

AACE Position Statement on the AGP Status of Chest Compressions and Defibrillation

Background

During the unprecedented COVID-19 pandemic, UK Ambulance Services have worked together through the AACE National Ambulance Service Infection Prevention and Control Group (NASIPCG), National Ambulance Lead Paramedics' Group, National Ambulance Service Medical Directors' Group and Quality, Governance and Risk Directors' Group. The NASIPCG has led on the continual development of the 'COVID-19 Guidance for Ambulance Trusts'; each iteration being discussed and approved by Public Health England (PHE).¹

PHE are responsible for determining the Infection Prevention & Control (IPC) guidance to be implemented by all NHS organisations in England. They have determined a list of interventions which are considered to be aerosol generating procedures (AGPs), based on the advice of the New and Emerging Respiratory Virus Threats Advisory Group (NERVTAG).² NERVTAG is an expert committee of the Department of Health, which provides scientific risk assessment and mitigation advice on the threat posed by new and emerging respiratory virus threats.

The NERVTAG and PHE position is that whilst many of the interventions associated with resuscitation (ventilation, LMA insertion, intubation) are AGPs; when delivered on their own, chest compressions and defibrillation are not.

It is important to note the difference between the general use of the terms 'CPR' and 'chest compressions':

- CPR includes chest compressions, airway management and ventilation. The term is defined by the RCUK as *"embracing all the procedures, from basic first aid to the most advanced medical interventions that can be used to restore the breathing and circulation in someone whose heart and breathing have stopped"*.³
- Chest compressions refer to rhythmic pressing on the centre of the patient's chest, as a key component of CPR.

NERVTAG Position

NERVTAG was recently asked to undertake an evidence review to consider whether chest compressions and defibrillation are associated with an increased risk of transmission of acute respiratory infections, and if they should be considered AGPs. The report was published on 27/04/2020 and concluded:⁴

"The scientific evidence base is extremely weak and heavily confounded by an inability to separate out specific procedures performed as part of CPR, e.g. chest compression, defibrillation, manual ventilation and intubation. A systematic review found that chest compressions and defibrillation were not significantly associated with an increased risk of SARS infection (Tran et al, 2012).



It is biologically plausible that chest compressions could generate an aerosol, but only in the same way that an exhalation breath would do. No other mechanism exists to generate an aerosol other than compressing the chest, and an expiration breath, much like a cough, is not currently recognised as a high-risk event or an AGP. Defibrillation is not likely to cause any significant breath exhalation. Airway intubation and manual ventilation consistently come out as the most high-risk procedures that take place during CPR.

In conclusion, we do not consider that the evidence supports chest compressions or defibrillation being procedures that are associated with a significantly increased risk of transmission of acute respiratory infections.”

These findings are in line with those from the previous NHE Scotland/Health Protection Scotland review.⁵

Resuscitation Council UK Position

The ambulance sector are aware of recent statements from the Resuscitation Council UK (RCUK) that chest compressions on their own should be considered an AGP.⁶ The supporting article which is set to be published in the journal Resuscitation, ‘COVID-19 in cardiac arrest and infection risk to rescuers: A systematic review’ is particularly welcome, as it clearly sets out the evidence base behind the RCUK statement.⁷ It should be noted that the document concludes:

“We did not find any direct evidence that chest compressions or defibrillation either did or did not generate aerosols. There is very limited evidence and a rapid need for further studies. Our finding that there is no direct evidence that chest compressions and defibrillation either are or are not aerosol generating procedures is important. However, this absence of evidence should not be interpreted as providing evidence that these procedures are not aerosol generating.”

Public Health England: COVID-19 Infection Prevention and Control Guidance

Public Health England advise:²

“Chest compressions and defibrillation (as part of resuscitation) are not considered AGPs; first responders (any setting) can commence chest compressions and defibrillation without the need for AGP PPE while awaiting the arrival of other clinicians to undertake airway manoeuvres.

Based on the NERVTAG evidence review and consensus statement, chest compressions will not be added to the list of AGPs.”

NHS Ambulance Services Position

Ambulance services appreciate that the differing positions may lead to additional uncertainty and anxiety, at a time when clarity is more important than ever.

Given the conclusion of the NERVTAG review, ambulance services will continue to follow PHE national advice that chest compressions on their own and defibrillation are not AGPs, and



level 2 PPE is therefore appropriate. Ambulance services also fully support that level 3 PPE must be worn when undertaking the majority of other procedures associated with resuscitation e.g. airway management and ventilation.

COVID-19 Guidance for Ambulance Trusts states *“In order to minimise the delay attending a time critical cardiac arrest, it is acceptable for the first person to enter the scene wearing Level 2 PPE. Where trained and equipped to use Level 3, this may be used where it will not cause a delay.”*

In line with good IPC practice for any infectious patient with respiratory symptoms, *“As additional protection, a fluid repellent surgical mask or oxygen mask may be placed over the patient’s face, prior to commencement of compressions to help control any droplets that may be produced.”* If an oxygen mask is used, O₂ should not be turned on unless ROSC is achieved prior to full airway management in level 3 PPE being possible.

Providing the option for the first clinician on-scene to don Level 2 PPE ensures that any delays in delivering chest compressions and defibrillation (where indicated) are minimised, in order to support the best patient outcome.

PHE guidance acknowledges that *“use of PPE should not detract from the usual infection prevention and control (IPC) risk assessments that staff carry out routinely to underpin all clinical practice and decision making.”*

Risk assessment on scene must consider both risks to patient and to staff and should be clearly documented afterwards in the clinical record. Staff should ensure the correct level of PPE is worn dependant on the patient presentation and the clinical skills that are required during patient care, and they will be supported in their risk-based decision-making by their trust.



References

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3. Resuscitation Council UK (2020) *Frequently Asked Questions*. Available at <https://www.resus.org.uk/faqs/faqs-cpr/> [Accessed 27 April 2020].
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6. Resuscitation Council UK (2020) *Statement on PHE PPE Guidance*. Available at <https://www.resus.org.uk/media/statements/resuscitation-council-uk-statements-on-covid-19-coronavirus-cpr-and-resuscitation/statement-on-phe-ppe-guidance> [Accessed 27 April 2020].
7. Couper K., Taylor-Phillips S., Grove A., Freeman K., Osokogu O., Court R., Mehrabian A., Morley P., Nolan J., Soar J. and Perkins G. (2020) COVID-19 in cardiac arrest and infection risk to rescuers: A systematic review. *Resuscitation*. Accepted to print - available [here](#).

Aerosols vs Droplets⁴

Droplet: Infection transmission over short distances (approximately 2 metres) via fluid droplets (>5µm) from the respiratory tract of one individual directly onto a mucosal surface or conjunctivae of another individual. Droplets penetrate the respiratory system to above the alveolar level. Level 2 PPE provides an effective barrier to fluid droplets.

Aerosols: Infection transmission via aerosols (≤5µm) from the respiratory tract of one individual directly onto a mucosal surface or conjunctivae of another individual without necessarily having close contact. Aerosols can penetrate the respiratory system to the alveolar level. Level 3 PPE provides protection against aerosols.