

## Commentary

# Responding to a cardiac arrest: Keeping paramedics safe during the COVID-19 pandemic

Steve Whitfield BParamedPract, GradDipStrategicLeadership, DipSecurityRiskMgt, is Lecturer and Course Convenor in Paramedicine<sup>1</sup>; Alexander MacQuarrie PhD, CCP, BSc, MBA is Senior Lecturer<sup>1</sup>; Malcolm Boyle PhD, is Academic Lead in Paramedic Education<sup>1</sup>

### **Affiliation:**

<sup>1</sup>Griffith University, School of Medicine, Queensland

<https://doi.org/10.33151/ajp.17.809>

## Abstract

This commentary aims to provide an overview of the current state and territory ambulance service cardiac arrest management recommendations to paramedics during the COVID-19 pandemic and highlight relevant risks to personnel.

### Keywords:

paramedic; COVID-19; cardiac arrest; CPR; pandemic

Corresponding Author: Steve Whitfield, [s.whitfield@griffith.edu.au](mailto:s.whitfield@griffith.edu.au)

## Introduction

Internationally, paramedics form a fundamental part of healthcare systems where they are often the primary contact for people in need of varying types of health care. Currently, just over 18,000 registered paramedics work in the Australian healthcare system with a majority of these in jurisdictional ambulance services providing frontline care (1).

The impact of the coronavirus disease, COVID-19, and the source virus, SARS-CoV-2 on ambulance services globally has been wide-ranging. There is an expectation this could result in an increased demand on the operational resourcing of ambulance services, hospitals and other healthcare facilities. As the infection and screening profile of the virus evolves, so too does the clinical care guidelines for frontline healthcare providers. The frequent updates to guidelines, processes and recommendations have left many healthcare providers, paramedics included, struggling to keep up with the changes. At the time of writing (26 April 2020), the confirmed number of global COVID-19 cases is just under 3,000,000 with over 203,000 deaths (2).

Although paramedics have risen to meet this challenge, conflicting healthcare guidelines have emerged as new information becomes available. What is known is that close proximity to a patient may permit droplet transmission to occur. This creates potential implications for paramedics performing cardiopulmonary resuscitation (CPR), for example, it poses a potential risk to healthcare provider wellbeing due to the potential of droplet transmission (3). Currently in Australia, approaches by state and territory ambulance services to cardiac arrest management recommendations appear to be inconsistent, and this bears examination.

This commentary aims to provide an overview of the current state and territory ambulance service cardiac arrest management recommendations for paramedics during the COVID-19 pandemic and highlight relevant risks to personnel.

## Discussion

A patient in cardiac arrest requires CPR, an emergency procedure that incorporates a combination of chest compressions and airway management including artificial ventilation to preserve brain function. This procedure requires close proximity between the patient and healthcare provider. Both chest compressions and airway management are aerosol generating medical procedures (AGMP) that may permit the exposure to droplets (3). Although advanced airways, such as endotracheal intubation and supraglottic airways, are connected to varying forms of closed circuits, chest compressions have been shown to generate airway pressures

that exceed the sealing pressures of some advanced airways, thus presenting an ongoing risk of receiving an exposure to droplets during chest compressions (4,5).

The International Liaison Committee on Resuscitation (ILCOR) distribute rigorous recommendations based on best evidence and consensus from the scientific literature on resuscitation including cardiac arrest management. The ILCOR group commenced a systematic review investigating the risk to ambulance personnel responding to cardiac arrest during the COVID-19 pandemic (3). Some of the key findings from that review identified that CPR has the potential to generate aerosols (based on weak evidence), that healthcare providers should use personal protective equipment (PPE) for aerosol generating procedures during resuscitation (based on weak evidence), and that it is reasonable for healthcare providers to consider defibrillation before donning PPE for aerosol generating procedures in situations where the healthcare provider assesses the benefits of commencing CPR may exceed the risks of exposure (good practice statement) (3). Although the emphasis of ambulance response and emergency medical services is to first assess the risk in order to protect the responder, these guidelines clearly express that defibrillation is a consideration before donning AGMP PPE only where the risks are perceived to be low. However, COVID-19 is a viral infection that spreads readily through droplet transmission and any unnecessary exposure of a paramedic to this must warrant consideration.

In distributed material to ambulance staff, both New South Wales Ambulance Service and Ambulance Tasmania have addressed this risk by providing guidelines to mitigate the risk of CPR to paramedics (6,7). These ambulance services have advised their paramedic workforce to treat all cardiac arrest patients as suspected COVID-19 and use the recommended AGMP PPE guidelines before approaching the patient for every potential resuscitation (6,7). Similarly, Ambulance Victoria has advised staff that if any AGMP are likely, to increase PPE to an N95 mask and gown (8). However, Queensland Ambulance Service recommend to staff that it may be impractical for the first crew to don a gown and recommend that the first crew can perform CPR with eye protection, P2/N95 mask and gloves only, but the backup crew must don a gown and other PPE before entering the scene. It is recommended that following treatment, if COVID-19 has been identified as a possibility, those staff without gowns should change uniforms immediately on returning to the station (9). Moreover, South Australia Ambulance Service advise that cardiac arrest PPE include surgical mask, safety glasses and gown for responses where CPR may be performed and to increase PPE before performing an AGMP (10,11). At the time of writing, we were unable to access information relating to ambulance service recommendations in Western Australia, the Australian Capital Territory, or the Northern Territory.

Internationally, recommendations in Canada and the United Kingdom are that paramedics attending cardiac arrests don full AGMP PPE before attending the scene. However, evidence from emergency services in New Zealand suggest that staff commence resuscitation provided the staff think it is appropriate to do so and recommends that staff don additional PPE (12-14). A recent communique from the World Health Organization advised that airborne transmission during specific medical interventions such as intubation was possible, however, it cautioned that further research is warranted to determine the probability (15). Although the evidence for droplet transmission during CPR remains low due to a paucity of research, ambulance services in Australia are clearly divided as to the level of risk paramedics are potentially exposed to.

## Conclusion

The authors recognise that information will continue to change rapidly during the COVID-19 pandemic response and that paramedics exposed to SARS-CoV-2 must evaluate the evolving information and adapt. However, although the research into the risk of viral transmission during CPR is weak, all cardiac arrest patients should be assumed to have COVID-19. Therefore, paramedics should ensure they use appropriate PPE to protect themselves knowing that donning PPE may delay treatment. Although this may be at odds with the paramedic ethos of always advocating for the patient, it is imperative that ambulance responders are protected first and foremost.

## Competing interests

The authors have no competing interests. Each author of this paper has completed a conflict of interest statement. Malcolm Boyle is Editor-in-Chief of the *Australasian Journal of Paramedicine*.

## References

1. Paramedicine Board of Australia. Paramedicine Board of Australia Registrant Data. 2019. Available at: [www.paramedicineboard.gov.au/News/Statistics.aspx](http://www.paramedicineboard.gov.au/News/Statistics.aspx)
2. Coronavirus Update (Live): 2,503,392 cases and 171,796 deaths from COVID-19 virus pandemic - Worldometer [Internet]. Worldometers.info. 2020 Available at: [www.worldometers.info/coronavirus/](http://www.worldometers.info/coronavirus/) [Accessed 21 April 2020].
3. International Liaison Committee on Resuscitation [Internet]. Ilcor.org. 2020. Available at: [www.ilcor.org/covid-19](http://www.ilcor.org/covid-19) [Accessed 21 April 2020].
4. Shin H, Yoo, H Bae, G Chang, et al. Comparison of oropharyngeal leak pressure and clinical performance of LMA ProSeal and i-gel in adults: meta-analysis and systematic review. *J Int Med Res* 2016;44:405-18. doi: 10.1177/03000060515607386
5. Langhelle A, Sunde K, Wik L, Steen P. Airway pressure with chest compressions versus Heimlich manoeuvre in recently dead adults with complete airway obstruction. *Resuscitation* 2000;44:105-8. doi: 10.1016/s0300-9572(00)00161-1
6. New South Wales Ambulance. Protocol NSW1 - NSW pandemic management protocol. New South Wales Government; 2020.
7. Ambulance Tasmania. Medical Services - Update No: 4-2020 Clinical practice during COVID-19 pandemic v1.0. Hobart: Department of Health; 2020. Available at: [www.dhhs.tas.gov.au/ambulance/clinical\\_services/medical\\_protocols/paramedic\\_protocols](http://www.dhhs.tas.gov.au/ambulance/clinical_services/medical_protocols/paramedic_protocols)
8. Ambulance Victoria. Paramedic response for managing coronavirus (COVID-19). Version 18. Melbourne: Ambulance Victoria; 2020.
9. Queensland Ambulance Service. Medical Directors' Circular NO. 16/2020. Brisbane: Queensland Health; 2020.
10. SA Ambulance Service. Personal protective equipment assessment matrix - COVID-19 (COVN 026) Version 1.2. Adelaide: SA Ambulance Service; 2020.
11. SA Ambulance Service. Clinical Communication. Guiding principles of practice for COVID-19 (CLC-20-007) Version 1.2. Adelaide: SA Ambulance Service; 2020.
12. Coronavirus: St John disputes 'no CPR on Covid-19 patients' claim. Stuff. 2020. Available at: [www.stuff.co.nz/national/health/coronavirus/120797659/coronavirus-st-john-wont-perform-cpr-on-patients-with-covid19-unless-primary-cardiac-arrest](http://www.stuff.co.nz/national/health/coronavirus/120797659/coronavirus-st-john-wont-perform-cpr-on-patients-with-covid19-unless-primary-cardiac-arrest) [Accessed 22 April 2020].
13. Alberta Health Services. AHS EMS COVID-19 Treatment approach for EMS practitioners. Alberta: Alberta Health Services; 2020.
14. London Ambulance Service. LAS guidance for patient facing staff Version 4.0 Medical Directorate 10th April 2020. London: London Ambulance Service (LAS); 2020.
15. Modes of transmission of virus causing COVID-19: implications for IPC precaution recommendations [Internet]. Who.int. 2020. Available at: [www.who.int/news-room/commentaries/detail/modes-of-transmission-of-virus-causing-covid-19-implications-for-ipc-precaution-recommendations](http://www.who.int/news-room/commentaries/detail/modes-of-transmission-of-virus-causing-covid-19-implications-for-ipc-precaution-recommendations) [Accessed 22 April 2020].