



Government of Western Australia
Department of Health
South Metropolitan Health Service



CCREM
Centre for Clinical Research
in Emergency Medicine



HARRY PERKINS INSTITUTE
OF MEDICAL RESEARCH



MRF
ROYAL PERTH HOSPITAL
Medical Research
Foundation

Centre for Clinical Research in Emergency Medicine

2015 Annual Research Report



Royal Perth Hospital



Government of **Western Australia**
Department of **Health**
WA Country Health Service



ARMADALE
HEALTH SERVICE



THE UNIVERSITY OF
**WESTERN
AUSTRALIA**

Centre for Clinical Research in Emergency Medicine

The Centre for Clinical Research in Emergency Medicine (CCREM) is a Centre within the Harry Perkins Institute of Medical Research, established in 2008 with start up and ongoing funding from Royal Perth Hospital, the Royal Perth Hospital Medical Research Foundation, and the Discipline of Emergency Medicine, University of Western Australia. Our research involves collaboration between academic emergency physicians working in the Emergency Department (ED), a team of research nurses recruiting patients presenting to the ED with acute illnesses, and scientists analysing samples in the laboratory using immunological and molecular biological techniques. We are unique in having a wet lab within the ED, which allows for timely specimen preparation. CCREM research approaches include observational studies and laboratory work designed to uncover the mechanisms of disease, and randomised controlled trials designed to improve clinical care. We also endeavour to integrate laboratory and clinical research, using laboratory studies to help us understand the results of clinical trials. CCREM provides opportunities for both laboratory and clinical post-graduate honours and PhD students, and research terms for Emergency Medicine Advanced Trainees at Royal Perth Hospital and Fiona Stanley Hospital.

CCREM staff and associates

Royal Perth Hospital

Clinical Academics

Professor Daniel Fatovich MBBS FACEM PhD, Program Director

Associate Professor Glenn Arendts MBBS MMed FACEM

Professor Simon Brown MBBS PhD FACEM

Dr Stephen Macdonald BSc MBChB DCH FRCP FACEM

Research management and administration

Ellen MacDonald RN, GradDipFN, Clinical Nurse Manager

Cathy Read RN, National Coordinator PSP Study

Sophie Damianopoulos, Administrative Officer

Fiona Seroney, Administrative Officer

Laboratory

Dr Erika Bosio BSc, PhD, Research Fellow (Sept - Dec)

Dr Shelley Stone BSc PhD, Research Fellow (Jan - Aug)

Ms Claire Neil BSc, Research Officer

Research Nurses

Lilian Offer RN, Helen Hamersley RN, Jen Wurmel RN, Kristy Matthews RN, Naomi

Sweeting RN, Ann-Marie Woodward RN, Christie Flanagan RN

PhD Students

Associate Professor Stephen Macdonald BSc MBChB DCH MRCP FACEM
Ms Abbie Creamer BSc
Dr Lisa Smart BVSc (Hons) DipACVECC

Fiona Stanley Hospital

Clinical Academics

Adj Professor Yusuf Nagree MBBS GradDipCompSci FACEM MBA(E)
Associate Professor Glenn Arendts MBBS MMed FACEM

Research Nurses

Alannah Cooper RN (commenced Dec), Elouise Constantine RN (Jan-Nov)

In February, transition occurred from Fremantle Hospital to Fiona Stanley Hospital, without the associated research infrastructure.

Armadale Health Service

Clinical Academic

Dr Stephen Macdonald BSc FBChB DCH MRCP FACEM
Dr David McCutcheon MBBS FACEM

Research Nurses

Jonathon Burcham RN, Kerry-Lee Dyke RN

South West Area Health Service

Clinical Academic

Dr Hugh Mitenko MBBS FACEM

Notable New Funding

Arendts G. A randomised trial of post discharge intervention in high-risk older people discharged from the Emergency Department. Western Australian Department of Health Merit Award. \$75,000

Brown S. Medical and Health Research Infrastructure Fund (Round 18). Government of Western Australia, Department of Health. \$34,698

Fitzgerald M, Fatovich D, Pestell C. Identification of biomarkers that correlate with clinical features and outcomes following concussion. Neurotrauma Research Program. \$38,925

Keijzers G, Macdonald S, Kinnear F, Taylor D, Arendts G, Fatovich D, Brown S, Asha S, Vlad I, McCutcheon D. Restricted Fluid Resuscitation in Sepsis associated Hypotension (REFRESH) trial. Queensland Medical Research Foundation. \$54,125

Saw J, Lawn N, Fatovich D, Dunne J. Prognosis after first-ever seizure. Royal Perth Hospital Medical Research Foundation. \$19,088

Smart L. Top Up Scholarship-PhD Candidate. Harry Perkins Institute Medical Research. \$10,000

Stafford A, Fatovich D, Bynevelt M, Licari M, Reynolds J, Christmass M, Quigley A. Methamphetamine Addiction: Is Baclofen effective in suppressing methamphetamine cravings? Functional MRI patterns of brain activation in Baclofen vs placebo treated methamphetamine addicts. State Health Research Advisory Council Research Translation Project. \$251,904

Isbister G, Buckley N, de Silva J, Brown S, Hodgson W, Lallo D, de Silva A, Dawson A, Gawarammana I, Graudins A. Translational Venom and Antivenom Research. National Health and Medical Research Council Centre for Research Excellence. \$2,495,164 over 5 years from 2016. Allocation to CREM/UWA (S Brown) \$381,455

Ongoing Funding

Brown S. A randomised controlled trial of interventional versus conservative treatment of primary spontaneous pneumothorax. National Health and Medical Research Council. 2015-2017 \$401,143

Sim M, Wong M, (Arendts G. AI). Better access to home hospital for residents in aged care facilities. Western Australian Health Targeted Research Fund. 2014-17 \$345,769

Dey I, Love J, Arendts G, Hare M. Emergency Department Delirium Initiative (EDDI): A study targeting the early identification of patients at risk of delirium. Western Australian Health Targeted Research Fund. 2013-16 \$260,000

Brown S. Immunological mechanisms and management of critical illness and injury. National Health and Medical Research Council Career Development Fellowship. 2012-2015 \$76,000 per annum

Rosenwax L, McNamara B, Semmens J et al (Arendts G. AI). Reducing demand on emergency departments in the last year of life. National Health and Medical Research Council Project Grant. 2014-16 \$358,835

New Research Projects

Coordinated by CCREM

Identification of biomarkers that correlate with clinical features and outcomes following concussion (Concussion)

Clinical data, imaging, neuropsychological testing and blood samples of patients with concussion will be correlated with outcomes. This may lead to the development of improved tools for diagnosis and prognosis.

Priorities in Emergency Research Studies – Patient EXpectations (PERSPEX)

A survey of 400 emergency department patients between Royal Perth Hospital and Armadale Health Service, to determine their priorities for emergency department research. Patient priorities for this area have not been previously published.

Collaborations - patient recruitment at CCREM sites, but coordinated by other centres or units

The RESPOND Project

A multi-centre randomised controlled trial of the RESPOND program to reduce secondary falls in older people presenting to the emergency department with a fall (Monash University).

Preferences for the organisation of acute health services for older people (PROSpER)

Preferences for providing acute medical care for people living in residential aged care facilities (University of Sydney).

Ongoing Research Projects

Coordinated by CCREM

Assessing Risk in Sepsis using Tissue Oxygen Saturation (ARISTOS)

A clinical observational study examining the use of near infrared spectroscopy derived tissue oxygen saturation at the bedside in emergency department patients with sepsis to determine the utility of this measure to predict organ dysfunction.

Critical illness and shock study (CISS)

A prospective study of patients presenting to the emergency department with critical illness or injury that compromise the cardiovascular and/or respiratory systems. Currently focussing on the acute immune response to anaphylaxis and septic shock.

Emergency Department Complex Needs Coordination Team (ED CoNeCT)

A randomised trial of patient centred intervention to reduce re-presentations of older people at risk after discharge from the emergency department.

Emergency Department Delirium Identification (EDDI) trial

A clinical trial of a new delirium identification tool and early warning system.

Primary Spontaneous Pneumothorax Study

An Australasian randomised controlled trial of conservative management with observation only versus interventional (aspiration and/or insertion of chest drain) treatment of primary spontaneous pneumothorax.

Improving quality of life in residential aged care

A randomised controlled trial to reduce emergency department transfers and improve quality of life in residential aged care facilities.

Sepsis/Saline Trial

A pilot randomised trial of hypertonic saline versus normal saline as the initial bolus fluid in patients with infectious systemic inflammatory response syndrome.

Emergency Department Anaphylaxis Studies (EDA II and III)

(i) A randomised controlled trial of intramuscular versus intravenous adrenaline during anaphylaxis (ii) A study of gene activation and biochemical mediators of anaphylaxis.

Chest Pain Registry

The chest pain registry is a longitudinal study of patients presenting to the emergency department with chest pain and is looking at medium term outcomes of these patients. Co-ordinated by CCREM partner, Fremantle Hospital Emergency Medicine Research.

Collaborations - patient recruitment at CCREM sites, but coordinated by other centres or units

The prophylactic hypothermia trial to lessen traumatic brain injury (POLAR).

This trial will investigate whether early and sustained cooling of patients with severe traumatic brain injury is associated with better survival and less disability compared to standard care in which patients are maintained at normal temperature (Australian and New Zealand Intensive Care Society Clinical Trials Group).

Australian Snakebite Project and Fresh Frozen Plasma Study (ASP-FFP)

A national multicentre prospective cohort study of snake envenoming in Australia (Dr G Isbister, University of Newcastle, Calvary Mater Hospital).

The FluCAN Surveillance System

FluCAN is the first system in Australia to collect high quality and reliable data on hospitalised acute respiratory disease and other influenza related admissions in real time. Royal Perth Hospital participates as the sentinel site for Western Australia. (Dr A Cheng, Infectious Diseases Unit, Alfred Hospital).

Publications

Aboagye-Sarfo P, Mai Q, Sanfilippo F, Preen D, Stewart L, Fatovich D. A comparison of multivariate and univariate time series approaches to modelling and forecasting emergency department demand in Western Australia. *J Biomed Inform.* 2015;57:62-73.

Aboagye-Sarfo P, Mai Q, Sanfilippo F, Preen D, Stewart L, Fatovich D. Growth in Western Australian emergency department demand during 2007-2013 is due to people with urgent and complex care needs. *Emerg Med Australas.* 2015;27(3):202-9.

Arendts G, Etherton-Beer C, Jones R, Bullock K, MacDonald E, Dumas S, Parker D, Hutton M, Burrows S, Brown S, Almeida O. Use of a risk nomogram to predict emergency department reattendance in older people after discharge: a validation study. *Intern Emerg Med.* 2015;10(4):481-7.

Arendts G, Popescu A, Howting D, Quine S, Howard K. 'They never talked to me about...': Perspectives on aged care resident transfer to emergency departments. *Australas J Ageing.* 2015;34(2):95-102.

Barker A, Cameron P, Hill K, Flicker L, Haines T, Lowthian J, Waldron N, Arendts G, Redfern J, Forbes A, Brand C, Etherton-Beer C, Hill A, Hunter P, Nyman S, Smit D. RESPOND--A patient-centred programme to prevent secondary falls in older people presenting to the emergency department with a fall: protocol for a multicentre randomised controlled trial. *Inj Prev.* 2015;21(1):e1.

Barrett O, Macdonald S, Playford D. Near-infrared spectroscopy-based microcirculatory assessment in acute atrial fibrillation. *Anaesth Intensive Care.* 2015;43(1):105-10.

Berling I, Brown S, Miteff F, Levi C, Isbister G. Intracranial haemorrhages associated with venom induced consumption coagulopathy in Australian snakebites (ASP-21). *Toxicon.* 2015;102:8-13.

Britton P, Eastwood K, Brew B, Nagree Y, Jones C. Consensus guidelines for the investigation and management of encephalitis. *Med J Aust.* 2015;202(11):576-7.

Britton P, Eastwood K, Paterson B, Durrheim D, Dale R, Cheng A, Kenedi C, Brew B, Burrow J, Nagree Y, Leman P, Smith D, Read K, Booy R, Jones C. Consensus guidelines for the investigation and management of encephalitis in adults and children in Australia and New Zealand. *Intern Med J.* 2015;45(5):563-76.

Fry M, Chenoweth L, Arendts G. Emergency nurses perceptions of assessing and managing pain in the older cognitively impaired person: a qualitative study. *HNE Handover: For Nurses and Midwives.* 2015;8(2).

Fry M, Chenoweth L, MacGregor C, Arendts G. Emergency nurses perceptions of the role of family/carers in caring for cognitively impaired older persons in pain: a descriptive qualitative study. *Int J Nurs Stud.* 2015;52(8):1323-31.

Isbister G, Page C, Isbister G, Buckley N, Fatovich D, Brown S. In reply. *Ann Emerg Med.* 2015;65(1):124-5.

- Macdonald S, Brown S. Near-infrared spectroscopy in the assessment of suspected sepsis in the emergency department. *Emerg Med J*. 2015;32(5):404-8.
- Mai Q, Aboagye-Sarfo P, Sanfilippo F, Preen D, Fatovich D. Predicting the number of emergency department presentations in Western Australia: a population-based time series analysis. *Emerg Med Australas*. 2015;27(1):16-21.
- McCutcheon D, Oosthuizen F, Hoggett K, Fatovich D. A bolt out of the blue: the night of the blue pills. *Med J Aust*. 2015;202(10):543.
- Rogers I, Grainger S, Nagree Y. Exercise-associated hyponatremic encephalopathy in an endurance open water swimmer. *Wilderness Environ Med*. 2015;26(1):59-61.
- Rosenwax L, Spilsbury K, Arendts G, McNamara B, Semmens J. Community-based palliative care is associated with reduced emergency department use by people with dementia in their last year of life: A retrospective cohort study. *Palliat Med*. 2015;29(8):727-36.
- Schnitker L, Martin-Khan M, Burkett E, Beattie E, Jones R, Gray L. Process quality indicators targeting cognitive impairment to support quality of care for older people with cognitive impairment in emergency departments. *Acad Emerg Med*. 2015;22(3):285-98.
- Schnitker L, Martin-Khan M, Burkett E, Brand C, Beattie E, Jones R, Gray L. Structural quality indicators to support quality of care for older people with cognitive impairment in emergency departments. *Acad Emerg Med*. 2015;22(3):273-84.
- Simons F, Ebisawa M, Sanchez-Borges M, Thong B, Worm M, Tanno L, Lockey R, El-Gamal Y, Brown S, Park H, Sheikh A. 2015 update of the evidence base: World Allergy Organization anaphylaxis guidelines. *World Allergy Organ J*. 2015;8(1):32.
- Taylor D, Fatovich D, Finucci D, Furyk J, Jin S, Keijzers G, Macdonald S, Mitenko H, Richardson J, Ting J, Thom O, Ugoni A, Hughes J, Bost N, Ward M, Gibbs C, Macdonald E, Chalkley D. Best-practice pain management in the emergency department: A cluster-randomised, controlled, intervention trial. *Emerg Med Australas*. 2015;27:549-57.
- Wanandy T, Gueven N, Davies N, Brown S, Wiese M. Pilsulins: A review of the structure and mode of action of venom peptides from an Australian ant *Myrmecia pilosula*. *Toxicon*. 2015;98:54-61.
- Williams T, Finn J, Fatovich D, Perkins G, Summers Q, Jacobs I. Paramedic Differentiation of Asthma and COPD in the Prehospital Setting Is Difficult. *Prehosp Emerg Care*. 2015;19(4):535-43.

Conferences

International

Williams T, Finn J, Fatovich D, Tohira H, Brink D, Perkins G, Ho K. Predicting sepsis using prehospital data from the ambulance services: a linked data cohort study. 40th Annual Scientific Meeting, Australian and New Zealand Intensive Care Society/Australian College of Critical Care Nurses Auckland.

Williams T, Finn J, Fatovich D, Tohira H, Ho Kwok M. Prehospital factors associated with an ICU admission (poster). 35th International Symposium Intensive Care and Emergency Medicine 2015, Brussels.

National

Arendts G. Preferences for the Organisation of Acute Health Services for Residential Aged Care. 32nd Annual Scientific Meeting, Australasian College for Emergency Medicine, Brisbane.

Arendts G. Use of a Risk Nomogram to Predict Emergency Department Reattendance in Older People After Discharge: a Validation Study. 32nd Annual Scientific Meeting, Australasian College for Emergency Medicine, Brisbane.

Arendts G. A Randomised Controlled Trial of Patient Centred Intervention to Reduce Re-Presentations of Older People at High Risk After Discharge. 32nd Annual Scientific Meeting, Australasian College for Emergency Medicine, Brisbane.

Arendts G. ED services for older people. Australian and New Zealand Society for Geriatric Medicine, Perth.

Fatovich D. The inverted U curve and Emergency Medicine. ED Thought Leadership, Brisbane.

Macdonald S. Restricted Fluid Resuscitation in Sepsis associated hypotension (REFRESH) trial. 32nd Annual Scientific Meeting, Australasian College for Emergency Medicine, Brisbane.

Macdonald S, Sivayoham N, Arendts G, Fatovich D, Brown S. External validation of the simplified MISSED score for mortality in Sepsis (poster). 32nd Annual Scientific Meeting, Australasian College for Emergency Medicine, Brisbane.

Macdonald S, Stone S, Neil C, Arendts G, Fatovich D, Brown S. Resistin and NGAL: relationships with inflammatory response, endothelial activation and clinical outcomes in sepsis . 32nd Annual Scientific Meeting, Australasian College for Emergency Medicine, Brisbane.

Creamer, A. Development of a polychromatic flow cytometry protocol to examine neutrophil activation during anaphylaxis. Annual Scientific Meeting, Australian Cytometry Society, Perth.

Local

Creamer, A. Investigating the immune mechanisms of acute human anaphylaxis. Royal Perth Hospital Medical Research Foundation Research Day.

Creamer, A. Investigating the immune mechanisms of acute human anaphylaxis. Harry Perkins Institute of Medical Research Scientific Retreat.

Macdonald S. Resistin & NGAL: relationships with endothelial activation, inflammatory response and clinical outcome in Sepsis. Royal Perth Hospital Medical Research Foundation Investigators Day.

Smart L, Macdonald S. Sepsis: Insights from research in the Emergency Department. SPARHC Seminar, University of Western Australia.

Smart L. Endocan in sepsis due to community-acquired pneumonia. Medical Research Foundation Research Day, Royal Perth Hospital.

Smart L. Endothelial glycocalyx damage in sepsis. Harry Perkins Student Seminar Day, Harry Perkins Institute of Medical Research.

Annual Research Symposium

Chair: Yusuf Nagree and Daniel Fatovich. 22 October 2015

The Concussion Study

Daniel Fatovich, Professor, Emergency Medicine, University of Western Australia and Emergency Physician, Royal Perth Hospital

The ED Complex Needs Coordination Team (ED CoNeCT) RCT

Glenn Arendts, Associate Professor, Emergency Medicine, University of Western Australia and Emergency Physician, Fiona Stanley Hospital

Anaphylaxis – When allergens attack!

Abbie Creamer, PhD Student, Emergency Medicine, University of Western Australia

Alcohol Harms (in) ED

Stuart McLay, Research Registrar, Royal Perth Hospital

Endothelial glycocalyx damage in sepsis

Lisa Smart, PhD Student, Emergency Medicine, University of Western Australia

Fluid Resuscitation in Sepsis - The REFRESH Trial

Stephen Macdonald, Senior Lecturer, Emergency Medicine, University of Western Australia and Emergency Physician, Armadale Health Service and Royal Perth Hospital

The dark art of activated charcoal for the intubated overdose patient

David McCutcheon, Emergency Physician, Armadale and Royal Perth Hospitals

Syncope – can we improve on the San Francisco Rules?

Peter Watson, Registrar, Fiona Stanley Hospital

Awards for research excellence

John Gilroy Potts Award, Australasian College for Emergency Medicine

Isbister G, Page C, Buckley N, Fatovich D, Pascu O, Macdonald S, Calver L, Brown S, on behalf of the RAVE investigators. Randomized controlled trial of intravenous antivenom versus placebo for latrodectism: The second redback antivenom evaluation (RAVE-II) study. *Ann Emerg Med.* 2014;64(6):620-8.e2.

Edward Brentnall Award, Australasian College for Emergency Medicine

Egerton-Warburton D, Gosbell A, Wadsworth A, Fatovich D, Richardson D. Survey of alcohol-related presentations to Australasian Emergency Departments. *Med J Aust* 2014;201: 584-587.

Best paper by a Fellow, Australasian College for Emergency Medicine

G Arendts. Results of the ED-CoNeCT RCT.

Royal Perth Hospital, Medical Research Foundation, Research Encouragement Award

Creamer A. Investigating the immune mechanisms of acute human anaphylaxis.

Jean Kahan Memorial Scholarship, Harry Perkins Institute of Medical Research

Smart L. 3 year scholarship.

Translation of research to clinical practice

The NET Trial evaluated the Abbreviated Westmead Post Traumatic Amnesia Score (AWPTAS) in assessing patients post minor head injury. Armadale Hospital was a control site for the study. As a result of local interest after involvement in the study, training of Armadale staff has been arranged by the trial investigators in using AWPTAS to assess these patients. A working group has been established to guide its implementation at Armadale Hospital.

Contacts

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Laboratory

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