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## Letter to the Editor

# A need for prone position CPR guidance for intubated and non-intubated patients during the COVID-19 pandemic



To the Editor,

The cardinal feature of severe coronavirus disease 2019 (COVID-19) is acute lung injury reminiscent of acute respiratory distress syndrome (ARDS).<sup>1</sup> Prone positioning is an established, evidence-based practice in patients with severe ARDS undergoing invasive mechanical ventilation (IMV).<sup>2</sup> The UK Intensive Care Society advocates the use of prone positioning in conscious ward patients requiring  $\geq 28\%$  oxygen.<sup>6</sup> With more frequent prone positioning of patients, both conscious and in those undergoing IMV, it is increasingly likely for cardiac arrests to occur in the prone position. Whilst fulminant COVID-19 may not be amenable to resuscitative attempts, reversible causes of cardiorespiratory arrest will still occur in this cohort. As such resuscitation institutions are required to provide clear guidance to frontline clinicians, outlining how best to undertake cardiopulmonary resuscitation (CPR) in the prone position and how and when to turn patients to limit both delays to CPR and reduce risks of viral transmission to healthcare workers.

Prone CPR has some evidence-base with a systematic review compiling a case series to describe the survival of 10 out of 22 patients receiving prone CPR.<sup>3</sup> Physiological studies demonstrate the generation of higher systolic and mean arterial pressures during prone position CPR compared with standard supine CPR.<sup>4,5</sup>

Ideally, prone CPR guidance should differentiate between intubated and non-intubated patients. In the UK, intubated patients with COVID-19 should only reside in areas where sessional use of FFP3 masks is mandated, thereby mitigating delays to CPR caused by time taken to don PPE. However, turning patients can require up to six personnel and may lead to dislodging of endotracheal tubes and lines. To avoid such complications, prone CPR could be trialled initially using end-tidal CO<sub>2</sub> and arterial pressure and waveforms to judge its efficacy before a decision to turn to supine CPR is made. The process of turning itself requires clear instruction from resuscitation institutions, noting how and when to clamp endotracheal tubes, or temporarily cease ventilation pressures, to reduce the risk of viral transmission to healthcare workers.

In the non-intubated COVID-19 patient, delays to CPR may result from the requirement of hospital staff to don appropriate PPE. As such, the UK Resuscitation Council advises the use of defibrillation prior to

commencing compressions.<sup>7</sup> This guidance does not incorporate patients in the prone position and updates could include advocating anterior-posterior defibrillation. However, all patients are likely to require a turn where not intubated at the time of arrest given the paramount importance of securing a definitive airway as early as possible; even the most experienced anaesthetist will find it challenging to attempt intubation in the prone position.

There is an urgent requirement for best practice guidance to performing CPR in prone positioned, intubated and non-intubated patients with COVID-19 during the pandemic.

## Conflicts of interest

All authors have no conflicts to declare.

## REFERENCES

- Gattinoni L, Coppola S, Cressoni M, Busana M, Chiumello D. Covid-19 does not lead to a typical acute respiratory distress syndrome. *Am J Respir Crit Care Med* 2020, doi:<http://dx.doi.org/10.1164/rccm.202003-0817LE> published online March 30.
- Bloomfield R, Noble DW, Sudlow A. Prone position for acute respiratory failure in adults. *Cochrane Database Syst Rev* 2015;2015:CD008095.
- Brown J, Rogers J, Soar J. Cardiac arrest during surgery and ventilation in the prone position: a case report and systematic review. *Resuscitation* 2001;50:233–8.
- Mazer SP, Weisfeldt M, Bai D, et al. Reverse CPR: a pilot study of CPR in the prone position. *Resuscitation* 2003;57:279–85.
- Wei J, Tung D, Sue SH, Wu S, van Chuang YC, Chang CY. Cardiopulmonary resuscitation in prone position: a simplified method for outpatients. *J Chin Med Assoc* 2006;69:202–6.
- Bamford P, Bentley A, Dean J, Whitmore D, Wilson-Baig N. ICS Guidance for Prone Positioning of the Conscious COVID Patient. 2020.
- Resuscitation Council UK Statement on COVID-19 in relation to CPR and resuscitation in healthcare settings. <https://www.resus.org.uk/media/statements/resuscitation-council-uk-statements-on-covid-19-coronavirus-cpr-and-resuscitation/covid-healthcare/> (accessed April 20, 2020).

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