AUSTRALIAN PARAMEDIC

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PARAMEDIC OBSERVER

Latest Updates

FEATURE

Two Systems, One Accountability

FEATURE

FOAMed Highlights

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About Us

Australian Paramedic is a journal being delivered to Paramedics across Australia. Our mission is to support and improve patient care through the sharing of knowledge and information from across Australia, and at the same time aid paramedics through delivering current information from recognised and emerging leaders in emergency care.

We are independent from any employer, associations or groups and our aim is simply to provide current, relevant information to the Australian Paramedic. With an Editorial Board consisting of paramedics and emergency medical professionals we will ensure that the information provided is accurate and timely in this developing professional environment.

Australian Paramedic will continue to evolve over time with feedback and review from readers. The aim of Australian Paramedic is to share knowledge and commentary from experts in the field, as well as provide background information on topics as research and programs develop both in Australia and internationally.

As Australian Paramedic develops we hope to become the leading voice for paramedics to share news, knowledge and information.

Editor's Note

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Australian Paramedic is proud to be independent of any professional association or academic institution.

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Too many paramedics—or not enough places for them?

It's a conversation that seems to come up more and more often—on placement, in station rooms, and across university cohorts: why is it so hard to get a job as a paramedic right now?

On the surface, the answer feels straightforward. Universities across Australia are graduating large numbers of paramedic students each year, while state ambulance services offer a relatively fixed number of graduate positions. The maths doesn't quite work, and many capable, motivated graduates find themselves waiting—sometimes for years—for a pathway onto the road.

But that explanation only tells part of the story.

At the same time as graduates are struggling to find roles, ambulance services are under sustained pressure. Demand continues to climb. Crews are ramped outside hospitals. Communities—particularly in rural and remote areas—still report gaps in access to timely care. It's hard to reconcile these two realities: a workforce that can't get in, and a system that can't keep up.

Change is needed! For a long time, the profession has been tightly linked to a single employment model—working on-road for a state ambulance service. It's a model that's well understood, well respected, and central to the identity of paramedicine in Australia. But it's also a narrow one. When that pathway becomes congested, there are limited alternatives for graduates to step into.

Meanwhile, the kinds of patients paramedics are seeing are changing. Not every call is a lights-and-sirens emergency. Many involve chronic illness, mental health, social complexity, or issues that sit somewhere between primary care and emergency response. These are areas where paramedics already have valuable skills—but not always the system support to use them differently.

This is where paramedicine needs to start looking at alternatives and movement into areas like community health, GP clinics, aged care, mental health outreach, or urgent care centres. This concept isn't entirely new, and there are pockets of innovation across Australia. But they're still the exception rather than the rule. Funding models, registration frameworks, and long-standing professional expectations all play a role in keeping things as they are.

But this is an opportunity, and a conversation we need to be having more openly. The roll-out of Queensland's new program for paramedic employment in remote areas will be one to watch – read more about this from the article in this edition!

There are many other key topics also covered in this edition with features on airway management research, a Polish ambulance service perspective, plus the latest from the Paramedic Observer and the Ambulance Service Medal recipients from Australia Day 2026.

Happy reading...

Two systems, one accountability...

Robert Rejtar & Tomasz Wieckowski

This article is not about which system is better, but how paramedics from different systems can learn from each other.

Emergency medical services are an area of healthcare where time, decisions, and responsibility directly affect human lives. Although Poland and Australia are thousands of kilometres apart, and their healthcare systems operate under different legal and social conditions, the profession of paramedic is based on the same principles. My goal is not to compare which of these systems is better, but to try to show the differences and similarities.

I will also try to answer the question: what can paramedics from both countries learn from each other... This is my second article in your magazine, written from the perspective of a paramedic working both in emergency medical teams and in the hospital emergency department, thus attempting to combine the everyday realities of work with a broader systemic view. I should mention that I am currently preparing for the OCT language exam, because you never know where I will be applying tomorrow, in times of mobile professional activity and a common language of emergency medicine...

ALMA MATER, OR EDUCATION

Despite different systemic realities, education in both countries is based on similar foundations. I have a master's degree in a field related to health care. At the beginning of my professional career, I completed a two-year post-secondary medical school, obtaining a diploma as a paramedic. In many European countries, this is where the systemic education of a paramedic ends. I then completed a three-year bachelor's degree, obtaining, so to speak, a second title of paramedic, and then a master's degree in a field related to medicine. Of course, this was my path.

Following the normal course of study, a paramedic candidate begins a three-year bachelor's degree, and then may, but does not have to complete a master's degree in emergency medical services, which will be available from 2025, or, like many paramedics with a bachelor's degree in previous years, complete a two-year master's degree in a field related to healthcare, as I did. Therefore, higher education is the basis of the profession, similarly to how in Australia, paramedic is an academic profession.

The Higher Vocational School in Gorzów Wielkopolski, my alma mater, where I have the pleasure of educating future paramedics. The university emphasises anatomy, physiology, pathophysiology, emergency medicine, pharmacotherapy, medical simulations, and professional practice, as these are the core of the three-year paramedic program, for their future work, preparing them not only to work in mobile emergency medical teams, but also in hospital emergency departments and certain other departments, such as intensive care units, i.e., to be versatile paramedics.

After graduation, paramedics in Poland are also required to pursue professional development by updating their knowledge and professional skills. As part of postgraduate education in specialist training and qualification courses. In Australia, paramedics are, so to speak, independent clinicians who, in the course of their studies, are prepared to make clinical decisions, work in the field, and, consequently, make independent decisions.

SAVING HEALTH AND LIVES. MULTITASKING/INDEPENDENT PRE-HOSPITAL CLINICIAN

Assessment of the patient's condition according to the ABCDE scheme, performing emergency medical procedures, securing airway patency – SGA instrumental methods, endotracheal intubation in sudden cardiac arrest, performing CPR – ALS, independent administration of 51 drugs (table 1), in accordance with current medical knowledge with the possibility of modification, immobilization of injuries and management of high-energy injuries, documentation of emergency medical procedures, action based on teleconsultations, are the most important pillars of the Polish system.

The emergency number 112, where emergency number operators from the former 998 -State Fire Service, 997 Police and the still valid number 999, where medics are on duty: medical dispatchers include paramedics and nurses specializing in emergency medicine with at least 5 years of experience in the system.

Basic medical rescue teams "P" with a designation on the ambulance, consisting of at least two people authorized to perform emergency medical procedures, including a system nurse or paramedic - 1,664 teams.

Specialist medical rescue teams "S" with a doctor , consisting of at least three persons authorized to perform emergency medical procedures, including a system doctor and a system nurse or paramedic – 248 teams.

Air medical rescue team: consists of at least three persons, including at least one professional pilot, a system doctor, and a paramedic or system nurse – 21 teams.

Table 1. 51 medications that a Paramedic in Poland can administer independently.

	Chemical substance	Brand name	parenterally	by mouth	other forms
1	Adenozyna	Adenocor	YES		
2	Adrenalina		YES		
3	Amiodaron	Amiokordin, Cordarone	YES		
4	Atropina		YES		
5	Budezonid	Nebbud, Pulmicort			Nebulisation
6	Deksametazon	Dexaven, Demezon	YES		
7	Diazepam	Relanium	YES	YES	Rectal enema
8	Drotaweryna	No-spa	YES		
9	Fentanyl		YES		
10	Flumazenil		YES		
11	Furosemid		YES		
12	Glukagon		YES		
13	Glukoza 20%		YES		
14	Glukoza 5%		YES		
15	Heparyna		YES		
16	Hydrokortyzon	Corhydron	YES		
17	Hydroksyetyloskrobia	HES	YES		
18	Hydroksyzyna	Atarax	YES	YES	
19	Ibuprofen			YES	
20	Izosorbid monoazotanu	Mononit		YES	
21	Kaptopryl				Sublingually
22	Ketoprofen	Ketonal	YES	YES	
23	Klemastyna		YES		
24	Klonazepam		YES		
25	Klopidogrel	Plavix		YES	
26	Kwas acetylosalicylowy	Aspiryna		YES	
27	Kwas transeksamowy			YES	
28	Lidokaina		YES		Gel
29	Magnez		YES		
30	Mannitol 15%		YES		
31	Metamizol	Pyralgin	YES		
32	Metoklopramid		YES		
33	Metoprolol	Betaloc, Metocard	YES		
34	Midazolam		YES		
35	Morfina		YES		
36	Nalokson		YES		
37	Nitrogliceryna	Nitromint, Perlinganit		YES	Sublingual spray
38	Noradrenalina	Levonor	YES		
39	Papaweryna		YES	YES	
40	Paracetamol		YES		Suppositories
41	Płyn fizjologiczny wieloelektrolitowy		YES		
42	Prasugrel			YES	
43	Roztwór Ringera		YES		
44	Salbutamol			YES	Nebulisation
45	Sól fizjologiczna 0,9%		YES		
46	Thiethylperazinum	Torecan	YES		Suppositories
47	Tikagrelor	Brilique		YES	
48	Tlen medyczny				medical gas
49	Urapidyl	Ebrantil, Tachyben	YES		
50	Wodorowęglan sodu 8,4%		YES		
51	Żelatyna modyfikowana Gelaspan		YES		

TWO SYSTEMS

A paramedic on duty at the Hospital Emergency Department is the first person to make contact with the patient and the hospital system, responsible for the initial assessment of the patient's condition, participating in diagnosis, stabilization, and treatment. This is not a supporting role, but an independent medical profession working in an interdisciplinary team.

The Emergency Department in Gorzów Wielkopolski, the "atrium" of the Multispecialist Provincial Hospital, is, in my opinion, the best medical facility I have ever worked in. Both the hospital management and the heads of individual departments, including the Department of Anesthesiology, Prof. Mirosław Czuczwar, MD, PhD, and the Emergency Department, Tomasz Wieckowski, MD, PhD, a specialist in anesthesiology and intensive care, are people who have mastered their profession and are highly respected by their colleagues. Mirosław Czuczwar, and the Hospital Emergency Department, Specialist in Anesthesiology and Intensive Care, Specialist in Emergency Medicine Tomasz Wieckowski, are people who perfectly understand that training medical personnel at every level is a key element in ensuring patient safety and, consequently, high-quality health services.

"PIT STOP... OF THE EMERGENCY DEPARTMENT."

In my opinion, paramedics in Poland working in hospital emergency departments have the opportunity to expand their knowledge and skills in managing a larger team, as in the case of sudden cardiac arrest, because often, at least in my workplace, I am the Team Leader, I participate in the interpretation of diagnostics starting from the "point of care" i.e., blood gas analysis, through performing a FAST ultrasound examination or, in the case of trauma patients, eFAST, which I also described in my previous article in your magazine (Spring, 2025).

Personally, I often encourage my students to start their professional careers in the emergency room, where they can observe their more experienced colleagues, practice a range of emergency procedures (such as pleural puncture and drainage), perform FAST examinations and, under the supervision of specialists such as Professor Mirosław Czuczwar, interpret them correctly, learn the secrets of computed tomography, and most importantly, I believe that there is no room for individualists in this job; here, we are a team in which everyone has their own tasks.

An Australian paramedic is an independent pre-hospital clinician in the field, focused on decision-making.

PROSPECTS, OR THE FUTURE...

Unfortunately, not everything looks so rosy for us. Both the emergency medical teams I mentioned above and, consequently, the next link in the system, i.e., hospital emergency departments, have been providing primary health care for several years. In Australia, as far as I know, paramedics have a strictly defined career path, while in Poland, for the time being, paramedics themselves, so to speak, create their own future by expanding their powers, often on their own. People who are passionate about this profession and have experience train future staff at medical universities, conduct specialist courses starting with BLS, through ALS, PALS within the workplace, FAST and eFAST examinations. The future of Polish paramedics depends on systemic decisions, investment in education, and real recognition of the role they play in healthcare. It is a profession with enormous potential, which has developed in Poland since 2006, a way of life for many of my colleagues—a passion that, with the right reforms, has a great chance of becoming one of the pillars of modern emergency medicine in Poland.

Finally, a few words from me. I am 47 years old, with 23 years of professional experience, and I am constantly improving my professional and language skills. If there was an opportunity to work in Australia, of course in our profession, i.e. as a paramedic, I would gladly take advantage of such a chance...

ABOUT THE AUTHORS

Robert Rajtar. Master's degree in emergency medical services with 23 years of experience in "P" and "S" type emergency medical teams, as well as in the Hospital Emergency Department. Academic lecturer for several years. Passions: emergency medical services, mountain ultramarathons, travel.

Tomasz Wieckowski. Specialist in anesthesiology and intensive care, specialist in emergency medicine with experience... Head of the Hospital Emergency Department in Gorzów Wielkopolski. His passions include sailing.

New nation leading paramedic role to support Queensland's most remote communities

The Crisafulli Government is delivering easier access to health services with experienced paramedics set to be able to work in remote hospitals and health services from April – an Australian-first initiative.

The new Remote Hospitals Paramedic role will take effect from 1 April 2026 in Queensland's most remote towns, strengthening frontline care and supporting local health services to respond to workforce shortages in rural and remote communities left by Labor.

When Remote Hospitals Paramedics are not responding to emergencies in the community, they will be able to work collaboratively alongside doctors, nurses and Aboriginal and Torres Strait Islander health workers to deliver more care closer to home.

Under the new model, these paramedics will deliver both primary and emergency care in Queensland Health's remote health services including hospitals, general practices, residential aged care facilities, and primary health care clinics.

The first Queensland Health Remote Hospitals Paramedics are expected to commence mid-year.

The nation-leading initiative responds directly to findings from the Crisafulli Government's Workforce Gap Analysis, which highlighted the depth of the health workforce crisis inherited after a decade of decline under Labor.

The Analysis revealed that 72 per cent of workforce growth over the past 10 years occurred primarily in metropolitan areas, while rural and remote Queensland was left facing mounting shortages. Although the Analysis found no workforce gaps for Queensland Ambulance Service paramedics in South Queensland, it showed challenges persisted in attracting and retaining paramedics in rural and remote communities under conventional workforce models.

The Remote Hospitals Paramedics role is part of the Crisafulli Government's broader work to strengthen the health workforce, including:

• The rollout of Hospital Based Ambulances across rural Queensland where local health staff and volunteers are now being provided a proper ambulance, life-saving equipment, and training, instead of relying on non-ambulance vehicles to respond to emergencies

• Axing Labor's GP payroll tax within the first month of government

• Introducing a $24 million GP Trainee Incentive to support the next generation of doctors and strengthen the GP pipeline

• Rolling out a $6.8 million Single Employer Model pilot to improve GP distribution in rural and remote areas

• Expanding regional GP access to specialist advice through a $6.4 million investment, reducing the need for patients to travel for care.

• Changing regulations to allow Queensland GPs to diagnose and treat adults with ADHD, improving access to important treatment and reducing long travel times for rural patients.

Minister for Health and Ambulance Services Tim Nicholls said the Crisafulli Government was delivering easier access to health services for all Queenslanders.

"These targeted reforms are about fixing a system left under strain after a decade of neglect under Labor, and restoring easier access to health services for rural, regional and remote Queenslanders,' Minister Nicholls said.

"Traditional workforce models alone are not meeting the needs of our most remote communities, which is why we are backing new and flexible ways of delivering care.

"The nation-leading Paramedic, Remote Hospitals model will give remote hospitals and health services greater flexibility to respond to local health needs and workforce challenges, and ultimately, improve access to care.

"Paramedics are highly trained clinicians with strong skills in assessment and acute care, and those skills are incredibly valuable in remote hospitals and clinics where clinicians must manage a wide range of health presentations."

Nine Queensland Health HHSs have facilities in areas classified as remote and very remote (Modified Monash Model) and will be able to employ paramedics within their facilities under the Directive.

These include:

• Cairns and Hinterland HHS
• Central Queensland HHS
• Central West HHS
• Darling Downs HHS
• Mackay HHS
• North West HHS
• South West HHS
• Torres and Cape HHS
• Townsville HHS

The association of prehospital advanced airway management time and outcome in out-of hospital cardiac arrest patients

Thongpitak Huabbangyang, Pramote Papukdee, Rossakorn Klaiangthong, Fahsai Jaibergban, Pannika Paharat, Patcharaporn Doungkaew, Fatiha Chanthep, Menatthinee Suntimetaneedol & Sitthichai Chuanart

Original article: Huabbangyang, T., Papukdee, P., Klaiangthong, R. et al. The association of prehospital advanced airway management time and outcome in out-of hospital cardiac arrest patients. Sci Rep 16, 4098 (2026). https://doi.org/10.1038/s41598-025-34602-2

ABSTRACT

Currently, there is limited evidence regarding the optimal duration of advanced airway management (AAM) with endotracheal intubation in out-of-hospital cardiac arrest (OHCA), particularly in the complex setting of prehospital on-scene management. The current study examined the association between the AAM time (≤ 2, 2–4, 4–6, and > 6 min) provided by the emergency medical service (EMS) team and patient outcomes. We attempted to replicate the chest compression assessment cycle, performing evaluations every 2 min. The primary outcome was survival to hospital discharge.

The secondary outcome was sustained return of spontaneous circulation (ROSC) at the scene, defined as continuous ROSC for > 20 min. Data on all adult patients aged > 18 years who experienced non-traumatic out-of-hospital cardiac arrest (OHCA) and met the eligibility criteria were collected from EMS patient care reports. Data on survival to hospital discharge were obtained from the electronic medical records. The association between AAM time and survival to hospital discharge and sustained ROSC at the scene was examined via univariable and multivariable analyses. Approximately 50% of patients received AAM within ≤ 2 min, 16.05% within 2–4 min, 9.74% within 4–6 min, and 24.21% after > 6 min. Sustained ROSC at the scene occurred in 39.7% of patients. When classified by AAM time, sustained ROSC rates were 36.2%, 42.6%, 41.2%, and 44.3%, while survival to hospital discharge was 4.2%, 3.3%, 4.1%, and 8.7%, respectively. There was no significant difference in sustained ROSC by AAM time. Among patients with shockable rhythms, AAM at 4–6 and > 6 min was associated with 1.23-fold and 1.28-fold increased ROSC likelihood compared to ≤ 2 min; for non-shockable rhythms, the likelihoods were 1.11, 1.15, and 0.95, respectively. Regarding survival to discharge, shockable-rhythm patients receiving AAM at 4–6 and > 6 min had 1.3-fold and 1.86-fold increased likelihoods compared to 2–4 min. For non-shockable rhythms, AAM at 2–4, 4–6, and > 6 min was associated with 0.48, 1.89, and 3.44-fold likelihoods of survival, respectively, compared to ≤ 2 min.

In this retrospective cohort, patients with non-shockable rhythms appeared to have higher survival among those who received AAM later (> 6 min); however, this pattern may largely reflect survivorship bias and residual confounding rather than any beneficial effect of delaying AAM. In contrast, earlier AAM did not show a clear survival advantage in patients with shockable rhythms. These associations should therefore not be interpreted as causal or as evidence that AAM timing is a modifiable determinant of outcomes. Instead, the findings are exploratory and hypothesis-generating, underscoring the need for prospective studies with appropriate adjustment for time-dependent confounding to clarify the true relationship between AAM timing and survival.

BACKGROUND

Out-of-hospital cardiac arrest (OHCA) is a major global public health problem and a leading cause of mortality [1,2,3,4,5]. In Thailand, cardiovascular disease is the predominant etiology, accounting for approximately 6% of all deaths annually [6]. High-quality cardiopulmonary resuscitation (CPR), including maintaining a chest compression fraction (CCF) > 80% with appropriate ventilation, is essential for improving outcomes [7]. Hypoxia is a reversible cause of cardiac arrest and contributes to approximately 20% of OHCA events due to non-cardiac etiologies [8].

Prior evidence suggests that early prehospital endotracheal intubation (ETI) may improve the likelihood of return of spontaneous circulation (ROSC) compared with bag-valve-mask (BVM) ventilation, although its impact on survival to hospital discharge remains uncertain [9]– [10]. The 2020 American Heart Association (AHA) guidelines recommend establishing an airway using either BVM or advanced airway management (AAM)—including ETI or supraglottic airway devices—during CPR [11]. ETI offers potential advantages such as improved oxygenation, carbon dioxide clearance, and continuous monitoring of CPR quality through end-tidal CO_2 [12]. However, ETI also carries risks, including interruption of chest compressions, potential esophageal intubation, and the need for considerable operator expertise [11].

Evidence regarding the optimal timing of AAM remains inconsistent. Some studies suggest that rapid AAM may improve ROSC or CCF [13,14], whereas others report negative or neutral effects on ROSC and survival [15,16,17]. Current AHA guidelines do not specify an optimal timeframe for AAM during resuscitation [11], and prior studies have not adequately addressed time-dependent biases that may influence the relationship between AAM timing and outcomes.

To address these knowledge gaps, the present study examined the association between time to AAM using ETI and two key outcomes—survival to hospital discharge and sustained ROSC at the scene—among patients with OHCA treated by EMS personnel.

METHODS

Study design and setting

This retrospective cohort study was conducted at the Vajira Emergency Medical Service (V-EMS), Faculty of Medicine, Vajira Hospital, Navamindradhiraj University, Bangkok, Thailand. V-EMS is the zone leader for EMS Area 1, one of 11 areas in the designated zones of Bangkok's EMS system. It operates under the dispatch of the Erawan Center in Bangkok [18]. For OHCA cases within its service area, V-EMS deploys one team per call, comprising at least three personnel, including paramedics or emergency nurse practitioners (ENPs) serving as the team leader and emergency medical technicians (EMTs). During each operation, paramedics or ENPs operate under both off-line and on-line medical protocols directed by emergency physicians. In cases of cardiac arrest, the paramedics or ENPs manage patients based on the 2020 AHA guidelines, and all personnel are certified in Advanced Cardiovascular Life Support (ACLS). The V-EMS provides ongoing simulation-based training in ETI for paramedics under the direct supervision of medical directors to ensure procedural competency and adherence to airway management standards. ETI is routinely performed by these personnel not only in cardiac arrest but also in other critical conditions such as severe trauma, respiratory failure, and altered mental status.

Participants

Data on adult patients with OHCA were collected from EMS patient care reports, coded under symptom group 6 (cardiac arrest) according to the Thailand Emergency Medical Triage Protocol and Criteria-Based Dispatch. These cases were managed by the V-EMS unit, Faculty of Medicine Vajira Hospital, Navamindradhiraj University, Bangkok, Thailand, between January 1, 2018, and December 31, 2023.

Inclusion criteria

The following patients were included in this study: adult patients aged > 18 years who experienced non-traumatic OHCA and who were dispatched to the V-EMS and coded with symptom group 6: cardiac arrest, based on the Thailand Emergency Medical Triage Protocol and Criteria-Based Dispatch. The patients received AAM with ETI insertion and were transported to the Emergency Department, Faculty of Medicine Vajira Hospital, Navamindradhiraj University, Bangkok, Thailand. Cases coded as dispatch code 6 represented EMS-attended cardiac arrests, meaning that EMS personnel initiated or continued resuscitation efforts upon arrival at the scene. However, not all cases were EMS-witnessed arrests, as this dispatch code was used to identify cases where EMS actively managed resuscitation rather than those occurring in their direct presence.

Exclusion criteria

The following patients were excluded from this study: patients who were confirmed dead before ambulance arrival at the scene (no resuscitation attempt by EMS), those with signs of irreversible death as considered inappropriate to resuscitate by the team leader, those with a do-not-attempt-resuscitation (DNAR) order, metastatic malignancy, CPR during transfer, re-arrest, incomplete data, or no record of resuscitation.

Data collection

Data on patients with OHCA were collected from EMS patient care reports, which were standardized records of advanced EMS operations. These reports were issued by the Bangkok EMS Center (Erawan Center) and used consistently across Bangkok's advanced emergency operation units. This form included data on EMS operation units, patients, and all treatments provided by the EMS teams, which were recorded by dispatchers and paramedics or ENPs operating at the scene. These data were a part of remuneration for the EMS operation units. Data on survival to discharge were extracted from the electronic medical record of Vajira Hospital. All data were filled in and recorded in Microsoft Excel. The data comprised the following: (1) general characteristics of patients with OHCA including sex, age, underlying disease, location of cardiac arrest, cause of cardiac arrest, witnessed collapse, performance of bystander CPR, initial cardiac rhythm, defibrillation, advanced airway management, prehospital fluid access

refers specifically to intravascular access (either intravenous or intraosseous) established for fluid administration before hospital arrival, total CPR duration, collapsed time to first chest compression, time to first epinephrine dose, and use of intravenous amiodarone, calcium, and sodium bicarbonate and (2) study outcomes including sustained ROSC and survival to discharge. Treatment outcomes were monitored every 30 days by the principal investigator (TH). The outcomes of in-patient status were monitored from the electronic medical records of Faculty of Medicine Vajira Hospital, Navamindradhiraj University, Bangkok, Thailand.

Definition

Sustained ROSC (> 20 min) was defined as return of spontaneous circulation lasting at least 20 min [9,19].

Survival to discharge was defined as the last status of the patients on the 30th day from the date of OHCA occurrence, counted as the 1st day. Data were collected from the hospital's electronic medical records [9,19].

AAM time was defined as the duration from first contact by paramedics or ENPs to successful endotracheal intubation.

Statistical analysis

A descriptive analysis was performed to examine variable distribution. Continuous variables were expressed as mean ± standard deviation (SD) or median and interquartile range (IQR). Categorical variables were presented as frequencies and proportions. To compare between-group differences, the independent t-test or the Mann-Whitney U test was used for numeric variables and the chi-square test or the Fisher's exact test for categorical variables.

The association between various AAM timing and survival to hospital discharge and sustained ROSC at the scene in patients with OHCA was analyzed using univariable and multivariable methods through multiple logistic regression analysis. Data were expressed as risk ratio (RR) and 95% confidence interval. All statistical tests were considered statistically significant, and a p-value of ≤ 0.05 indicated statistically significant differences. Stata version 17.0 (StataCorp College Station, TX, USA) was used for all analyses.

Calculation of sample size

The current study primarily examined the association between AAM timing with ETI and survival to hospital discharge in patients with OHCA. The sample size in this study was calculated using a sample size calculation formula for testing two independent proportions [20] with a level of significance of 0.05 (α = 0.05) and a power of 80%. Statistical values used in the calculation are from the study of Daorattanachai K et al. [21]. The rates of survival to hospital discharge in patients with cardiac arrest undergoing AAM within and > 2 min were 11.0% (p1 = 0.110) and 6.8% (p2 = 0.068), respectively. The sample size ratio of the comparison and study groups was 1:1, which was determined based on the proportion of the retrospective population in the studied population. The sample size calculated using the formula was at least 721 per group. An additional 5% was added to account for potential incomplete data. The sample size calculated using the formula (nnew = 721/(1−0.05)) was at least 759. Therefore, this study determined a sample size of 760 per group with a total number of 1520. Simple random sampling was performed.

Ethics approval and consent to participate

This study received ethical approval from the Institutional Review Board of the Faculty of Medicine Vajira Hospital, Navamindradhiraj University (COA No. 048/2567). Owing to the retrospective design of the study, the requirement for informed consent was waived by the committee. All procedures in this study were performed in accordance with the tenets of the Declaration of Helsinki.

RESULTS

Demographic and clinical characteristics of all patients with OHCA

A total of 1520 non-traumatic OHCA patients met the inclusion criteria (Fig. 1). Approximately half received AAM within ≤ 2 min and one-quarter after > 6 min (Table 1). Most patients were male, aged ≥ 60 years, and presented with non-shockable rhythms. Cardiac arrests occurred predominantly in non-public locations and were commonly of presumed cardiac etiology. Witnessed arrests and bystander CPR were frequent. Although some differences in age, comorbidities, and initial rhythm were observed across AAM-time groups, these were small and unlikely to be clinically meaningful. Time to first epinephrine increased with longer time to AAM, whereas other prehospital interventions were similar across groups.

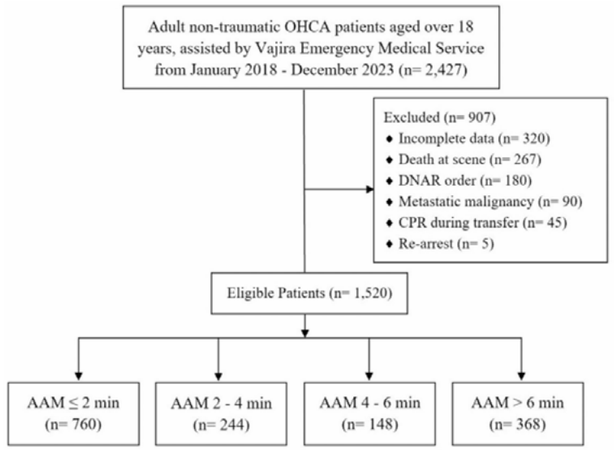


Fig. 1
Study flowchart.

Table 1
Demographic and clinical characteristics of out-of-hospital cardiac arrest patients according to prehospital advanced airway management timing.

(cont. next page)

Characteristics	Advanced airway management								*p*-value
	≤ 2 min (*n* = 760)		2–4 min (*n* = 244)		4–6 min (*n* = 148)		> 6 min (*n* = 368)		
	n	(%)	*n*	(%)	*n*	(%)	*n*	(%)	
Age (years), mean ± SD	62.64 ± 20.78		67.53 ± 16.71		62.36 ± 17.29		64.11 ± 16.76		0.004
< 60	312	(41.1)	78	(32.0)	67	(45.3)	122	(33.2)	0.003
≥ 60	448	(58.9)	166	(68.0)	81	(54.7)	246	(66.8)	
Sex									
Male	453	(59.6)	141	(57.8)	92	(62.2)	253	(68.8)	0.013
Female	307	(40.4)	103	(42.2)	56	(37.8)	115	(31.3)	
Underlying disease									
Yes	490	(64.5)	189	(77.5)	77	(52.0)	247	(67.1)	< 0.001
No	270	(35.5)	55	(22.5)	71	(48.0)	121	(32.9)	
Location of cardiac arrest									
Non-public	678	(89.2)	209	(85.7)	136	(91.9)	287	(78.0)	< 0.001
Public	82	(10.8)	35	(14.3)	12	(8.1)	81	(22.0)	
Cause of cardiac arrest									
Presumed cardiac cause	368	(48.4)	130	(53.3)	98	(66.2)	291	(79.1)	< 0.001
Respiratory	392	(51.6)	114	(46.7)	50	(33.8)	77	(20.9)	
Witnessed collapse									
Yes	466	(61.3)	156	(63.9)	98	(66.2)	277	(75.3)	< 0.001
No	294	(38.7)	88	(36.1)	50	(33.8)	91	(24.7)	

Continued >

Performance of bystander CPR									
Yes	460	(60.5)	134	(54.9)	83	(56.1)	234	(63.6)	0.131
No	300	(39.5)	110	(45.1)	65	(43.9)	134	(36.4)	
Initial cardiac rhythm									
Asystole	591	(77.8)	127	(52.1)	98	(66.2)	248	(67.4)	< 0.001
Ventricular fibrillation (VF)	38	(5.0)	64	(26.2)	41	(27.7)	83	(22.6)	
Pulseless electrical activity (PEA)	131	(17.2)	43	(17.6)	9	(6.1)	35	(9.5)	
Pulseless VT	0	(0.0)	10	(4.1)	0	(0.0)	2	(0.5)	
Initial cardiac rhythm									
Shockable rhythm	38	(5.0)	74	(30.3)	41	(27.7)	85	(23.1)	< 0.001
Non-shockable rhythm	722	(95.0)	170	(69.7)	107	(72.3)	283	(76.9)	
Defibrillation									
Yes	101	(13.3)	84	(34.4)	49	(33.1)	92	(25.0)	< 0.001
No	659	(86.7)	160	(65.6)	99	(66.9)	276	(75.0)	
Prehospital fluid access									
NSS	738	(97.1)	242	(99.2)	145	(98.0)	355	(96.5)	0.194
RLS/Acetar	22	(2.9)	2	(0.8)	3	(2.0)	13	(3.5)	
Total CPR duration (minutes), mean ± SD	32.51 ± 15.42		32.02 ± 16.72		34.59 ± 15.24		35.60 ± 16.85		0.008
< 30	317	(41.7)	104	(42.6)	46	(31.1)	120	(32.6)	0.003
≥ 30	443	(58.3)	140	(57.4)	102	(68.9)	248	(67.4)	
Collapsed time to first chest compression (minutes), median (IQR)	6	(3–13)	6	(2–12)	9	(4–12)	8	(3–12)	0.482
< 10	471	(62.0)	140	(57.4)	84	(56.8)	194	(52.7)	0.027
≥ 10	289	(38.0)	104	(42.6)	64	(43.2)	174	(47.3)	
Time to first dose of epinephrine (minutes), median (IQR)	3	(2–4)	3	(2–5)	4	(3–6)	8	(5–11)	< 0.001
< 5	612	(80.5)	178	(73.0)	76	(51.4)	81	(22.0)	< 0.001
≥ 5	148	(19.5)	66	(27.0)	72	(48.6)	287	(78.0)	
Use of intravenous amiodarone									
Yes	70	(9.2)	20	(8.2)	23	(15.5)	40	(10.9)	0.081
No	690	(90.8)	224	(91.8)	125	(84.5)	328	(89.1)	
Use of intravenous calcium									
Yes	124	(16.3)	52	(21.3)	28	(18.9)	75	(20.4)	0.206
No	636	(83.7)	192	(78.7)	120	(81.1)	293	(79.6)	
Use of intravenous sodium bicarbonate									
Yes	370	(48.7)	117	(48.0)	82	(55.4)	183	(49.7)	0.474
No	390	(51.3)	127	(52.0)	66	(44.6)	185	(50.3)	

1. IQR, interquartile range; SD, standard deviation; CPR, cardiopulmonary resuscitation; VT, ventricular tachycardia; NSS, normal saline; RLS, ringer lactate solution.

2. Data were presented as the number (%), mean ± standard deviation, or median (interquartile range). P-value corresponds to one-way ANOVA, Kruskal–Wallis test, chi-square test, or the Fisher's exact test.

Demographic and clinical characteristics by cardiac rhythm

Tables 2 and 3 summarize patient characteristics by rhythm type. Patients with shockable rhythms were younger, more often male, and had higher rates of witnessed arrest and bystander CPR. In both rhythm groups, longer AAM times were associated with older age and longer CPR duration.

Table 2 Demographic and clinical characteristics of out-of-hospital cardiac arrest patients with shockable rhythm according to prehospital advanced airway management timing.

Characteristics	Patients with shockable rhythm (*n* = 238)								*p*-value
	≤ 2 min (*n* = 38)		2–4 min (*n* = 74)		4–6 min (*n* = 41)		> 6 min (*n* = 85)		
	n	(%)	*n*	(%)	*n*	(%)	*n*	(%)	
Age (years), mean ± SD	53.18 ± 16.44		59.07 ± 15.64		58.32 ± 13.63		64.95 ± 12.95		< 0.001
< 60	32	(84.2)	43	(58.1)	26	(63.4)	18	(21.2)	< 0.001
≥ 60	6	(15.8)	31	(41.9)	15	(36.6)	67	(78.8)	
Sex									
Male	32	(84.2)	35	(47.3)	35	(85.4)	68	(80.0)	< 0.001
Female	6	(15.8)	39	(52.7)	6	(14.6)	17	(20.0)	
Underlying disease									
Yes	25	(65.8)	51	(68.9)	12	(29.3)	49	(57.6)	< 0.001
No	13	(34.2)	23	(31.1)	29	(70.7)	36	(42.4)	
Location of cardiac arrest									
Non-public	25	(65.8)	62	(83.8)	33	(80.5)	66	(77.6)	0.178
Public	13	(34.2)	12	(16.2)	8	(19.5)	19	(22.4)	
Cause of cardiac arrest									
Presumed cardiac cause	38	(100)	62	(83.8)	35	(85.4)	63	(74.1)	0.005
Respiratory	0	(0.0)	12	(16.2)	6	(14.6)	22	(25.9)	
Witnessed collapse									
Yes	33	(86.8)	43	(58.1)	28	(68.3)	73	(85.9)	< 0.001
No	5	(13.2)	31	(41.9)	13	(31.7)	12	(14.1)	
Performance of bystander CPR									
Yes	32	(84.2)	31	(41.9)	24	(58.5)	57	(67.1)	< 0.001
No	6	(15.8)	43	(58.1)	17	(41.5)	28	(32.9)	

Characteristics	Patients with shockable rhythm (*n* = 238)								*p*-value
	≤ 2 min (*n* = 38)		2–4 min (*n* = 74)		4–6 min (*n* = 41)		> 6 min (*n* = 85)		
	n	(%)	*n*	(%)	*n*	(%)	*n*	(%)	
Defibrillation									
Yes	38	(100)	70	(94.6)	39	(95.1)	82	(96.5)	0.625
No	0	(0.0)	4	(5.4)	2	(4.9)	3	(3.5)	
Prehospital fluid access									
NSS	30	(78.9)	74	(100)	41	(100)	80	(94.1)	< 0.001
RLS/Acetar	8	(21.1)	0	(0.0)	0	(0.0)	5	(5.9)	
Total CPR duration (minutes), mean ± SD	35.32 ± 5.59		30.27 ± 7.98		33.63 ± 10.78		36.19 ± 19.30		0.041
< 30	8	(21.1)	25	(33.8)	6	(14.6)	27	(31.8)	0.094
≥ 30	30	(78.9)	49	(66.2)	35	(85.4)	58	(68.2)	
Collapsed time to first chest compression (minutes), median (IQR)	10	(6–28)	4	(2–10)	10	(2–10)	5	(1–10)	0.003
< 10	14	(36.8)	53	(71.6)	19	(46.3)	56	(65.9)	0.001
≥ 10	24	(63.2)	21	(28.4)	22	(53.7)	29	(34.1)	
Time to first dose of epinephrine (minutes), median (IQR)	2	(2–4)	4	(3–6)	5	(3–7)	7	(5–10)	< 0.001
< 5	38	(100)	43	(58.1)	20	(48.8)	21	(24.7)	< 0.001
≥ 5	0	(0.0)	31	(41.9)	21	(51.2)	64	(75.3)	
Use of intravenous amiodarone									
Yes	24	(63.2)	16	(21.6)	18	(43.9)	27	(31.8)	< 0.001
No	14	(36.8)	58	(78.4)	23	(56.1)	58	(68.2)	
Use of intravenous calcium									
Yes	14	(36.8)	20	(27.0)	8	(19.5)	19	(22.4)	0.276
No	24	(63.2)	54	(73.0)	33	(80.5)	66	(77.6)	
Use of intravenous sodium bicarbonate									
Yes	15	(39.5)	45	(60.8)	20	(48.8)	48	(56.5)	0.154
No	23	(60.5)	29	(39.2)	21	(51.2)	37	(43.5)	

1. IQR, interquartile range; SD, standard deviation; CPR, cardiopulmonary resuscitation; VT, ventricular tachycardia; NSS, normal saline; RLS, ringer lactate solution.

2. Data were presented as the number (%), mean ± standard deviation, or median (interquartile range). The P-value corresponds to one-way ANOVA, Kruskal–Wallis test, chi-square test, or Fisher's exact test.

Table 3 Demographic and clinical characteristics of out-of-hospital cardiac arrest patients with non-shockable rhythm according to prehospital advanced airway management timing.

Characteristics	Patients with non-shockable rhythm (*n* = 1282)								*p*-value
	≤ 2 min (*n* = 722)		2–4 min (*n* = 170)		4–6 min (*n* = 107)		> 6 min (*n* = 283)		
	n	(%)	*n*	(%)	*n*	(%)	*n*	(%)	
Age (years), mean ± SD	63.14 ± 20.87		71.21 ± 15.84		63.91 ± 18.32		63.86 ± 17.76		< 0.001
< 60	280	(38.8)	35	(20.6)	41	(38.3)	104	(36.7)	< 0.001
≥ 60	442	(61.2)	135	(79.4)	66	(61.7)	179	(63.3)	
Sex									
Male	421	(58.3)	106	(62.4)	57	(53.3)	185	(65.4)	0.083
Female	301	(41.7)	64	(37.6)	50	(46.7)	98	(34.6)	
Underlying disease									
Yes	465	(64.4)	138	(81.2)	65	(60.7)	198	(70.0)	< 0.001
No	257	(35.6)	32	(18.8)	42	(39.3)	85	(30.0)	
Location of cardiac arrest									
Non-public	653	(90.4)	147	(86.5)	103	(96.3)	221	(78.1)	< 0.001
Public	69	(9.6)	23	(13.5)	4	(3.7)	62	(21.9)	
Cause of cardiac arrest									
Presumed cardiac cause	330	(45.7)	68	(40.0)	63	(58.9)	228	(80.6)	< 0.001
Respiratory	392	(54.3)	102	(60.0)	44	(41.1)	55	(19.4)	
Witnessed collapse									
Yes	433	(60.0)	113	(66.5)	70	(65.4)	204	(72.1)	0.003
No	289	(40.0)	57	(33.5)	37	(34.6)	79	(27.9)	
Performance of bystander CPR									
Yes	428	(59.3)	103	(60.6)	59	(55.1)	177	(62.5)	0.577
No	294	(40.7)	67	(39.4)	48	(44.9)	106	(37.5)	
Defibrillation									
Yes	63	(8.7)	14	(8.2)	10	(9.3)	10	(3.5)	0.036
No	659	(91.3)	156	(91.8)	97	(90.7)	273	(96.5)	
Prehospital fluid access									
NSS	708	(98.1)	168	(98.8)	104	(97.2)	275	(97.2)	0.599
RLS/Acetar	14	(1.9)	2	(1.2)	3	(2.8)	8	(2.8)	

Table 3 Cont. on next page

Characteristics	Patients with non-shockable rhythm (*n* = 1282)								*p*-value
	≤ 2 min (*n* = 722)		2–4 min (*n* = 170)		4–6 min (*n* = 107)		> 6 min (*n* = 283)		
	n	(%)	*n*	(%)	*n*	(%)	*n*	(%)	
Total CPR duration (minutes), mean ± SD	32.36 ± 15.76		32.78 ± 19.30		34.95 ± 16.66		35.42 ± 16.08		0.040
< 30	309	(42.8)	79	(46.5)	40	(37.4)	93	(32.9)	0.010
≥ 30	413	(57.2)	91	(53.5)	67	(62.6)	190	(67.1)	
Collapsed time to first chest compression (minutes), median (IQR)	6	(3–13)	9	(3–12)	7	(5–12)	10	(3–12)	0.104
< 10	457	(63.3)	87	(51.2)	65	(60.7)	138	(48.8)	< 0.001
≥ 10	265	(36.7)	83	(48.8)	42	(39.3)	145	(51.2)	
Time to first dose of epinephrine (minutes), median (IQR)	3	(2–4)	3	(2–4)	4	(3–6)	8	(5–11.5)	< 0.001
< 5	574	(79.5)	135	(79.4)	56	(52.3)	60	(21.2)	< 0.001
≥ 5	148	(20.5)	35	(20.6)	51	(47.7)	223	(78.8)	
Use of intravenous amiodarone									
Yes	46	(6.4)	4	(2.4)	5	(4.7)	13	(4.6)	0.175
No	676	(93.6)	166	(97.6)	102	(95.3)	270	(95.4)	
Use of intravenous calcium									
Yes	110	(15.2)	32	(18.8)	20	(18.7)	56	(19.8)	0.288
No	612	(84.8)	138	(81.2)	87	(81.3)	227	(80.2)	
Use of intravenous sodium bicarbonate									
Yes	355	(49.2)	72	(42.4)	62	(57.9)	135	(47.7)	0.087
No	367	(50.8)	98	(57.6)	45	(42.1)	148	(52.3)	

1. IQR, interquartile range; SD, standard deviation; CPR, cardiopulmonary resuscitation; VT, ventricular tachycardia; NSS, normal saline; RLS, ringer lactate solution.

2. Data were presented as the number (%), mean ± standard deviation, or median (interquartile range). The P-value corresponds to one-way ANOVA, Kruskal–Wallis test, chi-square test, or Fisher's exact test.

ASSOCIATION BETWEEN TIME TO AAM AND OUTCOMES

All rhythms

Overall, 39.7% achieved sustained ROSC and 5.1% survived to hospital discharge. Sustained ROSC did not differ significantly after adjustment despite slightly higher rates in the > 6-minute group. In contrast, delayed AAM (> 6 min) was associated with higher survival to hospital discharge (adjusted RR = 3.55; 95% CI: 2.05–6.15) compared with ≤ 2 min (Tables 4 and 5; Figs. 2 and 3).

	Event		Non-event		*p*-value
	n	(%)	*n*	(%)	
Sustained ROSC (> 20 min)					
All rhythms					
Advance airway management ≤ 2 min	275	(36.2)	485	(63.8)	0.042
Advance airway management 2–4 min	104	(42.6)	140	(57.4)	
Advance airway management 4–6 min	61	(41.2)	87	(58.8)	
Advance airway management > 6 min	163	(44.3)	205	(55.7)	
Shockable rhythm					
Advance airway management ≤ 2 min	17	(44.7)	21	(55.3)	0.230
Advance airway management 2–4 min	31	(41.9)	43	(58.1)	
Advance airway management 4–6 min	20	(48.8)	21	(51.2)	
Advance airway management > 6 min	49	(57.6)	36	(42.4)	
Non-shockable rhythm					
Advance airway management ≤ 2 min	258	(35.7)	464	(64.3)	0.265
Advance airway management 2–4 min	73	(42.9)	97	(57.1)	
Advance airway management 4–6 min	41	(38.3)	66	(61.7)	
Advance airway management > 6 min	114	(40.3)	169	(59.7)	
Survival to hospital discharge					
All rhythms					
Advance airway management ≤ 2 min	32	(4.2)	728	(95.8)	0.005
Advance airway management 2–4 min	8	(3.3)	236	(96.7)	
Advance airway management 4–6 min	6	(4.1)	142	(95.9)	
Advance airway management > 6 min	32	(8.7)	336	(91.3)	
Shockable rhythm					
Advance airway management ≤ 2 min	0	(0.0)	38	(100.0)	0.008
Advance airway management 2–4 min	6	(8.1)	68	(91.9)	
Advance airway management 4–6 min	2	(4.9)	39	(95.1)	
Advance airway management > 6 min	15	(17.6)	70	(82.4)	
Non-shockable rhythm					
Advance airway management ≤ 2 min	32	(4.4)	690	(95.6)	0.104
Advance airway management 2–4 min	2	(1.2)	168	(98.8)	
Advance airway management 4–6 min	4	(3.7)	103	(96.3)	
Advance airway management > 6 min	17	(6.0)	266	(94.0)	

Table 4 Outcome in out-of-hospital cardiac arrest patients according to prehospital advanced airway management timing subgroup analysis based on cardiac rhythm.

Table 5 Univariable and multivariable analyses of the association between prehospital advanced airway management timing and outcome according to a out-of-hospital cardiac arrest patients subgroup analysis based on cardiac rhythm.

	Event		Non-event		Univariable analysis			Multivariable analysis		
	n	(%)	*n*	(%)	Unadjusted RR† (95% CI)		*p*-value	Adjusted RR‡ (95% CI)		*p*-value
Sustained ROSC (> 20 min)										
All rhythms										
Advance airway management ≤ 2 min	275	(36.2)	485	(63.8)	1.00	Reference		1.00	Reference	
Advance airway management 2–4 min	104	(42.6)	140	(57.4)	1.18	(0.99–1.40)	0.064	1.07	(0.89–1.27)	0.482
Advance airway management 4–6 min	61	(41.2)	87	(58.8)	1.14	(0.92–1.41)	0.234	1.17	(0.95–1.44)	0.149
Advance airway management > 6 min	163	(44.3)	205	(55.7)	1.22	(1.06–1.42)	0.008	1.01	(0.86–1.17)	0.946
Shockable rhythm										
Advance airway management ≤ 2 min	17	(44.7)	21	(55.3)	1.00	Reference		1.00	Reference	
Advance airway management 2–4 min	31	(41.9)	43	(58.1)	0.94	(0.60–1.46)	0.772	1.00	(0.56–1.78)	0.991
Advance airway management 4–6 min	20	(48.8)	21	(51.2)	1.09	(0.68–1.75)	0.720	1.23	(0.70–2.16)	0.476
Advance airway management > 6 min	49	(57.6)	36	(42.4)	1.29	(0.87–1.92)	0.212	1.28	(0.74–2.21)	0.379
Non-shockable rhythm										
Advance airway management ≤ 2 min	258	(35.7)	464	(64.3)	1.00	Reference		1.00	Reference	
Advance airway management 2–4 min	73	(42.9)	97	(57.1)	1.20	(0.98–1.47)	0.070	1.11	(0.91–1.36)	0.305
Advance airway management 4–6 min	41	(38.3)	66	(61.7)	1.07	(0.83–1.39)	0.598	1.15	(0.89–1.50)	0.284
Advance airway management > 6 min	114	(40.3)	169	(59.7)	1.13	(0.95–1.34)	0.173	0.95	(0.80–1.13)	0.596
Survival to hospital discharge										
All rhythms										
Advance airway management ≤ 2 min	32	(4.2)	728	(95.8)	1.00	Reference		1.00	Reference	
Advance airway management 2–4 min	8	(3.3)	236	(96.7)	0.78	(0.36–1.67)	0.520	0.95	(0.47–1.92)	0.893
Advance airway management 4–6 min	6	(4.1)	142	(95.9)	0.96	(0.41–2.26)	0.931	1.59	(0.69–3.64)	0.277
Advance airway management > 6 min	32	(8.7)	336	(91.3)	2.07	(1.29–3.32)	0.003	3.55	(2.05–6.15)	< 0.001
Shockable rhythm										
Advance airway management ≤ 2 min	0	(0.0)	38	(100.0)	-	-	-	-	-	-
Advance airway management 2–4 min	6	(8.1)	68	(91.9)	1.00	Reference		1.00	Reference	
Advance airway management 4–6 min	2	(4.9)	39	(95.1)	0.60	(0.13–2.86)	0.523	1.30	(0.27–6.31)	0.749
Advance airway management > 6 min	15	(17.6)	70	(82.4)	2.18	(0.89–5.33)	0.089	1.86	(0.47–7.44)	0.378
Non-shockable rhythm										
Advance airway management ≤ 2 min	32	(4.4)	690	(95.6)	1.00	Reference		1.00	Reference	
Advance airway management 2–4 min	2	(1.2)	168	(98.8)	0.27	(0.06–1.10)	0.067	0.48	(0.10–2.23)	0.348
Advance airway management 4–6 min	4	(3.7)	103	(96.3)	0.84	(0.30–2.34)	0.744	1.89	(0.74–4.83)	0.183
Advance airway management > 6 min	17	(6.0)	266	(94.0)	1.36	(0.76–2.40)	0.298	3.44	(1.47–8.05)	0.004

1. IQR, interquartile range; SD, standard deviation; ROSC, return of spontaneous circulation; CI, confidence interval; RR, risk ratio; NA, data not applicable.

2. †Unadjusted risk ratio estimated using the Poisson regression with robust standard errors.

3. ‡Adjusted risk ratio estimated using the Poisson regression with robust standard errors adjusted for age, sex, underlying disease, location of cardiac arrest, cause of cardiac arrest, witnessed collapse, performance of bystander CPR, initial cardiac rhythm, defibrillation, prehospital fluid access, total CPR duration, collapsed time to first chest compression, time to first dose of epinephrine, and use of intravenous amiodarone, intravenous calcium, and intravenous sodium bicarbonate.

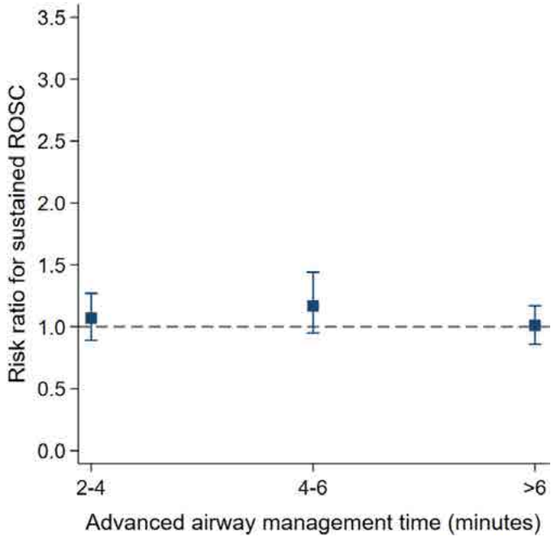
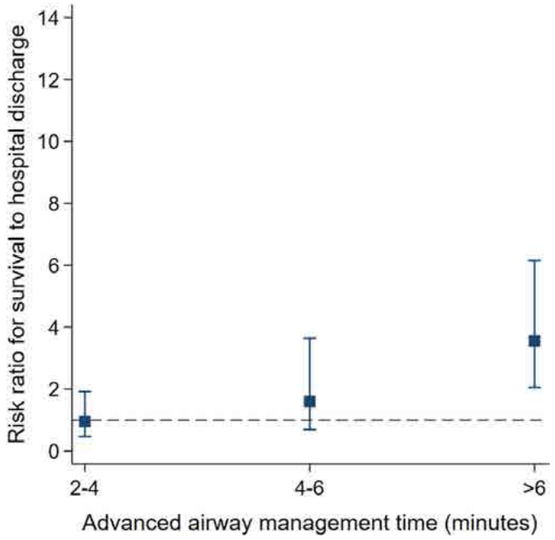


Fig. 2
Association between the risk ratio of AAM time with ETI and sustained ROSC in OHCA patients presenting with all types of cardiac rhythms. Risk ratios are shown with 95% confidence intervals. Wide confidence intervals that cross the line of no effect indicate that the observed associations are imprecise and should not be interpreted as statistically significant.

Fig. 3

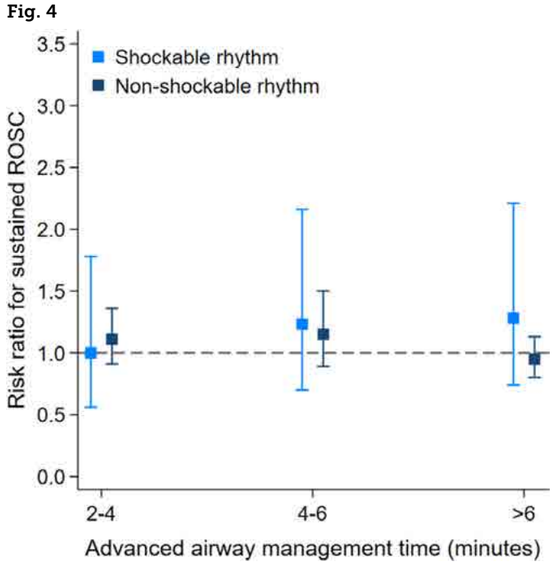


Association between the risk ratio of AAM time with ETI and survival to hospital discharge in OHCA patients presenting with all types of rhythms. Risk ratios with 95% confidence intervals are displayed. Although delayed AAM appears associated with improved survival, wide confidence intervals highlight uncertainty, and the findings should be interpreted as associative rather than causal.

Shockable rhythm

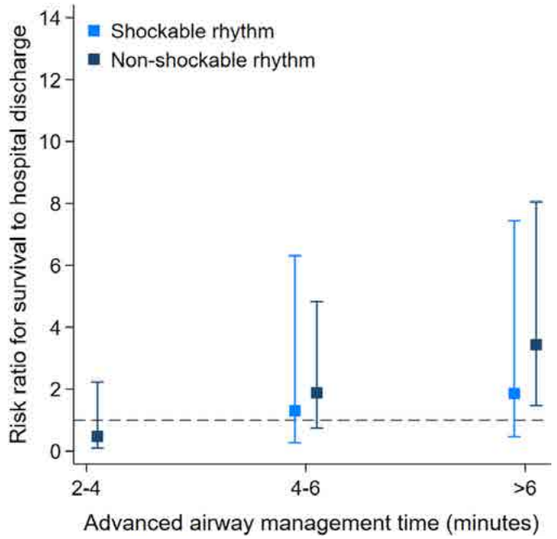
Among patients with shockable rhythms, neither sustained ROSC nor survival to discharge differed significantly across AAM-time categories (Tables 4 and 5; Figs. 4 and 5). Although survival appeared higher in the > 6-minute group (17.6%), the adjusted estimate was not statistically significant (adjusted RR = 1.86; 95% CI: 0.47–7.44).

Fig. 4



Comparison of the risk ratio of AAM time with ETI and sustained ROSC between the shockable and non-shockable rhythm groups. Risk ratios with 95% confidence intervals are shown. Confidence intervals frequently cross the line of no effect, indicating limited precision and insufficient evidence of a meaningful difference between rhythm subgroups.

Fig. 5



Comparison of the risk ratio of AAM time with ETI and survival to hospital discharge between the shockable and non-shockable rhythm groups. Risk ratios with 95% confidence intervals are presented. Wide and overlapping confidence intervals reflect low statistical power, suggesting that subgroup findings should be considered exploratory.

Non-shockable rhythm

In non-shockable rhythms, delayed AAM (> 6 min) was associated with higher survival to hospital discharge (adjusted RR = 3.44; 95% CI: 1.47–8.05), whereas sustained ROSC remained similar across groups (Tables 4 and 5; Figs. 4 and 5).

DISCUSSION

Results showed that initiation of AAM with ETI at various time intervals—≤2 min, 2–4 min, 4–6 min, and > 6 min—was not associated with statistically significant differences in sustained ROSC among patients with OHCA. In several figures, the confidence intervals crossed the line of no effect, indicating that observed differences should be interpreted as statistical patterns rather than causal effects, reinforcing the exploratory nature of these findings. The same pattern was observed when stratifying by cardiac rhythm (shockable vs. non-shockable).

This finding held true when patients were stratified by electrocardiogram rhythm type (shockable or non-shockable rhythm). This finding was consistent with that of the study by Lee SH et al., which was a retrospective observational study that collected data from patients with OHCA who visited South Korean emergency departments and showed that AAM with durations of ≤ 4 min, 5–6 min, 7–9 min, and > 10 min was not associated with ROSC at emergency departments for either ETI or supraglottic airway (SGA) intubation [22].

This result was also consistent with that of a study conducted in the emergency departments of northern Thailand by Neamjun S et al., which compared early and late ETI insertion. The manuscript defined early ETI as intubation within 5 min. There was no difference in ROSC at emergency departments between the two groups [23]. One of the possible explanations for this finding was that more than half of patients with OHCA in our study had presumed cardiac etiology. Therefore, this might result in AAM not improving the rate of sustained ROSC. After categorizing patients into the shockable and non-shockable groups, 198 and 689 patients were identified, respectively, accounting for approximately 58.35% of the whole study population.

This proportion was higher than that reported in a previous study in Thailand conducted by Daorattanachai K et al. which was 56.25% [21], but lowwwwwer than those from two Japanese studies—Nakagawa K et al. (64.1%) [24] and Izawa J et al. (73.9%), where cardiac causes predominated [25]. This may explain why ETI and ventilation timing did not improve sustained ROSC at the scene and might not be an optimal treatment, as these interventions may not directly address the underlying cardiac causes in most patients. Currently, the primary management focuses on early defibrillation by the ALS team [11]. For the general public, the standard guidelines still emphasize the importance of prompt bystander CPR and the use of an automated external defibrillator (AED) [26,27,28]. However, in the current study, paramedics or ENPs reported that respiratory conditions were the cause of cardiac arrest in 41.18% of the patients, which was higher than previously reported (19.0%) [21] and (9.2%) [24].

This relatively high proportion of respiratory-related OHCA may explain why early ETI might appear beneficial in certain subgroups; however, prior evidence remains inconclusive, and the current study design does not allow attribution of outcome differences to AAM timing itself. Thus, although respiratory etiologies highlight the physiologic rationale for airway management, the extent to which early ETI influences outcomes remains uncertain and may be confounded by unmeasured factors such as patient severity or provider decision-making.

Continued >

Although AAM, whether ETI or SGAs, is expected to improve the likelihood of achieving ROSC in patients with hypoxic or respiratory-related etiologies [29], previous evidence remains inconclusive. In particular, a meta-analysis did not support the notion that rapid AAM—especially ETI insertion—significantly improves ROSC [30]. Additionally, it is important to acknowledge a potential selection bias: patients with early respiratory compromise who received airway intervention promptly and did not progress to cardiac arrest would not be captured in our dataset. Consequently, the study population may disproportionately represent individuals with more advanced or severe respiratory failure, which could contribute to the lower ROSC rates observed in this subgroup. These considerations suggest that while respiratory causes of OHCA emphasize the importance of timely airway management, the specific advantage of early ETI over alternative approaches remains uncertain and warrants further investigation.

In our dataset, patients with non-shockable rhythms who received AAM after > 6 min appeared to have higher survival to hospital discharge, compared with those intubated earlier. However, this association must be interpreted with extreme caution. Because AAM timing was not randomly assigned, and because patients must remain in cardiac arrest long enough to receive later AAM, the observed pattern is likely influenced by survivorship bias, where only patients who survive longer can receive delayed interventions. Unmeasured factors—such as EMS judgment regarding airway difficulty, perceived prognosis, or team dynamics—may also influence the decision to perform AAM later. Thus, the higher survival observed among patients receiving later AAM should not be interpreted as evidence of a protective effect of delaying AAM, but rather as a possible artifact of residual confounding and time-dependent biases inherent in observational studies.

This finding is in contrast to that of a previous study by Wong ML et al., which revealed that patients who experienced cardiac arrest in hospitals and who underwenet advanced intubation for > 5 min had a significantly low rate of survival to hospital discharge, compared with those who had intubation for < 5 min [31]. The possible explanations are as follows: In particular, in patients with OHCA who had a non-shockable rhythms including PEA and asystole and who received AAM have a significantly lower likelihood of survival than those with shockable rhythm. Further, cardiac arrest is most commonly attributed to hypoxia, which can be managed with AAM [11].

Although previous studies, including large cohort analyses from Japan, have reported that advanced airway management performed within 10–15 min of EMS-initiated CPR is associated with improved one-month survival in patients with non-shockable rhythms [32], these findings share similar limitations related to non-randomized exposure and susceptibility to time-dependent bias. More recent time-dependent and randomized analyses, including those by Okubo et al. [32] and others [33 34], have not demonstrated a significant survival benefit attributable specifically to the timing of AAM. These mixed results suggest that while rhythm-specific differences may exist, any apparent window of 'optimal timing' should be interpreted as hypothesis-generating rather than definitive.

In our study, the observed association between delayed AAM (> 6 min) and higher survival among patients with non-shockable rhythms should likewise be interpreted with caution. This apparent benefit may reflect residual confounding and survivorship bias rather than a true therapeutic effect. Patients who survive longer on scene are inherently more likely to receive delayed AAM, potentially exaggerating the association between later AAM and improved outcomes. Additionally, unmeasured factors—such as EMS decision-making processes, patient selection for intubation, and variations in resuscitation workflow—may contribute to this association. These considerations suggest that the delayed AAM effect could represent an artifact of patient survivorship rather than a genuine biological advantage.

Taken together, the emerging evidence underscores that the relationship between AAM timing and survival likely reflects complex interactions among patient physiology, EMS workflow, and clinical judgment rather than a direct effect of AAM timing itself. Without analytic methods that explicitly account for time-dependent confounding, such as marginal structural models, causal interpretation is not possible. Thus, the patterns observed in the present study should be viewed strictly as associative and exploratory, warranting confirmation through future prospective and methodologically rigorous investigations.

ETI has long been a gold standard for advanced airway management and is still being used by EMS personnel in most OHCA cases [35]. However, the authors still believe that ETI management for patients with OHCA by EMS personnel should be facilitated by highly expert and experienced staff to prevent prolonged interruptions in chest compressions and delays in defibrillation, which may

ETI has long been a gold standard for advanced airway management and is still being used by EMS personnel in most OHCA cases

negatively affect patient outcomes by focusing on AAM alone [36]. A previous study found substantially interesting data about the modification of prehospital guidelines. AAM, with consideration of its duration, was associated with significantly increased hands-off time, which did not only improve ROSC but also significantly increased the mortality rate [34]. In the study area, simple and rapid devices, such as bag valve mask and laryngeal mask airway (LMA), could be easily and rapidly used in emergency conditions, and they require minimal training.

However, we found that the use of these devices had markedly decreased. Therefore, the EMS team could reduce the impacts of hands-off time and maintain the quality of CCF by maintaining the quality of CPR throughout the resuscitation process and by controlling the quality of ETI application. If ETI cannot be inserted initially, simple, efficient, and probably comparable procedures, such as LMA, should be used, which may be beneficial for the improvement of achieving ROSC in patients with OHCA [37]. While advanced airway management remains a central component of resuscitation, evidence from randomized trials indicates no consistent superiority of early ETI compared to supraglottic airway devices. Our findings align with this mixed evidence and further suggest that airway strategies and timing cannot be disentangled from factors such as provider expertise, hands-off time, and system workflow—all of which may influence outcomes independently of the airway device chosen.

These considerations help reconcile our findings with the mixed literature, including randomized trials reporting no clear superiority of early ETI over SGA and highlighting workflow-dependent trade-offs between ventilation and compression continuity [38,39]. Overall, physiologic plausibility (hypoxic/asphyxial etiologies, early ventilation optimization) and system factors (airway device choice, provider success rates) likely contribute to the signal observed in non-shockable rhythms.

LIMITATIONS

The current research had several limitations. First, this was a retrospective cohort study conducted within a single EMS agency (Vajira Emergency Medical Service), which may limit the generalizability of our findings. EMS systems differ widely in terms of protocols, scope of practice, training levels, resource availability, and patient characteristics. Therefore, the association observed between AAM timing and outcomes in this study may not be directly applicable to other EMS systems that operate under different medical oversight models, dispatch structures, or resuscitation workflows. Multicenter studies encompassing diverse EMS settings are warranted to validate and extend these findings. Because AAM timing was not modeled as a time-dependent exposure and the study design did not control for immortal time bias, survivorship bias likely influenced the results. Patients who remained in cardiac arrest longer inherently had the opportunity to receive delayed AAM, which may exaggerate the apparent association with survival. As such, the findings should not be interpreted as causal.

Second, data on patients with OHCA who were not intubated, such as those with supraglottic airway devices (e.g., LMA and BVM alone), were not collected. Therefore, this might cause selection bias. The exclusion of these patients may have introduced systematic differences between those who underwent endotracheal intubation and those who received alternative airway management. Patients selected for intubation are often those with longer resuscitation times or judged by EMS providers to have better potential for sustained efforts, which could influence both exposure and outcomes. Moreover, the lack of comparison with supraglottic or bag-valve mask ventilation limits the generalizability of our findings to EMS systems where such devices are primarily used. Future studies incorporating these airway modalities as comparators are warranted to clarify the influence of airway strategy selection on survival outcomes.

Third, this was a retrospective study. Thus, there were no data in the AAM methods used during video laryngoscopy and direct conventional laryngoscopy. However, these two methods can significantly affect AAM time, which can differ.

Fourth, unaddressed confounders including CPR quality and individual intubating were not controlled. This might

Continued >

increase complexity and conditions in the interpretation of study results. Fifth, the measurable outcomes in this study were limited to survival to hospital discharge and sustained ROSC at the scene. Data on other critical outcomes, such as the long-term effects of AAM—particularly post-discharge neurological function and neurological outcomes (e.g., CPC or Rankin scores), which would have strengthened the clinical relevance—were not available due to limitations in the hospital's electronic medical record system. Although survival to discharge was assessed as the primary outcome, neurological outcomes—which are considered the gold standard for OHCA research—were not available in this study due to the lack of systematic collection of measures such as CPC or Rankin scores. This limitation may restrict the clinical applicability of our findings and highlights the need for future studies incorporating neurological endpoints.

Sixth, multiple comparisons were conducted in this study without applying formal statistical adjustments (e.g., Bonferroni correction). As a result, the possibility of type I error inflation cannot be ruled out. Accordingly, the findings should be interpreted with caution and regarded as hypothesis-generating rather than confirmatory.

Seventh, in the subgroup analysis, the number of patients with shockable rhythms (n = 238) was relatively small, resulting in wide confidence intervals and limited statistical power. Moreover, these subgroup analyses were not predefined a priori but were conducted post hoc to explore potential rhythm-specific associations. Therefore, the observed patterns should be interpreted as exploratory and hypothesis-generating rather than definitive. Future studies with prespecified subgroup analyses and adequate sample sizes are required to verify these rhythm-based differences.

Finally, this study may not have accounted for unmeasured confounding factors associated with survival to hospital discharge in patients with OHCA, beyond AAM time, particularly those arising from variations across hospital settings (e.g., emergency departments, intensive care units, and general wards). Furthermore, data on potential confounders—such as transport time, compression fraction, provider skill level (e.g., ETI success rate), CPR quality, hands-off time during intubation, EMS team experience, and airway difficulty—were not available and therefore could not be included in the analysis. Moreover, this study did not evaluate the impact of advanced therapeutic interventions, such as percutaneous coronary intervention and target temperature management.

CONCLUSION

After adjusting for potential confounding factors, AAM time with ETI after > 6 min was associated with survival to hospital discharge, particularly in patients with OHCA who had non-shockable rhythms only. This finding indicates that other clinical factors might have affected patient selection and outcomes. Further, rapid AAM by the EMS team might not always be beneficial and have advantages, particularly in patients with shockable rhythms. Thus, CPR should primarily focus on delivering high-quality compressions and minimizing interruptions. Nevertheless, prospective studies must be conducted to improve knowledge on the impacts of AAM times on patient outcomes.

DATA AVAILABILITY

The datasets used and/or analyzed during the current study are available from the corresponding author upon reasonable request.

ABBREVIATIONS

AAM: advanced airway management
OHCA: out-of-hospital cardiac arrest
EMS: emergency medical service
ROSC:r eturn to spontaneous circulation
V-EMS: Vajira Emergency Medical Service
RR: risk ratio
CI: confidence interval
CPR: cardiopulmonary resuscitation
CCF:chest compression fraction
ETI:endotracheal tube
AHA:American Heart Association
ENP:emergency nurse practitioners
EMT:emergency medical technicians

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For a list of references please contact the editor

Examining Australian Paramedic Clinical Decision-Making in Cases of Acute Mental Health Crises

PROJECT OVERVIEW

Mental illness affects almost half of all Australian adults at some point in their life, but out-of-hospital medical care for people experiencing acute mental health crisis is subject to significant limitations in resources and service availability. As a result, many people experiencing acute mental health crisis turn to emergency services such as police and ambulance for help. The unique nature of mental health crises and the vulnerability of the patients involved often makes these cases an emotional and clinically challenging situation for the paramedics involved. However, there is a dearth of research into understanding how on-road paramedics assess and provide treatment to patients who are experiencing mental health crises. Gaining a deeper understanding of how paramedics assess and treat mental health crises will help ensure that treatment is evidence-based and patient-centred.

INVITATION TO PARTICIPATE IN RESEARCH

Researchers at Central Queensland University are seeking Australian registered paramedics to participate in a study exploring paramedics' pre-hospital management of mental health crises.

You are invited to complete an anonymous online survey, which should take approximately 20 minutes to complete.

On completion of the survey, you will receive an invite to participate in one-on-one semi-structured interviews with the researchers. You can also register your interest in participating in future studies about pre-hospital management of mental health crises.

This research study is being conducted by doctoral student Shannon King, under the supervision of Associate Professor Robert Stanton, Dr Adam Gerace, Dr Tim Makrides and Nathan Puckeridge.

The Paramedic Observer

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Registered Paramedics in Australia - December 2025

Posted 13 February 2025

The Paramedicine Board of Australia (PBA) has published the statistical summary of registrant data for the quarter ending 31 December 2025. You can access the PBA quarterly datasets here: https://tinyurl.com/4jxz5tta

The total number of Australian registered paramedics has grown to 27,875 - a significant increase in the past quarter of 1090 registrants - due to the end of year graduation numbers from the university sector. All jurisdictions saw static or increased numbers of registrants, led by Qld with 398, followed by NSW with 385 additional registrants.

The only area showing a decrease was in the number of paramedics not declaring a Principal Place of Practice (PPP). Paramedics declaring no PPP were down by 67 and now number 549. <images>

The number of non-practising registrants follows the usual cyclical pattern, but there has been a recent sharp increase in numbers to 1218 or 4.4% of the registered cohort. To show the persistent and potentially concerning growth trend in the non-practising cohort I have prepared a long term chart that graphically illustrates the pattern since paramedicine became a registered profession.

The No-PPP cohort has the largest percentage of non-practising paramedics at 13.3%, probably because some of the non-practising paramedics are recent graduates seeking placements. This view is reinforced by the age profile graph for non-practising paramedics that shows a skewed profile for the under-25 to 35 age bracket.

The proportion of female practitioners continues to grow and is now 52.7% of total registrants, with the highest female percentages being Victoria and South Australia both at 55.4%. Of interest may be that the growth in female practitioners is now noticeably greater than the growth rate of male practitioners.

I see the recruitment of women into paramedicine as one of the outcomes of paramedicine being a university degree level course and recognised (registered) as a health profession alongside nursing , medicine, dentistry and other allied health professions.

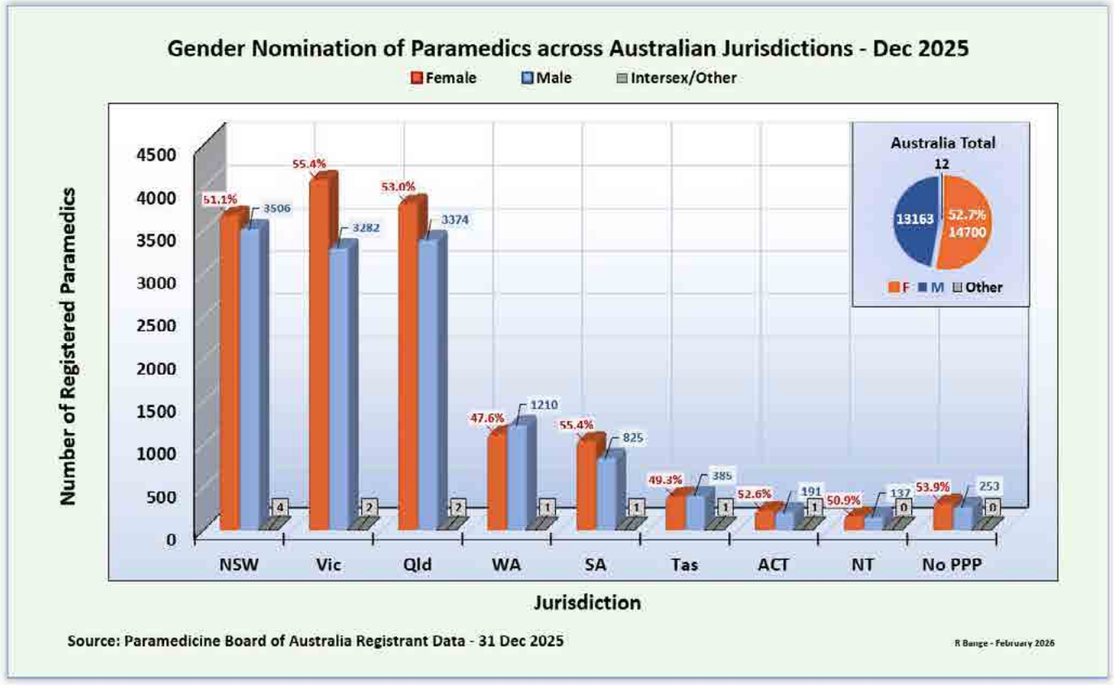
Aboriginal and Torres Strait Islander paramedic numbers have increased (+61) to 640, with the highest number in NSW at 242 followed by Queensland at 213. The NT remains an outlier with only

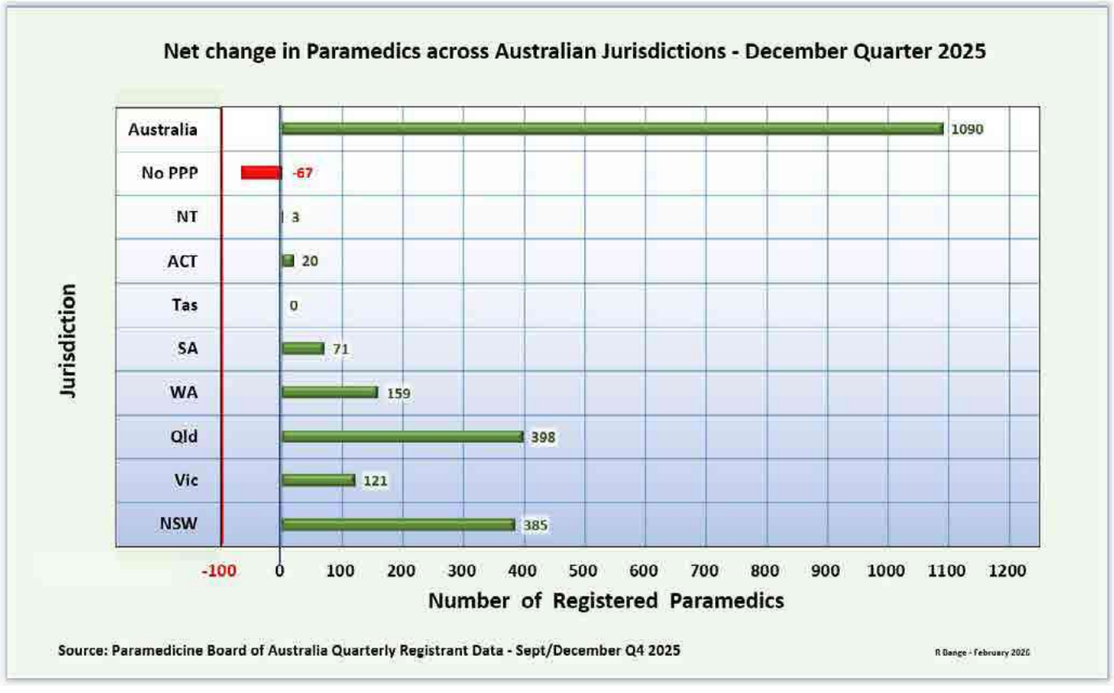
nine Indigenous paramedics. This is well below the composition of the NT population, which is more than 30% Indigenous.

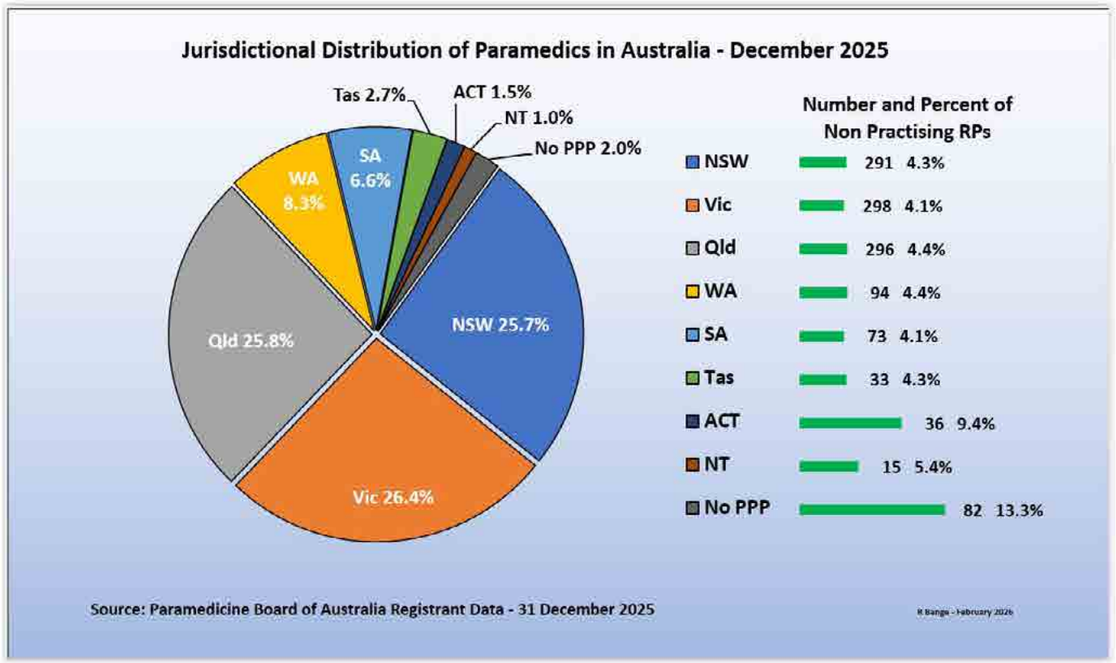
Queensland, NSW, and Victoria continue to account for more than three-quarters of Australia's total registrants, collectively making up 77.9% of the national total. The jurisdictional visualisation shows the non-practising numbers and percentages across each jurisdiction.

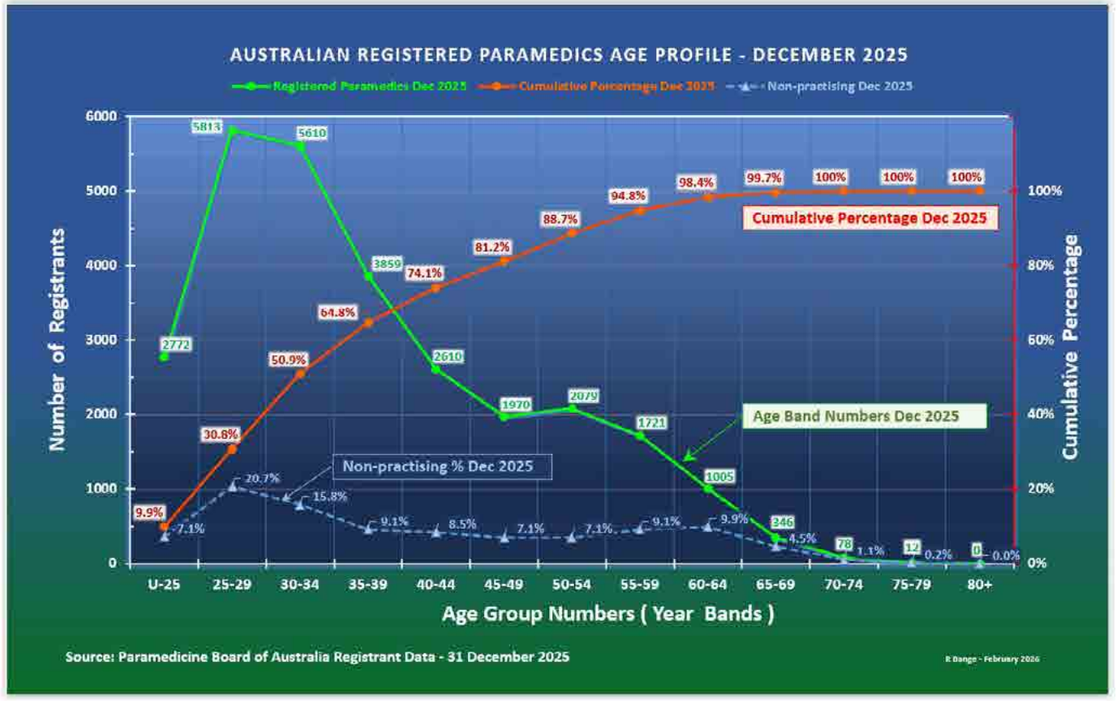
The age profile of the profession shows 74.1% of paramedics under 45 years of age.

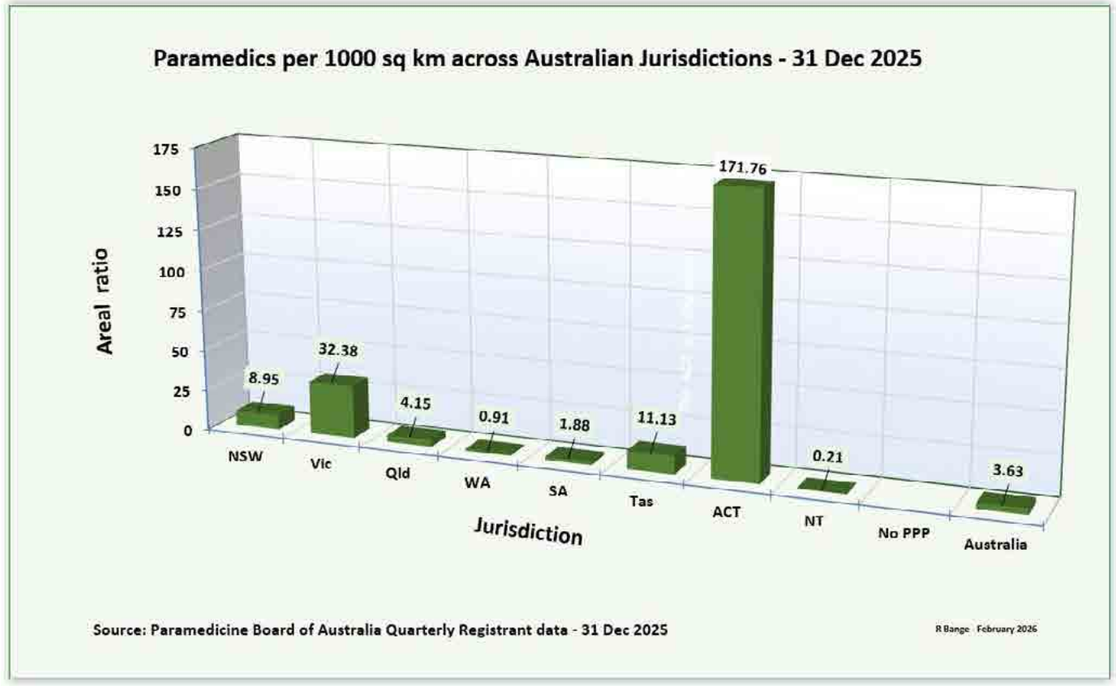
Showing the vast distances and sparse population of much of Australia, the NT has only 0.21 paramedics for every 1,000 sq km, followed by WA with 0.91. The ACT (which is essentially the city-state of Canberra) has 171.8 paramedics per thousand square kilometres while Victoria has 32.4. Nationally the average is 3.63 paramedics per 1000 sq km.

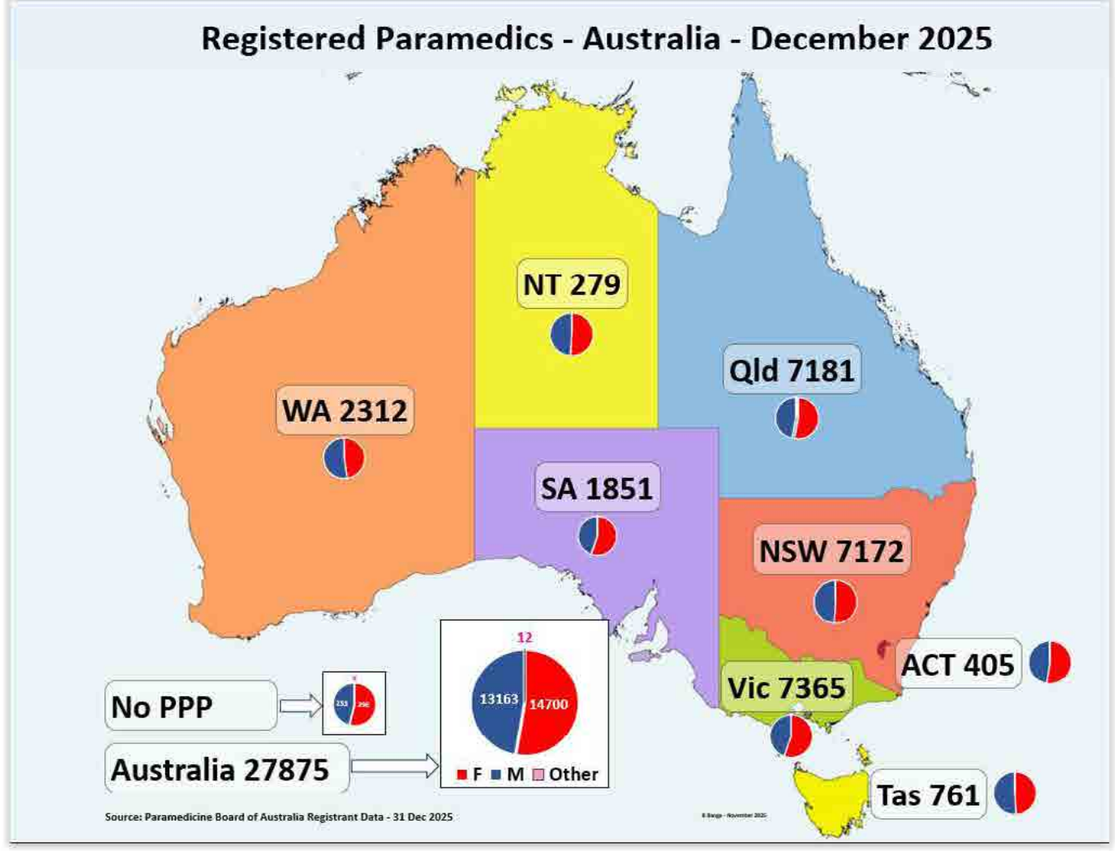


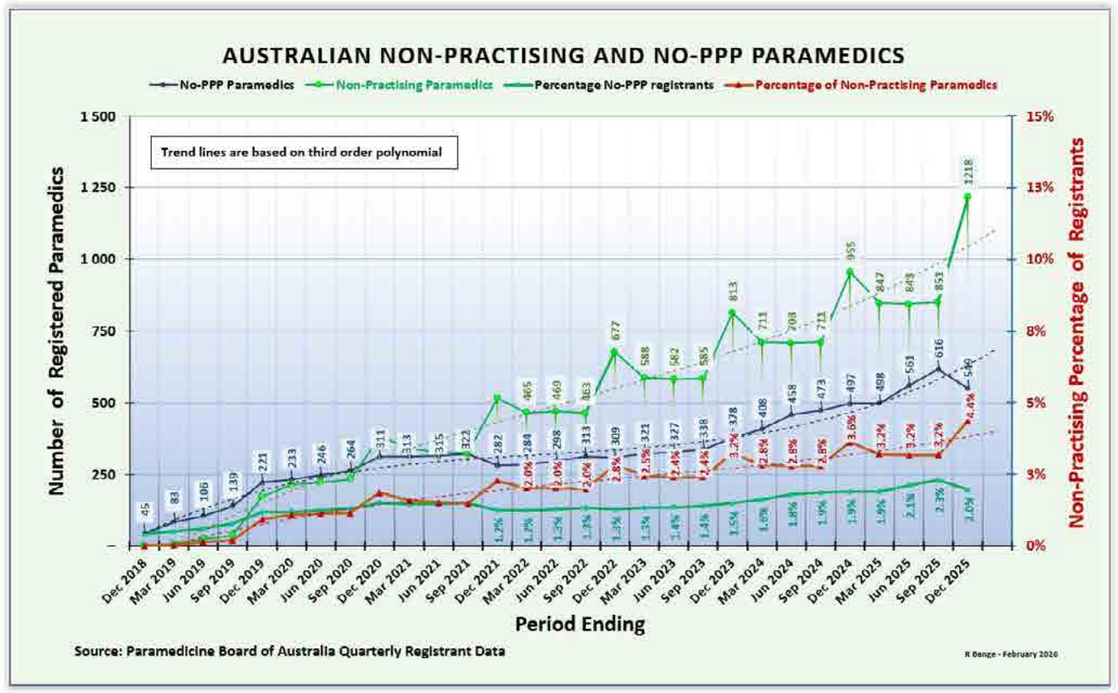


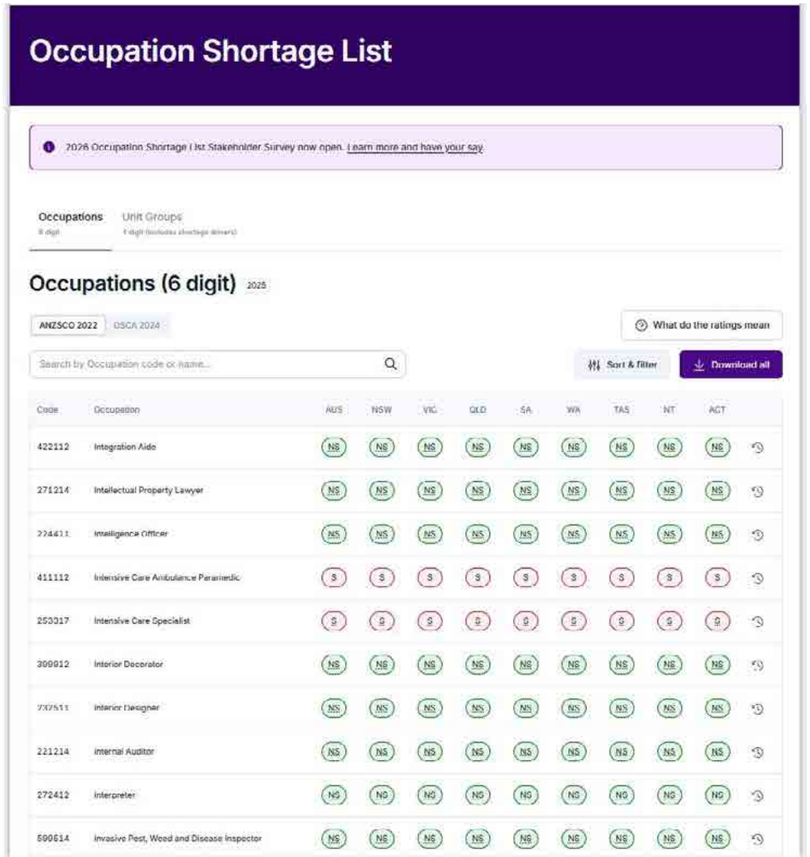

Jurisdictional Distribution of Paramedics in Australia - December 2025
Tas 2.7%
ACT 1.5%
NT 1.0%
No PPP 2.0%
SA 6.6%
WA 8.3%
NSW 25.7%
Qld 25.8%
Vic 26.4%
Number and Percent of Non Practising RPs
NSW 291 4.3%
Vic 298 4.1%
Qld 296 4.4%
WA 94 4.4%
SA 73 4.1%
Tas 33 4.3%
ACT 36 9.4%
NT 15 5.4%
No PPP 82 13.3%
Source: Paramedicine Board of Australia Registrant Data - 31 December 2025
R Bange - February 2026


AUSTRALIAN REGISTERED PARAMEDICS AGE PROFILE - DECEMBER 2025
Registered Paramedics Dec 2025
Cumulative Percentage Dec 2025
Non-practising Dec 2025
Number of Registrants
Cumulative Percentage
Age Band Numbers Dec 2025
Non-practising % Dec 2025
Cumulative Percentage Dec 2025
U-25
25-29
30-34
35-39
40-44
45-49
50-54
55-59
60-64
65-69
70-74
75-79
80+
Age Group Numbers (Year Bands)
Source: Paramedicine Board of Australia Registrant Data - 31 December 2025
R Bange - February 2026


Paramedics per 1000 sq km across Australian Jurisdictions - 31 Dec 2025
Areal ratio
Jurisdiction
NSW 8.95
Vic 32.38
Qld 4.15
WA 0.91
SA 1.88
Tas 11.13
ACT 171.76
NT 0.21
No PPP
Australia 3.63
Source: Paramedicine Board of Australia Quarterly Registrant data - 31 Dec 2025
R Bange February 2026


Registered Paramedics - Australia - December 2025
NT 279
WA 2312
Qld 7181
SA 1851
NSW 7172
ACT 405
Vic 7365
Tas 761
No PPP
Australia 27875
12
13163
14700
F M Other
Source: Paramedicine Board of Australia Registrant Data - 31 Dec 2025





The Paramedic Paradox

Posted 7 March 2026

A recent federal review into Jobs and Skills Australia (JSA) might sound like dry administrative process and probably didn't land on your radar. It discusses issues like funding models, work plans, and departmental duplication. https://tinyurl.com/2cz6df7r

But we should pay attention. Because buried in the Review of the Operations of the Jobs and Skills Australia Act 2022 is a roadmap that could help determine the future of paramedicine and solve a central challenge: the paradox of having both a graduate surplus and an experienced-staff shortage.

This review doesn't change how paramedics treat a cardiac arrest or manage a shift. It doesn't alter Ahpra registration standards or alter ambulance service operations. However, it proposes to fix the engine that produces the workforce data that policymakers rely on to advocate for resources, training, and new roles like the Paramedic Practitioner.

Ambulance services across the country are looking for experienced practitioners, yet newly qualified paramedics struggle to find permanent work, stuck in casual FIFO pools, going overseas, or leaving the profession entirely. How can there be both a surplus and a shortage?

That's where JSA comes in. JSA, as the government's primary labour market adviser, produces the Occupation Shortage List (OSL) - a document critical for funding and policy submissions.

In 2025, JSA officially classified Intensive Care Ambulance Paramedic as having a "national shortage". For the first time, there was independent validation that recruitment struggles are a systemic issue. https://tinyurl.com/2s45rayp

The answer lies in the data. The numbers don't lie (but they don't tell the whole story), and the JSA Review might provide the tools to fix it.

On the supply side, universities are producing approximately 2,500 final-year paramedic students annually. That's a significant number carrying HECS debts and hoping for a career. The major employers are the jurisdictional ambulance services (JAS) who employ about 70% of paramedics.

Here's where the numbers begin to get uncomfortable. The Report on Government Services (RoGS) 2026 data show what look like anomalies in the reporting of ambulance service data. It lists Queensland with 231 Patient Transport Officers (PTOs), Western Australia with 347, South Australia with 88 and NSW with none. Are those figures based on comparable roles? https://tinyurl.com/bdz8nv24

While graduates flood the market, the system also relies on "base-level and student ambulance officers" to fill operational roles. For instance, NSW employs a similar number of qualified officers (paramedics) as Victoria and Queensland (around 4,500), but NSW (at 906) has more than three times as many base-level officers as Victoria (267) or more than 16 times the number in Queensland (55). Again, are we comparing oranges with oranges or apples?

These base-level staff are often new graduates who require mentoring and significant supervision. As one Australian Paramedics Association (NSW) (APA NSW) official has noted. "That supervision workload falls on experienced paramedics, adding to pressure unless it is properly resourced and recognised".

This is the paradox: plenty of graduates, but not enough experienced paramedics or occupational pathways to mentor and supervise them. And we're potentially losing the experienced ones faster than we can replace them.

The retention crisis few are talking about

While NSW Ambulance grew its overall workforce by 431 fFTE over the past year, it also needed to replace 260 staff due to attrition. That's a revolving door for just one ambulance service. Many of these were experienced clinicians, the very people needed to mentor the intake of annual graduates.

The workforce demographics hold disturbing indications. Around 30% of Australia's paramedics are under 30, providing a strong foundation for the future. But with nearly 20% of Australia's paramedics over 50, the impending loss of decades of clinical experience is a major sustainability concern.

The Placement Poverty problem

Another barrier is 'placement poverty.' While we produce thousands of graduates, many struggle to finish due to hundreds of hours of mandatory unpaid clinical placement.' https://tinyurl.com/4z8dpwh6

Healthcare students are required to complete hundreds, and in some cases thousands, of hours of unpaid clinical placement to graduate. The Commonwealth's new Prac Payment Scheme for teaching, nursing, midwifery and social work students, provides eligible students with $338.60

a week while on placement. https://tinyurl.com/yc6hz27n

But paramedic students were among the professional groups excluded from eligibility.

There are growing calls to extend this payment to other allied health students. Independent MP Dr Helen Haines argues that "failing to act is a political choice, not a budget constraint". https://tinyurl.com/4d9nne8z

When health students struggle to pay bills and almost half go hungry on placement we are effectively filtering out our future workforce by who can afford to work for free. The students who persevere deserve a career pathway at the end. https://tinyurl.com/3twtcxzw

How the JSA Review can help

The JSA Review's recommendations, if implemented, could provide the tools to address some of these issues.

- Recommendation 4 pushes for "deeper data" that balances quantitative spreadsheets with qualitative insights. Currently, JSA's methodology relies heavily on vacancy fill rates and wage benchmarks. This misses the workface reality - the burnout driving experienced staff out, the supervision ratios that hamper graduate employment, and the placement poverty that students must overcome to qualify. The Review acknowledges this, recommending that JSA needs to better balance its spreadsheets with insights to capture the full context.

- Recommendation 19 would allow JSA to develop a charging model for commissioned work. This would enable health departments to commission JSA to model the right skill mix requirements, not just total headcount, but the right mix of AHPs and the potential graduate, qualified, and intensive care paramedics needed to maintain safe supervision ratios.

The Paramedic Practitioner: a path forward?

The new Paramedic Practitioner role in Victoria offers a glimpse of how we might resolve this paradox. It creates a career pathway that could retain experienced paramedics while also creating new supervisory opportunities in community settings, spreading the mentoring and supervisory load beyond the traditional emergency response system.

Under the Review's recommendations, JSA could move from being a passive data collector to a strategic partner in modelling the national workforce requirements for such roles and working with bodies like the Health Workforce Jobs and Skills Council and the Paramedicine Board of Australia to ensure that qualifications are recognised nationally across jurisdictions.

What needs to happen

To solve theses issues, we need a multi-pronged approach:

1. Recognise paramedicine as a highly trained health workforce that can be mobilised across the health domain.

2. Retain experienced staff through more flexible working arrangements, and recognition of their mentoring and supervision roles.

3. Support students by extending the Prac Payment Scheme to paramedics.

4. Use JSA's improved data capabilities to model workforce needs and required skills mix, not just total numbers.

What the Review does - and doesn't - do

One must be clear about the limits of this report. It doesn't alter the functions or powers of ambulance services. It doesn't change Ahpra's role in setting registration standards.

Instead, the Review focuses on making JSA more efficient and insightful. It recommends a 3-year work plan cycle (Recommendation 15) to provide funding certainty, and streamlined approvals (Recommendation 16) so that projects start on time. It pushes for "deeper data" (Recommendation 4) that is disaggregated by region, which is vital for proving the different recruitment needs of rural and remote healthcare. That disaggregated data is something for the Rural Workforce agencies to consider as well. https://tinyurl.com/mvyefce3

Combined with the recent occupational reclassifications, it offers a chance to better understand the workforce challenges and as a corollary may offer insights to improve the quality and accountability of RoGS reporting.

It may help to plan for a future where we have enough experienced paramedics to mentor the next generation, and enough graduate positions across the health sector to absorb the 2,500 students we educate each year.

Because right now, we're producing plenty of paramedics. We're just not producing enough careers.

Report on Government Services (RoGS) 2026

Posted 23 February 2026

The Report on Government Services ¬- commonly known as RoGS - provides comparative data on the delivery of public health and ambulance services. https://tinyurl.com/wpefn236

Ambulance services are included under Part E: Health and can be viewed as a separate Section 11 - Ambulance Services: https://tinyurl.com/bdz8nv24

While the data is quite informative there is no formal governance or legislative accountability requirement attached to the report.

RoGS data should be used with caution because there are several caveats regarding data integrity and interpretation. Some data may not be reported or may change from year to year such as the NT attrition rate for 2023-24 which varies between RoGS 2025 and RoGS 2026. Another factor to watch is that financial data is re-referenced to a particular period (normally the year prior to issue).

The Chapter 11 RoGS snapshot does not include military resources or contributions from non-government-funded services by various private aeromedical and land-based providers, including non-emergency patient transport (NEPT). However, personnel data on ambulance service patient transport officers (PTO) are included.

The three major jurisdictional ambulance services in Australia (JAS) are those agencies in Queensland (Qld), New South Wales (NSW) and Victoria (Vic). The private St John Ambulance services in WA and NT are included since they are largely government-funded and are contracted by the relevant government to provide a public service. <images>

The nature of ambulance service responses has been changing, which can be seen in the graph showing the overall trend for different response categories. Similarly, the role of paramedics has been evolving across the health sector.

Nationally, emergency response levels have hovered around 40% of the total responses but have increased recently to stand at 47.6% in 2024-25. Jurisdictional emergency responses vary substantially, ranging from a low of 32.3% in WA to a high of 53.6% in SA. South Australia has been an outlier in emergency response levels being 5-10% above the average in recent years.

The changing focus on community health by the erstwhile emergency ambulance services highlights the need for a reassessment of the Commonwealth/State financial arrangements and how the Commonwealth and States share health funding.

The current split-system funding, where states pay for community health while the Commonwealth funds GPs and Medicare, makes integrated care more complex. Navigating this mix is increasingly problematic as the focus shifts to managing chronic disease and preventing illness in community settings rather than hospitals.

A new funding model is needed that brings funding under both levels of government together. Such a model should properly support community healthcare, reward services that keep people out of hospital, and as part of this evolution, ensure the inclusion and integration of key workforces such as paramedicine.

The RoGS report has been slow to adapt to a new paradigm where paramedics in Australia are independently regulated (registered) as health professionals under the National Law alongside Medicine, Nursing and other Allied Health Practitioners (AHPs). https://tinyurl.com/bdhuda5h

The worksheet first introduced in ROGS 2023 with practitioner data from Ahpra has been retained (Table 11A.3). This duplicates quarterly information available from the national regulator but there is no correlation between that data and other workforce statistics in RoGS that would provide added value.

For definitive practitioner data, readers are advised to refer to the Australian Health Practitioner Regulation Agency (Ahpra) source data for quarterly figures for registered health practitioners. https://www.ahpra.gov.au/

The Observer considers Table 11A.3 is unnecessary and potentially misleading unless substantially modified. While RoGS mentions that qualified ambulance officers must be registered paramedics, the inclusion of this data covering the same jurisdictions could create the misapprehension that registered paramedics work only for the ambulance services or that the services employed all paramedics.

Several thousand paramedics don't work for the JAS with about 30% of the national workforce estimated to be employed elsewhere (or underemployed/unemployed).

The Observer has called for services to report the number of employed paramedics as part of their workforce data profiles to assist in workforce planning and development.

Given the importance placed on patient safety it should not be difficult to maintain an up to date list of registered paramedics, nurses, medical practitioners and other registered practitioners. This level of detail will become increasingly necessary if paramedics with scope of practice endorsements are going to be employed to meet different triage and coding needs.

Along with the number of employed paramedics, the Observer believes a breakdown of diversity statistics would also be desirable. Other data could be lost time and physical and mental injury statistics as part of risk management and to ensure appropriate health and workforce safety. Some data on diversity is available separately in various CAA and professional body surveys but more definitive provider data is needed. http//bit.ly/3o5qzTB

Total expenditure on ambulance services in 2024-25 was $6.374 billion in 2024-25 dollars funded from a mixture of revenue sources (Table 11A.11). That expenditure exceeded the total revenue of $6.259 billion (Table 11A.1).

The per capita revenue for WA ($181.85) remains well below the Australian average ($228.44). However, the proportion of WA revenue attributed to transport fees (35.3%) is more than twice the national average of 15.9%.

This appears unworthy support from a state facing extreme service delivery challenges yet blessed with healthy government finances fully capable of funding an essential community service.

South Australia also had a far higher per capita transport fee income than other state agencies, with the per capita transport revenue more than twice the national average.

The Observer considers that on access and equity grounds, patients should not be expected to cover such a high proportion of the maintenance and operational costs of a service that the community generally considers is an essential service available for all.

After significantly increasing government funding in the past five years, per capita total revenue in South Australia was a much improved $323.93 in 2024-25 (2024-25 dollars). That compares with the much lower national revenue picture of $228.44. The two lowest revenue states were NSW at $199.53 with WA coming up last at $181.84 per capita.

Considering WA, support for a public service provider should involve adequate government funding regardless of whether that provider is a contracted entity or not. The choice of service model should consider the overall community health outcomes and the other externalities (costs and benefits within the health sector outside the ambulance service). It should not be based on the cost to government of maintaining an inadequately resourced service.

Nationally in 2024-25, ROGS (Table 11A.2) reports there were 25,568 FTE salaried personnel, 5891 volunteer personnel, and 954 Community First Responders. The importance of volunteers in Western Australia (3144) is evident as well as their significant contributions in South Australia (1216). Volunteers also play an important role in Victoria, Tasmania and Queensland and a lesser role in NSW (80). Volunteer data are not reported for the Northern Territory and the ACT.

Examination of the service age profiles shows the relative youth of both operational staff and the paramedic population. In June 2025 Australia-wide, 61.7% of the operational workforce was less than 40 years of age and 79.5% was less than 50 years of age (Table 11A.9).

NSW relies strongly on operational staff under the age of 40 and its profile shows significant recruitment of graduates. Operational staff includes more than paramedics but the divergent national profile charts show the increasing number of younger paramedics potentially working outside the ambulance services.

Australia has had low attrition rates for ambulance service operational staff except for the Northern Territory (Table 11A.9). The current Australian attrition rate of 4.1% remains much lower than in many overseas countries such as the U.S. and the increased attrition levels during the COVID pandemic period are now abating.
<image>

Attrition in the NT in 2023-24 jumped to 24.8% (initially reported in RoGS 2025 as 20%) and has dropped back to 23.3% in 2024-25. The NT holds many challenges for service delivery given its size, geographical diversity and demographic factors. One hopes that the provision of paramedicine education at Charles Darwin University (Darwin) and key changes to Health and ambulance service staffing will enhance future performance. https://tinyurl.com/7zdxxt8n

The attrition high for the ACT of 11.4% has now come down to 5.3%. The steady rise in the WA attrition rate has also seen a reversal and was 4.2% in 2024-25. The Queensland rate has consistently been the lowest and for 2024-25 was 2.6%.

There were 4.486 million incidents reported and 5.864 million responses, of which 47.6% were classified as emergency responses, to attend to (overall) 4.267 million patients (Table 11A.4). South Australia maintained its outlier status for the highest percentage of responses reported as emergency at 51.8%.

The ambulance role in non-conveyance of patients to hospital EDs can be gauged by the Patient Treatment charts showing non-transport responses nationally at 15.7% with Tasmania remaining the outlier at 23.8%. NSW is also a standout with an above average level of patient treatment (non-transport).

Another snapshot view of responses per 1000 population shows the NT and Qld as the two jurisdictions with the highest per capita responses at 283.5 and 275.4 respectively, followed by SA at 268.1. The national average is 214.
<image>

ROGS provides a snapshot of other measures or KPIs including response times, triple zero answering time, pain management, and cardiac arrest survived event rates (Table 11A.12).

For 2024-25, the SA and Vic adult VF/VT cardiac arrest survival rates are outstanding at 61.8 and 61.0 respectively. Victoria and SA show consistently high outcomes and remain the leading Australian OHCA performers aided by AED-linked communities.

For clinical performance reports, readers are strongly encouraged to study the more detailed OHCA Registry reports such as those published by the different services https://tinyurl.com/me94dwdt

Significant recruitment activity and several Parliamentary Inquiries have recommended increased engagement of paramedics along with other substantial investments in the health system. Transfers into and out of services are evident as well as increased engagement of paramedics that will have an impact on future employment data. Trans-Tasman employment is also a factor in immigration and emigration. https://tinyurl.com/2s4kafhf

The workforce by age group and staff attrition measures should be considered together. Each provides a different aspect of the changing profile and sustainability of the ambulance service workforce.

Enrolments in accredited university paramedicine courses remain firm with overall enrolments of 8209 and with 2499 enrolments in the final year for 2024. (Table 11A.10).

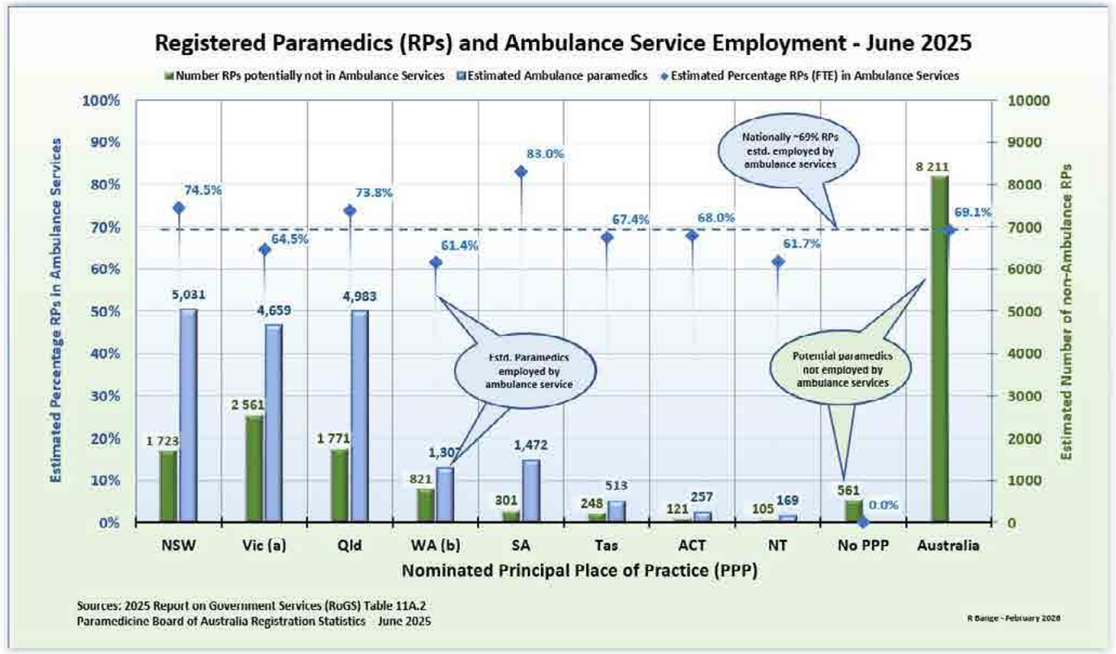
There are well over 2000 graduates annually entering the workforce. This number is likely to be more than the annual intake from JAS and will add to the existing surplus of paramedics available for deployment elsewhere within the health system. The supply/demand situation means a delay in graduate employment. Some returning graduates from overseas also have reported difficulty in obtaining appropriate service placements that recognise their level of experience and skills.

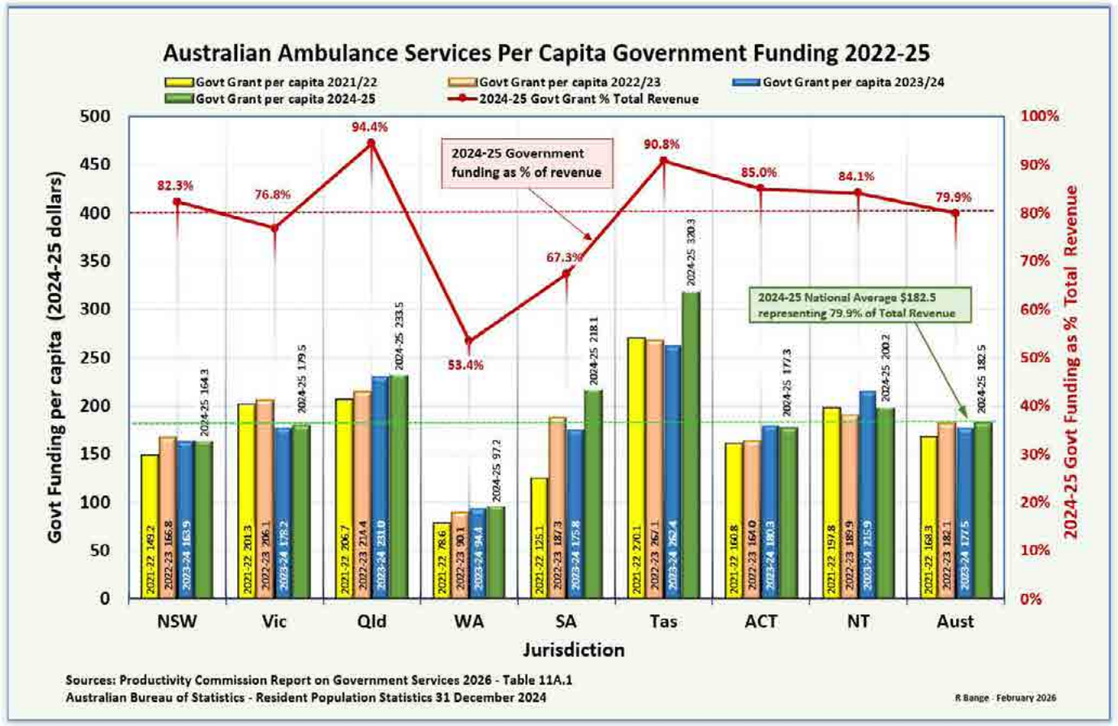
Overseas recruitment by the UK has virtually ceased at this time as UK educational centres have significantly increased their output of paramedics in recent years. Offsetting that drop in UK demand, Canadian and U.S. ambulance (Fire/EMS) services are recruiting limited numbers as they have become more aware of the availability of highly-educated paramedics from Australia. No consolidated public emigration data is available.

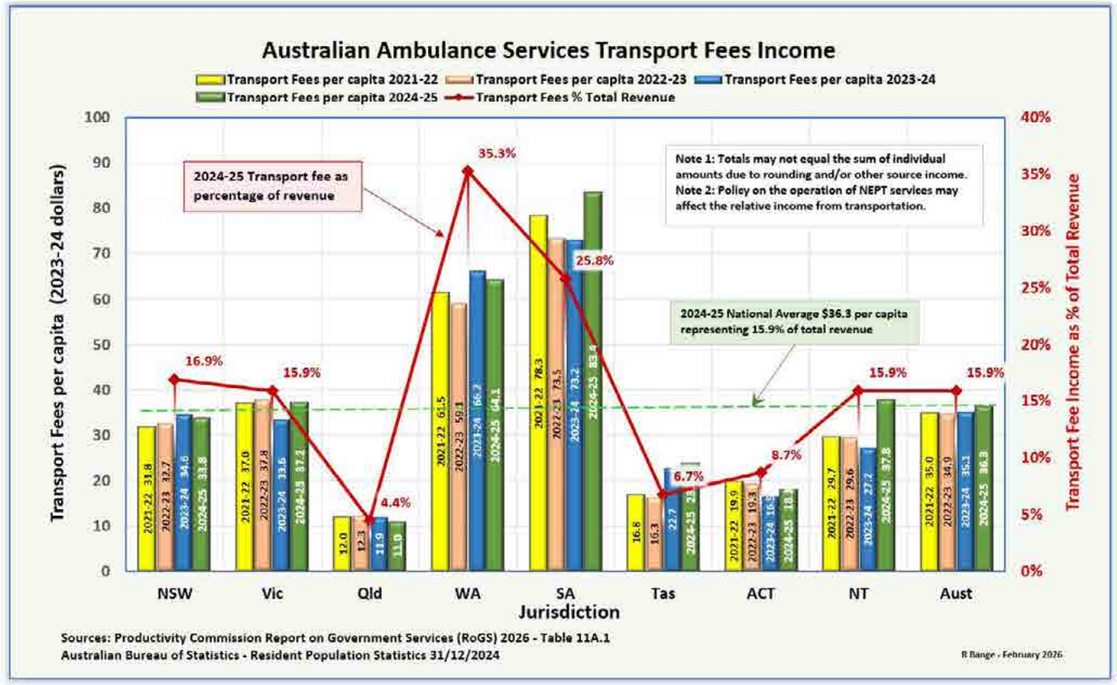
Workforce data for paramedicine remains problematical - although recent developments have seen improvements in recognition and classification of paramedicine as a health workforce by the Australian Bureau of Statistics (ABS) and the move by some states to mobilise paramedics more widely across the health system. https://tinyurl.com/yj8wa5y9

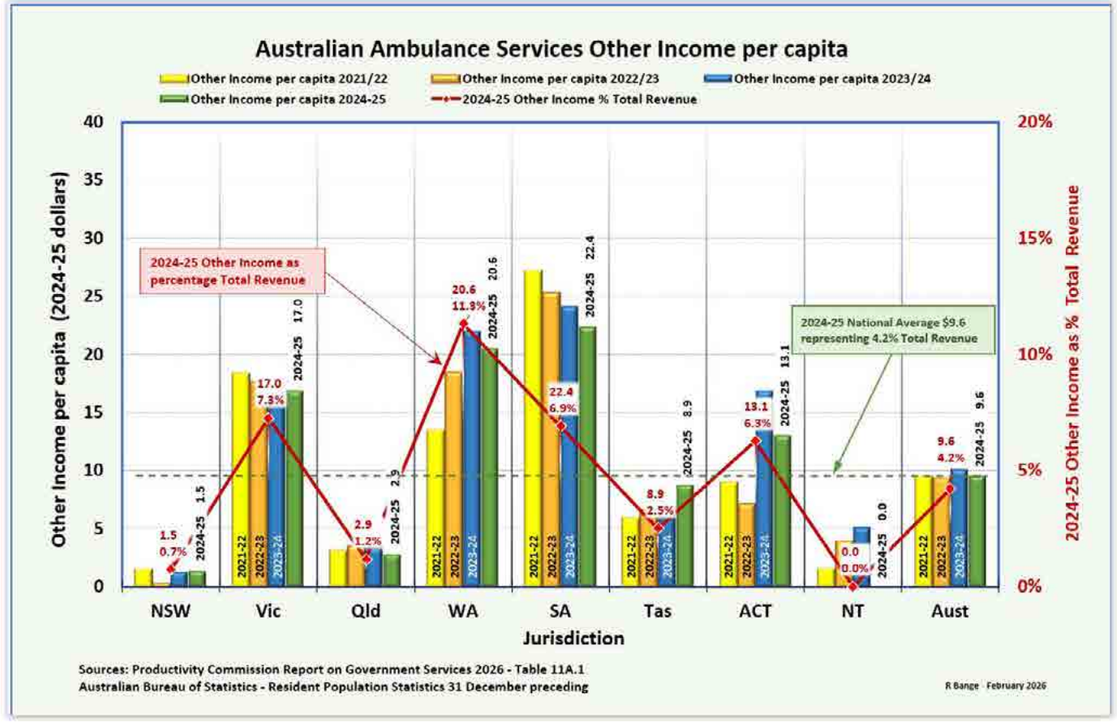
You can access the full suite of ROGS Part E reports on Health including primary and community care, ambulance services, public hospitals, and services for mental health here: https://tinyurl.com/yery95z4

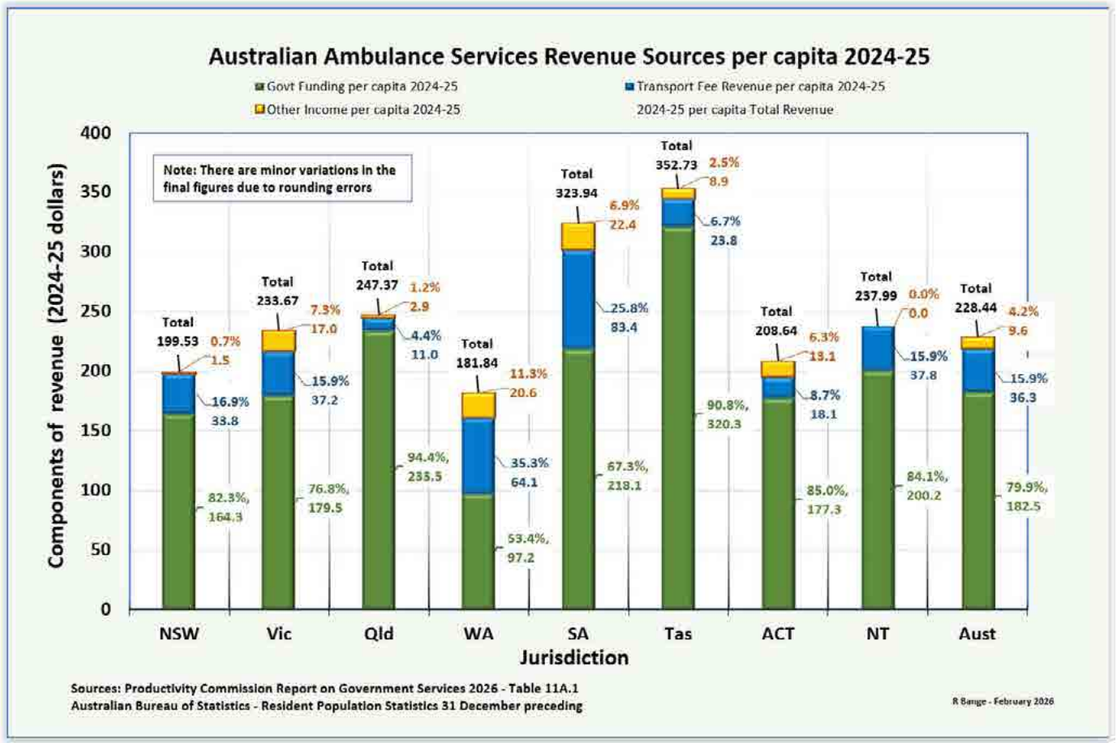
These reports were released on 5 February 2026.

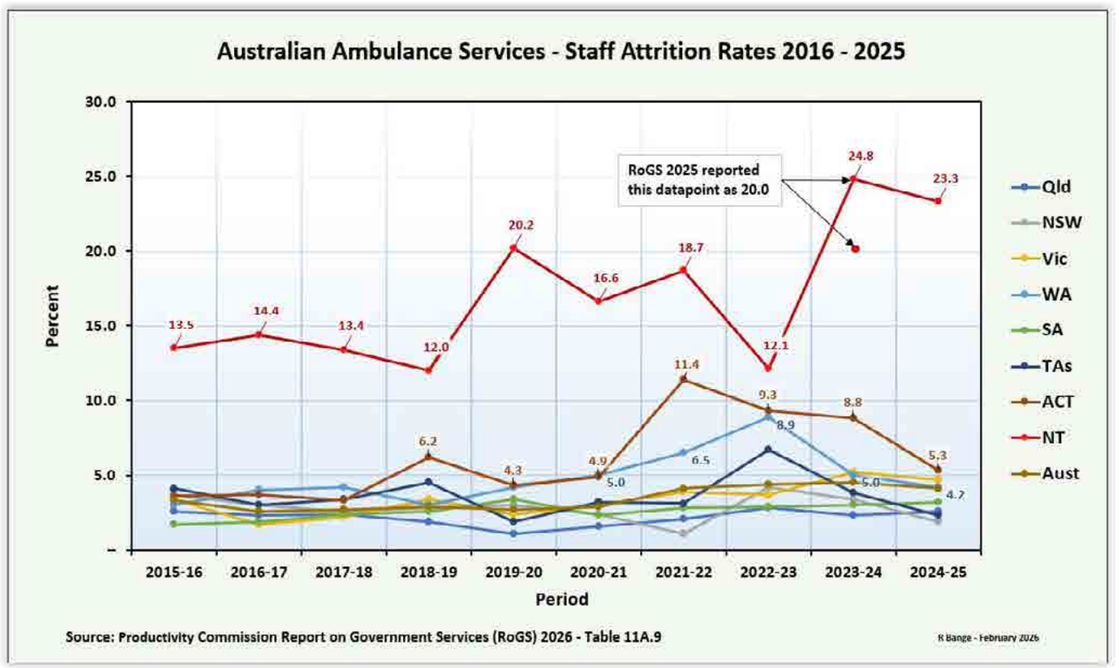

Registered Paramedics (RPs) and Ambulance Service Employment - June 2025
Number RPs potentially not in Ambulance Services
Estimated Ambulance paramedics
Estimated Percentage RPs (FTE) in Ambulance Services
Estimated Percentage RPs in Ambulance Services
Estimated Number of non-Ambulance RPs
Nationally ~69% RPs estd. employed by ambulance services
Estd. Paramedics employed by ambulance service
Potential paramedics not employed by ambulance services
74.5%
64.5%
73.8%
61.4%
83.0%
67.4%
68.0%
61.7%
0.0%
69.1%
5,031
4,659
4,983
1,302
1,472
513
257
169
561
8 211
1 723
2 561
1 771
821
301
248
121
105
NSW
Vic (a)
Qld
WA (b)
SA
Tas
ACT
NT
No PPP
Australia
Nominated Principal Place of Practice (PPP)
Sources: 2025 Report on Government Services (RoGS) Table 11A.2
Paramedicine Board of Australia Registration Statistics June 2025
R Bange - February 2026

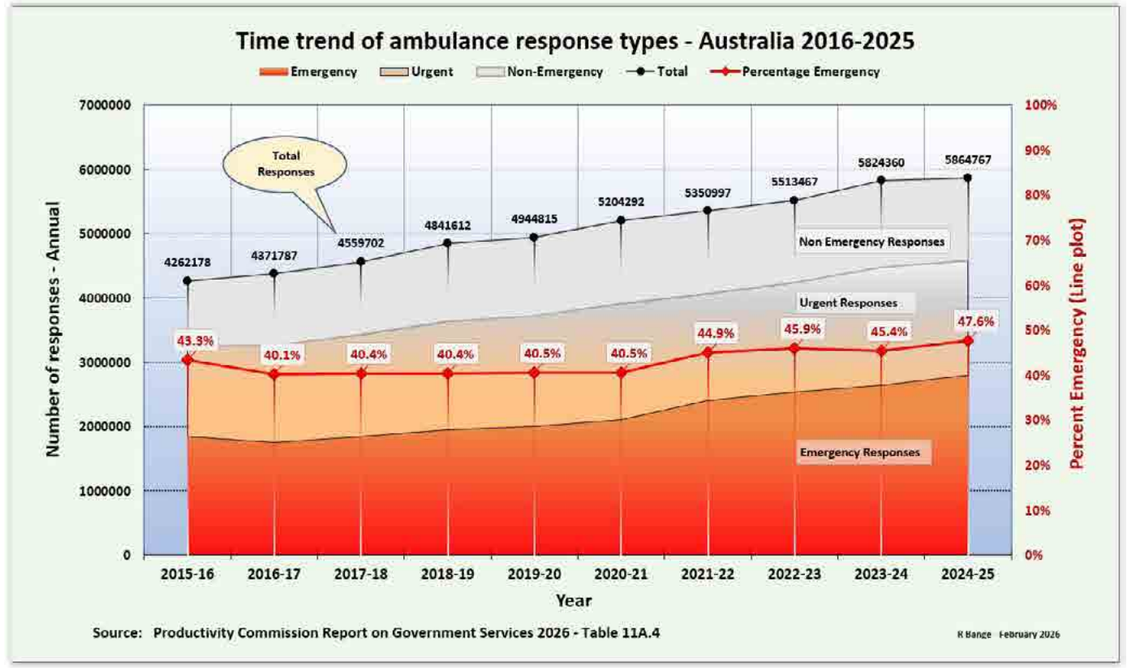

Australian Ambulance Services Per Capita Government Funding 2022-25
Govt Grant per capita 2021/22
Govt Grant per capita 2022/23
Govt Grant per capita 2023/24
Govt Grant per capita 2024-25
2024-25 Govt Grant % Total Revenue
Govt Funding per capita (2024-25 dollars)
2024-25 Govt Funding as % Total Revenue
2024-25 Government funding as % of revenue
2024-25 National Average $182.5 representing 79.9% of Total Revenue
82.3%
76.8%
94.4%
53.4%
67.3%
90.8%
85.0%
84.1%
79.9%
NSW
Vic
Qld
WA
SA
Tas
ACT
NT
Aust
Jurisdiction
Sources: Productivity Commission Report on Government Services 2026 - Table 11A.1
Australian Bureau of Statistics - Resident Population Statistics 31 December 2024
R Bange - February 2026

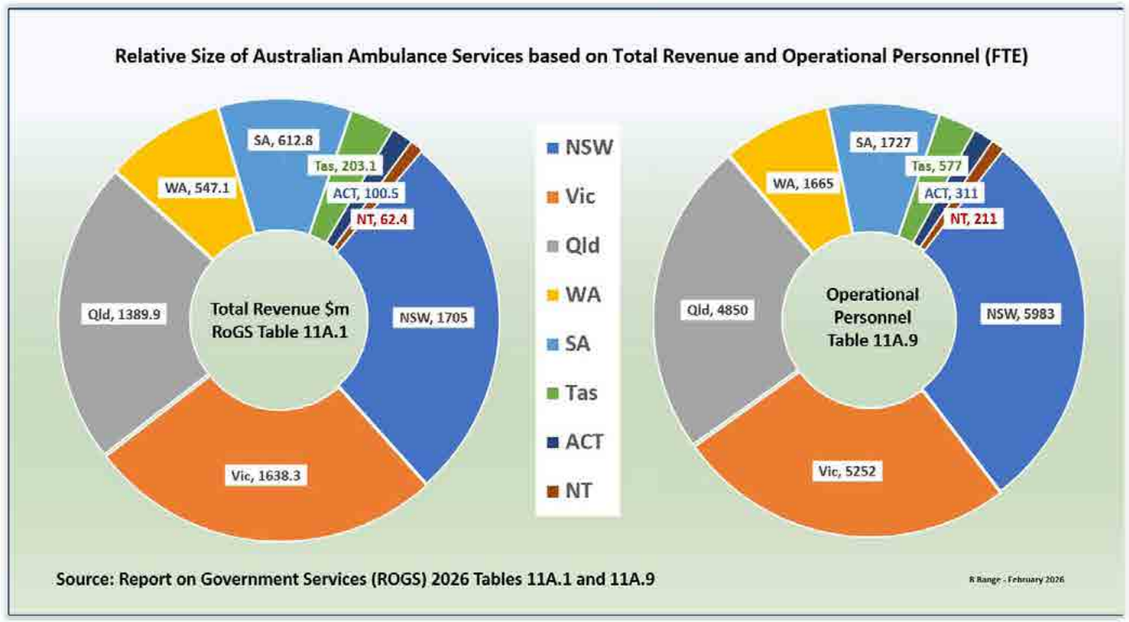

Australian Ambulance Services Transport Fees Income
Transport Fees per capita 2021-22
Transport Fees per capita 2022-23
Transport Fees per capita 2023-24
Transport Fees per capita 2024-25
Transport Fees % Total Revenue
Transport Fees per capita (2023-24 dollars)
Transport Fee Income as % of Total Revenue
2024-25 Transport fee as percentage of revenue
Note 1: Totals may not equal the sum of individual amounts due to rounding and/or other source income.
Note 2: Policy on the operation of NEPT services may affect the relative income from transportation.
2024-25 National Average $36.3 per capita representing 15.9% of total revenue
16.9%
15.9%
4.4%
35.3%
25.8%
6.7%
8.7%
15.9%
15.9%
NSW
Vic
Qld
WA
SA
Tas
ACT
NT
Aust
Jurisdiction
Sources: Productivity Commission Report on Government Services (RoGS) 2026 - Table 11A.1
Australian Bureau of Statistics - Resident Population Statistics 31/12/2024
R Bange - February 2026

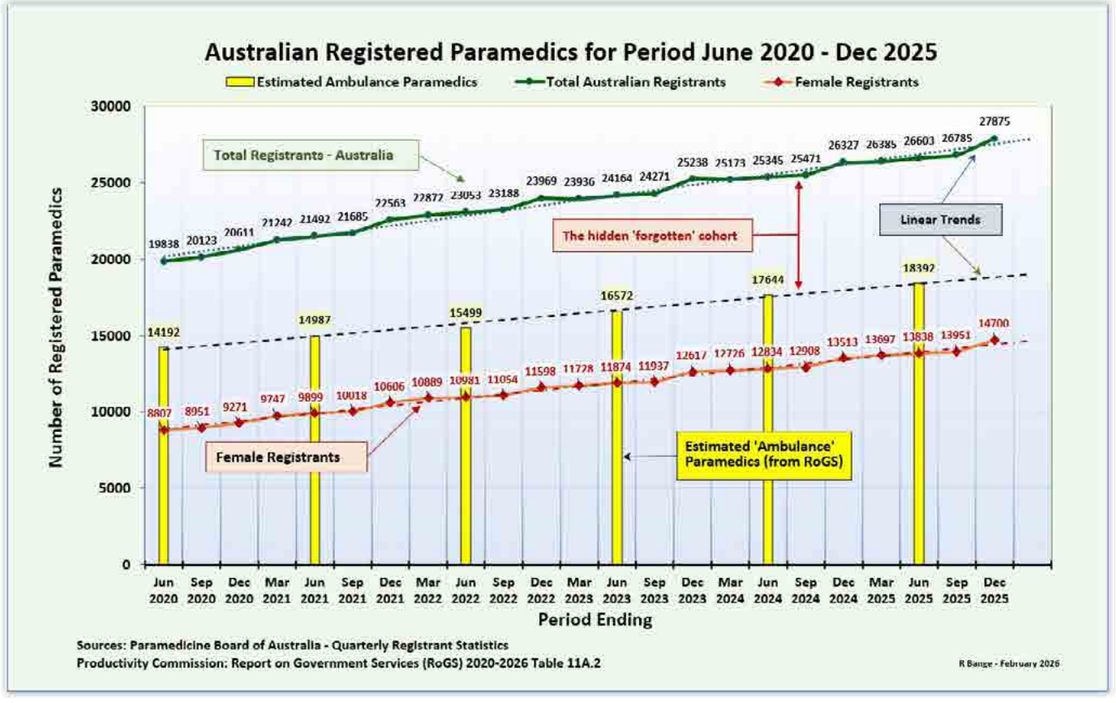

Australian Ambulance Services Other Income per capita
Other Income per capita 2021/22
Other Income per capita 2022/23
Other Income per capita 2023/24
Other Income per capita 2024-25
2024-25 Other Income % Total Revenue
Other Income per capita (2024-25 dollars)
2024-25 Other Income as % Total Revenue
2024-25 Other Income as percentage Total Revenue
2024-25 National Average $9.6 representing 4.2% Total Revenue
1.5
0.7%
17.0
7.3%
2.9
1.2%
20.6
11.9%
22.4
6.9%
8.9
2.5%
13.1
6.3%
0.0
0.0%
9.6
4.2%
NSW
Vic
Qld
WA
SA
Tas
ACT
NT
Aust
Jurisdiction
Sources: Productivity Commission Report on Government Services 2026 - Table 11A.1
Australian Bureau of Statistics - Resident Population Statistics 31 December preceding
R Bange - February 2026


Australian Ambulance Services Revenue Sources per capita 2024-25
Govt Funding per capita 2024-25
Transport Fee Revenue per capita 2024-25
Other Income per capita 2024-25
2024-25 per capita Total Revenue
Note: There are minor variations in the final figures due to rounding errors
Components of revenue (2024-25 dollars)
Jurisdiction
NSW
Vic
Qld
WA
SA
Tas
ACT
NT
Aust
Total 199.53 0.7% 1.5 16.9% 33.8 82.3%, 164.3
Total 233.67 7.3% 17.0 15.9% 37.2 76.8%, 179.5
Total 247.37 1.2% 2.9 4.4% 11.0 94.4%, 233.5
Total 181.84 11.3% 20.6 35.3% 64.1 53.4%, 97.2
Total 323.94 6.9% 22.4 25.8% 83.4 67.3%, 218.1
Total 352.73 2.5% 8.9 6.7% 23.8 90.8%, 320.3
Total 208.64 6.3% 13.1 8.7% 18.1 85.0%, 177.3
Total 237.99 0.0% 0.0 15.9% 37.8 84.1%, 200.2
Total 228.44 4.2% 9.6 15.9% 36.3 79.9%, 182.5
Sources: Productivity Commission Report on Government Services 2026 - Table 11A.1
Australian Bureau of Statistics - Resident Population Statistics 31 December preceding
R Bange - February 2026


Australian Ambulance Services - Staff Attrition Rates 2016 - 2025
Percent
Period
RoGS 2025 reported this datapoint as 20.0
Qld
NSW
Vic
WA
SA
TAs
ACT
NT
Aust
Source: Productivity Commission Report on Government Services (RoGS) 2026 - Table 11A.9
R Bange - February 2026


Time trend of ambulance response types - Australia 2016-2025
Emergency
Urgent
Non-Emergency
Total
Percentage Emergency
Number of responses - Annual
Percent Emergency (Line plot)
Year
Total Responses
Non Emergency Responses
Urgent Responses
Emergency Responses
4262178
4371787
4559702
4841612
4944815
5204292
5350997
5513467
5824360
5864767
43.3%
40.1%
40.4%
40.4%
40.5%
40.5%
44.9%
45.9%
45.4%
47.6%
Source: Productivity Commission Report on Government Services 2026 - Table 11A.4
R Bange February 2026


Relative Size of Australian Ambulance Services based on Total Revenue and Operational Personnel (FTE)
Total Revenue $m RoGS Table 11A.1
SA, 612.8
Tas, 203.1
ACT, 100.5
NT, 62.4
WA, 547.1
Qld, 1389.9
NSW, 1705
Vic, 1638.3
NSW
Vic
Qld
WA
SA
Tas
ACT
NT
Operational Personnel Table 11A.9
SA, 1727
Tas, 577
ACT, 311
NT, 211
WA, 1665
Qld, 4850
NSW, 5983
Vic, 5252
Source: Report on Government Services (ROGS) 2026 Tables 11A.1 and 11A.9
R Bange - February 2026



Paramedicine, POCUS, and scene-time thinking

Posted 25 January 2026

A recent paper by Jake Donovan et al, tackles a question that keeps coming up whenever a new capability is proposed in paramedicine: Is it worth it - and at what cost?

Drawing on systems theory, health economics, and the lived realities of paramedic practice, the authors argue that barriers to POCUS implementation are less about evidence or technology, and more about culture, governance, and how we define "performance."

The study conclusions are that significant disparities in POCUS training and a lack of standardised governance across Australasian services, are major impediments to its adoption. Additionally, financial considerations and the perceived value of POCUS impact its acceptance and expansion.

To fully leverage the capabilities of POCUS in enhancing paramedic practice, development of comprehensive, standardised frameworks addressing these challenges is essential.

Response and scene times, inherited from trauma-centric models and treated as a blunt KPI, continue to shape much decision-making, despite growing evidence that well-integrated POCUS does not meaningfully delay care and may accelerate access to definitive treatment downstream.

While not POCUS-specific, other recent papers place a nuanced perspective on scene time, including the observations by Luca Carenza on exertional heat stroke https://tinyurl.com/3xdm5xaa

(also see cited papers) and the work by Matt Wilkinson-Stokes et al on the time-and-motion study of community paramedics (with more to come). https://doi.org/10.1016/j.auec.2025.11.003

The Donovan paper makes an important point about value: if we only measure benefits within ambulance services, we miss the real gains that may occur across the patient journey, from ED bypass to earlier activation of critical pathways.

Systemic delays and benefits have featured strongly in multiple Inquiries over the past decade into "ambulance ramping".

The rebuttal of concerns about POCUS-related delays is well supported. However, as Dr Aidan Baron frequently notes in his teaching and papers on POCUS and research literacy, absence of harm is not the same as evidence of benefit.

He and others have argued that legacy KPIs - particularly scene time - persist less because of evidence and more because of organisational habit, medico-legal anxiety, and managerial and reporting simplicity from a different era.

While the Donovan-cited literature shows no significant scene-time penalty, these papers raise the question of what kind of benefit/s decision-makers should care about, particularly when benefits accrue across the system and downstream (ED bypass, protocol activation) rather than at the scene itself.

This tension is central to any critique of outcome frameworks in pre-hospital and out-of-hospital research: paramedicine often bears the cost of innovation, while hospitals and patients reap the benefit.

Along with the demonstrated contribution of the ambulance services to community care, it's a strong argument for greater recognition and funding from the Commonwealth as recommended by the Observer on many occasions. https://tinyurl.com/3r3w42da

Rather than calling for more training courses or more devices, the Donovan work argues for coordinated system redesign: clinical governance, education, infrastructure, audit, and feedback - working together to provide integrated care.

It's a thoughtful contribution to the conversation about professionalism, evidence, and what good paramedicine and good health policy actually look like. https://link.springer.com/article/10.1186/s13049-025-01471-7

Hearing the Voices of Women

Posted 23 January 2026

It's 13,000+ voices with one clear message: women's pain is downplayed or dismissed far too often. Australia has clear evidence on women's pain. The policy challenge is to act on it.

A landmark Victorian inquiry has revealed that women's pain is still vastly under-recognised and undertreated across the health system.

Drawing on the experiences of more than 13,000 women and girls, the Bridging the Gender Pain Gap inquiry shows how widespread dismissal, delayed care, and cost barriers are impacting lives -physically, mentally, and socially.

Patients, paramedics, allied health professionals, nurses, GPs, specialists, hospitals and clinics - everyone along the care pathway plays a role. Early decisions shape outcomes, and the evidence is that the system is failing for women.

The Victorian inquiry highlights the urgent need for systemic reform, not just awareness. Victoria is leading with a Women's Pain Standard, a Women's Pain Action Plan, and new clinics for young people. The challenge now is for other states and territories to act.

That's something I am working on at a policy level. It's also something I hope every reader can support at their local or operational level by disseminating this information and supporting change. Join the conversation about why we can't afford to ignore women's pain any longer.

I wrote about this in Pearls and Irritations just yesterday. https://tinyurl.com/5rfu6xkj

And for context on why out-of-hospital and community care and first responders and paramedics matter in women's pain, see my earlier post: https://tinyurl.com/68ku3brk

An infographic flipbook: https://online.fliphtml5.com/eeyoy/jbli/

Kings Birthday Honours 2026

The Ambulance Service Medal (ASM) and Medal of the Order of Australia OAM

Medal of the Order of Australia OAM

Ambulance Service Medal

AMBULANCE SERVICE MEDAL (ASM)
For distinguished service as a member of an Australian ambulance service.

NEW SOUTH WALES

Bernard COREN

Mr Bernard Coren joined NSW Ambulance in January 2003. Over more than 22 years of dedicated service, Mr Coren held a wide range of frontline and operational roles including paramedic, intensive care paramedic, station officer, duty operations manager, sector duty operations manager, cardiac project officer, service planner, and is currently operational as the associate director of Service Planning. He has also represented NSW Ambulance on numerous committees, both internally and externally, including with HealthShare NSW and NSW Health service planning forums. Mr Coren has made significant and lasting contributions to the organisation, particularly through his leadership in service planning and strategic workforce development. His frontline experience has deeply informed his work in shaping safer, more effective service models to support paramedics across NSW.

Mr Coren played a key role in the development and delivery of the Strategic Workforce and Infrastructure Team (SWIFT) program, one of the largest strategic initiatives in NSW Ambulance 's history. His work established a robust, evidence-based service planning methodology that integrates demand, workload, coverage, and capability, which was highly commended by the Audit Office of NSW.

Additionally, Mr Coren has overseen the commissioning of advanced external modelling to improve strategic forecasting and was instrumental in developing the NSW Ambulance Clinical Services Plan and Role Delineation Framework, setting clear direction for clinical services across the state. Throughout his career, Mr Coren has demonstrated outstanding dedication and professionalism in both frontline clinical roles and executive leadership positions. He has contributed extensively to managing complex and hazardous incidents, including serving on the State Incident Management Team during the 2019-2020 NSW bushfires. His commitment to excellence and his strategic foresight has transformed NSW Ambulance's capacity to support its frontline workforce with the right staffing, infrastructure, and clinical capabilities. His efforts have created enduring benefits for both paramedics and the community.

Kirsty ENGLAND

Ms Kirsty England joined NSW Ambulance in 1998 and has dedicated over 25 years to frontline clinical roles and paramedic education across regional and metropolitan areas. Throughout her career, Ms England has held numerous key positions and is currently the senior manager of Foundation and Specialist Education as well as an intensive care paramedic. In Ms England's early paramedic career she earnt respect for her calm and capable response, and as station officer, she demonstrated strong operational leadership and a commitment to improving staff welfare and clinical standards.

Her most significant contributions have been in education, where she has transformed paramedic training, especially in rural and regional NSW. She was the first Volunteer Educator providing vital training and support to regional community first responder units, and she pioneered the introduction of simulation-based training to frontline teams , significantly enhancing clinical readiness and patient outcomes. Ms England's innovation extended to the adoption of the Emergo Train System for major incident training. She voluntarily gained certification and adapted the system to meet the specific needs of regional and remote ambulance teams.

During the COVID-19 pandemic, she played a pivotal role in rapidly developing a COVID-safe Intensive Care Paramedic skills uplift program. She produced a comprehensive, multi-modal training package delivered in a fraction of the usual development time, showcasing her expertise, dedication, and deep understanding of clinical education. Ms England transformed Clinical Volunteer Education into a formal, professional program, with clear development pathways, significantly enhancing volunteer training, support, and integration into NSW Ambulance operations.

Known for her initiative, drive, and collaboration, Ms England continuously seeks opportunities to improve education and patient care, balancing innovation with compassion, mentoring new paramedics and leading strategic education programs with empathy and professionalism. Ms England exemplifies the highest values of NSW Ambulance as a dedicated, innovative, and compassionate leader whose work has left a lasting impact on paramedic education and the communities NSW Ambulance serves.

Martin PEARCE

Mr Martin Pearce is a highly experienced intensive care, motorcycle, and critical care helicopter paramedic who joined NSW Ambulance in 1990 and has worked across multiple metropolitan and regional areas. He is a vital member of NSW Ambulance's aeromedical helicopter operations, undertaking hundreds of missions throughout NSW, offshore and in remote wilderness locations.

Mr Pearce is the lead trainer for remote area vertical rope access within the medical rescue environment. His dedication to safety and best practice has been instrumental in championing vertical rope access procedures. His expertise extends to international disaster response, having been deployed as a member of the Urban Search and Rescue Taskforce. Mr Pearce has a key leadership role within the Helicopter Education and Training team as senior paramedic educator. In this capacity, he leads a team of critical care paramedic educators and is responsible for developing and delivering comprehensive training programs. These programs ensure that both paramedics and aeromedical doctors are highly skilled and prepared for the complex demands of aeromedical retrievals.

Mr Pearce has been a driving force behind the transformation of aeromedical education to a structured, cyclic training program introduced in 2016-2017. This redesign has led to improved training quality, better staff preparedness, enhanced operational safety, and significant fiscal benefits for NSW Ambulance. Throughout his career, Mr Pearce has provided expert education and leadership to the prehospital and retrieval aeromedical workforce. His work has ensured that all skill groups within NSW Ambulance's aeromedical system are supported by tailored training that evolves to meet the growing clinical and operational requirements of a modern aeromedical helicopter rescue service.

Mr Pearce's dedication to clinical excellence, safety, and education has made a lasting impact on NSW Ambulance and the broader community. His tireless commitment to advancing aeromedical retrieval capabilities, combined with his extensive operational experience, exemplifies the highest standards of professional service and leadership

Terence SAVAGE

Mr Terry Savage is a highly respected and experienced intensive care paramedic (ICP) who commenced his career with NSW Ambulance in 1981 and has served across the state in a wide range of clinical and leadership roles. He was one of the service's earliest flight paramedics after completing specialist helicopter

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training. His participation in this groundbreaking program helped establish and develop NSW Ambulance's aeromedical and rescue response capabilities.

Mr Savage's clinical leadership and operational insight have shaped multiple key developments in NSW Ambulance, including laying the foundations for the regional ICP program. His efforts directly improved access to emergency critical care in regional and rural areas. Mr Savage was seconded to the Queensland Ambulance Service to support the design and delivery of their first ICP training program. This inter-jurisdictional collaboration in clinical development had a lasting influence on the progression of critical care paramedicine interstate and nationally. He has also contributed to major events and projects outside the traditional scope of paramedic work, including as a venue commander during the 2000 Sydney Olympic and Paralympic Games and as a member of the Ambulance Games Committee for 10 years.

Mr Savage has long been a champion for staff wellbeing and workplace culture. He was one of the first trained peer support officers in NSW Ambulance and has remained in the role for over 35 years. He plays an important role in advocating for sustainable workforce practices. He was a founding contributor to roster reform throughout the state and has been a trusted and respected voice on numerous committees and working groups. His contributions extend beyond Australia, having been deployed internationally with medical response teams on multiple occasions.

Mr Savage's depth of experience, unwavering dedication, and quiet leadership have left a lasting mark on the organisation. His career is distinguished by steady, enduring contributions that continue to benefit both colleagues and communities across NSW and beyond.

VICTORIA

Jessica DRUMMOND

Ms Jessica Drummond has been a committed member of Ambulance Victoria since 2009, beginning her career in rural ambulance service at Castlemaine. Her early experiences in rural communities shaped her clinical and operational approach and continue to inform her mentorship of metropolitan paramedics.

In 2015, Ms Drummond was appointed as a paramedic educator at Vermont South branch, where she has consistently demonstrated leadership, clinical excellence, and a passion for education.

Her engaging personality and sound clinical knowledge have made her a trusted mentor to countless graduates and colleagues.

Ms Drummond is a long-standing emergency medical response trainer and a key contributor to strengthening partnerships with Fire Rescue Victoria and other first responders. She is also an active member of the Metro 2 Best Care Community, sharing her valuable insights to enhance patient care and clinical practice.

In 2024, Ms Drummond took on the role of Monbulk's Heart Safe lead, spearheading a community-wide initiative to improve out-of-hospital cardiac arrest survival rates. Her efforts included connecting with 121 local groups, delivering over 15 training sessions, and reaching more than 500 residents with life-saving CPR and automated external defibrillator (AED) (ASM education. Under her leadership, Monbulk increased its AED access from 1 to 17 devices and tripled its GoodSAM responder rate. The community graduated as a Heart Safe Community in just eight months, well ahead of the typical two-year timeline.

Ms Drummond's work has had a measurable and lasting impact on both her team and the Monbulk community. Her dedication to education, innovation, and patient care has left an immeasurable impact on the Monbulk community.

Danny ELBAUM

Mr Danny Elbaum has been a steadfast and highly respected member of Ambulance Victoria for over 25 years. Known for his enduring commitment to both paramedic practice and community service, his career reflects a deep dedication to operational excellence, mentorship, and the enhancement of paramedic capability across the organisation.

Having served as the founding operations manager of Chevra Hatzolah Melbourne for over 20 years, Mr Elbaum's leadership is defined by his calm composure, thoughtful approach and ability to foster trust and collaboration among colleagues. He is regularly sought out by peers for guidance on sensitive and complex matters, a testament to the respect he has earned through his integrity and professionalism. His clinical expertise and leadership in high-pressure situations have made a lasting impact on both patients and colleagues.

Mr Elbaum's contributions extend well beyond his clinical and operational duties. He is actively involved in public education, regularly delivering sessions on CPR, first aid, and emergency preparedness to schools, community groups, and local organisations. His outreach efforts have significantly improved community awareness and resilience, reinforcing the vital role of paramedics in public health.

His mentorship has played a pivotal role in supporting new paramedics and strengthening team cohesion. As an active participant of Ambulance Victoria's Peer Support Program, Mr Elbaum offers emotional support and operational guidance to Ambulance Victoria and community emergency response teams responders in times of need.

Mr Elbaum's career is marked by a proactive and hands-on approach to improving paramedic practice and community outcomes. Through his work, he continues to elevate the standards of care and support within Ambulance Victoria and the broader community. His dedication to continuous improvement, inclusivity, and patient care has created a legacy that will endure beyond his years of active service.

Steven GROVE

Mr Steven Grove has been a dedicated paramedic with Ambulance Victoria for over 34 years, delivering exceptional care across both rural and metropolitan communities. His career has been defined by clinical excellence, leadership, and a deep commitment to patient outcomes. With a strong focus on evidence-based practice, Mr Grove has continually developed his knowledge and skills, ensuring that patients benefit from the latest innovations in pre-hospital medicine.

As the senior team manager of Helicopter Emergency Medical Services 2 and a practicing Mobile Intensive Care Ambulance (MICA) flight paramedic, Mr Grove has spent years operating in some of Victoria's most remote and hazardous environments. His work has taken him into rugged terrain, over open seas, and through extreme weather conditions, often at night and without backup. He brings his advanced clinical skill, sound judgment, and unwavering commitment, which reflect his courage, resilience, and dedication to those in urgent need of care.

Beyond his operational duties, Mr Grove has made a profound impact through community engagement, particularly in Gippsland, where he has built strong partnerships with local ambulance auxiliaries. His grassroots community-driven approach has enhanced support for emergency services and strengthened the overall capacity and resilience of Ambulance Victoria.

As a passionate mentor and educator, Mr Grove continues to invest time and energy into developing the next generation of paramedics. His guidance has helped shape careers in MICA, air ambulance, academia, and leadership, fostering a culture of excellence and compassion across the organisation. His influence has had an incredible and lasting effect on the formation of a generation of personnel, instilling a strong sense of purpose, clinical excellence, and community responsibility.

Mr Grove's career reflects a rare combination of courage, innovation, and service. His contributions have strengthened Ambulance Victoria's capacity to deliver care and have left a lasting legacy across the communities he has served.

Heather HODGKIN

Ms Heather Hodgkin has served as an ambulance community officer (ACO) with Ambulance Victoria since 2005, based at the Mitta Mitta ambulance branch. Her career spans two decades of dedicated frontline service in one of Victoria's most remote and challenging regions, where ACOs are often first on scene for extended periods before paramedic support arrives.

From 2013 to 2023, Ms Hodgkin held the role of ACO team leader, overseeing the operations of the Mitta Mitta branch team. Her leadership extended beyond administration, she was the central point of contact for her team, providing mentorship, conducting medication checks, managing vehicle and equipment logistics, and leading community engagement initiatives. Ms Hodgkin's operational excellence was particularly evident during critical events such as bushfires, floods, and the COVID- 19 pandemic, where she demonstrated calm leadership and unwavering support for her team and community. Ms Hodgkin's contributions extend beyond emergency response.
She supports her peers and often volunteers her time to work through training assessments with new ACOs, including travelling with staff to gain confidence whilst driving the vehicle.

Embedded deeply in the Mitta Mitta Valley commun ity, Ms Hodgkin regularly checks in on elderly neighbours, liaises with paramedic coordinators about patient welfare, and volunteers her time for local health initiatives. Her compassionate care for aged and palliative patients is widely recognised, including accompanying patients on their final

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ambulance journeys and providing support to families during emotionally difficult times. Ms Hodgkin's career is a testament to compassionate service, operational excellence, and community leadership.

Rebecca VEITCH

Ms Rebecca Veitch has been a dedicated advanced life support paramedic with Ambulance Victoria since 2000, serving the Carlton and North Melbourne communities. With a background in critical care nursing, Ms Veitch brought a wealth of clinical expertise to her paramedic role and quickly became a leader in education and community engagement.

As a paramedic educator within the Emergency Medical Response (EMR) program, Ms Veitch has delivered over 7,500 hours of EMR training to over 550 firefighters through the course of her career. Her commitment to education extends to some of the state's most isolated areas, where she has trained approximately 65 remote area nurses across 15 bush nursing centres. Ms Veitch's educational achievements extend beyond first responders and nurses as she plays a pivotal role in the Public Access Defibrillation (PAD) program and the GoodSAM program.

She maintains strong relationships with 21 PAD sites and regularly visits locations to ensure automated external defibrillators are operational and staff are confident in their use. She supports GoodSAM by providing follow-ups, debriefings, and peer support after emergency incidents, ensuring responders feel valued and cared for.

Ms Veitch's passion for empowering first responders and everyday Victorians to improve cardiac arrest survival in the communities where they live and work has been a driving force throughout her career. Her enthusiasm and ability to connect with learners have made her a standout educator.

Through these programs, Ms Veitch has trained, empowered, and inspired thousands of Victorians directly contributing to the improved survival rates from cardiac arrest. Her dedication to education, community care, and frontline support has ensured that bystanders and first responders were trained and ready to provide care when it matters most.

QUEENSLAND
Stephen JOHNS

Mr Stephen Johns has an extensive history within the Queensland Ambulance Service since commencing with the service in 1985.

Mr Johns has consistently demonstrated clinical excellence, leadership, and an unwavering commitment to patient care throughout a distinguished career. In his current role as a senior operations supervisor, he provides critical operational and tactical oversight, ensuring seamless, effective response across day-to-day ambulance operations. His calm leadership, operational insight, and patient-centred focus continue to enhance the quality and reliability of ambulance service delivery across Queensland.

He recently made a significant contribution to successfully implementing and performing in the new role of director of clinical operations for South East Queensland. Mr Johns has provided high-level leadership in a multitude of significant events in the emergency and disaster management environment including the 2025 Northern Queensland weather events. He recently completed a deployment to Far North Queensland to support the floods. He has participated in both operational and strategic roles in various high-profile events, participated at team level and as the lead in various events requiring high-level decision-making in mission-critical environments.

He has provided excellent role modelling of leadership behaviours and continues to engage significantly in the mentoring and coaching of aspiring and emerging leaders. Mr Johns has an innate ability to adapt to challenges and applies his knowledge and skills to a diverse range of roles and activities from the operational paramedic, supervisor and managerial roles, into the challenges associated with taking the management lead in an operations centre environment.

Susan NEALE

Ms Susan Neale has worked consistently in the operational environment for Queensland Ambulance Service, where, as an advanced care paramedic officer, she has responded to a significant number of high acuity incidents and provided expert care in the pre-hospital environment.

Throughout her career, Ms Neale has consistently performed at the highest level in numerous emotionally challenging and often confronting cases. Her calm professionalism and clinical expertise under pressure have earned her the deep respect of her colleagues and the enduring trust of the communities she serves. Her dedication was exemplified during the recent 2025 Ex Tropical Cyclone Alfred response. Throughout this incident, she voluntarily amended her work hours and remained at the station to ensure adequate coverage and continuity of care for her community during a time of crisis, reflecting her unwavering sense of duty and her reliability in times of heightened demand.

Ms Neale approaches her work with exceptional compassion, empathy, and dedication to whole person care. She consistently goes beyond her professional obligations, not only delivering critical medical intervention, but also providing emotional support and dignity to patients and families during their most vulnerable moments. Her steadfast commitment to respectful and comprehensive end-of-life care is particularly commendable.

Beyond her professional duties, Ms Neale donates her time to Ambulance Wish Queensland, a volunteer initiative that fulfills the final wishes of terminally ill patients. Her involvement has provided profoundly moving and meaningful experiences for individuals in their final days, bringing comfort, closure, and joy to patients and their loved ones. Ms Neale has demonstrated an unwavering commitment and dedication to the care, dignity and wellbeing of patients. She has an unmatched compassion for both patients and their families in challenging and often hazardous situations and exemplifies the very best of the ambulance profession and the values of the Queensland Ambulance Service.

Dahleen NUGENT

Miss Dahleen Nugent has an extensive history as an on-road paramedic spanning 37 years with the Queensland Ambulance Service. Since her commencement in 1987, Miss Nugent has experienced all facets of patient care service delivery ranging from positive outcomes of contributing to a life saved, to dealing with significant hazardous and trauma incidents.

Miss Nugent has demonstrated a clear passion and commitment to her patients and to her community in Millaa Millaa, Far North Queensland. As an advanced care paramedic and officer in-charge, Miss Nugent has responded to highly critical incidents under challenging conditions and provided expert clinical care in the out of hospital environment.

Miss Nugent often responds to highly critical patients as a solo officer and uses her high-level critical thinking and knowledge to analyse and problem solve to determine the best care for patients. She also has experience in emergency management during the many major incidents and disaster events in Far North Queensland over her long and distinguished career.

Miss Nugent is an advocate for rural Queensland, engaging in continuous community activities, supporting local events and advocating for community members in need. She works tirelessly for and has earned the affection and respect of her community by educating community groups, the local primary school and other organisations in topics such as health literacy, community safety and basic first aid. She also maintains supportive relationships with the local Queensland health, police and fire departments.

Miss Nugent demonstrates a commitment and dedication to upholding the highest of professional standards, vigilantly and consistently behaving in a manner that has supported community and organisational standards.

WESTERN AUSTRALIA
Lauren D'ARCY

Mrs Lauren D'Arcy is a dedicated frontline paramedic based at Rockingham Ambulance Station, delivering critical prehospital care. Beyond her operational role, she supports and mentors colleagues, has lectured paramedicine students at university, and is a trusted guide for junior officers on-road.

Known for her professionalism under pressure, Mrs D'Arcy remains calm in challenging and often dangerous situations, ensuring the safety of both her crewmate and patients. She is highly regarded among peers for her proactive approach and unwavering commitment to both her profession and the broader community.

A passionate advocate for inclusivity, Mrs D'Arcy has dedicated significant personal time and resources to promoting the use of Australian Sign Language (Auslan) within St John WA. She regularly teaches Auslan, often using her own leave and finances to support training sessions, create materials, and provide refreshments. Her aim is to ensure those with hearing loss are not excluded from quality healthcare and to empower paramedics with tools to communicate more inclusively.

Mrs D'Arcy views her colleagues at St John WA as an extended family and is committed to breaking down barriers for patients with hearing challenges. Her respect for all individuals, regardless of background or ability, underpins her inclusive approach to care. Her efforts have led to the successful introduction of the Convo application-a real-time video interpreting service for deaf patients-making St John WA the first Australian ambulance service to implement this

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innovation.

Alongside her work with St John and her teaching, Mrs D'Arcy also serves in the Australian Defence Force, further highlighting her dedication to service. Her commitment has had a lasting impact on both her peers and the wider community, promoting inclusive healthcare and elevating communication standards across the service.

David EMERSON

Mr David Emerson has been with St John WA since 2011, progressing from student ambulance officer to clinical lead in 2025. His journey through roles including ambulance paramedic, clinical support paramedic, and clinical hub lead reflects a consistent commitment to frontline care and clinical excellence.

With a background in registered nursing, Mr Emerson fosters a culture of patient-centred care and knowledge-sharing. Since becoming a senior clinician in 2019, he has guided countless officers with expertise and compassion. From 2021 to 2024, he led the clinical support paramedic (CSP) team with dedication, especially on blue and red category work shifts, building a strong and resilient group capable of delivering advanced clinical care both on-road and remotely via the State Operations Centre.

Mr Emerson recognised that quality patient care starts at the 000 call. He personally funded training in the Medical Priority Dispatch System (MPDS), including travelling to the United States to become an MPDS instructor. He then trained all new CSPs, enhancing their decision-making during critical incidents. His work on the Dispatch Review Committee further improved the accuracy of MPDS coding and prioritisation, directly impacting patient outcomes by ensuring appropriate and timely resource allocation. He also worked closely with State Obstetrics Referral Call to improve childbirth instructions provided during emergency calls, contributions now influencing international protocols.

Following the tragic death of a colleague in 2023, Mr Emerson was a pillar of support for his team, particularly on red category work shifts. He conducted welfare checks and helped staff navigate their grief with empathy and steadiness. Now operating the clinical lead car on blue category work shifts, Mr Emerson continues to model excellence. His clinical knowledge, leadership, and heartfelt commitment have made a lasting impact on the organisation, the community, and the paramedics he mentors every day.

SOUTH AUSTRALIA
Sandra GUTSCHE

Mrs Sandra Gutsche has 24 years of exceptional service to the Yorke Peninsula community and SA Ambulance Service (SAAS). Mrs Gutsche is a volunteer ambulance officer at Yorketown Ambulance Station, providing frontline ambulance services to her local community. In her role as Yorketown volunteer team leader since 2011, she has mentored countless volunteers, coordinated training and led her team through emergencies ranging from multi-casualty road accidents to large-scale bushfires.

Mrs Gutsche's leadership was critical during the 2019-20 Lower Yorke Peninsula bushfires, when she monitored the health of 150 firefighters, even while her own property was under threat. In 2024, Mrs Gutsche received commendations from SAAS and SA Police for her courage and professionalism in a high-risk mental health incident.

Mrs Gutsche has also strengthened the sustainability of ambulance services in the region by championing volunteer recruitment and retention, and community engagement.
Her dedication, leadership and compassion have made an enduring impact on the Yorketown community, her fellow ambulance volunteers and SAAS.

Mrs Gutsche's willingness to juggle the demands of family, farming and ambulance service is a testament to her extraordinary dedication and community spirit. She is an inspiration to those around her and has established a legacy that will benefit her community for many years to come.

Kieran JOHNSON

Mr Kieran Johnson has over 24 years of exceptional service to the Riverland community and SA Ambulance Service (SAAS). From his humble beginnings as a casual ambulance officer in the Riverland, Mr Johnson has been in many frontline roles in the region including as an intensive care paramedic, clinical team leader in Renmark, and is qualified in SAAS Remote to provide assistance via rope rescue work.

It was during the Riverland flood emergency that his outstanding leadership shone through. He led the complex evacuation of 17 aged care residents from Renmark under high-stress and high stakes conditions all while his own home was under threat from floodwaters. Further, he initiated local flood-awareness training, co-developed a swift-water safety package, and advocated for Personal Flotation Devices for all Riverland crews.

Mr Johnson is widely respected for going above and beyond his professional duties to support both his local area and the broader South Australian community. His deep personal and professional commitment to the Riverland community has been consistently demonstrated through exceptional operational leadership, voluntary service, and an enduring focus on improving community outcomes, especially during times of crisis.

Mr Johnson's contributions are not defined by a single achievement, but by years of sustained, impactful service across clinical, educational, operational, and community domains. His selflessness, resilience, and leadership have left an enduring legacy across the Riverland and South Australia.

NORTHERN TERRITORY
Aaron BROOKS

Mr Aaron Brooks commenced service with St John Ambulance Australia (SA) as a cadet in 1998 progressing to the adult division and gaining early clinical and leadership experience. Since transferring to the Northern Territory (NT) in October 2009 he has balanced professional paramedic duties as a frontline clinician, operational leader and mentor to staff, with exceptional volunteer leadership.

Continuing to serve as a qualified paramedic in excess of 15 years, Mr Brooks has undertaken numerous leadership and management positions across the NT, including leadership roles in impact events during his career, such as COVID-19 and cyclone events. He has always provided exceptional patient-focused care, clinical professionalism, operational excellence, strong community engagement and a sustained commitment to developing others.

Most recently, Mr Brooks has played a pivotal role in the implementation of the new Territory deployment manager position. Designed to directly support staff in operational service delivery and provide clinical support and guidance to on-road clinicians, this role has provided significant benefits to staff wellbeing and operational capacity. Mr Brooks's leadership in relation to this role has been instrumental in enhancing the organisation's ability to manage staff welfare particularly in the critical area of fatigue management while demand for ambulance services has reached significant and at times unprecedented levels.

By facilitating processes that prioritise staff support, Mr Brooks has supported service resilience, improved operational decision-making, and fostered a sustainable balance between the ongoing demand of service delivery and the health of frontline crews. He has tirelessly worked to reinforce strong, respectful relationships with key stakeholders, including the Northern Territory Police, Department of Health, CareFlight and the Royal Flying Doctor Service, ensuring seamless inter agency cooperation.

Mr Brooks's leadership has strengthened operational capability in NT communities, fostered public trust, inspired youth and cadets to pursue clinical careers, enhanced volunteer integration into ambulance operations, and provided caring and professional support to patients and paramedics across the NT.

MEDAL OF THE ORDER OF AUSTRALIA (OAM) IN THE GENERAL DIVISION

Gregory BIDDLE

For service to the community through emergency response organisations.

St John Ambulance New South Wales

- Member, St John NSW Retired Members Network, current.
- Various executive roles including Area Manager Sydney South East New South Wales, and Deputy Assistant Commissioner - Metro, 2000-2019.
- Officer-in-Charge, Divisional Superintendent, Campbelltown Cadet Division, 1996-2000.
- Divisional Ambulance Officer, Macarthur and Campbelltown Cadet Divisions, 1989-1996.
- Member, Cronulla/Caringbah Division, 1965-1989.
- Instructor, Occupational Instructor, Trainer and Examiner, 1973-1996.

Other

- Divisional President, The University of Tasmania Division, St John Ambulance Tasmania,

2019-2020.

- Paramedic, New South Wales Ambulance Service, 1973-2009.
- Justice of the Peace, since 1993.

Awards and Recognition include:

- Service Medal in Gold and 1 Bar, St John Ambulance Australia, 2020.
- Officer, Order of St John, 2019, and Member, 2011.
- Honorary Life Member, St John Ambulance Australia, 1988 .
- Ambulance Long Service and Good Conduct Medal with 2 clasps

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Dr Felix Ho Lam HO ASM
For service to community health. St John Ambulance

• National Youth Officer, since 2020.
• Paramedic, since 2007.
• Northern Territory Youth Training Officer, 2017-2020
• Training Development Coordinator, St John Australia Youth Council, 2006-2009.
• Superintendent, 2005-2007.
• Communications Officer, 2002-2003.
• Volunteer, since 2001.

The National Critical Care and Trauma Response Centre

• Paramedic, since 2011.

Australian Medical Assistance Team

• Victoria Bushfires Response, 2020.
• Samoa Measles Outbreak (Delta Rotation), 2019.

National Rural Health Students' Network

• Executive Committee, Community and Advocacy Officer, 2015.
• President, Students Association for Rural and Remote Health, 2013-2014.

United Nations - Timor-Leste

• Intensive Care Paramedic, Timor-Leste, United Nations, 2010-2011.
• Volunteer Trainer, Timor-Leste National Ambulance Service, 2010-2011.

State Emergency Service

• Volunteer, Northern Territory, since 2014.
• Volunteer, Western Australia, 2002-2003.

Australian Red Cross

• First Aid Instructor, 2002.
• Volunteer, 2000s.

Professional

• Medical Officer, Royal Darwin Hospita,l since 2016.
• Ambulance Communications Officer, Tasmanian Ambulance Service, 2004-2005.
• Group Leader, Asthma Camp for Kids, 2001-2005.

Australian Air Force Cadets

• Officer/Instructor, 8 Wing, current.
• Coordinator, Duke of Edinburgh Awards, current.

• Staff Member, over 15 years.

Royal Australian Air Force

• Aviation Medical Officer, RAAF Reserves, current.
• Team Medical Officer, lnvictus Games, Canada, 2025.

Awards and Recognition include:

• Volunteer of the Year Award, Northern Territory Chief Minister, 2025.
• Ambulance Service Medal, 2022.
• Northern Territory Award, Australian Medical Association, 2014.
• Young Australian of the Year, Tasmania, 2006.
• Various Service Medals including Defence Long Service Medal and Australian Cadet Forces Services Medal.

Charles KHAN
For service to the community of Dimbulah.

Queensland Ambulance Service

• Honorary Ambulance Officer, Dimbulah Ambulance Station, 1992-2023.
• Former Advanced Care Paramedic.
• Paramedic, 1992-2023.

Dimbulah Men's Shed

• Founding Member, since 2010.
• Former Secretary.
• Former Treasurer.

Community

• Director, Mareeba and Dimbulah Financial Services, since 2014.
• Member, Dimbulah Brigade, Queensland Fire and Emergency Services, since 2005.
• Former President and Member, Parent and Citizens Committee, Dimbulah State School.
• Justice of the Peace, since 1997.
• Honorary Member, Dimbulah Railway Museum, current.

Dimbulah-Mutchilba Chamber of Commerce (now Mareeba Chamber of Commerce)

• Former Secretary.
• Former Treasurer.

Awards and Recognition include:

• National Medal and 1st Clasp.
• Long Service Medal, Queensland Ambulance Service, and First and Second Clasps.
• Queensland Fire and Emergency Services Medal.
• Australia Day Achievement Medallion, 2010.

Shane WICKS
For service to the community through emergency response organisations.

Gerringong Rural Fire Brigade, New South Wales Rural Fire Service

• Captain, 2005-2008.
• Senior Deputy Captain, 2002-2005, and 2008-2012.
• Deputy Captain, 2012-2022, and 2023-2024.
• Volunteer, current.
• Life Member.

New South Wales Rural Fire Service

• Operational Officer Level 1, since 2024.
• Volunteer, since 1990.

Emergency Services - Other

• Flood Rescue Operations Officer, NSW State Emergency Service, 2023-2024.
• Paramedic, NSW Ambulance Service, 2009-2024.

Surf Life Saving NSW, South Coast Brancy

• President, since 2024.
• Deputy President, 2022-2024.

Gerringong Surf Life Saving Club

• Volunteer, current.
• Life Member.

Gerringong Lions Rugby League Club

• Medical Support Officer, current.

Other

• Volunteer and Spokesperson, Gezza Cares Program, current.
• Correctional Officer, New South Wales Department of Communities & Justice, 1998-2009.

Awards and Recognition include:

• National Medal, 1st Clasp, 2023.
• National Emergency Medal - Bushfires 2019-2020, 2022.
• Parent of the Year, NSW Public Schools, 2016.

Member of the Order of Australia (AM) in the General Division

Commissioner Dr Dominic Paul MORGAN ASM

For significant service to the community through emergency response governance and leadership.

New South Wales Ambulance

• Commissioner and Chief Executive, since 2016.
• Member, Ambulance Service Advisory Board, since 2018.
• Various operational roles, 1986-2009.

Council of Ambulance Authorities

• Chair, 2019-2021.
• Former Deputy Chair.
• Board Member, since 2009.
• Chair, Strategic Business Advisory Comm ittee, 2012-2014.

Governance

• Chief Executive Officer, Ambulance Tasmania, Department of Health and Human Services, Tasmanian Government, 2009-2015.

• Member, Senior Executive Forum and Health Service Strategy Group, NSW Health.

• Member, Advisory Board, Fortem Australia, 2021.

• Expert Advisory Group, Answering the call: National survey, Beyond Blue, 2018.

University of Technology, Sydney

• Adjunct Professor , Health Services Management, since 2022.

• Adjunct Associate Professor, Health Services Management, 2019-2022.

Awards and Recognition include:

• Group Bravery Citation, 2019.

• Ambulance Service Medal, 2011.

• National Medal, 2002; 1st Clasp, 2011; 2nd Clasp, 2021.

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AUSTRALIAN PARAMEDIC

Writing an article for Australian Paramedic

Australian Paramedic welcomes articles from paramedics across Australia and internationally – you too can become a part of this exciting new journal!

We welcome articles on any of the following:

- Clinical review, report or discussion;
- Case study;
- Management in emergency medical services;
- Occupational health and safety;
- Opinion pieces;
- General health, psychology or law relevant to emergency medical services;
- Any other article or knowledge that you would like to share that is relevant to the Australian Paramedic.

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Getting published in Australian Paramedic

DO YOUR HOMEWORK

The key to having your article published is to do your homework first, and ensure your writing is targeted to our journal. Knowing the target audience is imperative, and an essential first step. For us, we are looking for articles with good content and information relevant to paramedics in Australia.

This does not mean we will limit our information only to Australian content... far from it. There is also a lot to learn from methods and processes used internationally, and we will endeavour to include such information in our journal too. What we do want is current information that provides updates relevant to emergency medical care.

DISCUSS WITH THE EDITOR

Discussing ideas and proposals with the Editor can be a great way to ensure that you do not waste your time. Our Editor is very happy to receive enquiries and provide advice on an approach for an article or identifying areas of key interest for our journal. All you have to do is drop a line or two to *amy@ausparamedic.com.au*

GRAB THE READER'S ATTENTION

It is essential to grab the attention of the reader in the first paragraph of the article – by providing a catchy phrase, or simply giving an interesting snippet of what your article will be talking about. After that, good flow, grammar and punctuation is essential as well, to keep our readers engaged.

PROVIDE SOME GREAT PHOTOS

Photos also are a great way to grab attention, and they make up a crucial part of articles in our journal. Photos can be submitted as separate files, with ideally a resolution of at least 300dpi. However, it is up to you to ensure you have the permission of people appearing in the photo for publication.

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