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WA Health and Medical Research and Innovation Strategy
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Introduction

The Australasian College for Emergency Medicine (ACEM) welcomes the opportunity to provide a submission to the WA Health and Medical Research and Innovation Strategy (the Strategy). Our submission focuses on key issues within emergency medicine (EM) that would benefit from additional investment via research and innovation, as well as suggestions for policy and legislative changes to enable leading clinical and translational research in emergency medicine.

ACEM is the peak body for emergency medicine and has a vital interest in ensuring the highest standards of emergency medical care for all patients. ACEM is responsible for the training and ongoing education of emergency physicians and the advancement of professional standards for emergency medicine in Australia and New Zealand.

Emergency Departments (EDs) are the key interface between primary health and hospital care. In 2017-18 856,707 people in Western Australia (WA) presented to emergency departments across the state.[1]

Given the vital role EDs play in modern health care, limited investment is made to ED research in Australia and particularly in Western Australia. For instance, of all National Health and Medical Research Council (NHMRC) grants funded between 2000 and 2016, only 0.095% were specifically in the EM field.[2] While only 20% of this funding was granted in WA. Thus the Health and Medical Research and Innovation Strategy comes at an opportune time to invest in EM research. These efforts are needed to drive innovative ways to avoid unnecessary ED attendances, deliver improved care, reduce access block and overcrowding, and avoidable mortality. Ideally, this could be in the form of an overarching EM Research Foundation to support research activities in this area.

1. Priority areas for research

Research in Western Australian EDs is essential to not only improving patient clinical outcomes by assisting clinicians with decision making in uncertainty but also has the ability to enhance overall hospital and ED functionality.[3] As a highly collaborative research discipline and an area that is at the crossroads of most medical pressure points, EM research can involve a range of disciplines including

[1] Australian Institute of Health and Welfare (2018) Emergency Department Care 2017-18, Australian Hospital Statistics, Health services series no. 89, Catalogue no. HSE 216, Canberra, AIHWhttps://www.aihw.gov.au/getmedia/9ca4c770-3c3b-42fe-b071-3d758711c23a/aihw-hse-216.pdf.aspx?inline=true

[2] National Health and Medical Research Grants (2017) *All grants 2000-2016,* https://www.nhmrc.gov.au/funding/data-research/research-funding-data

[3] Ting, J. (2017), 'Collaborative research between emergency medicine and physicians', Internal Medicine Journal, vol. 48, pp. 379-381.

other specialities, primary and pre-hospital care, public health, and other health professionals working in the ED.[4]

In many situations EM research differs from the majority of health and medical research and thus requires innovative approaches to research methodologies. This is because many patients present with 'problems' as opposed to a formal diagnosis. Furthermore, different research methodologies and approaches to consent/enrolment may be needed given the time-critical nature of EM particularly for critical illness and injury such as heart attacks, strokes, brain injury, major trauma, sepsis, allergies and poisonings. Broader demographic shifts, rising demand for care, higher patient expectations along with increased demand of ED services from patients with mental illness, substance use and end-of-life care reflect the urgent need for increased investment in research and innovation.

Despite the many benefits that investments in EM research can bring, this speciality, has relatively poor clinical and epidemiological research infrastructure and expertise due to its short history and non-traditional focus. Furthermore, research funding specifically for EM research is underrepresented from funding bodies. Thus ACEM believes that ED research should be a key research priority as part of the WA Health and Medical Research and Innovation Strategy. This is essential for closing gaps in knowledge, capacity and effort, supporting research to implement best practice, and reducing unwarranted variation in outcomes across EDs. In particular, ACEM believes that translational EM research, avoiding ED attendances and reducing access block should be identified as key funding priorities under the Future Health Research and Innovation Fund.

1.1 Overcrowding

Overcrowding is a persistent issue in WA hospitals and is caused by blocks to admission and poor flow overwhelming ED capacity.[5] ED access block: when a patient spends more than eight hours in an ED waiting for an inpatient bed results in hospital overcrowding and ambulance ramping.[6] Access block compromises patient care and is associated with increased risk of death, delayed diagnosis of myocardial infarction, medical error and delayed care as well as staff burnout and job dissatisfaction.[7]

To address this issue, in 2009 WA introduced the four-hour target to EDs.[8] This target, which has been subsequently been adopted nationally as the National Emergency Access Target (NEAT), seeks to either discharge or admit 90% of patients from the ED within 4 hours. Research has shown that following the introduction of the 4-hour rule, WA had a decline of mortality rates in the three tertiary hospitals located in Perth attributed to reduced access block.[9] Despite this, WA EDs continue to experience severe access block[10] with mental health patients in WA experiencing extreme wait times compared to other states and territories.[11] Addressing overcrowding and access block cannot be fixed solely through time-based KPIs and instead requires a whole-of-system and whole-of-hospital approach. Systems-based and cost-effectiveness research in EM is vital to identify causes and solutions to this problem and improve efficiencies, effectiveness and sustainability within this important section of the health system.

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[4] Ting (2017); Babl, F., Krieser, D., Oakley, E. and Dalziel, S. (2014), 'A platform for paediatric acute care research', *Emergency Medicine Australasia*, vol. 26, pp. 419-422.
[5] Geelhoed, G. and de Klerk, N. (2012), 'Emergency department overcrowding, mortality and the 4-hour rule in Western Australia', *The Medical Journal of Australia*, vol. 196, no. 2, pp. 122-126
[6] ACEM (2019) *Access block*, https://acem.org.au/Content-Sources/Advancing-Emergency-Medicine/Better-Outcomes-for-Patients/Access-Block
[7] Geelhoed and de Klerk (2012); Richardson, D. and Mountain, D. (2009), 'Myths versus facts in emergency department overcrowding and hospital access block', The Medical Journal of Australia, vol. 190, no. 7, pp. 369-374.
[8] Forero, R. et al. (2018), 'Impact of the four-hour National Emergency Access Target on 30 day mortality, access block and chronic emergency department overcrowding in Australian emergency departments', *Emergency Medicine Australasia*, vol. 31, no. 1, pp. 58-66.
[9] Geelhoed and de Klerk (2012); Forero, R. and Hillman, K. (2008) Access block and overcrowding: A literature review, Simpson Centre for Health Services Research, University of New South Wales, Sydney.
[10] Forero et al. (2018)
[11] ACEM (2018) *Waiting Times in the Emergency Department for People with Acute Mental and Behavioural Conditions*, February 2018, https://acem.org.au/getmedia/0857d22e-af03-40bb-8e9f-f01a2a2bf607/ACEM_Mental-Health-Access-Block.aspx

ACEM considers that there are still large gaps in knowledge about the drivers of increasing ED demand and hospital workloads. Furthermore, there is a need to design interventions that can be trialled to reduce or reverse this expansion. Such issues should form a key pillar of research as part of The Strategy.

1.2 Translational EM research

It is ACEM's position that current funding models for traditional disease-based programs do not readily apply to ED patient populations. Due to this lack of funded capacity, many treatments understood as the standard of care for emergency and critical care patients may only be supported by evidence extrapolated from other, non-time critical medical settings. Indeed, there have been reported instances of the withdrawal of 'standard care' in emergency and critical care medicine as new evidence shows they are not beneficial, and sometimes detrimental.

ACEM considers that there should be continued emphasis on research which translates into EM practice and where applicable, health policy. Funding should also be directed to translational research that defines the science of translation for EM and what works in specific environments like EDs. At a more granular level, translation of what works in EM is fundamentally important to implement new standards of ED care, reduce unnecessary, low-value care, and to understand what works in mixed (i.e. adult/paediatric) EDs as well as different EDs servicing metropolitan, regional, rural and remote areas. Furthermore, embracing the philosophy of research activity integrated into health care delivery, rather than a distinct or even competing enterprise, will provide faster, easier access to translatable information that can assist all priorities and more quickly realise the benefits of research. Due to the large numbers of patients that attend EDs each day, clinical research and translation of findings to patient care has the potential to influence the outcomes of thousands of patients each week.

1.3 Multi-centre research networks

One strategy to address the gap in EM research is through the establishment of multicentre research networks, including clinical trial networks (CTNs). Such networks bring together clinical researchers and epidemiologists with strong translational capacity. Furthermore, multicentre research networks creates access to a larger number of eligible participants and also assists when a condition or outcome may be more uncommon.[12] Similarly, such networks create a collective of expertise and avoids duplication whilst enhancing the overall generalisability of results.[13] Having collaborative networks also increases the likelihood of external research funding with the potential for future high returns on the original investment.

One WA example of involvement in such a network is the Paediatric Research in Emergency Departments International Collaborative (PREDICT). PREDICT has been operating for the past 15 years and is a multi-site collaborative that involves all tertiary paediatric hospitals and a number of mixed EDs with a large number of paediatric presentations.[14] PREDICT has conducted innovative research in the use of second-line status epilepticus management and head injuries in children, has established the Australasian Bronchiolitis Guidelines and plays a key role in global disease surveillance.[15] Another example of excellent use of research funding has been the Emergency Foundation using research funding from the Queensland Government, which has fostered large amounts of new research and many multi-site collaborations (http://emergencyfoundation.org.au/)

[12] Babl et al. (2014)
[13] Babl et al. (2014)
[14] Babl et al (2014)
[15] Babl et al. (2014); PREDICT (2016) Australian Bronchiolitis Guideline, http://www.predict.org.au/publications/2016-pubs/

2. Access to data

The increasing amount of digital data produced in the acute health system as part of routine patient management and care is also exponentially increasing the ability of researchers to use techniques such as data linkage, complex adaptive system modelling, big data analytics (e.g. classification tree analysis, machine learning and artificial intelligence), and geospatial modelling of disease and its determinants.

Well-resourced registries can be utilised as platforms for both interventional research trials and epidemiological studies over significant time periods, particularly in cases of infrequently seen but important disease groups (e.g. influenza epidemics, severe acute respiratory syndrome, avian influenza, Ebola virus disease etc.), with the capacity for outcomes to be tracked to specific interventions (e.g. step-wedge cluster designed registry based trials, platform trials). Emergency medicine epidemiological registries should also be funded to monitor the distribution, determinants and changing patterns of disease among specific populations.

In WA approaches to managing access to data have become a barrier to researchers even when such data are de-identified. There are further barriers with the high cost of data linkage services which results in poorly coordinated research The Health and Medical Research and Innovation Strategy must enable access to such data to support such important research. Emergency-based epidemiological research can be used to investigate longer-term public health interventions for infectious diseases, trauma, and chronic diseases such as cancer, heart disease and diabetes. These conditions often present acutely to EDs, affect a growing proportion of the community, and involve large amounts of health funding. One example of the usefulness of such data is in regards to repeat presenters to WA EDs. Analysis of such data has been essential to examining and showing the benefits of the 4 hour rule but was delayed by 2-3 years due to a lack of a streamlined approach to the use of these data.[16]

3. Policy and legislation to support emergency medicine research

A number of Fellows of ACEM have indicated the urgent need to resolve issues of consent in acute clinical research in WA where potential participants lack capacity due to the severity or time-critical nature of their illness or injury. In EM research 'waivers of consent', 'retrospective consent' or 'surrogate consent' are sometimes necessary instead of informed patient consent. Alternate consent or assent processes may be considered ethically appropriate in certain clinical circumstances such as when a patient is unconscious or in severe pain or distress, when there is a short therapeutic window, or when next of kin are unable to provide consent.[17] These principles are set out in the NHMRC National Statement on ethical conduct in Human Research. Critical to alternate methods of consent is the thorough review of study protocols by an ethics committee which is qualified to assess the balance of clinical important of the research with patient safety and confidentiality.[18]

In WA, there has been an issue whereby the State Solicitor's Office has deemed next of kin consent or waivers of consent to be unlawful under the current Guardianship and Administration Act (1990). While we are pleased to be advised that amendments to the existing legislation to address this are proposed, the matter is urgent since patients in Western Australia are currently being denied access to EM research which is permissible in all other Australian jurisdictions. This is an inequitable situation, which not only places patients in WA at a disadvantage but also seriously hinders the advancement of EM in WA more broadly. We therefore strongly advocate for a more flexible interpretation to allow

[16] Forero et al. (2018)
[17] Roberts, I., Prieto-Merino, D., Shakur, H., Chalmers, I. and Nicholl, J. (2011), 'Effects of consent rituals on mortality in emergency care research', *The Lancet*, vol. 377, no. 9771, pp. 1071-1072; Rebers, S., Aaronson, N., van Leeuwen, F. and Schmidt, M. (2016), 'Exceptions to the rule of informed consent for research with an intervention', *BMC Medical Ethics*, vol. 17, no. 9, pp. 1-11.
[18] Rebers et al. (2016); Morgans, A. (2014), 'Waiver of Informed Consent in Prehospital Emergency Health Research in Australia', Monash Bioethics Review, vol. 29, no. 1, pp. 49-64.

urgent and critical care research to resume in WA as soon as possible, acknowledging the time is takes for legislative amendments to occur. The current situation means that patients with mild or moderate conditions may be enrolled as research participants in WA, while those with the most serious conditions are unable to be researched. These limitations introduce bias and limit the generalisability of results, compromise patient care and limit the capacity of collaborative research projects in WA.[19]

Furthermore, a study conducted by PREDICT of consumers found that there was general support for waivers of consent amongst parents of children requiring acute clinical care.[20] However, it was noted that such support was contingent on the fact that research had been approved by an ethics committee, was considered low risk and that deferred consent was sought sensitively.[21]

ACEM believes that in accordance with contemporary accepted best research practice consumers be involved in the design and implementation of research studies involving proxy consent or waivers of consent to ensure the continued ability of EM research to be at the forefront of innovations in clinical care for the benefit of our patients and the wider community.

4. Research infrastructure

A key aspect which should be built into the Health and Medical Research and Innovation Strategy should be support for collaborative research opportunities within WA and throughout Australia. Such a model has the capacity to establish WA at the forefront of EM research and developing a research culture focused on translational and cutting-edge research.

ACEM suggests establishing a formal and resourced EM research network or Foundation in WA similar to that of the Emergency Medicine Foundation. The Emergency Medicine Foundation (the Foundation) is funded by the Queensland Department of Health. Between 2008-09 and 2016-17 the Foundation has awarded 131 grants amounting to $12.95 million.[22] The projects the Foundation has funded have also secured approximately $44 million in linked, in-kind and leverage funding. It is estimated that six of the projects funded through this foundation have a current and future economic contribution to the Australian health care system amounting to $564 million.

An important aspect to this program is that grants can be awarded to all clinicians who provide direct clinical care to emergency patients including nurses, paramedics, allied health professionals, rural generalists and emergency specialists.[23] In addition, this program supports researchers by providing local capability development through grant writing/review education, upskilling for new researchers, navigation of research governance and ethics processes and preparation for peer review. Establishment of a similar network in WA would not only attract and grow the calibre of emergency medicine researchers in the state, as has been the case in Queensland, but it would also ensure consistency of funding and stability within this area of research in EM.

In the context of EM research, an ideal network for collaborative research will collectively provide (i) a critical mass of academic leaders/senior researchers to cover core areas of clinical research expertise and assist the development of early career researchers, (ii) dedicated time for clinicians to undertake vital research, (iii) experienced clinical trial managers and administrative support, (iv) research nurse/assistant support, (v) biostatistical support, (vi) information technology and infrastructure, and

[19] Roberts et al. (2011); Rebers et al. (2016)

[20] Furyk, J., McBain-Rigg, K., Watt, K., Emeto, T., Franklin, R., Franklin, D., Schibler, A., Dalziel, S., Babl F., Wilson, C., Phillips, N., Ray, R. (2017), 'Qualitiative evaluation of a deferred consent process in paediatric emergency research: a PREDICT study', *BMJ Open*, vol. 7, online.

[21] Furyk et al. (2017)

[22] Emergency Medicine Foundation (2017) *2007-2017: 10 years of emergency medicine research funding, Emergency Medicine Foundation, Brisbane* http://emergencyfoundation.org.au/wp-content/uploads/2017/11/EMF-10-year-booklet-WEB.pdf

[23] Emergency Medicine Foundation (2019) *Queensland Research Program*, http://emergencyfoundation.org.au/queensland-research-program/

(vii) research laboratory infrastructure and personnel, and (viii) exploratory epidemiological studies to generate new hypotheses and trial concepts.

5. Commercial opportunities

EM is a leader in time critical care and incremental improvements, systems innovation and efficacy, innovation in drug application. Such improvements may not directly result in immediate commercial opportunities, but will in the long-run bring about significant returns on investment throughout the public health system from more efficient care and improved patient outcomes. Indeed, there are important outstanding research questions related to currently used standard accepted treatments, as well as many evidence-practice gaps. These are best addressed in investigator-initiated 'common good' research studies with the aim of delivering the best clinical outcomes while eliminating low-value care and harmful practices. ACEM believes that prioritising these aspects of the research agenda represents the best value and appropriate use of research funds.

ACEM is concerned with the focus throughout the discussion paper on commercial outputs as a direct result of translational research. It is ACEM's position that commercial interests should not be positioned above innovations that lead to reduced patient mortality and morbidity as the primary motivation, but also considering the important costs to the WA state health system and how hospital care can be made more efficient and effective.

Thank you for the opportunity to provide a submission to this consultation. If you have any questions please do not hesitate to contact Freya Saich, Policy Officer on 03 9230 0444 or Freya.Saich@acem.org.au.

Yours sincerely,

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