Emergency Medicine Comes of Age in the ADF

M Little, J Williams, A Holley, A Parkin, D Ward , C Balfour, B Butson, D Cooksley, A Pearce

Abstract

Background: Emergency medicine is a well-established specialty in Australia and New Zealand. The Australian Defence Force (ADF) has progressively identified the value of this discipline across a range of domestic and deployed activities, with EM trainees and fellows deploying on a range of ADF exercises and operations since 1991. In 2017, Operation OKRA (Iraq) saw the first ADF deployment of specialist emergency physicians (EPs) in a dedicated EP position as the Senior Medical Officer and lead clinician of a deployed health facility.

Purpose: This narrative review seeks to highlight the skills and abilities EPs bring to the ADF, as well as opportunities for the future.

Conclusion: ADF EPs are increasingly providing key clinical capabilities within Role 1, 2 and 2E facilities on exercises and overseas deployments, and have established the requirement for EP inclusion in the manning of future deployed facilities. Involvement of EPs in ADF technical and clinical governance at all levels will enable these specialists to provide advice to commanders as well as clinicians, and influence policy and future ADF health capability development

Key words: Emergency physician, emergency medicine, ADF

Introduction

The Australasian College for Emergency Medicine (ACEM) was formed in July 1983, with the first fellows passing Fellowship of the Australasian College for Emergency Medicine (FACEM) exams in 1986. The National Specialist Qualification Advisory Committee subsequently recognised emergency medicine as a medical specialty and the FACEM as the appropriate specialist qualification in 1993. Emergency medicine is now an established and respected civilian practice specialty in Australia, New Zealand and worldwide. The Australian Defence Force (ADF) has progressively identified the value of this discipline across a range of domestic and deployed activities, with emergency medicine trainees and fellows deploying on a spectrum of ADF exercises and operations since 1991. In 2017, Operation OKRA (Iraq) saw the first ADF deployment of EPs in a dedicated EP position as the Senior Medical Officer (SMO) and lead clinician of a deployed health facility. This narrative review seeks to highlight the skills and abilities EPs bring to the ADF, as well as opportunities for the future.

International military experience with emergency medicine

Other nations have been deploying military EPs for many years. United States (US) Army EPs contributed to health support during the US assault on Panama (Operation Just Cause) in 1989.[1] Muck et al., in their review of EPs in the US military, reported that since 2001, Operation Iraq Freedom (OIF), Iraq and Operation Enduring Freedom (OEF), Afghanistan have been the first conflicts that EPs fully participated as an integral part of the military health system.[2] During these conflicts, the roles of the EPs have evolved, such that EPs are now the most frequently deployed medical specialists in the US Army and Airforce.[3] In these conflicts, EPs have been deployed to Role 1, 2, 2E and 3 health facilities,leading resuscitation of major trauma cases, as well as managing non-battle casualties. Gerhardt et al. retrospectively reviewed data from a US battalion aid station (Role 1) which was augmented with EPs during a one-year deployment to Iraq.[4] During this time, 85% of all battalion aid posts were clinically led solely by primary care physicians. Combat units served by an aid station with an EP had a battle casualty rate of 22.2% with a case-fatality rate of 7.1%. This can be compared to a theatre-wide battle casualty rate of 6.7%, and associated case-fatality rate of 10.5%. Although these data suggest an association between EPs working in a Role 1 and improved survival in the setting of a higher casualty load, as a retrospective study, the authors are unable to prove that the presence of EPs improved outcomes.

EPs have been frequently requested by US special operations forces to provide both clinical care in austere environments, as well as training of medics and medical support for mission planning. Approximately 40% of all US critical care aeromedical evacuation (AME) teams include EPs. These teams have enabled the rapid movement of severely injured soldiers out of theatre (93% arriving in Germany within 72 hours of injury), with a marked reduction in mortality.[2] EPs also provide value in command roles. Muck et al. reported that in the recent conflicts in Iraq and Afghanistan, EPs had significantly impacted military medical preparation, evacuation platforms and hospital commands in a way never previously experienced in US military history.[2]

While militaries should excel at managing battle casualties, data from all conflicts shows that non-battle casualties are numerically more significant. The ratio of deployed US service members hospitalised for disease and non-battle injuries (DNBI) to those with battle injuries has steadily reduced from 8.5 (WW1) to 2.4 (Vietnam); however, during OEF and OIF, DNBI casualties outnumbered battle casualties by a ratio of 3:1.[5] EPs are ideally placed to help manage this workload alongside deployed general practitioners and the junior medical officer workforce.

Bebarta and colleagues reported on 1745 casualties managed by EPs in the emergency department (ED) of a Role 3 US military hospital deployed to Iraq from 2007–2008.[6] Of those, 429 were diagnosed with emergent medical conditions and 203 with acute surgical pathology. Disposition of these patients is summarised in Table 1.

Table 1: Disposition of patients seen in the Emergency Department

Disposition	Emergent cases seen in ED (n = 632)
Discharged from ED	291 (46%)
Admitted to ward	180 (28%)
Admitted to ICU	106 (17%)
Admitted to operating room	34 (5%)
Died	10 (1.6%)

ED = Emergency Department, ICU = Intensive Care Unit. Adapted from Bebarta et al.[5]

Table 1 demonstrates that only a small minority (5%) were transferred to the operating room for surgery. The three most common diagnoses in the ED presentations were abdominal complaints (17%), orthopaedic injuries (12%) and headache (6%). Emergent medical conditions included meningitis, pulmonary embolism, overdose, gastrointestinal bleeding, acute myocardial infarction, chest pain and atrial fibrillation. Of the emergent cases, 374 required laboratory work, 248 required x-rays, 226 required CT scans and 37 required ultrasound investigations. A small number of patients required procedures such as intubation, central venous access, procedural sedation, regional anaesthesia, joint or fracture reduction, and the use of advanced cardiac life support (ACLS) drugs and inotropes. These are all core skills and part of the standard EP scope of practice.

Training skills

The ACEM has provided structured training, standards and professional recognition for EPs in Australia and New Zealand since 1984. Despite the bulk of training occurring in the ED during the five-year training program, trainees are rotated to other specialties, including intensive care medicine, anaesthesia, surgical, paediatrics and general medicine including medical specialties. Optional special skills rotations may be completed in areas such as retrieval medicine, toxicology, psychiatry, hyperbaric medicine and general practice. During core terms in the ED, registrars undertake training in clinical care provision for a diverse range of presentations and procedures including trauma, critical illness, clinical teaching and management of the ED, all under the direct supervision and mentorship of EPs.[7] The evolution of emergency medicine training has contrasted with that of specialties previously tasked with resuscitation. Anaesthetic training now mandates only a three-month module of critical care, and there is no requirement for emergency medicine exposure. Australasian intensive care training gives a six-month option of emergency medicine and six months of internal medicine. The differences in training may lead to differences in confidence and capability to manage the varied emergency presentations to a military health facility on operations or exercises.

Australasian emergency physicians in civilian practice

EDs are often challenging and busy environments. A 2017 survey of 39 ACEM-accredited EDs in Australasia found 7.16 million patients were collectively treated in that year.[8] EPs are specialist generalists, who are not only trained to diagnose and manage a wide range of individual acute pathologies but adopt a team- and systems-based approach to acute healthcare delivery in order to maximise

efficiency and patient safety. In a modern ED, an EP may be guiding resuscitation of critically ill patients, dealing with fast-track patients, managing inpatients in the ED observation wards, as well as managing patients in remote locations through telemedicine. They are accustomed to operating in chaotic environments with limited clinical information, so flexibility and acceptance of the requirement to make decisions with limited information are essential personal attributes. The ACEM policy on clinical privileges demonstrates a wide potential scope of practice (see Appendix A).[9]

Specific roles

In most major hospitals, trauma teams have been established, and EPs typically lead the initial trauma response. They will oversee the initial resuscitation and management of seriously and critically injured patients, activate trauma teams and coordinate specialist team responses as required. In a military setting, the presence of specialist EPs will enable surgical teams to continue operative work while the routine workup of trauma patients continues. In one US study, surveyed surgeons were of the opinion that only surgeons should manage trauma patients on presentation. When asked about providing initial trauma care, only 60% of the surgeons surveyed felt comfortable with providing this initial care, compared to 84% of EPs surveyed.[10]

As well as major trauma, EPs are managing many less severe cases of trauma. They regularly provide safe procedural sedation to allow fractures to be aligned, dislocations reduced and lacerations repaired without patients needing admission and care in an operating theatre. In Australia, there are guidelines for both paediatric and adult procedural sedation in the ED.[11] In one prospective study, 2623 patients in 11 emergency departments received procedural sedation over a three-year period and by implication, substantially decreased demand for operating theatre time and post-theatre ward beds.[12]

EPs are also heavily involved in training and clinical mentoring of junior medical and nursing staff. Most EDs in Australasia have extensive training programs for both emergency medicine trainees and junior staff rotating through the ED. There are set training program requirements produced by the ACEM.[7]

The nature of emergency medicine experience and exposure has allowed for the evolution of other essential roles outside of the ED, including aeromedical retrieval services. This includes the provision of initial clinical advice to referring clinicians, the planning, coordination and conduct of retrievals, as well as leading retrieval systems. The combined ACEM, Australian & New Zealand College of Anaesthetists and College of Intensive Care Medicine policy on the transport of the critically ill, stipulates that prehospital and retrieval medical staff need to have the prerequisite skills and knowledge to provide the highest level of care in these environments and for the patients they are likely to encounter.[13]

EPs undergo training and examination in leadership in disaster planning and training, with a significant number being leaders or members of Australian Medical Assistance Teams (AUSMATs). EPs have been deployed on every international AUSMAT deployment for at least 13 years, including Jogjakarta 2006, Pakistan 2010, Christchurch 2011, Tacloban 2013, Vanuatu 2015, Fiji 2016, Bangladesh 2017, PNG 2018 Samoa 2019 and PNG 2020. EPs as AUSMAT members were embedded for the entire ADF Pakistan Assist 2 deployment in 2010.[14] EPs serving on maritime platforms, including ADF EPs, were deployed in teams in response to the summer 2019–2020 bushfire crisis in Australia. In April 2020, a combined AUSMAT/ADF team deployed to NW Tasmania to run a regional hospital ED as part of the COVID-19 response. This involved the deployment of both AUSMAT and ADF EPs. The ACEM policy on disaster health sciences emphasises that EPs should be involved in all aspects of disaster planning, management and patient care.[15]

Every major ED in Australia has an EP as the director (college requirement for training accreditation). This person will usually be managing one of the larger departments in a hospital (from a staffing perspective), as well as being one of the few departments that provides a dedicated 24/7 service to the community. Many EPs will have significant administrative roles that frequently focus on processes-of-care and quality assurance activities.

Up to 5% of all ED presentations are due to poisoning and envenoming.[16] As such FACEM training has a heavy focus on this area. The majority of clinical toxicologists in Australia are EPs, supporting a national poisons information service, as well as the running of inpatient toxicology services in many hospitals. They are experts in the management of poisoned and envenomed patients and the use of antidotes and antivenoms, and many have specific training in chemical, biological, radiation and nuclear exposure in patients, and explosive (CBRN-E) threats. EP toxicologists are also extensively involved in the training of other clinicians, as well as research; textbooks have now standardised the approach to a poisoned patient for clinicians in Australasia.[16]

Evolution of emergency physicians contributions to the ADF

During the late 20th century, as the operational tempo for the ADF was increasing, some fulltime ADF ACEM advanced trainees and fellows began deploying to several military operations. The capability these doctors brought with them was recognised early by their commanders as providing a significant increase to the General Duties Medical Officer skill set that had been the previous standard.

Military deployments, including conflict, peacekeeping and humanitarian aid have occurred in locations such as East Timor, Solomon Islands, Iraq, Afghanistan, Indonesia and Pakistan. The roles EPs have filled included Regimental Medical Officer, Resuscitation Medical Officer, AME Medical Officer and SMO, as well as intensive care consultant. During these deployments, it has become increasingly clear that along with the generalist skill set of ACEM trainees and fellows, their advanced skills were useful in the provision of medical care to deployed troops.

It was also recognised that the skills and experience gained by ACEM trainees on operations, when appropriately supervised, was valuable. ACEM has notably approved Category T (special skills) accreditation for army emergency trainees serving two terms in the NATO Role 2 hospital in Afghanistan, in August 2011 and February 2016

The rapid expansion of the pool of ADF SERCAT 5 FACEMs since 2016 has seen EPs recurrently deployed on operations most commonly as resuscitation specialists in Role 2 facilities. Prior to this, completion of courses such as early management of severe trauma (EMST) had sufficed for posting into these roles. EPs are now recognised as an essential part of advanced resuscitation and shock/trauma teams deployed on exercises and operations.

Emergency physicians and the Australian Army

Within Army's R2E facility, EPs lead resuscitation and trauma teams and provide clinical leadership and mentoring for all clinicians in the ED. Other roles performed by EPs in the R2E include retrieval specialist and facility director of clinical services. The Army's R2LM (light manoeuvre) facility is a small, mobile resuscitation and surgical facility in which an EP provides similar clinical and leadership expertise to that found in civilian resuscitation rooms. EPs also provide similar clinical and leadership expertise to various army units such as special operations and regional force surveillance units that are operationally active. Every Army medical officer during initial training (Medical Officers Introductory Course) receives a week's tuition and mentoring from EPs in skills such as assessment and management of battle casualties.

Emergency physicians and the Royal Australian Navy

The Royal Australian Navy (RAN) has increasingly recognised the importance of EP contributions to the ADF. With the acquisition of Landing Helicopter Dock (LHD) vessels HMAS *Canberra* and *Adelaide*, came the capability to provide Maritime Role 2E medical care in a dedicated facility at sea. This significantly enhanced capability is delivered onboard RAN ships by the Maritime Operational Health Unit (MOHU), a unit that augments the ships' posted medical crews in periods of increased operational tempo. Specialties assembled within the MOHU consist of emergency medicine, anaesthesia, surgical, intensive care medicine and AME. The EP role within this team is the provision of casualty reception, resuscitation and management of mass-casualty (MASCAL) events, and critical care retrieval and transfer. In other circumstances, where high acuity trauma is considered possible but unlikely, EPs may be deployed without the full complement of MOHU specialists.

The care of divers and submariners is another significant priority for clinicians within the navy context. ADF EPs are well placed to fill roles within the resuscitation phase of such an event pending definitive hyperbaric care by hyperbaric specialists, a role in which some EPs have subspecialised.

Emergency physicians and the Royal Australian Air Force

Royal Australian Airforce (RAAF) EPs, like Army EPs, work in their role of initial casualty assessment and treatment in the Air Force (AF) R2E facility, as well as often providing overall clinical leadership in the facility as director of clinical services. They also deliver key components of the new 'Resuscitative Surgical Capability' (RSC), a small eight-person, rapidly deployable and highly mobile advanced resuscitation and damage control surgery asset which can also integrate with a Role 2E. EPs are involved in training AME teams and serve as members of RAAF Military Critical Care AME Teams (MCATs) that undertake long-distance transfers of high-dependency and critically ill or injured patients. RAAF EPs have also been at the forefront of helping develop advanced military pre-hospital care capability and pre-veterinary Military Working

Dog (MWD) emergency care and AME. RAAF EP's are available to deploy with Army or Navy and have done so recently on exercise and deployments overseas.

There are other roles available to RAAF EP's along the managerial pathway within Director-General Health Reserves-Air Force (DGHR-AF) including clinical and regional director/deputy director positions. The most relevant clinical director role is CD Emergency Medicine and AME. The regional directors have a crucial role in recruiting, mentoring and integration with the regional health advisory groups (RHAG).

The future of emergency physicians in the ADF

EPs have a broad clinical scope in civilian practice and offer ADF a highly-skilled specialist workforce. The value of the EP has been increasingly identified by health commanders and has been reflected by aggressive recruitment to numbers that are now able to sustain essential operations realistically.

It is increasingly common for positions on deployment to be occupied by EPs independent of the service they represent. EPs from Army and RAAF have deployed onboard LHDs in support of MOHU and Navy AME. Navy and RAAF EPs have deployed with the Army to Afghanistan and Iraq. It may therefore be appropriate to recommend that all EPs within the ADF are trained to a common standard for essential activities such as hyperbaric, critical care transport and aviation medicine.

As the ADF continues to move to a joint-force and command model, EPs of all services are increasingly deploying side-by-side, as seen on Operation OKRA. During this deployment, EPs provided resuscitative care to critically ill patients, inpatient care, training and mentoring to deployed health personnel, from both Anzac forces and coalition militaries. These specialists, as the SMO on Operation OKRA provided specialist medical advice to commanders.

The value of EPs might be enhanced with additional training for these specialists to further develop their understanding of the military procedures and command structure. EPs will need to actively engage with commanders at all levels to understand their needs as well as promote their skills and abilities in the ADF.

Conclusion

Emergency medicine is a relatively new and evolving specialty, characterised by a broad scope of practice, and the requirement of a range of procedural skills EPs have expertise in leading resuscitation and trauma teams, flexibility, leadership of multidisciplinary teams and time-critical decision-making abilities in chaotic environments with limited clinical information. ADF EPs are increasingly providing key clinical capabilities within Role 1, 2 and 2E facilities on exercises and overseas deployments, and have established the requirement for EP inclusion in the manning of future deployed facilities. Involvement of EPs in ADF technical and clinical governance at all levels will enable these specialists to provide advice to commanders as well as clinicians, and influence policy and future ADF health capability development.

Corresponding Author: Mark Little
Mark.Little@health.qld.gov.au
Authors: M Little[1], J Williams[2], A Holley[2], B Butson[3], A Parkin[4], D Ward[5], C Balfour[6], D Cooksley[7], A Pearce[8,9]
Author Affiliations:
1 Cairns Hospital
2 Royal Brisbane and Women's Hospital
3 Townsville Hospital
4 PA Hospital
5 Holy Spirit Northside
6 Medstar
7 Sunshine Coast University Hospital
8 Royal Adelaide Hospital
9 MedSTAR Retrieval Services

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Appendix A: ACEM POLICY ON PRIVILEGES FOR EMERGENCY PHYSICIANS. (www.acem.org.au)

The clinical privileges of an emergency physician extend to direct clinical patient care, the supervision of junior medical staff, clinical support duties and risk management activities. These activities include, but are not limited to, quality assurance, teaching, research and participation in activities that relate to the maintenance of professional standards, and professional College activities to further Emergency Medicine. Emergency Medicine is not solely practiced in the ED and, by the mutual agreement of the appropriate authority, emergency physician clinical privileges may extend outside the ED and may include:

- Clinical assessment of the deteriorating patients
- Clinical work in short stay units.
- Clinical work in diagnostic units.
- Clinical work in medical assessment units.
- Clinical work in toxicology services.
- Duties under the local Mental Health Legislation.
- Transporting patients outside the hospital premises such as interfacility transports.
- Clinical work in intensive care.
- Clinical work in rapid response teams (e.g. MET Call or Code Blue).
- 'Hospital in the Home'.
- Clinical work in telemedicine.
- Clinical work in other inpatient services as negotiated locally.
- The collection of medico-legal specimens or performing forensic medical examinations.
- Duties related to organ and tissue donation.
- Duties related to child protection.
- Outpatient services