previous work has shown that ZIC proteins inhibit β-catenin/TCF mediated transcription when overexpressed in cell lines. ZIC proteins physically interact with TCF proteins, but not β-catenin, and do not contact DNA to inhibit β-catenin/TCF mediated transcription.

Methods: To determine whether Zic3 inhibits canonical Wnt signalling in vivo, katun mice were crossed with the bat face (Bfc) activating allele of β-catenin.

Results: The katun mutant protein cannot inhibit β-catenin/TCF mediated transcription. The genetic cross increases the penetrance and severity of Wnt-associated phenotypes, providing the first evidence that the Zic proteins function as novel in vivo Wnt inhibitors.

Conclusion: In mouse and human, mutation of Zic3/ZIC3 is associated with Heterotaxy, a disorder of left-right axis formation. Therefore, analysis of the Ka and Bfc strains indicates that dysregulated Wnt signalling may contribute to the development of Heterotaxy in humans.

84. Exploring Radiation Therapy Planning Workflow in a Newly Implemented Palliative Radiotherapy Rapid Access Clinic

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Introduction: Canberra Hospital Radiation Oncology Department has recently established a palliative radiotherapy rapid access clinic (PRRAC), which allows palliative patients to undergo radiotherapy planning and treatment in one day. This study sought to investigate the effect the clinic has on radiation therapy planning workflow.

Methods: Planning workflow was assessed through an audit of time taken to complete individual planning tasks for PRRAC and conventional plans. A qualitative assessment was performed through interviewing both PRRAC and conventional Radiation Therapist planners regarding their opinions and experiences of palliative planning in the department. The interview data was analysed using thematic analysis.

Results: The planning task time for PRRAC plans and conventional plans were not significantly different. However, PRRAC plans took significantly less time overall. The Radiation Therapist planner interviews revealed that PRRAC planners were more likely to feel stressed and pressured when planning due to their tighter deadline, however they also experienced great pride in their work and felt a strong sense of teamwork.

Conclusion: The planning task time for a PRRAC plan is similar to that of a conventional palliative plan. Stricter deadlines for plan completion increase the pressure on the planner. However involvement in PRRAC encouraged cohesive teamwork and pride.

85. Targeting Endosomal Tlrs for Waldenström's Macroglobulinaemia Baffling Discrepancy Between In Vitro and In Vivo Responses

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Introduction: MYD88^{L265P} mutation is found in 30% of diffuse large B cell lymphoma (DLBCL) and 90% of Waldenström's macroglobulinaemia (WM). We demonstrated that this mutation drove autonomous in vitro B cell proliferation, which was significantly impaired by the disruption of endosomal Toll-like receptors (TLRs). Thus, TLR inhibitors emerge as an attractive drug for MYD88^{L265P}-positive lymphomas. Here we examine the effects of TLR inhibition on MYD88^{L265P}-induced B cell proliferation in vivo.

Method: Activated mature B cells from either wildtype, Unc93b1$^{3d/3d}$ mutant or Tlr9$^{-/-}$ mice were transduced with retroviral vectors encoding MYD88^{L265P}:EGFP and adoptive transferred into recipient Rag1$^{-/-}$ mice or Tnfsf13b$^{-/-}$ (BAFF KO) mice.

Results: The disruption of endosomal TLRs by Unc93b1^{3d} mutation or Tlr9 deficiency suppressed the proliferation of MYD88^{L265P} B cells in vitro. These disruptions paradoxically failed to prevent MYD88^{L265P} B cell growth in vivo and intriguingly induced B cell differentiation into antibody producing plasmablast. Tlr9$^{-/-}$ MYD88^{L265P} B cells were not able to accumulate and differentiate into plasmablast in BAFF-deficient recipient mice. Furthermore, the addition of BAFF in vitro rescued the proliferation defect of Tlr9$^{-/-}$ MYD88^{L265P} B cells. These results established an essential role for BAFF in MYD88^{L265P} diseases.

Conclusion: Our findings indicate that a range of receptors in different circumstances/contexts can activate the MYD88^{L265P} mutation for malignant B cell growth. Our in vivo experiments shed new light on BAFF as an activator for MYD88^{L265P} and provide a rational for targeting BAFF and TLRs in treating MYD88^{L265P} lymphomas.

86. Towards the Understanding of Wear in UHMWPE Total Knee Replacements Using Surface Roughness and Vibration Measurements

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Introduction: Lower wear rates make ultra-high molecular weight polyethylene (UHMWPE) the most popular choice of tibial spacers in orthopaedic total knee replacement (TKR). However, wear still is significant owing to friction and possible implant misalignments. Large numbers of wear particles can result in dramatic immunological responses, aseptic prosthesis loosening, bone resorption, premature failure and revision surgery. Here the development of surface roughness and its correlation to frictional wear and vibration in UHMWPE tibial spacers is studied.

Methods: Using a constant load knee motion simulator and a laser vibrometer, the operational vibration of a total knee replacement system is measured and interpreted over multiple gait cycles. Vibration spectra and the total mass difference owing to wear are correlated with surface roughness measurements using a chromatic confocal profilometer.

Results: The profilometer data shows preliminary results of the detailed surface roughness of the tibial spacer and provides an explanation for changes in vibration amplitudes and increased wear.

Conclusion: Multimodal measurements using dynamic data recorded over many cycles and vibration data, when correlated to static surface profile data may be useful and could give more detailed insights into wear mechanisms of orthopaedic articulating implants such as total knee replacements.

87. Risk Factors for Developing Pancreatic Leaks following Pancreatico-duodenectomy: A Meta-Analysis

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Introduction: Post-operative pancreatic fistula (POPF) is a frequent complication of pancreaticoduodenectomy and predicts increased morbidity and mortality. This study analyzes the risk factors that have been identified to predispose patients to POPF.

Methods: A systematic search of electronic databases (PubMed, EMBASE, OVID, The Cochrane Library) for studies published between 1948 and 2013 was performed. Cohort, case-control studies and randomized controlled trials that examined factors that predict post-pancreaticoduodenectomy pancreatic fistulae were assessed.

Results: 39 studies fulfilled our inclusion criteria (n= 8,880) – 2000-2014 period. POPF rates ranged from 8.9-36.9% and cohort sizes ranging from 62 to 610. Pooled analyses showed the following POPF risk factors: Gender – pooled OR of 1.376 (95% CI 1.137-1.665; P= 0.001) at univariate analysis; Pancreatic texture – pooled OR of 4.187 (95% CI 3.207-5.468, P= 0.000) at univariate analysis and 4.451 (95% CI 3.161-6.268, P= 0.000) at multivariate analysis; Pancreatic duct diameter(PDD) less than 3mm – pooled OR of 2.887 (95% CI 2.207-3.776; P= 0.000) at univariate analysis and 4.278 (95% CI 3.239-5.652; P= 0.000) at multivariate analysis; Large blood loss – pooled OR of 1.495 (95% CI 1.115-2.005 P= 0.007) at univariate analysis.

Conclusions: Gender, soft pancreatic texture, PDD less than 3mm and blood loss are predictive of POPF.

88. Trends in Testing for Chlamydial Infection in the ACT, 2003 to 2012

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Introduction: Around Australia, notifications for chlamydial infection have increased rapidly over recent years. Notification data is susceptible to changes in testing in the community. This study sought to describe testing trends to assist the interpretation of disease notifications.

Methods: We used pathology testing data provided by two major pathology providers in the ACT (accounting for 77% of laboratory notifications) from 2003 to 2012. Pathology results were analysed by sex, age, clinical setting and year of test, using Stata13.

Results: The overall proportion of positive tests was higher in males than females (6.9% compared with 4.3%) with no statistically significant change in positivity over this period. The number of tests performed annually increased from 10,830 in 2003 to 19,099 in 2012, with increased testing in both a general practice and sexual health setting. Approximately two-thirds of all tests were performed on women, although the proportion of tests performed on men has increased over time from 26.9% to 34.9%.

Conclusions: Analysis of ACT data suggests the increase in chlamydial notifications is associated with increased testing. This study has demonstrated that it is feasible to utilise pathology testing data to interpret trends in notification data.

89. Detection of Alternative Transcription as a Result of Pharmacologically Induced Radiosensitisation using RT-MLPA

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Introduction: Radiosensitisers such as 5-Fluouracil (5-FU) are included in conventional treatment protocols for many tumour types, including colorectal cancer. However, mechanisms of radiosensitisation by different classes of pharmacological agents are poorly understood and require further investigations. One such mechanism involves changes in gene expression levels and alternative splicing (AS). These changes have been shown to occur in a p53 dependent and independent fashion.

Methods: Isogenic colorectal cancer cell lines HCT116 p53(+) and p53(-) were pre-treated with different concentrations of 5-FU for 6 hours or HDACi (SAHA) for 20 hours before irradiation with 2 or 10Gy, irradiated only or left untreated. Cells were harvested 4 and 24 hours post-irradiation. RT-MLPA (reverse-transcription multiplex ligation-dependent probe amplification) was performed using probes designed to detect alternative transcripts of genes known to undergo AS in response to irradiation.

Results: Preliminary data indicate AS induction by radiosensitizers such as HDACi in some of the studied genes.

Conclusion: We successfully established RT-MLPA for detection of transcript variants. Determined alterations in AS induced by HDACi might potentially reflect a functional role of HDAC in AS induced by DNA damage.

90. Do Volar Plates Lead to the Best Outcome in Elderly Patients with Distal Radius Fractures?

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Introduction: Distal radial fractures (DRF) are very common in the elderly. Volar plates are increasingly used to treat these fractures but there is uncertainty about their efficacy in the older patient. This study aimed to investigate the functional outcomes 5-year outcomes of volar plates versus other fixation methods in the elderly.

Methods: A cohort of patients aged 65 years or older treated for DRF between 2005 and 2009 at Canberra Hospital were identified. Patients were surveyed and outcomes were measured using the Disabilities of the Arm, Shoulder and Hand (DASH), Assessment of Quality of Life (AQoL 6D) and a Visual Analogue Scale (VAS) for satisfaction with wrist performance and pain. Fracture severity was classified using the AO classification system. Fixation method and length of stay were obtained from medical records.

Results: 86 patients responded (38% response rate) with a mean age of 73 (64-92) at time of fracture. A statistically and clinically significant difference was found between the DASH scores in favour of volar plates ($p = 0.002$). The volar plate group performed better in all other measures but the differences were not significant.

Conclusion: The results of this study indicate that volar plates are a successful treatment for DRF in the elderly.

91. This abstract has been withdrawn.

92. Direct Antiglobulin Test Positivity is a Prognostic Marker in Diffuse Large B-Cell Lymphoma

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Introduction: The revised International Prognostic Index (r-IPI) used for prognosis in DLBCL has limited ability to stratify patients with a very poor prognosis. We investigated the prognostic value of subclinical autoimmunity directed against red blood cells [demonstrated by a positive direct antiglobulin test (DAT)] in DLBCL.

Methods: Clinical and laboratory data on DLBCL patients at Canberra Hospital between 2004-14 identified 96 patients in whom a DAT was performed at diagnosis. Of these, 77 were DAT negative (80.2%) and 19 DAT positive (19.8%). In addition to descriptive statistics and Kaplan-Meier curves, Cox proportional hazard regression (SPSSv22.0) was used to calculate the prognostic effect of DAT positivity on progression free survival (PFS) and overall survival at 3 years (OS) controlling for R-IPI, gender, and anaemia.

Results: DAT positivity resulted in a poorer 5-year PFS (HR = 2.3, p= 0.046) and OS (HR = 2.605, p=0.035). This effect was accentuated in the 'poor prognosis' subset of patients identified by an r-IPI score of 3 or higher (OR = 5.630, p = 0.004).

Conclusion: The findings of this study demonstrate that DAT positivity is a strong negative prognostic marker in DLBCL and may be particularly useful in identifying patients with a very poor prognosis.

93. Eosinophilic Oesophagitis – A Differential Diagnosis to Remember

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Introduction: Oesophageal obstruction by foreign body is a relatively common paediatric surgical problem. Eosinophilic oesophagitis is an increasingly commonly recognised condition in children and may be associated with coeliac disease.

The current study aims to characterise the clinical features predictive of positive findings of eosinophilic oesophagitis at endoscopy.

Methods: The study was performed as a retrospective case note review of patients with histologic evidence of eosinophilic oesophagitis from 1st of April 2003 to 15th of November 2014, taking note of patient demographics as well as histological, laboratory and endoscopic features.

Results: There were 59 children with confirmed eosinophilic oesophagitis during this period. The diagnosis was slightly more common in males (59.3%). The most common presentation was dysphagia (44.1%) with similar numbers of presentations with failure to thrive and food bolus impaction (22.1% and 20.3%). It was noted that a gross appearance of eosinophilic oesophagitis was seen in 86% of endoscopies, with classic signs of concentric rings and/or micro abscesses. In all of these cases, the histology was consistent with the surgeon's findings and report. 22% of children with eosinophilic oesophagitis also had coeliac disease, and 88% where history is available, have a background history of atopic disease.

Conclusion: Eosinophilic oesophagitis is a perhaps under diagnosed condition that should be considered as a cause of both dysphagia and food bolus impaction. There is a significant association with coeliac disease seen in our series, and a strong association with atopic disease.

94. Allergic Constipation: Common and Treatable

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Introduction: The senior author has noted that cows' milk protein exclusion diets (CMPED) seem to be frequently curative for children referred to the constipation clinic. The study aimed to characterise this group of patients with presumed allergic-based constipation

Methods: Clinical data and family history was obtained prospectively from patients referred to a tertiary paediatric constipation clinic over the course of a year. Patients who responded to a CMPED were then analysed in detail.

Results: 113 patients were reviewed for the calendar year 2014. 19 patients definitely or probably responded to a CMPED. One patient failed to respond to CMPED, but did improve when soy was excluded. Overall 18% of patients showed signs of response to an exclusion diet. There were 4 girls and 16 boys. This contrasts with the non-allergic group, which had 46% girls. (Two-tailed P value = 0.0671. Fisher's exact test.) The age of onset of symptoms was 1.4 years, older than children with slow transit constipation, but younger than children with other non-specific functional constipation. (t test p = 0.079 by comparison with slow transit.)

Three quarters of the patients had a family history of other allergic problems.

Conclusion: Cows' milk protein allergy is a very common cause of chronic constipation that may be intractable until the diagnosis is entertained. Commonly symptoms start after cessation of breastfeeding, and with a background family history of atopic disease. Our patients show a marked male predominance, more so than the general constipation group.

Response to an appropriate diet is quick, but attention must be paid to the detail of the diet, and support from a dietician is advised.

The authors suggest that other common dietary allergens may also be important in this setting.

95. Direct Regulation of Chromatinized Protein Kinase C Theta in Epithelial to Mesenchymal Transition and Breast Cancer Stem Cells

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Introduction: Epithelial to mesenchymal transition (EMT) is a key event in cancer progression and the process of metastasis that creates a reservoir for cancer stem cells (CSCs) and is associated with highly aggressive traits. CSCs play a vital role in metastasis, therapeutic resistance and relapse in breast cancer patients. Protein Kinase C theta (PKC-t) is signal transduction kinase that has been implicated in inflammatory disorders, tumor progression, and metastasis has been recently linked to aggressive breast cancer. We have previously shown that PKC-t can directly translocate to nucleus to regulate inducible immune responsive gene transcription and micro-RNAs that essential for effective immune response in T cells. Hence, it will be a crucial step to unravel the molecular role of PKC-t in EMT and CSCs formation process.

Methods and Results: Using cancer biological and epigenetics analysis, we have shown that PKC-t promotes EMT by directly tethering chromatin for mediating inducible genes via transforming growth factor beta (TGF-beta) and the key inflammatory regulatory protein NF-kappa B. Chromatinized PKC-t acts as an essential active transcription complex for establishing permissive chromatin state at signature EMT genes. Genome-wide analysis identifies a unique cohort of EMT inducible genes that are directly tethered to PKC-t. More recently, in vivo data have further illustrated the unique signaling pathway of PKC-t in eliciting EMT and CSCs formation.

Conclusion: PKC-t plays an irreplaceable role in regulating inducible transcription programs that drive EMT and CSCs formation via cross-talking with chromatin, which provide a novel mechanism to target breast cancer using epigenetic therapy.

96. The Domesticated Human: Hirschsprung Disease (HSCR) as a Generalised Neuropathy

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Introduction: HSCR is a neurocristopathy with diffuse effects. We have previously shown that there are a variety of effects in spotting lethal (sl) rat intracranial structures. We asked whether this would be reflected in a global diminution of rat brain size, and whether that would be reflected in the human.

Method: 1. Intracranial volumes of sl rats were calculated using high-resolution micro-CT. 2. Birth statistics including head circumference (HC) from a retrospective study of 205 HSCR patients were reviewed and compared with normals. Patients with known microcephaly associated HSCR were excluded.

Results: 1. Intracranial volumes of 10 neonatal rats were calculated. The sl rats showed an approximately 15% reduction in intracranial volume (491 mm3vs 579 mm3+), compared to matched littermates. ($p < 0.05$)

2. The average birth HC percentile for human HSCR patients born between 25 and 41 weeks gestation was 40.4, implying an approximately 5% cranial volume difference. Birth HC in HSCR patients was then compared against a control group of non-HSCR patients. HC Z scores in the HSCR group were significantly lower ($p \sim 0.004$ by t-test), and boys showed a larger effect. Long segment children had the smallest HC.

Conclusion: An ednrb mutation in the sl rat is associated with overall brain size reduction. Human HSCR patients at the moment of birth also show a size reduction. The data supports the role of HSCR genes in human brain development. We have earlier shown decreased autonomic activity in the sl rat. Interestingly, these features are characteristic of domestication in animals.

97. Effect of Varying the Acetate and Citrate Dialysate Components on Calcium Balance in Intermittent Haemodialysis

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Introduction: Traditionally the dialysate concentrate, even in bicarbonate buffered haemodialysis, has contained a small concentration of acetate to acidify the solution. Recently concentrates that substitute a low concentration of citrate have been marketed. Citrate is a dialyzable calcium chelator, so substituting citrate for acetate has a potentially large impact on intradialytic calcium balance, serum calcium and consequently on patient morbidity and mortality. It was the aim of this study to investigate this.

Methods: Haemodialysis was performed using dialysate composed of either; 1.25mmol/L calcium, acidified with 3mmol/L acetate; or 1.5mmol/L calcium acidified with 1mmol/L citrate. Calcium balance was calculated by measuring the volume and calcium concentration of a total dialysate effluent collection and multiplying this volume by the difference between dialysate inflow and effluent calcium concentrations.

Results: 30 haemodialysis sessions were assessed for calcium balance. The median calcium losses were 0.8mmol/hour of dialysis in both dialysate groups. A correlation was seen between blood ionized calcium and calcium balance in the acetate containing dialysate sessions (r_s 0.54, p=0.04), but not in the citrate containing dialysate sessions (r_s=-0.03).

Conclusions: Dialysis using either acetate acidified, 1.25mmol/L calcium dialysate, or citrate acidified, 1.5mmol/L calcium dialysate results in an equivalent, but very small, negative, calcium balance.

98. The Biosynthesis and Functions of Haem in Toxoplasma gondii

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Introduction: Haem, a ubiquitous prosthetic group molecule, is critical for the survival of most eukaryotes. Apicomplexan parasites are able to synthesise haem through an eight-enzyme pathway that is unusual in that the enzymes are distributed across the mitochondria, cytosol and a reduced plastid organelle called the apicoplast. Given the limited knowledge of haem use and synthesis in the apicomplexans, we aimed to investigate the importance of haem biosynthesis and the haem-containing cytochrome proteins in Toxoplasma gondii.

Methods: We generated an anhydrotetracycline (ATc)-regulatable knockdown mutant in uroporphyrinogen III decarboxylase (UroD), an apicoplast-localising enzyme in the pathway. We performed chemiluminescent detection of parasite free haem levels through the reconstitution of active horseradish peroxidase and western to detect changes in cytochrome c abundance.

Results: Knockdown in expression of UroD causes a subsequent ablation of parasite growth, indicating that UroD is essential for T. gondii survival. This may be due to the decrease in free haem levels in the parasite. Furthermore, loss of UroD causes a decrease in the abundance of cytochrome c.

Conclusion: Our data indicate that haem biosynthesis is critical for the survival of T. gondii, and suggest a central role for apicoplast metabolism in the proper functioning of the parasite mitochondrion.

99. Case Study: Nuclear Medicines Role in Imaging Paraganglioma

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Introduction: A seventeen year old male presented to Canberra Hospital with a six-year history of headaches while straining and a year of worsening haematuria. Computed Tomography (CT) images demonstrated possible bladder tumour. Subsequent clinical evaluation and pathology results suggested a diagnosis of extra-adrenal paraganglioma.

Method: ^{18}F-Fluorodeoxyglucose (FDG) Positron Emission Tomography (PET) imaging and ^{123}I-Metaiodobenzylguanidine (MIBG) whole body imaging with Single Photon Emission Computed Tomography/ Computed Tomography (SPECT/CT) were performed in order to investigate this suspicion. ^{18}F-FDG PET imaging revealed FDG avid lesions in the bladder wall which extended to the prostate, bilateral iliac lymph nodes and a large aortocaval mass. ^{123}I-MIBG imaging demonstrated only the aortocaval lesion to be MIBG avid.

Results: These unexpected findings left only two possibilities in the differential diagnosis:

Two separate pathologies; the aortocaval soft tissue mass a paraganglioma and a different non-MIBG avid primary tumour in the bladder.

A heterogenous molecular expression of the same pathology.

Histopathological examination confirmed paraganglioma at all sites of excision.

Conclusion: This case study explores the role of nuclear medicine in the investigation of neuroendocrine tumours. Furthermore, it demonstrates the importance of molecular imaging in the assessment of heterogeneous expression of the same pathology across multiple sites.

100. Clinical Information Supplied to Radiologists, Case Note Entries, and Correlation with Subsequent CT Findings – A Pilot Study as Part of a Quality Improvement Project

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Introduction: The aim of this study was to examine the appropriateness and quality of electronic CT requests and correlate this with respect to the clinical impressions recorded in case notes. Subsequent correlation was made with CT findings.

Methods: 50 CT examinations were randomly selected and analysed by two observers: one radiologist and one non-radiologist. Each referral was assessed against WA pathways guidelines and scored on a scale of 1-3 (the degree of appropriateness). A second scale of 1-3 reflected the quality of clinical information supplied. A further scale of 1-4: extent to which the clinical information supplied mirrored what was recorded in the clinical notes.

Results: 9 (18%) of requests were found to be inconsistent with entries in the clinical notes. 6 of these were from one department. 2 out of these 6 requests were justified as being at the insistence of a senior clinician. 2 of 3 requests from a different department super-selected data from patients with multiple co-morbidities in order to justify a CT scan, while the remaining 1 request detailed symptoms which were not recorded in the notes.

Conclusion: This pilot study highlights several potential areas for improvement. A larger blinded study is now underway to see if the extent of the problem can be substantiated with less bias, and if so, to use improvement methodologies to enhance the quality of patient care.

101. Interval Colorectal Cancers in Australian Capital Territory – A Population-Based Cohort Study

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Introduction: Colorectal cancers (CRCs) diagnosed within 5 years of a negative colonoscopy are referred to as interval CRCs. We investigated the proportion of interval CRCs and their clinical and molecular characteristics.

Methods: We performed a population-based cohort study of all residents who underwent colonoscopy between 2001 and 2009 at Canberra Hospital. These records were linked (i) with the relevant Australian cancer registries using probabilistic record linkage and (ii) the hospital medical record. Matches were verified and pathology, tumour stage, and mismatch repair status were extracted.

Results: 11074 individuals had a colonoscopy from 2001-2009 (52% female) with minimum follow-up of 50.5 months. There were 1574 CRC notifications to the registry with 381 (24.2 %) residents having prior colonoscopy at our centre. Fourteen interval cancers (IC) occurred (3.7%) with an incidence of 2.94 IC per 1000 person years of follow-up. Individuals with IC were more likely to have a family history of CRC (P = 0.001), diverticulosis (P = 0.01) and index colonoscopy was more likely to be performed by a trainee (P = 0.008). IC were more likely to have mucinous histology (P = 0.03). There were no differences with respect to stage, MMR or BRAF mutation status.

Conclusion: In our population-based cohort study in Australia, 3.7% of all patients with CRC had IC.

102. Knowledge and Practices of Seasonal Influenza Prevention among First-Generation Indian Migrants in the Australian Capital Territory (ACT)

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Introduction: Knowledge and practices on seasonal influenza prevention (SIP) is important to curtail the spread. We studied the knowledge and practices on SIP among the first-generation adult Indian immigrants in the Australian Capital Territory (ACT).

Methods: We used a self-administered questionnaire during Autumn 2014 in this cross-sectional study to obtain information on knowledge and practices on SIP. Respondents were recruited from Indian community organisations. Analysis included bivariate and chi-squared tests.

Results: The response rate was 25% and the sample had 70 respondents. Majority were male (59%), post-graduates (67%) and professionals (57%). Only 29% (n=20) were vaccinated in 2013. Male respondents had more awareness on modes of spread ($p<0.05$) and preventing fomite spread ($p=0.03$). Most respondents (54%) were unsure whether high-risk populations should be vaccinated. Vaccinated respondents confirmed vaccination as a prevention measure ($p=0.001$), knew side effects were rare ($p<0.001$) and that over 65 year-olds could be vaccinated ($p<0.05$). Of those vaccinated, majority received health messages on prevention and vaccination at workplaces (n=20, 100%) and at the general practice (n=16, 80%)

Conclusion: We found low vaccination rates for seasonal influenza in this group and gaps in knowledge about vaccination. We recommend targeted communication initiatives to increase vaccination rates.

103. Sun Protection Practices of Undergraduate University Students

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Introduction: Currently, there are no published reports to identify gaps in the sun protection practices of university students in Australia to guide future sun protection campaigns

Methods: This cross-sectional study assessed undergraduate university students' use of five sun protection practices (sunscreen, hat, sunglasses, shade and clothing) whilst outdoors. Emails containing links to the online questionnaire were sent to 3341 randomly selected students from all academic areas aged 18-24 years. Those who travelled to a winter location were excluded. The response rate was 19% and 507 students met the inclusion criteria.

Results: Mean age of the sample was of 20.5 years (Standard deviation ±1.9). Any method of sun protection was used always or often by 32% of respondents. Majority used <3 methods at a given time. Commonest method used was shade (58%) while the least was hat (8%). Domestic students (44%) used sunglasses significantly more than the international students (23%) ($p<0.05$) while female students used sunscreen (48%) and sunglasses (37%) significantly more than male students (33% and 23% respectively) ($p<0.05$). In the 22-24 year age group non-medical students (53.9%) used sunglasses more than the medical students (36%) ($p <0.05$). There were no other statistically significant differences.

Conclusions: Our cross-sectional study reported a low use of sun protection methods of ANU undergraduate students in the last fortnight of summer. These findings suggest the study sample had an increased risk of sun damage and development of skin cancer.

104. CTPA Using 50ml of Contrast Medium – A Retrospective Analysis and Prospective Improvement Project

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Introduction: Our audit sought to optimise a low contrast medium dose CTPA technique and compare it with established higher volume standards.

Methods: The patient population was derived from a medium-sized tertiary teaching hospital. CTPA images were acquired using Toshiba Aquilion ONE ViSION and PRIME scanners. 50mL Iopamidol 370mg/ml contrast medium and 50mL normal saline chaser were used for contrast enhancement at a rate of 5mL/sec. Siemens syngo software was used for image analysis. A retrospective analysis of 66 CTPAs performed in 2014 was completed. This group had SureStart software triggering at 180HU centered on the main pulmonary artery followed by a 2-second delay. The images were analysed with optimal scans being defined as having an MPA density of >250HU.[1] A further 103 scans were analysed after increasing the triggering to 200HU and scan delay to 4-seconds.

Results: The initial cohort had a 4.55%(n=3/66) suboptimal rate. After increasing the trigger and scanning delay, the suboptimal rate was reduced to 1.94%(n=2/103).

Conclusion: Published studies using 75mL and 100mL have demonstrated failure rates of 17.14%(n=12/70) and 18.84%(n=13/69).[2] We have shown that a lower contrast medium dose with an optimised automatic trigger and scanning delay can achieve density values sufficient to detect pulmonary emboli in 98% of cases.

105. Families' Experiences in a Two-Cot NICU

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Introduction: Family centred care (FCC) is described as an approach to the planning, delivery, and evaluation of healthcare that is based on a partnership between healthcare professionals and families. Neonatal intensive care units (NICUs) are trending away from the open plan design (OPD) to single or smaller rooms (SRs) to achieve a better FCC model of care. In 2012 the Canberra NICU moved into a two-cot room (TCR) design to better facilitate FCC. This study aimed to evaluate the TCR design though explores families' experiences guided by the 7 Picker principles (PP) of FCC.

Methods: Semi structured face-to-face interviews were held with parents (n=10) whose infant had been in the NICU for greater than seven days. Each interview was audiotaped and transcribed using QuickTime Player. Data was analysed using thematic analysis following a qualitative descriptive approach, grouping parents' feedback under PP themes.

Results: Parents' experiences in TCR design were extremely positive and TRC design enables FCC. They stated the layout allowed them privacy and an individualised space to spend quality time with their infant. Parents stated that the environment facilitated excellent two-way communication, and allowed them to actively participate in their infants' care while enabling them to build a trusting relationship with staff. Parent's suggestions will be used to further improve the environment and model of care for future families.

Conclusion: This study has shown TCR design effectively promotes and supports FCC according to PP in the NICU. We are currently undertaking further research to evaluate other aspects of TCR design.

106. Medical Stewardship: Pathology Evidence Based Ordering to Reduce Inappropriate Test Ordering in a Teaching Hospital

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Introduction: This study was designed as an educational program aimed at promoting evidence-based pathology ordering with the aim of reducing inappropriate test ordering.

Methods: Researchers benchmarked the Hospitals pathology in 2013-2014 before conducting a multifaceted education program in 2014-2015 aimed at reducing inappropriate test ordering.

Results: Through this educational method the researchers achieved a reduction in the average test per admission in 2014-2015 (M=12.98) from 2013-2014 (M=13.83). A paired t-test indicated that this difference was significant, t(3.3006) = 0.0071, p 0.01. The intervention included a focus on specimen collection issues and achieved a reduction in specimen error rates (M=2695) from the previous year (M=3000). A one sample t-test indicated that this difference was significant, t(3.0804) =0.0105, p 0.05. This multi-faceted education intervention focused on common inappropriate pathology tests within the Hospital. This intervention decreased the total pathology requests of Full Blood Count (-4.21%), Liver Function Test (-8.36%), Vitamin B12 (-6.45%) and Coagulation profile (-21.22%). Researchers found that commonly inappropriate tests decreased (M= 7120.33) from (M=7609.67). A Paired t-test indicated that this difference was significant, t(3.7730) = 0.0031, p .005. "Results will be discussed".

Conclusions: Results confirmed that a multi-faceted education program can reduce inappropriate pathology, commonly over-ordered pathology, and pathology specimen error rates while maintaining positive patient outcomes.

107. Febrile Neutropenia in Haematology Patients at Canberra Hospital

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Introduction: A new standard operating procedure "Febrile Neutropenia Management Pathway" was issued in October 2013 to initiate prompt care and antibiotic therapy for neutropenic patients who develop febrile episodes in Canberra Hospital.

Methods: A retrospective analysis of timing of initiation of antibiotics and outcome in febrile neutropenia patients in haematology department from November 2012 to October 2014.

Results: We describe 205 patients with febrile neutropenia. 134 patients developed febrile neutropenia while inpatient whereas 71 patients presented to Emergency Department. Out of the 134 patients, 58 patients (Group A) were treated within 12 months before the introduction of new pathway, and 76 patients (Group B) were within 12 months after that. Median age of Group A was 55.5 years (18-80) and Male/Female ratio, 48/20. Group B had median age of 58 (20-80) with Male/Female ratio, 49/27. In Group A, mean time to initiate antibiotics was 242.8 min (0-3530) whereas 84.7 min (0-1210) for Group B. Mortality rate of Group A (8.6%) was higher than that of Group B (1.3%).

Conclusion: This study supports the issue of new febrile neutropenia management pathway results in a change in management and outcome of patients.

108. Hospital Outcomes from Ambulance Calls Which Do Not Require Transport

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Background: Many ambulance services have introduced paramedic-level protocols to identify patients in whom transport is not required (TNR), but little follow up data is available.

Objectives: To describe early presentations to hospital after a TNR decision by paramedics.

Methods: Cohort study of all TNR cases in Canberra and its tertiary ED over two years. Cases were matched with records using name and date of birth. TNR events and ED presentation within 48 hours were linked as the closest possible pairs, notes were manually audited.

Results: There were 8290 TNR events, 7207 (87%) with sufficient identifying details. Of 6190 different patients, 5683 (92%) had only 1 TNR in the period and 507 had more. 4229 (59%) of TNRs were paramedic-initiated, 2649 (37%) were patient-initiated despite paramedic advice, and 329 (4%) recorded an alternative transport method.

Patient-initiated TNRs were almost twice as likely to visit ED at 6.2% [95%CI 5.3-7.2] than the paramedic-initiated cases at 3.7% [3.2-4.3]. Overall rates of hospital ward admission were close: 1.9% [1.5-2.5] for patient-initiated and 1.4% [1.1-1.8] for paramedic-initiated.

Conclusions: TNR protocols appear safe and effective. Paramedics provide better triage than patients themselves in predicting early ED presentation after TNR, but overall admission rates are surprisingly similar.

109. Case-Control Study of Outcomes in Low Risk Patients Presenting to a Crowded ED

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Introduction: Crowded EDs are recognised to be high-risk environments, especially for time-critical patients. This study aimed to quantify the risks of crowding to non-time-critical admissions after accounting for patient factors.

Methods: Case-control study over 3 years in TCHED. General ward admissions of local patients aged over 50 were included, critical care ward admissions and interstate ambulance transfers were excluded. Occupancy with patients waiting for inpatient beds ("boarders") was calculated throughout the period. Cases were defined as those who presented at times when 8 or more boarders were present. For each case a control with the same referral source, triage category, age (10 year groups), sex, admitting unit, and season was randomly selected from the remaining sample.

Results: 13600 admissions met the inclusion criteria. 2473 cases (78%) were successfully matched to controls. Cases demonstrated longer mean waiting time at 1:45 (95% CI 1:41-1:51) to 1:20 (1:18-1:41), no difference in time to assess and request beds and much longer delay to obtaining a bed at 6:44 (6:26-7:03) to 4:22 (4:08-4:37).

Conclusions: Low risk (general ward) patients presenting to an ED crowded with boarding inpatients receive much more delayed care and have much higher rates of boarding themselves than comparable controls.

110. The Development of an Integrated Community and Hospital Eating Disorders Programme for the ACT

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Introduction: Eating disorders encompass a range of psychiatric illnesses that are both difficult to treat and often follow a chronic, relapsing course. Current evidence based guidelines support early intervention and a multidisciplinary, stepped-care approach to promote recovery and minimise healthcare expenditure. The objective of this report was to review the current management for eating disorders in the Australian Capital Territory and recommend changes to better reflect the best practice model.

Methods: Key medical and allied health workers were consulted and policy documents were reviewed to investigate the current model. A literature review was performed in order to establish the best practice model for comparison.

Results: The current model of care was found to be effective in providing multidisciplinary care through inpatient and outpatient services. The major weakness identified was the lack of intermediate steps between community care and hospital admission.

Conclusion: When compared to the best practice model, the current system can be improved by implementing additional intensive outpatient services. This is an evidence based, cost effective measure to improve clinical outcomes by reducing hospital admissions.

111. The Enemy Within: AIDS and an Unusual Complication

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Introduction: Haemophagocytic syndrome (HPS) is a rare, poorly understood complication of Human Immunodeficiency Virus (HIV) infection.

Case: We describe the case of a patient with known HIV infection, admitted under our team with fevers and significant weight loss. He was initially diagnosed in 1985 but was lost to follow up and had self-ceased his antiretroviral therapy several years prior to admission.

On presentation, he was profoundly immunosuppressed with a CD4 T cell count of 10 and was noted to be pancytopenic. Septic screen and testing for HIV associated opportunistic and co- infections were all negative. He was found to have a new diagnosis of chronic hepatitis B not detected on previous screening. In addition, ferritin levels and lipid studies were markedly abnormal. Despite broad-spectrum antibiotics, he progressively deteriorated, becoming coagulopathic and hypotensive, requiring Intensive Care Unit admission. A bone marrow biopsy showed hypercellularity with marked haemophagocytosis and a diagnosis of HPS was made. Unfortunately, the patient passed away before appropriate treatment was instituted.

Conclusion: We postulate that HPS was driven by advanced HIV infection in our patient .Due to its high case fatality it is important to recognize and treat HPS promptly in patients at risk.

112. A Retrospective Analysis of Thyroglossal Cyst (Tgc) Management

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Introduction: Thyroglossal cyst (TGC) is a congenital anomaly that occurs in about 7% of the population. Sistrunk procedure has been widely accepted as the mainstay of treatment for this condition. The aim of this study was to determine the incidence of recurrence and the best management option that would reduce its likelihood. The secondary aim was to determine the incidence of malignancy that has been confirmed histologically on excised TGC.

Method: A retrospective analysis of all patients that underwent surgical resection for TGC at John James Memorial Hospital and Canberra Hospital from January 1980 through December 2014 was carried out using Clinical Records Information System (CRIS) or patient files.

Results: There were 84 cases of TGC identified. Seventy-six patients (93%) had undergone Sistrunk procedure and 1 patient (1.3%) had recurrence of TGC. Five patients (6%) had local excision and 3 of them (60%) had to undergo Sistrunk procedure for recurrence. Two patients (2.4%) had non-surgical approaches as initial treatment for TGC and 1 of them (50%) had recurrence. On histopathology, there was 1 patient (1.2%) had malignancy confirmed on lesion excised from Sistrunk procedure.

Conclusion: Sistrunk procedure is the best surgical procedure for the treatment of TGC. Prompt treatment and sufficient resection of tract is crucial in reducing the chance of recurrence. Incidence of malignancy was low in our series.

113. Recruiting Women for Health Research

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Introduction: Qualitative research investigating the barriers and facilitators to post pregnancy healthy lifestyle recommendations in Australian (ABW) and overseas born women (OBW) with previous gestational diabetes (GDM) was undertaken. This paper examines the recruitment process.

Method: A two-step recruitment process was adopted: (1) women managed for GDM in the period of 1st June 2009 to 31st May 2011 were contacted by the Diabetes in Pregnancy Service (DIPS) staff at Canberra Hospital starting with the first woman registered; (2) the chief investigator contacted the women who showed interest in participating. Recruitment goals were set at data saturation or maximum of 18 interviews within each of the two groups.

Results: Time constraints of the DIPS staff resulted in slow recruitment; however, no significant difference was observed in the response rate between ABW and OBW at either the first (P=0.4) or second steps (P=0.6) of recruitment. Recruiting OBW required a higher number (2.0±1.0, vs. 3.0±1.6) and longer duration phone calls (7.5±3.8 vs. 13±5.2 minutes) prior to obtaining consent. Due to recruitment difficulties of OBW, the data collection continued for four months.

Conclusion: Recruiting women for health related research is difficult. Recruiting OBW has additional challenges, which must be considered during research planning.

114. Making Student Placements at ACT Health More Interprofessional: A Pilot Study of Student Perspectives

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Introduction: The objective of this pilot study was to gather health students' insights on the most suitable approaches to making student placements at ACT Health more interprofessional. Literature supporting interprofessional learning is widespread but often at the conceptual level. Understanding students' perspectives is important to guide implementation of strategies that are consistent with the literature and locally contextualised.

Methods: An interprofessional group of students from the University of Canberra (UC) developed a list of ten ideas for making student placements more interprofessional. A survey was distributed to UC students seeking information including level of support for each of these ideas (on a five point Likert scale) and ranking of the ideas in terms of preference.

Results: The key results are that:

- All ten ideas received a positive aggregate agreement score (respondents tended to agree or strongly agree with all ideas); and
- The overall top ranked idea was to offer interprofessional observation opportunities for students, however rankings varied depending on profession.

Conclusion: In general, the sample surveyed agreed with ideas to make student placements more interprofessional. The variation in preferences between professions should be considered before implementing any ideas. Future work is planned to broaden the survey sample to include other local universities.

115. Nicotine Replacement Therapy and Adverse Outcomes in Intensive Care Patients: A Case Control Study

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Introduction: Nicotine replacement therapy (NRT) is a common first line treatment to prevent nicotine withdrawal in smokers. However, available literature report conflicting results regarding its safety in critically ill patients. The objective of this study was to evaluate the relationship between NRT in smokers admitted to the intensive care unit (ICU) and adverse events including 30-day mortality, ventilation requirements, and antipsychotic administration.

Methods: This case control study was conducted in a university affiliated tertiary hospital ICU.

Results: We identified 252 smokers admitted over 5 years, of whom 126 received transdermal NRT. We adjusted for sex, age and APACHE II score. The 30-day mortality and proportion of patients intubated was not statistically different between groups. Average length of intubation time was greater in the NRT group compared to the control group ($p<0.05$). More patients were prescribed haloperidol ($p<0.05$) and olanzapine ($p<0.01$) in the NRT group, which was statistically significant. There was nil statistical difference for quetiapine or dexmedetomidine between groups.

Conclusion: We were able to demonstrate harm associated with NRT and add to growing evidence that questions the efficacy NRT in critically ill patients. We conclude that a randomised, blinded, controlled trial is required to adequately assess this.

116. Initial Operation of a Multidisciplinary Palliative Radiotherapy Rapid Access Clinic

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Introduction: To describe the Palliative Radiotherapy Rapid Access Clinic (PRRAC) pilot program at Canberra Hospital.

Method: In August 2013 a PRRAC was established. Eligible patients included poor prognosis patients with symptomatic bone metastases from proven metastatic malignancy. Patients were seen, planned and treated in one day, where appropriate, with clinical resources re-arranged to meet this model of care. Data collected included details of timing for referral, consultation, and treatment and a patient feedback questionnaire.

Results: Twenty-one patients accessed the service in the first six months, utilising 19% of allocated clinic spots. PRRAC patients were seen on average six days (0-21) from the receipt of referral, with 0.7 days from initial consultation to treatment. Nineteen received treatment on the same day. The palliative care nurse practitioner saw two-thirds of the patients.

Feedback questionnaires were completed by 57%, with all respondents providing positive feedback. 100% were “very satisfied” and felt “all their needs were met”. Most preferred the new model compared to splitting the activities over two days. Most (10/11) felt the treatment was “very worthwhile”.

Conclusion: PRRAC patients had a reduced waiting time compared to historical controls. Patient feedback regarding PRRAC was very positive. Challenges remain in increasing service utilisation.

117. Getting 'Inspired' in Pulmonary Rehab – Involving Patients in Implementing Evidence-Based Practice

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Introduction: Patient with chronic obstructive pulmonary disease (COPD) experience inspiratory muscle weakness. Inspiratory muscle training (IMT) improves inspiratory muscle strength, reduces dyspnoea, increases exercise capacity and enhances quality of life for patients with COPD. The feasibility of adding IMT to an existing Pulmonary Rehabilitation Program (PR) was explored.

Method: A pilot feasibility study was conducted adding IMT to PR over a period of 6 months. Patients completed one supervised session a week and three independent sessions at an intensity ≥30% Maximal inspiratory pressure (MIP). Outcome measures included 6 minute walk tests, Quality of Life measures (Chronic Respiratory Disease Questionnaire), respiratory muscle strength (MIP, MEP and SNIP), and Dyspnoea (MRC). Patients completed exercise diaries.

Results: IMT was completed by 12 PR patients (age 72 (±15)). Statistically significant improvements were found in CRDQ scores including dyspnoea ($p<0.004$). IMT resistance increased significantly across the study (20 cmH2O to 30.25 cmH2O) ($p < 0.009$) with a trend towards improved MIP (mean pre 74.5: post 87.9 cmH_2O).

Conclusion: IMT is feasible and safe when incorporated within an existing PR program. Future studies should identify which PR participants are most likely to benefit from IMT so that they can be targeted for training.

118. Pyrosequencing Assay to Measure DNA Methylation in Clinical Samples of Breast Cancer

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Introduction: Long interspersed nuclear element-1 or LINE-1 is a mobile genetic element capable of making copies of itself and integrating into random sites throughout the genome via retrotransposition. It can modify the human genome through insertions, inversions, deletions and recombination events. Consequently, these active LINE-1s can potentially induce genomic instability by creating DNA double-stranded breaks and chromosomal rearrangements. Therefore, LINE-1 promoter is heavily methylated in normal cells to repress LINE-1 activity. Conversely, lower methylation levels of LINE-1 have been observed in cancer cells.

The overarching aim of this project is to explore LINE-1 promoter DNA methylation in clinical samples of various stages of breast cancer and its association with clinicopathological characteristics of patients.

Methods: Pyrosequencing assay of bisulphite-converted DNA isolated from formalin-fixed paraffin-embedded (FFPE) samples of breast tissues was performed to measure DNA methylation levels across seven CpG sites within the LINE-1 promoter.

Results: Differences in LINE-1 DNA methylation level between normal and tumour samples were not significant. No association between LINE-1 DNA methylation status and clinicopathological characteristics was observed. LINE-1 DNA methylation level was not associated with patient's survival outcome.

Conclusion: Contradictory findings between the present study and previous research suggest that various mechanisms may exist to regulate LINE-1expression.

119. Examining Chromatin Dynamics and Interactions during T Cell Immune Memory Formation

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Introduction: Immune memory is the phenomena whereby upon secondary presentation of an antigen, the adaptive immune system will launch a more robust response than was previously shown upon primary stimulation. This study aims to examine the chomatin regulatory mechanisms, which underpin the memory response in T cells.

Methods: Chromatin and transcription factor binding dynamics were characterised by chromatin immunoprecipitation in a Jurkat model of T cell memory. RNAi was used in conjunction with RT-PCR and formaldehyde-assisted isolation of regulatory elements to examine the role identified immune transcriptions factors on regulatory immune gene expression and chromatin accessibility.

Results: Nucleosome composition of promoter and enhancer regions in immune memory responsive genes is dynamic during T cell activation, resting and reactivation. Transcription factor appear to play a role in memory recall responses for a subset of immune genes.

Conclusions: This study has shown various chromatin signatures associated with T cell memory formation, on immune memory associated genes in Jurkat T cells.

120. Correlation between light levels and the development of deprivation myopia

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Introduction: Daily exposure to bright light (15,000 lux) has been shown to retard the development of experimental myopia (EM) in chickens by roughly 60%. This study investigated whether there is a correlation between the intensity of light and the protective effect afforded against the development of EM.

Methods: Chicks wore translucent diffusers for a period of 7 days to induce EM, and were exposed to one of the following light intensities daily; 500, 10,000, 20,000, 30,000, and 40,000 lux, n = 12 per group.

Results: A significant correlation was observed between log light intensity and the development of EM, with a less myopic refraction ($F(28, 330) = 60.86$, $P < 0.0001$) and shorter axial length ($F(4, 20) = 8.87$, $P < 0.0001$) seen with increasing light intensities.

Conclusion: The level of protection from the development of EM is enhanced with increasing light intensity. By 40,000 lux the development of EM has been abolished.

121. Reversing ABC Transporter Mediated Multidrug Resistance by Inhibition of the PI3K/AKT Pathway

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Introduction: Multidrug resistance (MDR) is a major issue in chemotherapy and affects 1 in 2 cancer patients. A key contributor of MDR is the overexpression of ABC transporters such ABCB1 and ABCG2. Despite intensive efforts, to date there are no clinically used methods to overcome MDR. One potential strategy to overcome MDR could be to inhibit the PI3K/AKT signal transduction pathway, as it has been known to modulate ABC transporter expression. This project aims to elucidate if ZSTK474 could be used in combination with chemotherapeutic agents to overcome the resistance phenotype.

Methods: Whole cell expression, transport and cytotoxicity assays were completed using sensitive and resistant cell lines. Purified protein was used to complete ATP hydrolysis assays.

Results: Whole cell expression assays showed a reduction in expression of ABCB1 and ABCG2 in the presence of ZSTK474. Secondly, it was found to affect drug transport by ABC transporters. ZSTK474 also stimulated ATP hydrolysis in the presence of purified ABCB1, indicating a direct interaction between the drug and ABCB1. Combination cytotoxicity assays of ZSTK474 and existing chemotherapeutic agents in sensitive and resistant cells potentiated the effect.

Conclusion: Using ZSTK474 with commercial chemotherapeutic agents to overcome ABC transporter mediated MDR, could reduce side effects for cancer patients.

122. Identification of MicroRNAs in Transcriptional Memory in Human T Cells

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Introduction: Transcriptional memory is a key feature of immunological memory; it provides the ability for memory T cells to respond more rapidly and robustly when subsequently activated by the same antigen. There are numerous layers of gene regulation for tightly controlled expression during a memory response. MiRNAs are short non-coding segments of RNA that work to regulate gene expression at the post-transcriptional level. MiRNAs are able to regulate the gene expression in one of two ways, by either mRNA degradation or inhibition of translation.

Methods: Human Jurkat T cells were stimulated with PMA/CaI for two hours to produce cells of primary and secondary immune responses. A high throughput screen (TaqMan miRNA array) was performed on Stimulated human Jurkat T cells.

Results: Through a global analysis of 754 miRNA profiles in transcriptional memory a number of distinct cohorts were identified. Novel miRNA cohorts were identified as expressed only during primary activation, short-term secondary activation or long-term secondary activation as well as a cohort of miRNAs expressing transcriptional memory.

Discussion: This Study shows for the first time the importance of a distinct cohort of miRNAs in transcriptional memory, these miRNAs may be important at different stages of memory being either long or short term memory.

123. Towards Identification of Malaria Parasite Proteins that Activate Platelets

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Introduction: Malaria is a disease caused by the parasite Plasmodium falciparum that kills over one million people a year. Platelets are well known for their role in hemostasis and thrombosis, but more recently platelets have been shown to have a role in immune function and more specifically in the protection against malarial infection. It has been shown when platelets bind to infected red blood cells, the chemokine platelet factor 4 is released from platelets and targets the digestive vacuole of the infected red blood cell killing the parasite within. The hypothesis is the infected cell expresses molecules that cause platelet binding and activation. The aim of this work is to identify these molecule(s).

Methods: Purified platelets will be used with whole parasites as well as fractions of infected red blood cells to test for platelet activation under in vitro conditions. Once activating fractions have been identified, various chromatographic separation techniques will be used to isolate the protein(s) of interest. The proteins will then be identified using mass spectrometry and the activation process will be studied in more detail using purified or recombinant forms of the protein(s).

Results: Preliminary data shows that trophozoite stage parasites activate platelets.

124. Green Tea Polyphenols and Neuroprotection: A Systematic Review of Animal Pre-Clinical Trials

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Introduction: Alzheimer's Disease (AD) is a neurodegenerative disorder and the most common form of dementia. Currently, the nootropic potential of plant-derived compounds in relation to AD is being investigated. The green tea catechins (GTC), in particular epigallocatechin-3-O-gallate (EGCG), are being shown significant interest due to their exceptional antioxidant and anti-inflammatory properties.

Methods: A systematic review of the literature was performed following the PRISMA 2009 guidelines. Peer-reviewed articles, published between January 2000 and September 2014, were sourced from electronic databases (PubMed; Cochrane Library; Scopus).

Results: The preliminary searches of the selected databases with the terms "Green tea polyphenols" and "Alzheimer's disease" identified 4635 records but the secondary search reduced this to 500 articles. Based on more specific selection criteria, only 3 studies (1 in rats and 2 in mice) were included. The 3 papers identified in this systematic-review indicated that GTC and/or pure EGCG possess neuroprotective properties, which may be useful for preventing the development, or for the maintenance, of AD.

Conclusion: Although the findings in the 3 papers were from pre-clinical animal models, they nevertheless provide a "stepping stone" for the utilisation of GTC and/or EGCG as nootropic nutraceuticals for the potential suppression of neurodegenerative diseases such as AD.

125. Anti-Retroviral Efavirenz Drug Reduces DNA Double Strand Breaks in Breast Cancer Cell

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Introduction: Long Interspersed Nuclear Element 1 (L1 element) is rarely expressed in normal somatic tissues, but widespread in human cancers. L1 elements can initiate cancer formation by DNA double-strand breaks (DSBs). When L1 becomes active, they can rapidly multiply its copy numbers by a 'copy-and-paste' mechanism. Consequently, L1 insertions provide a source of genetic mutations by activating oncogenes or inactivating tumour suppressor genes. Our research addresses a growing awareness that L1 expression can lead to the development of breast metastases.

Methods: The antiretroviral drug, Efavirenz, is an inhibitor of the reverse transcriptase enzyme that can supress the activity of L1-encoded reverse transcriptase. We use immunofluorescence to detect DNA DSBs marker H2A.Xγ in both Efavirenz treated and untreated cells to investigate the effects of inhibition function of Efavirenz in breast cancer cells.

Results: Here we provide the evidence that Efavirenz-treated breast cancer cells (MCF10AT and MCF10CA1) have lower proportion of DSBs compared with untreated cells. Notably, non-cancerous MCF10A cells show no significant differences in terms of DSBs, irrespective of with or without treatments.

Conclusion: Together, our studies confirm the effects of Efavirenz in breast cancer cells. However, further studies are required to understand the role of L1 retrotransposons in cancer cells.

126. Screening of Chemical Compounds to Identify Specific Inhibitors of the Nutrient Transporter B0AT1, a Potential Drug Target to Treat Type 2 Diabetes

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Introduction: Apical broad-spectrum neutral (0) amino acid transporter B^0AT1 (SLC6A19) is a Na^+-dependent neutral amino acid transporter mainly expressed in intestine and kidney. It is co-expressed with the carboxypeptidase angiotensin-converting enzyme 2 (ACE2) in the intestine or its homolog collectrin (TMEM27, transmembrane protein 27) in the kidney, which is critical for the activity of the transporter. Our lab previously reported that $B^0AT1^{-/-}$ mice had reduced body weight and insulin secretion in response to food ingestion, indicating that the depletion of the transporter led to improved insulin sensitivity and better resistance to high fat diet – induced obesity.

Methods: Chinese Hamster Ovary (CHO) cells, stably transfected with B^0AT1 and collectrin, were validated as a tool for compound screening. A fluorescent membrane potential assay and a radioactive uptake assay were optimised to observe transporter function.

Results: We have identified a number of compounds with IC50 ~40-60μM. Compound NSC63912 was identified as a non-competitive inhibitor, whereas compound NSC22789 was a competitive inhibitor. The specificity was tested by using the endogenous Na^+-independent transport activity of CHO cells.

Conclusion: The inhibition of B^0AT1 using chemical compounds could lead to new drugs to treat type 2 diabetes.

127. Identifying the Drug Binding Sites of the Multi-Drug Efflux Pump, P-glycoprotein

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Introduction: P-glycoprotein (P-gp) utilizes ATP to actively efflux a broad range of hydrophobic compounds from the lipid bilayer into the extracellular environment. It is implicated in conferring multidrug resistance in many types of cancer. The location(s) of the drug binding sites on P-gp is unknown, as are the molecular mechanism of drug-protein interaction. There is a pressing need to identify them in order to design compounds that avoid efflux by P-gp or those that inhibit its function.

Methods: 7 residues within the transmembrane binding domain was mutated to cysteines and expressed in insect cells. Membranes for each mutant were successfully purified, with their ATPase activities measured. The ability of P-gp substrates Vinblastine, Paclitaxel, Rhodamine123, and modulator, Nicardipine to stimulate ATPase activity and potencies was measured.

Results: Mutation at residue 769C affects the potency of Nicardipine, whereas that at 311C affects both Nicardipine and Paclitaxel. Rhodamine123 potency is affected by mutations at 982C, 65C and 336C and only 197C affects the potency of Vinblastine. 978C showed decreased potency, or complete absence of stimulation of ATP hydrolysis in the presence of all four compounds. This could be due to affected communication between the transmembrane domain and nucleotide binding domains.

Conclusions: These studies established contact points for four pharmacologically distinct compounds on P-gp, indicating four spatially putative binding sites.

128. A Novel Cationic Amino Acid Transporter Implicated in Gametocytogenesis in Plasmodium berghei

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Introduction: The novel putative transporters (NPTs; Martin et al., 2005) are a family of membrane proteins unique to apicomplexan parasites. These proteins have twelve transmembrane domains and, as such, have the structural characteristics of a transporter. However members of this family lack clear sequence homology to any known transporter. A recent study (Boisson et al., 2011) has demonstrated that in the murine parasite, Plasmodium berghei, one of the NPT proteins, PbNPT1, plays a critical role in the development of the sexual-stage (gametocyte) form of the parasite. The focus of this study was to investigate the substrate specificity and the physiological role of PbNPT1.

Methods: We expressed PbNPT1 in Xenopus laevis oocytes, and measured the uptake of a range of radiolabeled substrates. For substrates that were found to be transported in oocytes expressing PbNPT1, transport was measured in both wild-type P. berghei parasites and 'knockout' parasites in which the gene encoding PbNPT1 had been disrupted.

Results: Oocytes expressing PbNPT1 showed a marked increase in arginine and lysine uptake. Uptake of radiolabeled arginine in this system was inhibited by unlabelled forms of other cationic amino acids. Radiolabeled arginine and lysine uptake in the PbNPT1 knock-out parasites was significantly reduced relative to that in wild-type parasites.

Conclusion: These data are consistent with PbNPT1 being a cationic amino acid transporter.

129. Human Rhinovirus 3C Protease Cleaves RIPK1, an Important Intermediate in Extrinsic Apoptosis

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Introduction: Human Rhinovirus (HRV) is a human pathogen of significant medical importance, being a major cause of upper respiratory tract infections and majority of virus-induced asthma exacerbations. We investigated whether HRV could modulate apoptosis, an antiviral innate immune response. Apoptotic signals are generated either extrinsically or intrinsically and are propagated via caspase cascades that lead to cell death, reducing HRV viral replication, which relies on cellular machinery.

Methods: Using HRV16 infected cells, cells treated with chemical inducers and inhibitors of extrinsic apoptosis, and in vitro protease cleavage assays we have shown that HRV16 3C protease cleaves a key intermediate in extrinsic apoptosis.

Results: Receptor-interacting protein kinase-1 (RIPK1), an extrinsic apoptosis adaptor protein, was cleaved by caspase 8, as expected, during chemical induction of apoptosis. RIPK1 was cleaved in HRV infection albeit at a different site. Caspase 8 activation, which is associated with extrinsic apoptosis, was required for optimal HRV 3C protease mediated cleavage of RIPK1, potentially by increasing the accessibility of the HRV 3C cleavage site within RIPK1.

Conclusion: The caspase 8 mediated RIPK1 cleavage product has a pro-apoptotic function, and further cleavage of this pro-apoptotic cleavage product by HRV 3C may provide a mechanism by which HRV regulates apoptosis.

130. The Self-Interaction Properties of Dihydropyridine Receptor β1a Subunit Explained

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Introduction: The β_{1a} subunit of the dihydropyridine receptor (DHPR) is essential for excitation-contraction coupling. It is composed of an Src homology-3 (SH3) and a guanylate kinase (GK) domain separated by a HOOK region. All structures of the β-subunit isoforms have been solved without the HOOK. We demonstrate that the HOOK interacts with the SH3-GK domains.

Methods: The oligomeric state of full-length β_{1a} subunit, SH3-HOOK-GK, SH3-GK and reconstituted SH3-GK:HOOK was determined by multi-angle laser light scattering (MALLS). The secondary structure composition of SH3-GK and HOOK domains was assessed by circular dichroism (CD) spectropolarimetry. The NMR spectra of HOOK in isolation and complexed with SH3-GK domain was recorded.

Results: Full-length β_{1a} and SH3-HOOK-GK constructs are multimeric, whereas SH3-GK and HOOK proteins are monomeric. Notably, SH3-GK:HOOK forms a one-to-one complex. The CD spectra of SH3-GK combined with HOOK are not additive as is expected for non-interacting entities. The NMR chemical shifts of HOOK were perturbed upon titration with SH3-GK.

Conclusion: The SH3-GK domain interacts with the HOOK region. The HOOK is also responsible for the multimerisation of full-length β_{1a} and SH3-HOOK-GK. Because the polydispersity of SH3-HOOK-GK makes it difficult to structurally characterize, the reconstituted SH3-GK:HOOK complex, which is amenable to structural characterisation, offers a better alternative.

131. Investigating the Cytotoxic Effects of Corticosteroids on Retinal Cells

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Introduction: Corticosteroids are widely used in the treatment of ocular conditions due to their anti-inflammatory properties. The aim was to investigate the cytotoxic effects of corticosteroids on retinal cells over a range of clinically relevant concentrations, and durations of exposure.

Methods: Cells were seeded in DMEM containing 10% fetal bovine serum (4,000 cells/well) on day 1, and then treated with serum-deficient DMEM on day 2. Dexamethasone and Triamcinolone Acetonide were added to separate wells at concentrations of 10, 1, 0.1, 0.01, 0.001 and 0.0001µg/µl on day 3. Cell viability was assessed at 12 and 24 hours following addition of the corticosteroids using an MTT Assay. All samples were read in triplicate (n=3). These experiments were performed on 661W, MIO-M1, ARPE19 and N11 cells.

Results: Dexamethasone caused a significant reduction in cell viability at the highest concentration (10µg/µl) at 12 and 24 hours, in 661W, MIO-M1 and N11 cells. Cell viability of 661W cells was also significantly reduced at 12 hours, following addition of 10µg/µl of Triamcinolone Acetonide. No significant effects on cell viability were observed at the remaining concentrations for each of the cell types at both time points.

Conclusion: A majority of the clinically relevant concentrations of corticosteroids tested did not exhibit cytotoxic effects on retinal cells. This warrants further investigation into their use in the treatment of retinal inflammation.

132. LSD1 Mediates Global Changes in Gene Expression during EMT and in Breast CSCs

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Introduction: Epithelial to Mesenchymal Transition (EMT) is a critical early event in cancer progression and metastasis as well as the formation of a subset of cancer stem cells (CSCs). Recently, EMT and CSCs have been shown to be under multiple layers of epigenetic control including histone modifications. Lysine-specific demethylase 1 (LSD1) is one such histone-modifying enzyme that has been implicated closely in breast carcinogenesis. In this study we wanted to elucidate the involvement of LSD1 in EMT and in breast CSCs.

Methods: siRNA based knock-down and inhibitor approaches were used to determine the involvement of LSD1 in EMT and breast CSCs. These approaches were coupled with genome-wide studies utilising Affymetrix microarrays and an in vivo mice model.

Results: We have shown for the first time that LSD1 regulates the expression of a number of genes genome-wide during EMT and in breast CSCs. Importantly, we have also identified distinct signalling pathways that LSD1 is involved in during the EMT process and in breast CSCs. We have also shown that LSD1 is important in a metastatic tumour microenvironment, as well as tumour recurrence.

Conclusion: We have identified LSD1 as a key regulator of EMT and breast CSCs.

133. The Role of Adipose Tissue Inflammation in the Pathogenesis of Non-Alcoholic Steatohepatitis (NASH) in High Fat Fed foz/foz Mice

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Introduction: Alms1 mutant (foz/foz) mice develop obesity due to defective appetite regulation. 24 weeks high-fat (HF) fed NOD.B10 foz/foz mice develop diabetes, adipose restriction and NASH; whereas Balb/c foz/foz mice do not. The aim of this study is to determine the role of adipose inflammation in the abnormal metabolic phenotype of NOD.B10 foz/foz mice.

Methods: Female NOD.B10 and Balb/c WT and foz/foz mice were fed chow or HF-diet from 4 weeks of age. Body weight, fat pads and blood chemistry were measured fortnightly until 12 weeks of age. Dual Energy X-ray Absorptiometry (DEXA) and glucose tolerance tests were performed one week prior to harvesting. mRNA expression of adipose differentiation and inflammation markers was evaluated.

Results: HF-fed foz/foz mice of both strains developed obesity and hyperinsulinaemia, but only NOD.B10 mice displayed early glucose intolerance and hyperglycaemia. HF-fed foz/foz mice of both strains exhibited similar increased fat mass and differentiation, accompanied by low-grade adipose inflammation.

Conclusion: There was early evidence of diabetes and insulin resistance in HF-fed NOD.B10 foz/foz mice without concomitant adipose restriction and dedifferentiation. A pro-inflammatory environment occurs in both strains, leading to chronic low-grade inflammation associated with obesity, suggesting a secondary role for adipose inflammation in NASH pathogenesis.

134. Can 670 nm Light Ameliorate Proliferative Gliosis in Retinal Müller Cells?: an In Vitro Study

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Introduction: Müller cells have an important role in supporting architectural stability, and neurons in the retina. Following retinal damage, Müller cells undergo gliosis that uncontrolled, can form glial scars that hinder nutrient absorption and then disrupt functional recovery. 670 nm red light has been shown beneficial effect on neurons in retinal diseases. However, the effect of 670 nm light on Müller cells is still unclear. The aim of this study was to examine whether 670nm light treatment modulates the activation of retinal Müller cells in an in vitro stress model.

Method: The Human Müller cell line MIOM-1 was plated and then scratched with pipettes after reaching confluency. Half of cells was treated with 670 nm light (9J/cm2) for 3 minutes, 3 times for the first 24 hours after scratch. Cellular migration, proliferation, structural change, stress and cytotoxicity were analysed over 72 hours using different analysis.

Results: 670 nm light reduced the rate of cell migration and mitigated proliferation in this model. Cells treated with 670 nm light maintained cellular structure and showed lower levels of stress. Treatment with 670 nm light didn't have cytotoxic effect on cells.

Conclusion: 670 nm light modulated activation of retinal Müller cells in vitro. This may be the therapeutic target strategy in maintaining gliotic changes.

135. Characterisation of Toxoplasma Gondii NBP35 in Iron-Sulfur Cluster Biosynthesis

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Introduction: Iron-sulfur (Fe-S) clusters are prosthetic groups on iron-sulfur proteins, and are essential for survival of all eukaryotes. Studies in model eukaryotes have identified independent Fe-S cluster biosynthesis pathways in the mitochondrion, plastid and cytosol, which produce Fe-S clusters for the respective compartments. Little is known about Fe-S cluster biosynthesis in apicomplexan parasites, the causative agents of diseases such as malaria and toxoplasmosis. NBP35 is the central protein in the synthesis of cytosolic Fe-S clusters, and has a cytosolic localisation in all eukaryotes studied thus far. Unexpectedly, we found the NBP35 homologue of the model apicomplexan Toxoplasma gondii (TgNBP35) localised to the mitochondrion, thus prompting further characterisation of this protein.

Methods: We generated anhydrotetracycline-regulatable knockdown mutants in TgNBP35 to conduct growth assays and western blots. We also generated modified-TgNBP35 mutants to conduct immunofluorescence assays and growth assays.

Results: TgNBP35 knockdown leads to severe defects in parasite growth and the biogenesis of cytosolic Fe-S clusters. Without the presence of an N-terminal transmembrane domain, TgNBP35 cannot target to the mitochondrion, which leads to a severe growth defect.

Conclusion: TgNBP35 is essential for parasite survival and is involved in cytosolic Fe-S cluster synthesis. Interestingly, its mitochondrial localisation may be important for its function.

136. Novel ENU-induced ankyrin-1 mutations reveal complex role ankyrin plays during malaria infection

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Introduction: Host genetic polymorphisms provide long term protection against malaria infection in both humans and mice. This project aims to identify novel pathways to identify the mechanisms underlying the host response to malaria infection using large scale N-ethyl-N-nitrosourea (ENU) mutagenesis in mice. Malaria resistance was observed in mice with ENU-induced ankyrin-1 (Ank1) mutations. Mice with mutations at various location in Ank1 gene were examined to explore the resistance mechanisms.

Methods: ENU mutagenesis of mice, followed by phenotypic screening were used to identify mice with Ank1 mutations. The red blood cell (RBC) half-life, osmotic fragility and morphology were examined. Malaria challenges were done to assess the malaria resistance. Invasion and TUNEL assay were done to examine the possible mechanisms of clearance.

Results: Ank1 mice exhibited low RBC volume and haemoglobin, high RBC count and increased osmotic fragility. Some strains exhibited shorter RBC half-life and deformed morphology. Most Ank1 mice were resistant to P. chabaudi. The RBCs from Ank1 mice were resistant to parasite invasion, some impair parasite growth and some were prone to clearance.

Conclusion: Different Ank1 mutations cause changes on erythrocyte properties and malaria resistance with different severity. Truncation-causing mutations seem to affect parasite maturation, substitution causes increased clearance.

137. "She's never getting out of here!" Innovative multidisciplinary rehabilitation in ICU – A complex case study

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Introduction: Prolonged intensive care (ICU) admission is associated with reduced function, increase utilisation of resources on discharge and increased mortality. This case study presents innovative multidisciplinary interventions that facilitated positive outcomes for a patient predicted not to survive ICU.

Methods: 67 year old female with a background of significant cardiac and respiratory disease was admitted to ICU (APACHE II = 28) with a small bowel obstruction requiring laparotomy, complicated by cardiac failure requiring vasopressor support, renal failure, pneumonia and ICU acquired weakness. Multidisciplinary interventions included weekly multidisciplinary meetings (from day 8); early mobilisation and treadmill training utilising portable ventilators; inspiratory muscle training; cuff deflations and speaking valve; early commencement of oral intake; transition to nocturnal non-invasive ventilation; and use of cough assist machine to facilitate decannulation.

Results: Total length of ICU stay was 112 days, with 105 days of mechanical ventilation. Physical function (Acute Care Index of Function) improved from 0.40 on admission to 1.00 (full independence) on ICU discharge. Patient was discharged home day 147, only 5 weeks following ICU discharge, with full independent mobility, no increase in home services and no readmissions.

Conclusion: Through multidisciplinary collaboration and innovative rehabilitation strategies, holistic rehabilitation is achievable for complex ICU patients.

138. The Dynamics of microRNA and mRNA 3'UTR Interactions in Normal and Hypertrophic Hearts

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Introduction: microRNAs and their mRNA 3'untranslated region (3'UTR) targets can both be expressed as multiple processing variants. Each variant could have different targeting properties, thus affecting microRNA-mediated regulation in the cell. We aim to comprehensively uncover these processing variants in the heart and evaluate their changes and interactions during cardiac hypertrophy.

Methods: Transverse aortic constriction (TAC) was performed to induce cardiac hypertrophy in C57BL/6 mice. RNAs were extracted from the cardiomyocytes of sham-treated, pre-hypertrophic (2d post-TAC), and hypertrophic (7d post-TAC) mice, and then subjected to small-RNA and polyA-tail (PAT-) sequencing.

Results: There is a widespread occurrence of microRNA isomiRs in the cardiomyocyte, however their relative proportions remained unchanged during cardiac hypertrophy. Our mRNA PAT-seq data identified novel 3'UTRs for 7,348 genes. Notably, there was a significant global shift towards shorter 3'UTR variants as hypertrophy develops. We shortlisted 583 genes with a statistically significant change in the proportion of its 3'UTR variants during hypertrophy, 7 of which we have validated through qPCR. Sucrose density gradient centrifugation revealed that different 3'UTRs of an mRNA could differ in their polysome associations. microRNA target prediction analysis from our sequencing datasets identified 104,001 microRNA-mRNA interactions in the cardiomyocyte. Differential analyses of these interactions suggested that the connectivity between microRNA and their 3'UTR targets are modulated during hypertrophy.

Conclusion: Collectively, our data add richer textures to a systems-level understanding of microRNA-mediated regulation during normal and hypertrophic states of the heart, which may aid in the development of microRNA-based therapy for cardiac disease.

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