

RESEARCH REPORT

2014 - 2015



Capital & Coast District Health Board



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INTRODUCTION



The purpose of this report is to provide an overview of the research undertaken by staff at Capital & Coast District Health Board in 2014 and 2015. It serves as a record of the research activities in the DHB and a guide to the research interests of CCDHB staff. Above all it demonstrates that the DHB staff is engaged in research programs across a wide range of medical fields and disciplines.

Many of the staff who are active in research are supported by part-time university appointments but a large part of the of the research undertaken in the DHB is done by staff outside of working hours. This report recognises the commitment of the DHB staff to clinical research, as well as the support provided by the board and management.

Capital & Coast DHB has strong links with external research institutions, including University of Otago Wellington (UOW), Victoria University of Wellington (VUW), the Malaghan Institute and the Medical Institute of New Zealand (MRINZ), and with Hutt Valley and Wairarapa DHBs. The Research office is staffed by a dedicated team led by Service Leader Marina Dzhelali. The Clinical Trials Unit is running at near capacity providing patients with access to as-yet-unfunded treatments, contributing to the development of new drugs and generating income to support the costs of the research office.

Over the last two years the Research Office has been developing some new projects, including a CCDHB tissue banking policy, which will standardise the way that tissue is collected and stored for use in future research. The Research Governance Group, which is comprised of DHB staff who are active in research, has provided valuable guidance on this and other matters.

Finally, I would like to acknowledge the patients who have participated in trials and studies, often without any personal benefit other than the satisfaction of contributing to improvement in health outcomes.

Andrew Harrison

Clinical Director, Research



ALLIED HEALTH

Several of the Allied Health, Scientific and Technical practitioners at CCDHB are actively engaged in research to further clinical knowledge across a wealth of areas of the health system. Examples are outlined below of just some of the achievements of the many professions who have contributed to our understanding in a wide range of health disciplines.

The practitioners involved are from a diverse range of backgrounds including; Radiation Therapy, Psychology, Physiotherapy and Dietitians.

Rob Louwe, Principal Medical Physicist, Daniel Seller, Physiotherapist, and Dr Paul Skirrow, Professional Psychology, between them represent the Allied Health, Scientific and Technical professions on the research committee at CCDHB.

Furthermore, David Robiony-Rogers, Service Leader Respiratory Medicine, is also a Clinical Senior Lecturer, Department of Medicine, University of Otago, Wellington. While Catherine Epps, Executive Director Allied Health, Scientific and Technical, is an Adjunct Teaching Associate at the Graduate School of Nursing, Midwifery, and Health, Victoria University.

Highlights and Achievements shared at conferences in 2014/15:

Bennett A (2015) "The prevalence of co-morbid asthma in a New Zealand Cystic Fibrosis (CF) population," Australian and New Zealand Society of Respiratory Science conference

Brown F (2015) "NewER Aspects – a physiotherapy assistant perspective at C&C DHB", Allied Health Assistants' conference, Christchurch

Dixon H (2015) "Value added role of Physiotherapy- the impact of a new model of care," World Federation International Musculoskeletal conference, Dublin

Kallesen M (2015) "Comparison of Cough Reflex Testing against Video endoscopy in Extubated ICU" 5th Annual Congress of the European Society of Swallowing Disorders, Barcelona

Williams L and Stern K (2015) "Ask the Experts" panel, Cystic Fibrosis New Zealand Lay conference



Catherine Epps

**Executive Director Allied Health,
Scientific and Technical**

ALLIED HEALTH

Highlights and Achievements shared at conferences in 2014/15 continued:

Prebble R, Epps C, Simpson R (2015) "Designing our Future Together: Allied Health, Scientific and Technical Strategic Approach", APAC conference

Stet B (2015) "Eosinophilic Oesophagitis", Australasian Society of Clinical Immunology and Allergy conference, Adelaide

Stern K, (2014) "Nutrition and COPD", The Asthma foundation Respiratory conference

Stewart J (2015) Malnutrition in the hospital setting, National Dietitians NZ meeting

Stubbs S, Owens M (2015) "Lining Up the Ducks: Allied Health New Entry to Specialist practice for Allied Health", Allied Health Conference, Melbourne



Molly Kallesen

Examples of Publications:

McWilliams J, de Terte I, Leathem J, Malcolm S and Watson J (2014) "Transformers: A Programme for People with an Intellectual Disability and Emotion Regulation difficulties", Journal of Intellectual Disabilities and Offending Behaviour, 5:178-188.

McWilliams, J., de Terte, I, Leathem, J., and Malcolm, S. (2014). "An evaluation of an emotion regulation programme for people with an Intellectual Disability." Therapeutic Communities, 35, 105-118.

Patries M. Herst, Noelle C. Bennett, Annie E. Sutherland, Ruth I. Peszynski, Dean B. Paterson, Marieke L. Jasperse. (2014), "Prophylactic use of Mepitel Film prevents radiation-induced moist desquamation in an intra-patient randomised controlled clinical trial of 78 breast cancer patients." Radiotherapy Oncology <http://dx.doi.org/10.1016/j.radonc.2014.01.005>

Steiner F, Evans J, Marsh R, Rigby P, James S, Sutherland K, Wickens R, Nedev N, Kelly B, Tan ST, (2015) "Mouth opening and trismus in patients undergoing curative treatment for head and neck cancer" International Journal of Oral Maxillofacial Surgery 44: 292-296

ALLIED HEALTH

Psychologists

The psychologists that are involved in research are Paul Oxnam, Emma Gardner, Jared Watson, Cecilia Small.

Paul and Emma previously published a description of the Stepping Stones programme: Oxnam, P & Gardner, E (2011). Stepping Stones – a group therapy programme for the treatment of emotion regulation difficulties in offenders with an intellectual disability, *Journal of Learning Disabilities and Offending Behaviour*, 2: 146-151.

And Jared Watson and Sandra Malcolm were involved in writing up a description of the Transformers programme (a community-based version of Stepping Stones): McWilliams J, de Terte I, Leathem J, Malcolm S and Watson J (2014) Transformers: A Programme for People with an Intellectual Disability and Emotion Regulation difficulties, *Journal of Intellectual Disabilities and Offending Behaviour*, 5:178-188.

Followed by this evaluation of Transformers: McWilliams J, de Terte I, Leathem J, and Malcolm S (2014). An evaluation of an emotion regulation programme for people with an intellectual disability, *Therapeutic Communities*, 35, 105-118.

Psychologist Cecilia Small completed DLitt et Phil in Psychology at the University of South Africa (UNISA) in 2015. Title of thesis: South African immigrants in New Zealand: Towards an ecomodel of assessment and intervention. In a nutshell, it draws attention to immigrants that “fall between the cracks” of the two main categories of migrants, i.e. immigrants (voluntary) and refugees (involuntary). Using South Africans as an example, she discussed the settlement difficulties faced by so-called “reluctant/semi-voluntary immigrants” or “anticipatory refugees” who often felt compelled to leave their country of origin due to high levels of violent crime and worsening political instability.

Cecilia presented research findings at ESP group at Te Papa in February 2016 and a workshop titled “Working with South Africans as reluctant immigrants in New Zealand”, at the New Zealand College Of Clinical Psychologists (NZCCP) Conference in April 2016. She is currently refining an article written (as part of her thesis) for publication in a peer reviewed journal.



Cecila Small and her Supervisor Prof. F.J.A. Snyders, UNISA

Cecilia would like to give a special thanks to her supervisor at the University of South Africa, Professor ‘Ricky’ Snyders.

NURSING and MIDWIFERY

Nurses and Midwives contribute to research across the DHB; working with patients and families, participating in research as participant's themselves or research team members. Research experience as principal researchers is gained through Masters and PhD with staff usually enrolled through Massey University and Victoria University of Wellington.

There have been funded research and project undertaken in 2014 to 2015. These are:

Genesis Oncology Trust Special Purpose Grant. "Building knowledge transfer and innovation in palliative care: Visit of international expert Professor Philip Larkin" (NZ\$4,517)

Australasian Critical Care Nurses Experienced Research Award: Preparing families for treatment withdrawal: An intervention study (AUD\$12,000)

University Faculty Grant. Managing transitions in care for people with advanced, progressive illness: An organisational ethnography (NZ\$33,600)

Wellington Anaesthesia ICU Trust: A cross sectional descriptive survey to investigate the provision of bereavement follow-up services in intensive care units across New Zealand and Australia (NZ\$1,400)

Presentations completed as a sole presenter by CCDHB staff:

- *Coombs MA, de Vries K, Tester R, Donovan S, Fullbrook P (2014). Areas of uncertainty and difference in attitudes about end of life nursing care practices: an international comparison (Poster). European Society of Intensive Care Medicine (ESCCM) 27th Annual Congress, Barcelona, Spain.*
- *Coombs MA Tang J, Long T. (2014). 'She's gonna die': what families notice about impending death in intensive care. (Poster) British Association of Critical Care Nurses (BACCN) conference. Cardiff, Wales.*
- *Coombs MA. (2014). Followership: the forgotten part of leadership in end of life care. Invited international keynote speaker. BACCN Conference, Cardiff, Wales.*
- *Pedersen A, Psirides A, Coombs MA (2014). Examining the dying trajectories of patients referred to the rapid response team. Poster presentation, Australian and New Zealand Intensive Care Society (ANZICS) Safety & Quality Conference, Melbourne, Australia.*
- *Pedersen A, Psirides A, Coombs MA. (2014). 'Critical care outreach: a service out of reach for New Zealand' First prize - oral presentation. ANZICS New Zealand Conference Christchurch, NZ.*



Andrea McCance
Director of Nursing & Midwifery



Maureen Coombs

CARDIOLOGY

Consultants who are active in research include Peter Larsen and Stewart Mann (Associate Professors with UOW) and Scott Harding and Alex Sasse (Adjunct Professors with VUW).

Cardiovascular disease remains the leading cause of death, and a significant cause of morbidity in the western world. The Wellington Cardiovascular Research Group undertakes basic science projects, translational research and clinical research into ischaemic heart disease, heart failure and cardiac arrhythmia. Our current areas of research interest include platelet reactivity and inflammation in ischaemic heart disease, technical aspects of interventional cardiology, mechanisms of ventricular arrhythmia, provision of implantable cardioverter defibrillator therapy, applications of novel imaging techniques to aid in diagnostic processes, and scoring tools for risk stratification in cardiac disease.

The main areas of investigator-led research are; acute coronary syndromes, sudden cardiac death, ventricular tachyarrhythmias, defibrillation, implantable cardioverter defibrillators, heart rate variability, respiratory variability.

The Department runs a registry and a biobank that has allowed the comparison of genotype and outcome with a view to personalising treatment for individuals. An important example of this is the higher frequency of resistance to clopidogrel in people of Maori and Pacific ethnicity. The Cardiology Department also takes part in multicentre drug and device trials.

There are a number of tangible ways in which research benefited the health of cardiology patients in 2014. Participation in drug trials has made unfunded treatments available to patients. The patient registry has been a source of continuous quality improvement and audit. The clinically focused research being undertaken by a large proportion of the cardiology staff fosters critical evaluation of practice and delivery of care. In the ten years since Scott Harding's return to Wellington, the expanding research activities of the department have enhanced Wellington's reputation as a hub for academic cardiology. As an example, three of the four candidates for the Young Investigator prize at the NZ Cardiac Society meeting in 2014 were from Wellington. Nurses from the department also gave presentations and the Affiliates Prize was awarded to a CCDHB cardiac technician. Research funding comes from the Heart Foundation, the Wellington Medical Research Foundation and Astra Zeneca.



Stewart Mann



Scott Harding



Alex Sasse

Associate Professor Peter Larsen

UOW Dean's Research Grant Round. *Genetic risk scores and outcomes in patients with acute myocardial infarction*

Associate Professor Stewart Mann

Capital Cardiovascular Trust. *Audit on status of Assessment and Management of Cardiovascular Risk in New Zealand*

EMERGENCY MEDICINE

Andy Swain is a consultant in Emergency Medicine and a Senior Lecturer at University of Otago Wellington. He is also the medical director of Wellington Free Ambulance, in which role he has been undertaking research into treatment administered by paramedics before arrival at the Emergency Department (ED).

He looked at the Impact of an Air Nebuliser on Prehospital Oxygen Saturations in Patients with Chronic Obstructive Pulmonary Disease (COPD). This involves one ED registrar and former staff of Wellington Free Ambulance. There is no funding involved.

Also he looked at the validation of a Prehospital Early Warning Score. This involves one former ED registrar and former staff of Wellington Free Ambulance. There is no funding.

Diagnostic accuracy of septic shock by paramedics and the appropriateness of prehospital ceftriaxone administration. This involves one paramedic. There is no funding.

The PATCH trial - Pre-Hospital Anti-fibrinolytics for Traumatic Coagulopathy and Haemorrhage. Multicentre Australasian trial of tranexamic acid in major trauma patients. Funded by the National Health and Medical Research Council (NHMRC Australia) and the Health Research Council (HRC.)

All New Zealand Acute Coronary Syndromes Quality Improvement (ANZACS-QI) Registry-Based Trial to evaluate two oxygen protocols in patients presenting with suspected acute coronary syndrome. This involves ambulance services, major emergency departments, and cardiology units in NZ (including Dr Ranchord in Wellington). Funding is currently unknown.



Andy Swain

ENDOCRINOLOGY, DIABETES AND RESEARCH CENTRE

Staff Members in Active Research: Dr Jeremy Krebs, Associate Professor at UOW, Dr Brian Corley and Dr Richard Carroll Phd Students at UOW, Dr Amber Parry Strong, Dr Rosemary Hall, Lindsay McTavish, Pip Cresswell.

2014/2015/2016 Current projects:

- Diabetes in pregnancy, Rosemary Hall, Jeremy Krebs Health Research Council (HRC)
- Hypoglycaemia treatment in people with insulin treated type 2 diabetes, Lindsay McTavish, Jeremy Krebs, Diabetes Wellington
- Hypoglycaemia treatment in people with type 1 diabetes and an insulin pump, Lindsay McTavish, Jeremy Krebs New Zealand Society for the Study of Diabetes (NZSSD)
- Intermittent fasting in people with type 2 diabetes and hypoglycaemic medications, Richard Carroll, Jeremy Krebs, Brian Corley, Internal Reserves
- Very low calorie intake vs gastric bypass, Richard Carroll, Jeremy Krebs, NZSSD
- Low volume meal tests post gastric bypass, Richard Carroll, Jeremy Krebs NZSSD
- DNA methylation and weight loss in type 2 diabetes, Amber Parry Strong, Jeremy Krebs, NZSSD, Waikato Medical Research Foundation (WMRF)



Jeremy Krebs



Richard Carroll

Highlights:

- Jeremy Krebs awarded grants from NZSSD and WMRF
- Brian Corley awarded grant from WMRF
- Rosemary Hall awarded grant from HRC
- Amber Parry Strong presented work at the 2015 NZSSD conference



Rosemary Hall

GASTROENTEROLOGY

Key researchers in gastroenterology are Nigel Stace, Rees Cameron (Clinical Leader) and Ben Griffiths who are all Senior Clinical Lecturers at UOW.

The Gastroenterology Department has several areas of research interest including: Viral Hepatitis, Endoscopy and Inflammatory Bowel Disease.

Gastroenterology: Endoscopy

Rees Cameron is a Gastroenterologist who's special areas of interest include: endoscopic management of large colonic polyps, dysplastic Barrett's oesophagus, gastrointestinal strictures and fistulae. He has established the Wellington regional endoscopic ultrasound service. Dr Cameron is an early adopter of a novel technique of endoscopy – underwater colonoscopy. In contrast to the often-painful procedure of inflating the bowel with air, water is pumped into the colon, improving the view of polyps and allowing the simultaneous use of endoscopic ultrasound to better define the submucosal aspect of polyps and tumours.



Rees Cameron

Gastroenterology: Liver Research

Nigel Stace is a Gastroenterologist with a special interest in liver disease. He cares for many patients with chronic liver disease and for many transplant patients. He leads the Viral Hepatitis Research Team. This includes the all important Clinical Trial Study Coordinators, Rina Ty RN, Gizelle Lopez RN, and Belinda Christie RN. Multiple hepatitis C trials in the last few years have given many Wellington patients the opportunity to be cured using exciting new medicines that have very mild or no side effects and a near 100% cure. A vaccination trial in patients with chronic hepatitis B has recently been completed. The funds generated from the trials, has allowed a large donation towards the purchase equipment for endoscopic ultrasound. A Fibroscan machine has also been purchased. It uses ultrasound to measure liver stiffness and therefore the quantity of scar tissue and overall severity of chronic liver disease, in many situations it has replaced liver biopsy.



Nigel Stace

Gastroenterology: Inflammatory Bowel Disease

Ben Griffiths is a Gastroenterologist with a special interest in inflammatory bowel disease. With the help of the Gastroenterology team and especially the IBD nurse Lisa Griffiths, he looks after many patients with Ulcerative Colitis and Crohn's disease. Medical treatments for these conditions are limited and new drugs are badly needed. There is currently one multicentre drug trial recruiting for Ulcerative Colitis and 2 further multicentre trials are in the pipeline for patients with Ulcerative Colitis and Crohn's. Drug trials give IBD patients access to the latest potential treatments whilst furthering our understanding of these conditions.



Rina Ty and Gizelle Lopez

INFECTIOUS DISEASE

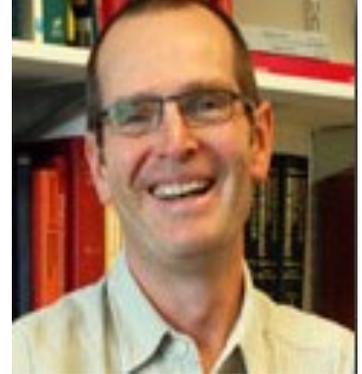
In addition to clinical activities, all members of the Infectious Diseases (ID) department are actively involved in research and audit. This includes Nigel Raymond (Clinical Senior Lecturer at UOW), Tim Blackmore (Adjunct Professor with VUW), Michelle Balm (Honorary Senior Lecturer at UOW), James Taylor, Max Bloomfield, Kelly Bargh, and Ayesha Verrall (Senior Lecturer at UOW)

Dr Raymond has participated in an international study on endocarditis in association with Duke University, North Carolina. He has collaborated with the Emergency Department on a sepsis study and worked with primary care on a cellulitis pathway. He is also working alongside Kelly Bargh, research coordinator, on the Australian HIV Observational Database (AHOD).

Prof Blackmore and Dr Raymond have participated in a multicentre *Clostridium difficile* treatment study, which has helped patients gain access to otherwise-unavailable treatment. Prof Blackmore was a co-author for a paper on paracetamol use in influenza, and is involved in a study with the respiratory department on a new treatment for non-tuberculosis mycobacteria. He is also involved in national rotavirus and *C. difficile* projects.

Dr Balm obtained a CCDHB research grant to develop gold standard testing for *Legionella* pneumonia at CCDHB, allowing participation in a national prevalence study. Recent publications include description of an unusual case of botulism in New Zealand, re-emergence of Lymphogranuloma venereum and is presently involved with research into efficient use of molecular diagnostic tests for routine diagnosis.

Dr Taylor is involved in international multicentre trials involving a new antibiotic for bone infections in children (along with Prof Blackmore), antiviral treatment for a common viral infection (RSV), and a new treatment for influenza A. He also recently completed an observational study on cutaneous diphtheria infection and has a cellulitis observational trial in the planning stage.



Tim Blackmore



Nigel Raymond



James Taylor

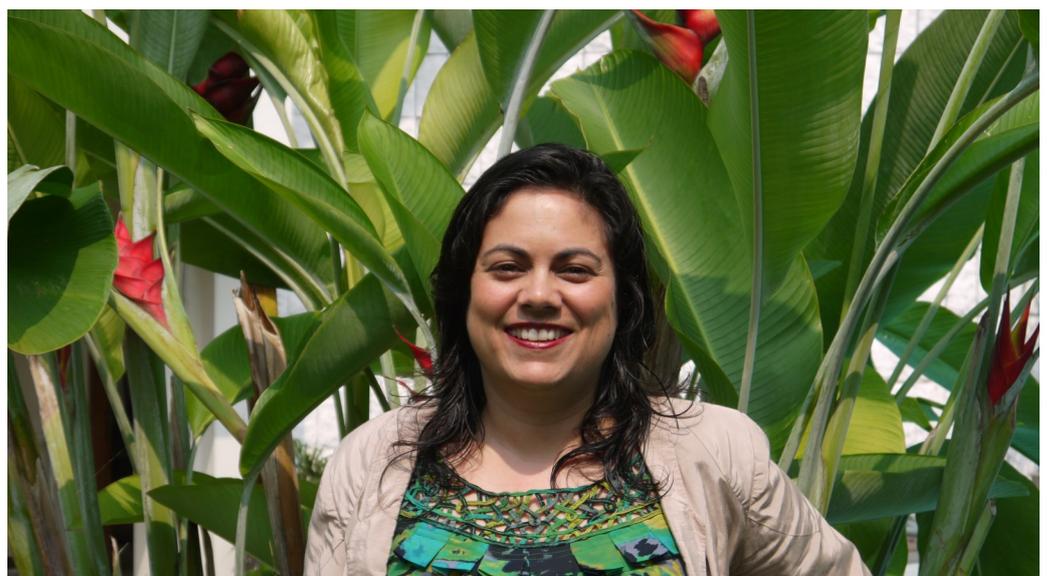
INFECTIOUS DISEASE

ID registrars are required to undertake research projects as part of their training. Dr Bloomfield is undertaking a project screening for carbapenem resistant Enterobacteriaceae in patients undergoing prostate biopsy. He presented the interim results from this study and was awarded the national trainee presentation prize at the Australasian Society of Infectious Diseases NZ meeting in 2015. He also published (along with Prof Blackmore and Dr Balm) a paper in the journal *Pathology* in 2015 on new methods for testing for causes of gastroenteritis.



Michelle Balm

Dr Verrall runs a large cohort of Tuberculosis case contacts in Bandung Indonesia that explores how host factors confer protection against *M. tuberculosis* infection. This study is a collaboration between the University of Otago, Universitas Padjadjaran (Indonesia) and Radboud University (Netherlands). Ayesha collaborated with National University Singapore on a prospective study of acute HIV as a cause of febrile illness presentations in Singapore. She has also worked with ESR on a national antibiotic consumption project. Having recently returned to Wellington she is interested to build local research collaborations. She has recently been awarded a grant to research the immunology of staphylococcal colonization.



Ayesha Verrall

IMMUNOLOGY

Richard Steele has been developing his research interest in a recently recognized autoimmune neurological disease – NMDAR encephalitis, which is caused by an antibody against the NMDA (N-methyl D-aspartate) receptor in the brain. Richard continued to collaborate with adult and paediatric neurologists in Auckland and in Australia to develop tests to diagnose this potentially deadly yet treatable condition.



Richard Steele

Richard has also been collaborating with Rohan Ameratunga, an Auckland immunologist, on research into a mutation of NFKB1, which they have identified as one of the causes of combined variable immunodeficiency. Richard has a longstanding collaboration with staff at the Hutt-based biotechnology company Arotec to develop a new assay for SSA, an important antibody in lupus and Sjögren’s syndrome.

Russell Barker works in both Clinical Immunology at CCDHB and Immunopathology at the diagnostic laboratory. Before moving back to Wellington he worked at LabPlus in Auckland and co-authored several papers on hypogammaglobulinaemia.



Russell Barker

Most of his training took place in Sydney where he has been involved in case reports and continues to develop a case series on IgG4 related orbital diseases having successfully treated several patients. In Wellington he continues to lead several projects including the continuation of his predecessors reviews of the DFS70 ANA pattern and it's relevance to our population along with original ventures to improve community allergy testing and a planned visit to Fiji to progress understanding and the utility of Immunopathology in a developing country.

In the future Dr Barker would like to build on his relationships with the Clinical Trials unit at Wellington Hospital particularly in regards to the increasing use of immunotherapy across all areas of medicine.

RESPIRATORY



The Medical Research Institute of New Zealand (MRINZ) is an independent medical research organisation founded in 2001. Based within Wellington Hospital, we have strong links with the Capital & Coast District Health Board (CCDHB) with many of our researchers holding CCDHB clinical staff status.

The research activities of the MRINZ encompass a range of medical and surgical specialties, many of which are mentioned elsewhere in this report. The study and progression of respiratory medicine is an area in which the MRINZ is particularly strong, leading to improvements in clinical management.

Richard Beasley

Professor Richard Beasley
 Director
 Medical Research Institute of New Zealand

Some key highlights for 2015:

- Senior responsibility for drafting the Thoracic Society of Australia and New Zealand Oxygen Guidelines.
- The authoritative Lancet review of “Risk factors for asthma: is prevention possible?”.
- Review of the burden of bronchiectasis in COPD in New Zealand.
- Novel characterisation of the overlapping disorders that make up the syndrome of asthma and COPD.
- Determination of the efficacy/safety profile of the novel SMART regimen in high risk asthma.
- Development of the use of electronic monitors to determine patterns of inhaler use in asthma.



WELLINGTON BLOOD AND CANCER CENTRE

Haematology

Researcher and affiliations: Dr Robert Weinkove Consultant Haematologist, Capital & Coast DHB, Wade Thompson Clinical Research Fellow, Malaghan Institute of Medical Research, Honorary Senior Clinical Lecturer, UOW.



Robert Weinkove

Current research projects:

- Synthetic Vaccines Incorporating Innate-like T cell ligands (collaboration with Ferrier Institute). Funding from Health Research Council. Ian Hermans, Robert Weinkove, Gavin Painter, Olivier Gasser.
- Innate-like T cells in prostate cancer (collaboration with University of Otago Wellington). Funding from Cancer Society Wellington. Shaun Collings, Robert Weinkove, John Nacey, Brett Delahunt.
- Phase II Feasibility trial comparing red cell transfusion thresholds in myelodysplasia (REDDS trial) (collaboration with NHSBT and Monash University). Funding from Cancer Society Wellington. Robert Weinkove (Chief Investigator Dr Simon Stanworth, UK).
- Pesticide exposure and biomarkers of NHL risk in farmers (collaboration with Centre for Public Health Research at Massey University). Funding from Health Research Council. Andrea 't Mannetje, Robert Weinkove, Jeroen Douwes.
- Paracetamol during febrile neutropenia: Phase II feasibility trial (collaboration with MRINZ). Funding from Health Research Council. Robert Weinkove, Paul Young, Richard Beasley.
- Mitochondrial transfer between bone marrow transplant donor and recipient erythroblasts (collaboration with Victoria University. Funding from Marsden Fund. Mike Berridge, Robert Weinkove, Melanie McConnell, Patries Herst, Carole Grasso, James Baty, David Eccles.
- Quantification of conjunctival pallor using digital imaging (collaboration with Callaghan Innovation). Funding from Leukaemia & Blood Cancer NZ. Shaun Collings, Robert Weinkove, Evan Herst, Oliver Thompson, Anup George, Louise Goossens.

Highlights and achievements:

- Made Clinical Director of Clinical Human Immunology Laboratory at Malaghan Institute of Medical Research, Wellington
- Elected to Scientific Advisory Committee of Australasian Leukaemia & Lymphoma Group
- Elected as Chair, Supportive Care Disease Group at Australasian Leukaemia & Lymphoma Group
- Made member of Trial Management Committees for ALLG CML10 and CML11 trials
- Lead author of oral presentation at 2014 Keystone Symposium: the Modes of Action of Vaccine Adjuvants
- Co-author of oral presentation at 2015 American Society of Hematology meeting (abstract 496): Results of the Safety Run-In Phase of CLL14 (BO25323): A Prospective, Open-Label, Multicenter Randomized Phase-III Trial to Compare the Efficacy and Safety of Obinutuzumab and Venetoclax (GDC-0199/ABT-199) with Obinutuzumab and Chlorambucil in Patients with Previously Untreated CLL and Coexisting Medical Conditions

WELLINGTON BLOOD AND CANCER CENTRE

Haematology

Researcher and affiliations : Dr Kenneth Romeril. Consultant Haematologist, Capital & Coast DHB. Honorary Senior Lecturer in Medicine , UOW. Consultant Haematologist at Wakefield Hospital, Newtown, Wellington



Kenneth Romeril

Current research projects:

- Principal Investigator for the TOURMALINE trial which investigates the oral Proteasome inhibitor Ixasomib
- Principal investigator for the FIRST trial which is a ground breaking phase III
- Trial with newly diagnosed MM receiving Lenalidomide and Dexamethasone vs MPT
- Co-author of a paper concerning efficacy in the FIRST trial in Journal of Clinical Oncology to be published in June 2016
- Sub investigator in the Keytruda trials recently opened in newly diagnosed and Refractory MM

Highlights and achievements:

- Current active only NZ member of International Myeloma Working Group.
- Recently stepped down as Chair of Myeloma for Australian Leukaemia & Lymphoma Group.
- Member of the Trial Management Committee for ALLG MM17.
- Author of oral presentation on Utility of CyBorD in Multiple Myeloma (MM) at 2015 Haematology Society of Australia and New Zealand, Australian & New Zealand Society of Blood Transfusion and the Australasian Society of Thrombosis and Haemostasis (HAA) in Adelaide, Australia.
- Co- author of the BOMER study of Bortezomib in MM published in 2015 in Am.J Haematology.
- Convenor of the upcoming International Myeloma Summit meeting in Queenstown August 2016 featuring top US myeloma experts.

WELLINGTON BLOOD AND CANCER CENTRE

All Medical Oncology Senior Medical staff are actively recruiting and participating in the conduct of over 20 clinical trials – Phase I, II, III from co-operative groups and industry partners. Dr Catherine Barrow, Dr Sarah Barton, Dr Brendan Luey, Dr Kate Clarke, Dr Anne O’Donnell, Dr Jonathan Graham, Dr Kate Gregory and Dr Andrew Simpson. In the month of January alone more than 50 patients were seen as part of these trials.

Individual staff members are also taking part in investigator initiated or personal research – with publications / grants this year for Dr Wendy Tsai, Dr Sarah Barton, Dr Kate Clarke.



Catherine Barrow

“Outcomes of patients treated with perioperative epirubicin, cisplatin and fluoropyrimidine chemotherapy for Gastroesophageal cancer in a NZ cancer Centre. “ NZSO 2 – 3 November 2015 Dr Sarah Barton

Ki67 and Mitotic Count in endocrine sensitive early breast cancer. Cancer Society Funding Grant May 2015 \$25,367. Dr Catherine Barrow.

Poster at American Association for Cancer Research (AACR) 2016:

KEYNOTE-006: PD-L1 Expression and Efficacy in Patients (Pts) Treated With Pembrolizumab (Pembro) vs Ipilimumab (IPI) for Advanced Melanoma. Authors: Matteo Carlino, Antoni Ribas, Rene Gonzalez, Christoph Hoeller, Gil Bar-Sela, Catherine Barrow, David Chao, Pascal Wolter, Carola Berking, Oddbjorn Straume, Alfonso Berrocal, Esther Holgado, Tara C. Gangadhar, Geoffrey Weiss, Honghong Zhou, Kenneth Emancipator, Nageatte Ibrahim and Dirk Schadendorf.

Poster at AACR 2016:

Phase I study of RAF dimer inhibitor BGB-283 in patients with B-RAF or K-RAS/N-RAS mutated solid tumors. Jayesh Desai, Hui Gan, Catherine Barrow, Michael B. Jameson, Jason Yang, Lai Wang, Zhen Qin, Lusong Luo and Ben Solomon.

Poster presentation at national melanoma summit:

Diffuse melanosis cutis in BRAF mutation positive metastatic melanoma: a case report and literature review. P Barlow, S Johnson, C Adams, P Matheson, C Barrow. Wellington Regional Hospital, Wellington, New Zealand and Hutt Hospital, Lower Hutt, New Zealand

And IV.

Cutaneous Lymphoma. Manaf Ajishi and Catherine Barrow. Images in Clinical Medicine, New England Journal of Medicine June 18th 2015, page 2437. Dr Anne O’Donnell. AT RISC 2 – an exploration of toxicity assessment tool for chemotherapy in the over 65

MENTAL HEALTH

Capital & Coast DHB provides a full range of mental health and addiction services, from crisis, acute inpatient care, intensive psychiatric care, services for the elderly, psychology, alcohol and drug and also specialist services for children and young people, including early intervention, personality disorder and maternal mental health. There is research being undertaken in the mental health field at CCDHB. Here we report on the work undertaken by CCDHB members of staff, who many cases have joint appointments with University of Otago Wellington.



Alison Masters

Alison Masters is a consultant psychiatrist who has worked in various roles for Capital & Coast since her appointment in 1990 as a Psychiatric Registrar. Alison was appointed as the Mental Health Service Directorate (MHD) Executive Director (Clinical) in 2007. Prior to this she was the consultant psychiatrist for the Early Intervention Service. Alison was also, for many years, CCDHB Professional Advisor for Psychiatry. As the Executive Director, Alison provides clinical leadership for both Local Mental Health & Addiction Services and Te Korowai-Whāriki and is the Chair of the Mental Health Directorate Clinical Governance Group.

Ann Connell has been the Psychology Professional Leader since 1997. She completed her clinical psychology training at the University of Otago and began work as a new graduate at the Hawke's Bay Area Health Board before taking up a position at Porirua Hospital in 1987. Since then, Ann has worked in a number of adult mental health settings within CCDHB and currently works in the Regional Personality Disorder Service. Ann is a Clinical Incident Leader and provides leadership in the Open Communication policy. She has taken a special interest in ethics and boundaries in mental health services, and in supporting staff through debriefing. Ann chairs the NZ DHB Psychology Leadership Council. She is a member of the DHB NZ Allied Health Workforce Strategy Group. She has been an active participant in the NZ College of Clinical Psychologists and is convenor of the Allied Health Professional Association Forum.

Dr Liam O'Connor is a consultant child and adolescent psychiatrist who trained in both Wellington and Melbourne, Australia. In Melbourne he worked at the Austin Hospital, Mindful (the child psychiatry training programme) and was Director of the Parent Infant Service at the Albert Road Clinic. He returned to work in Wellington in 2004 based at the Child Adolescent and Family Service in Porirua.

Rosie Edwards was born and brought up in New Zealand. She trained as a doctor at Otago University, working in Rotorua before moving to Wellington. She completed her training as a psychiatrist in Wellington and continued working for Capital and Coast District Health Board as a consultant forensic psychiatrist with Te Korowai-Whāriki.

Also, Rosie has worked in Australia as a general adult psychiatrist in a private hospital and for the newly established Justice Health Service for New South Wales until she returned to Wellington in 2007. In May 2008, Rosie was appointed as Clinical Leader for the General Adult Mental Health Service. This latest role has allowed her to use her enthusiasm and interest for the way services are delivered and to look at how services can be improved. Rosie works in partnership with Operations Leaders and reports to the CCDHB MHD Executive Director (Clinical).

MENTAL HEALTH

Although research is not yet a compulsory component of training in psychiatry, many CCDHB psychiatry trainees have engaged in research projects.

A team of multidisciplinary researchers led by Dr Susanna Every-Palmer from mental health have recently published new findings on antipsychotics’ effects on gut motility, attracting local and international media attention. This is the first study of its kind and it shows that the antipsychotic clozapine dramatically slows bowel function. Rarely, this can lead to serious or life-threatening consequences.

Clozapine is a valuable antipsychotic drug that can be effective when other treatments have failed. For many people clozapine can be life-changing, but it does have considerable side effects, which need to be managed.

The researchers tracked the movement of small markers, which could be seen on X-ray, through the gastrointestinal system of people taking clozapine and other antipsychotic medications to measure the speed at which the gut was working. The study showed that that clozapine slows bowel function quite considerably, causing constipation. This ranges from moderate to severe. If it results in complete bowel obstruction, this can have potentially fatal consequences.

“In the past twenty years, this impaired gut motility has contributed to the deaths of at least 29 people using clozapine in New Zealand and Australia, so it is important to increase our understanding of how this occurs”, says lead author Dr Susanna Every-Palmer. “We found that in patients using clozapine the markers took four times longer moving through the gut compared to those on other antipsychotics or in people on no medication,”

“Four out of every five people taking clozapine were affected in this way, irrespective of their gender, age, ethnicity or length of clozapine treatment. Therefore we are recommending that everyone starting on clozapine should be prescribed laxatives, to try to reduce this problem.”

“We have already incorporated the recommendations into our practice, and our patients are benefitting from being on this important medication, but with fewer side effects”.

This research was funded by a grant from Capital and Coast District Health Board and was published in the Lancet group’s translational medicine journal EBioMedicine. The full paper is available at <http://dx.doi.org/10.1016/j.ebiom.2016.02.020>



Susanna Every-Palmer

CLINICAL TRIALS UNIT

Wellington Hospital's Clinical Trials Unit (CTU) is a dedicated clinical research facility funded by the Capital & Coast District Health Board. Here, patients and volunteers can participate in medical research programmes that are run according to robust trial protocols.

The 14-bed unit is the first to be located in a New Zealand public hospital, offering unprecedented access to the state-of-the-art facilities of a major regional institution, including radiology, intensive care, library and pharmacy services.

The CTU has access to a wide range of clinical specialists and networks for single-centre and multi-centre clinical research trials. Researchers are able to continue medical studies overnight, allowing closer monitoring of participants for longer periods and significantly enhancing the potential scope for clinical trials.

We work with pharmaccompanies and collaborative groups nationally and internationally, on a number of clinical trials.

Our staff are experienced in Phase I - IV studies in a variety of therapeutic areas, including diagnostics and device studies.

The CTU is currently recruiting for Cardiology, Infectious Diseases, Oncology/Haematology, Paediatric,



Jonathan Barrett
Charge Nurse Manager

Respiratory (RSV, influenza, nontuberculous mycobacterial lung infections), Gastroenterology (Crohn's disease and ulcerative colitis), Rheumatology (Rheumatoid Arthritis and Lupus) and Vascular studies and further studies are in development.



Marina Dzhelali,
Team Leader Research

CHILD HEALTH

The Child Health Service (CHS) includes an active academic department of joint clinical paediatricians as well as including a number of full-time clinicians interested in and active in research. At the end of 2014 the CHS research committee was formed. This committee is a sub committee of the CHS Governance Group and also includes Marina Dzhelali as a co-opted member.

In 2015 the research committee reviewed 18 projects affecting children in the DHB. Three of these projects were lead by CHS staff and in a further 9 a CHS staff member was listed as a local investigator. The remaining five either involved children when treated by specialities outside the CHS or required review of the clinical records of children only. In 2015 the committee also reviewed 9 audit proposals.

Staff members active in research:

Academic Staff, Dept of Paediatrics & Child Health, University of Otago, Wellington (UOW)

- Dawn Elder, Professor & HOD, Paediatric Sleep Physician
- Esko Wiltshire, Associate Professor, Paediatric Endocrinologist
- Lynette Sadleir, Associate Professor, Paediatric Neurologist
- Thorsten Stanley, Senior Lecturer, General Paediatrician
- Philippa McDowall, Post-Doctoral Fellow, Clinical Psychologist (UOW employee)



Thorsten Stanley

Academic Staff, Dept of Obstetrics and Gynaecology UOW, Clinical Member of CHS

- Kevin Pringle, Professor, Paediatric Surgeon – retired July 2015

Clinical Staff, Child Health Service, CCDHB

- Mark Stringer, Hon Professor of Paediatric Surgery, Dept of Paediatrics & Child Health, UOW
- Brendon Bowkett, Paediatric Surgeon, Clinical Senior Lecturer, UOW
- Vaughan Richardson, Neonatal Paediatrician, Clinical Senior Lecturer, UOW
- Michael Hewson, Neonatal Paediatrician
- Helen Miller, Neonatal Paediatrician, Clinical Senior Lecturer, UOW
- Tim Savage, General Paediatrician, Clinical Senior Lecturer, UOW
- Nikki Blair, General Paediatrician
- Katherine Neas, Clinical Geneticist, Clinical Senior Lecturer, UOW
- Gemma Poke, Clinical Geneticist



Lynette Sadleir

CHILD HEALTH

RMOs involved in audit and research

David Foley, Nick Reid, Aimee Neels, Nitin Rajput, Penny Kane, Ari Peiffenberger, Stanley Ng, Meghan Sandle, Kiarash Taghavi, Jessica Allen

Projects in progress during 2014 and 2015

Neonatal Intensive Care Unit

- Talking to Babies in a Neonatal Intensive Care Unit: The impact of verbal soothing on measures of infant stress during heel prick procedures. Lucie Zwimper PhD student, Dawn Elder, Esko Wiltshire Supervisors.
- 24-hour oxygen saturation recordings at discharge in preterm infants. Grace Wellington, BMed Sci student, Dawn Elder, Angela Campbell supervisors
- The Developmental Origins of Chronic Lung Disease study (DOCLD), Max Berry, Colin Marsland (also involved paediatric and orthopaedic surgery patients).
- PROVIDE Study: Does better early nutrition in preterm babies improve development? Multicentre RCT led by Barbara Cormack and Frank Bloomfield Auckland. Local Investigator Michael Hewson.
- N3RO international multicentre RCT studying the effect of fatty acid supplementation on chronic lung disease – Max Berry NZ lead and also local investigator for the Women's and Children's Health Research Institute, Adelaide, Australia).
- Medicines in Babies-Cooling: International collaboration examining the effect of therapeutic hypothermia for birth asphyxia on drug pharmacokinetics – Max Berry as Wellington collaborator for the John Hunter Medical Research Institute, Newcastle, Australia)

General Paediatrics

- Parent knowledge about children's sleep: Validation of a parent questionnaire. Philippa McDowall Post-doctoral Fellow, Dawn Elder.
- Goodnight Kiwi: Kei te moe ngā tamariki? [Are the children sleeping?] Philippa McDowall Post-doctoral Fellow, Dawn Elder.
- Heart rate variability in adolescents with type 1 diabetes: Use of non-linear analysis methods to identify early cardiac autonomic neuropathy. Penny Kane Paediatric Registrar, Esko Wiltshire, Peter Larsen supervisors.
- The effect of epiderm ointment on eczema severity in children: a new Zealand study
- A Randomized, Double-blind, Placebo Controlled, 2 Part Study of Orally Administered ALS008176 to Evaluate the Safety, Tolerability, Pharmacokinetics and Pharmacodynamics of Single Ascending Dosing and Multiple Ascending Dosing in Infants Hospitalized with Respiratory Syncytial Virus (RSV) Infection.

CHILD HEALTH

Paediatric Surgery

- Postoperative return to activity after common paediatric surgical procedures: can we give evidence-based advice to parents? Rosemary Lane (House surgeon), Spencer Beasley (Professor of Paediatric Surgery, Christchurch), Mark Stringer.
- Fetal megacystis: a systematic review. Kiarash Taghavi (Paediatric Surgery Registrar), Caitlin Elizabeth (Summer Student), Mark Stringer. Supported by a grant from Wellington Surgical Research Trust.

Genetics

- Women's experiences of antenatal screening in NZ. Christina Buchanan (MGC student), Kate Neas supervisor.

Achievements in 2014/2015:

A number of staff presented their data at conferences in New Zealand and International. Staff were also successful in applications for grant funding as listed below:

2015

Associate Professor Lynette Sadleir

HRC project grant - \$1,198,06, 36 months

Gene discovery in epilepsy: the building block of precision medicine

Associate Professor Sadleir has also secured funding via donations from Cure Kids and NZLAE

Dr Max Berry

HRC emerging research grant - \$149,941

Premature celebration? The late effects of early birth

WMRF project grant - \$7500

Premature birth and the pancreas: the function of preterm birth on adult metabolic dysfunction

MBIE project grant - \$5118

Bodies and Bugs: Cool kids doing cool things!

Dr Berry also has secured research income from others sources including income raised with the assistance and support of the Chancellor.

Dr Thorsten Stanley

Co-investigator on HRC project grant, \$1,199,980

Lead investigator - Professor Jeroen Douwes, Massey University

Persistent airflow limitation and the airway microbiome in childhood asthma

UORG grant - \$20,000

Feasibility Study – Probiotics and Repeat Food Challenge in Food Allergic Children

CHILD HEALTH

Achievements in 2014/2015 continued:

Professor Dawn Elder

University of Otago Wellington Grant in aid, Operating expenses \$5,000

Goodnight Kiwi: Kei te moe ngā tamariki?

Lottery Health Research – Post doc Students grant - \$113,626

Improving the sleep of children living in poverty

Dr Maria Saito-Benz

Freemason's Paediatric Scholarship

2014

Professor Dawn Elder

WMRF equipment grant - \$5415

Goodnight Kiwi: Kei te moe ngā tamariki? [Are the children sleeping?]

Lottery Health equipment grant - \$6642

Masimo RAD-8 oximeters and software

UOW Equipment fund top up - \$1195

Maurice and Phyllis Paykel Trust Grant in Aid - \$4000

Goodnight Kiwi: Kei te moe ngā tamariki? [Are the children sleeping?]

Associate Professor Esko Wiltshire

UORG grant - \$41,332

What drives clinical decision making for children born with a Disorder of Sex Development (DSD)

Dr Max Berry

NZ Lottery Grants Board - \$40,000

Equipment grant for Radio-telemetry data acquisition system

INTENSIVE CARE UNIT

The staff involved in the ICU include: Dr Paul Young, Intensive Care Specialist and Intensive Care Research Programme Director at the MRINZ. Intensive Care Specialists; Dr Shawn Sturland, Dr Alex Psirides, Dr Dick Dinsdale, Dr Bob Ure, Dr Ben Barry, Dr Peter Hicks, Dr Chris Poytner and Research Nurses; Lean Navarra, Raulle Cruz, Anna Hunt.

Our current projects include:

ADRENAL study: clinician-initiated study. Hydrocortisone vs. placebo for septic shock. Primary end point: day 90 mortality (n=3800). Funded by the Health Research Council of New Zealand (HRC).

SPICE study: clinician-initiated collaborative clinical trial comparing early light sedation with dexmedetomidine with standard care in patients anticipated to require prolonged mechanical ventilation. Primary end point: day 90 mortality (n=4000). Funded by the HRC.

TRANSFUSE study: clinician-initiated collaborative clinical trial comparing standard issue blood with freshest available blood for transfusion in critically ill adults (excluding cardiac surgical patients and patients with haematological malignancies). Primary end point mortality (n=4000). Funded by the HRC.

RELIEF study: clinician-initiated collaborative clinical trial comparing liberal with restrictive fluid therapy for major abdominal surgery. Primary end point: disability-free survival at one year (n=2800). Funded by the HRC.

TRICS-III study: clinician-initiated collaborative clinical trial comparing lower with higher transfusion thresholds in high risk cardiac surgery. Primary end point: composite of death and major complications within 28 days of surgery (n=3750). Funded by the Canadian government.

ICU-ROX study: Wellington hospital-led clinical trial comparing strict avoidance of hyperoxaemia with standard care in patients anticipated to require prolonged mechanical ventilation. Primary end point: ventilator free days (n=1000). Under consideration for funding by the HRC.

ART-123: Pharmaceutical trial of human recombinant thrombomodulin for septic coagulopathy.

PEPTIC study: Wellington hospital led 24,000 patient study comparing PPIs with histamine receptor blockers for stress ulcer prophylaxis in ICU. Funded by the HRC.

TARGET trial: clinician-initiated collaborative clinical trial comparing standard enteral nutrition (1kcal/ml) with energy dense nutrition (1.5kcal/ml) in the ICU. Primary end point: day 90 mortality. (n=4000). Funded by the HRC.

AT-II study: pharmaceutical trial of angiotensin-II for catecholamine refractory shock.

ETHICUS II: a global epidemiology study evaluated end of life practices in Intensive Care.



Paul Young

Our highlights of 2015:

In the past 12 months Dr Young completed two large-scale multicentre clinical trials as Chief Investigator.

The first of these studies was a 700-participant randomised controlled trial of paracetamol vs. placebo conducted in 23 ICUs in Australia and New Zealand published in the New England Journal of Medicine.

The second compared 0.9% saline with Plasma-Lyte® 148 for ICU fluid therapy, and enrolled 2281 participants in just 28 weeks of active recruitment and was published in the Journal of the American Medical Association. Based on Almetric™ scores, these were the number one and number three highest impact critical care papers of 2015 respectively.

INTENSIVE CARE UNIT

Areas of active research interest within the ICU:

Oxygen is common treatment in patients who need care in an ICU. In partnership with investigators in Australia and France we completed a pilot trial comparing conservative with liberal oxygen therapy in ICU patients requiring life support. This study was published in 2015 in the *American Journal of Respiratory and Critical Care Medicine*, which is the highest impact journal in the field of Intensive Care Medicine. This trial laid the foundation for a large-scale multicentre randomised controlled trial evaluated oxygen therapy which is currently under consideration for funding by the HRC.

Acutely ill patients are commonly treated with intravenous fluids. We completed the SPLIT study comparing the effectiveness of two commonly used intravenous fluids in 2015. The SPLIT study was published in the *Journal of the American Medical Association* and was the third highest impact publication in the field of Intensive Care Medicine in 2015. The study enrolled 2278 participants from four New Zealand hospitals and compared the routine use of 0.9% saline for fluid therapy with Plasma Lyte® 148 in ICU patients. The study hypothesis was that routinely using Plasma Lyte® 148 for fluid therapy instead of 0.9% saline would reduce the risk of developing acute kidney failure. Kidney failure which occurs in the setting of acute illness is associated with a high risk of death and may require treatment with costly kidney dialysis treatments. This study addressed an issue of major global public health significance because more than a million litres of 0.9% saline are administered to patients around the world daily. The study showed that 0.9% saline and Plasma Lyte® 148 led to a similar risk of acute kidney injury but also raised the possibility that in high risk patients Plasma Lyte® 148 therapy may reduce the risk of death. The SPLIT study was funded by the HRC and Baxter Pty Ltd. A follow-up study confirming whether or not Plasma Lyte® 148 therapy reduces mortality compared to 0.9% saline will be conducted by the MRINZ in partnership with The George Institute for Global Health. This follow-up study has been funded by the National Health and Medical Research Council in Australia for \$5.9M and is currently under consideration for funding by the HRC.

Nutrition therapy is an essential standard of care for all ICU patients who are mechanically ventilated and remain in ICU for more than a few days. There is a substantial and well established dissociation between

the recommended calorie requirement and calories actually delivered to ICU patients. Nevertheless, while it remains logical that energy delivery should match energy consumption, the benefits of such matching remain to be confirmed by a robust, high quality clinical trial. We will soon commence enrolling patients into a 3,800 patient trial designed to evaluate whether delivery of the full recommended calorie (energy) requirement to critically ill patients improves 90-day survival when compared to standard practice. This trial is funded by the HRC and Australia's National Health and Medical Research Council.

The administration of stress ulcer prophylaxis (SUP), either with a Proton Pump Inhibitor (PPI) or a Histamine-2 Receptor Blocker (H2RB) is recommended in international guidelines and incorporated into quality-oriented checklists for care of ICU patients. Our recent data show that PPIs and H2RBs are routinely used for SUP in Australia and New Zealand with the choice of medication probably not based on patient factors, but instead dependent on clinician preference or unit policy. This practice variation reflects the lack of definitive evidence comparing PPIs to H2RBs in the ICU setting. Although data suggest PPIs are more effective at reducing upper GI bleeding risk in ICU patients than H2RBs, it also appears that using PPIs in ICU patients is associated with an increase in pneumonia risk compared to H2RBs, and that PPI use but not H2RB use is associated with increased risk of *Clostridium difficile* infection. The overall influence of the opposing risks of upper GI bleeding and SUP-related infectious complications on in-hospital mortality is unknown. We are leading a multicentre, multinational trial comparing the safety and efficacy of PPIs vs. H2RBs in 25,000 mechanically ventilated ICU patients. This trial is funded by the HRC.

Blood transfusion is commonly required in ICU patients. We are leading the Transfusion Requirements in Cardiac Surgery (TRICS) trial in New Zealand. This trial is an international, multicentre, randomised trial comparing liberal and restrictive transfusion strategies in patients undergoing major cardiac surgery.

All our grateful thanks to our valued research partners and funding bodies including; clinical and support staff, CCDHB Legal Services and above all, the patients who have participated in our research.



CallaghanInnovation



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