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 processing.

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**
Professor Daniel Fatovich MBBS FACEM PhD, Program Director
Dr Stephen Macdonald BSc MBChB DCH FRCP FACEM
Dr David McCutcheon MBBS FACEM
Dr Jessamine Soderstrom MBBS FACEM

*Research management and administration*
Ellen MacDonald RN, GradDipFN, MNursing, Clinical Nurse Manager (to July 2017)
Helen Hamersley RN and Jen Wurmel RN, acting Clinical Nurse Managers (from July 2017)
Cathy Read, BSc (Hons) National Coordinator (PSP Study)
Sophie Damianopoulos, Administrative Officer
Natasha Pringle, Administrative Officer (WISE Study)

*Laboratory*
Dr Erika Bosio BSc, PhD, Research Fellow
Dr Abbie Francis BSc, PhD, Research Officer
Ms Claire Neil BSc, Research Officer

*Research Nurses*
Helen Hamersley, Jen Wurmel, Rebecca Thompson, Karyn Lim, Karen Ridley
PhD Students
Dr Stephen Macdonald BSc MBChB DCH FRCP FACEM
Dr David McCutcheon MBBS FACEM
Ms Abbie Francis BSc (completed September 2017)
Dr Lisa Smart BVSc (Hons) DipACVECC

Fiona Stanley Hospital
A/Professor Yusuf Nagree MBBS GradDipCompSci FACEM MBA(E)
A/Professor Glenn Arendts MBBS MMed FACEM PhD

Research Nurse
Alannah Cooper

Armadale Hospital
Research Nurse
Jonathon Burcham

South West Area Health Service
Dr Hugh Mitenko MBBS FACEM

NHMRC Centre of Research Excellence (CRE) in Translational Venom and Antivenom Research
Prof Simon Brown, University of Western Australia, is CI-D, with Dr Abbie Francis as a named Early Career Researcher, supervised by Dr Erika Bosio.
Notable New Funding

Macdonald S, Shapiro N. 'Investigating the role of the endothelium in the pathogenesis of sepsis', University of Western Australia Research Collaboration Awards. $29000

McCutcheon D, Raghavan M, Fatovich D, Soderstrom J, Macdonald E, Oosthuizen F. Western Australian Illicit Substance Evaluation (WISE). Royal Perth Hospital Medical Research Foundation. $19653

Ryan N, Francis A, Bosio E. Development of a 3D In Vitro human cell culture system to investigate the mechanism of sudden collapse following snakebite envenoming. University of Sydney: Translational Australian Clinical Toxicology Pilot Grant. $30000


Ongoing Funding

Armstrong C, Bosio E, Fatovich D. Does the early miRNA profile of cardiac arrest have prognostic potential? Sophie Lewis Fellowship in Acute Cardiovascular Emergencies, Australasian College for Emergency Medicine. $60000

Bosio E, Fatovich D. Does the early microRNA profile of stroke have diagnostic potential? Royal Perth Hospital Medical Research Foundation. $20000


Macdonald S, Bosio E. The role of Resistin in endothelial cell activation in human sepsis. Royal Perth Hospital Medical Research Foundation. $20000 plus 1.0 FTE

Schnitker L, Beattie E, Arendts G, Carpenter C. The development and evaluation of an educational program for the care of older people with dementia in emergency departments. Alzheimer's Australia Dementia Research Foundation. $50000


Smart L, Ho KM, Mori T, Barden A, Boyd C. The effect of 4% succinylated gelatin on acute kidney injury in patients with critical illness. Royal Perth Hospital Medical Research Foundation. $19463

New Research Projects

Coordinated by CCREM

Does the early microRNA profile of stroke have diagnostic potential?
A laboratory-based investigation of microRNAs in samples from patients with ischaemic or haemorrhagic stroke and transient ischaemic attack to identify potential diagnostic biomarkers.

Does the early miRNA profile of cardiac arrest have prognostic potential?
A laboratory-based investigation of microRNAs in samples from patients post-cardiac arrest to identify biomarkers with prognostic utility.

The role of Resistin in endothelial cell activation in human sepsis.
A mechanistic investigation designed to investigate the effect of human Resistin on endothelial cell physiology with a view to understanding its role in sepsis. The significance of Resistin oligomer composition in sepsis patients will be evaluated.

Collaborations with other centres

Translational Venom and Antivenom Research
Development of a mast cell-based in vitro system within which to assess antivenom-induced anaphylactic responses in order to define the underlying mechanism. Strategies to reduce the prevalence of antivenom-induced anaphylaxis will also be evaluated using the in vitro system.

The effect of 4% succinylated gelatin on acute kidney injury in patients with critical illness.
A pilot randomised controlled trial comparing the effect of intravenous gelatine fluid with compound sodium lactate on urinary biomarkers of acute kidney injury in intensive care unit patients.

Australian Paediatric Head Injury Rules Study: Assessing the gap prior to implementation (APHIRST-Gap)
A mixed-methods study to identify gaps in current clinician knowledge and practice related to ordering CT brain for children with minor head injury. This will contribute to the knowledge translation strategy for the APHIRST study. (Paediatric Research in Emergency Departments International Collaborative).
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.

Identification of biomarkers that correlate with clinical features and outcomes following 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.

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.

NEED study
A prospective cohort study using a discharge risk nomogram to predict return of consecutive community dwelling discharged patients aged 65 and over to the Emergency Department.

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.

Restricted Fluid Resuscitation in Sepsis-associated Hypotension Trial (REFRESH)
A multicentre randomised trial of fluid restricted versus fluid liberal resuscitation in early management of sepsis.

Western Australian Illicit Substance Evaluation (WISE)
A single centre observational study of patients with suspected intoxication with illicit stimulant drugs
Collaborations

Australian Snakebite Project (ASP)
A national multicentre observational study investigating the appropriate use, dose and safety of snake antivenoms 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).

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).

Patient outcomes for those receiving CPAP for severe respiratory distress in the prehospital setting
A randomised controlled trial of paramedic-administered continuous positive airways pressure (CPAP) with usual care or usual care for severe respiratory distress (Prehospital, Resuscitation and Emergency Care Research Unit, Curtin University).

Functional status of survivors of out-of-hospital cardiac arrest in Perth Western Australia
A retrospective review of medical records for OHCA victims who survived to hospital admission to determine functional / neurological outcome and estimate the uptake of post-resuscitation practices such as therapeutic hypothermia. (Prehospital, Resuscitation and Emergency Care Research Unit, Curtin University).
Publications


secondary falls in older people presenting to the emergency department with a fall: protocol for an economic evaluation. Injury Prevention 2017;23:124-130


**Investigator Group Papers**


**Published Abstracts**


Posters
Arendts G. Systematic Development of the Delirium Action Response in ED Intervention (moderated poster presentation). 34th Annual Scientific Meeting, Australasian College for Emergency Medicine, Sydney


Dumas S, Leyte N, Mandal B, Arendts G. The Fiona Stanley Hospital Falls Project. 50th AAG Meeting, Perth


Tohira H, Fatovich D, Rao S, Williams T, Bailey P, Finn J. Helicopter transport of rural major trauma patients is no better than ambulance. XI European Congress of Emergency Medicine, Greece

Conferences

**International**
Arendts G. The Emergency Department Delirium Initiative (EDDI) trial. 21st International Association of Gerontology and Geriatrics (IAGG) World Congress, San Francisco

**National**
Fatovich D. Clinical research, evidence and the emergency department. Anniversary Symposium, Emergency Medicine Foundation, Brisbane

Fatovich D. EM Hacks: Change your practice? 34th Annual Scientific Meeting, Australasian College for Emergency Medicine, Sydney

Fatovich D. EM Research: How to for novice and early career researchers. 34th Annual Scientific Meeting, Australasian College for Emergency Medicine, Sydney

Forero R, Nahidi S, Gibson N, McCarthy S, Fatovich D, Mohsin M. Emergency department staff perceptions and experiences during the implementation of the four hour rule/National Emergency Access Target (NEAT) in Australia: a social dynamic perspective. 34th Annual Scientific Meeting, Australasian College for Emergency Medicine, Sydney


Man N, Forero R, Ngo H, Mountain D, Mohsin M, Richardson D. Impact of the National Emergency Access Target (NEAT) on time-based and admission-related outcomes in emergency departments in NSW, ACT and QLD. 34th Annual Scientific Meeting, Australasian College for Emergency Medicine, Sydney


Macdonald SPJ, Arendts G, Fatovich DM, Brown SGA. Improving the predictive utility of the qSOFA score: effect of comorbidity. 34th Annual Scientific Meeting, Australasian College for Emergency Medicine, Sydney

McCutcheon, D. Waiver of Consent in Emergency Medicine Research. 34th Annual Scientific Meeting, Australasian College for Emergency Medicine, Sydney

Local

Fatovich D. Recreational drugs in the Emergency Department - the inside story. WA Family Pathways Network Annual Conference.

Macdonald S. Restricted fluid resuscitation in sepsis associate hypotension (REFRESH). WA Health Translation network clinical trials forum.

Macdonald S. Sepsis: a time critical illness? Australasian College for Emergency Medicine WA Faculty Annual Scientific Meeting.

McCutcheon, D. C-Spine Immobilisation: The Evidence. Australasian College for Emergency Medicine WA Faculty Annual Scientific Meeting, Perth


Annual Research Symposium

Taylor D. Professor, Emergency Medicine, University of Melbourne. (Keynote speaker) Emergency Medicine Research: Where are we up to and where are we going?

Brown S, Professor, Emergency Medicine, University of Tasmania. Simon says ....

Arendts G. Why do people from nursing homes come to ED? Introducing choice experiments.

McCutcheon D. Methamphetamine in the ED.

Macdonald S. Near-infrared spectroscopy in Sepsis: the ARISTOS study.

Bosio E. Can MiRNA tell us what stroke you’ve got? MicroRNA biomarkers as novel diagnostic tools.

Smart L. Inflammation and endothelial damage after hypertonic saline, compared to isotonic saline, in Emergency Department patients with infection: the Saline in Sepsis Trial (SST).

Fatovich D. Clinical research, evidence and the Emergency Department.
Awards for research excellence

Arendts G. Morson Taylor Award, Australasian College for Emergency Medicine
Vitamins and delirium in older emergency department patients.

Francis A. Royal Perth Hospital, Medical Research Foundation, Best Paper Award.

Macdonald S. Australasian College for Emergency Medicine Annual Scientific Meeting 2017, Best Paper Award.

Riou M. European Emergency Medical Congress, Copenhagen. People’s Choice Award.

Other notable achievements
Fatovich D. Appointed deputy chair, WA State Government Methamphetamine Action Plan Taskforce