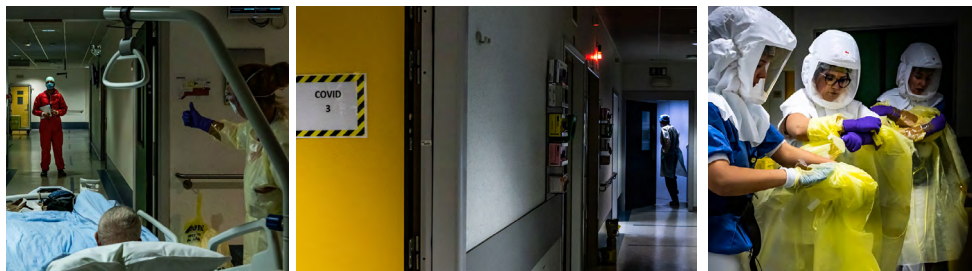


European Resuscitation Council COVID-19 Guidelines



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Section 3

Advanced Life Support in Adults

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► *This guideline was provided on 24 April 2020 and will be subject to evolving knowledge and experience of COVID-19. As countries are at different stages of the pandemic, there may be some international variation in practice.*

— Introduction

The significant risk of transmission of SARS-CoV-2 to healthcare staff mandates changes to Advanced Life Support (ALS) guidelines.¹⁻³ The guidance may change as more is learnt about COVID-19 – Check the ERC website for the latest guidance (www.erc.edu).

Safety is paramount and the safety priorities are: (1) self; (2) colleagues and bystanders; (3) the patient. The time required to achieve safe care is an acceptable part of the resuscitation process.

In-hospital cardiac arrest

1. Identify as early as possible any patients with a COVID-19 like illness, who are at risk of acute deterioration or cardiac arrest. Take appropriate steps to prevent cardiac arrest and avoid unprotected CPR.
2. Use of physiological track-and-trigger systems will enable early detection of acutely ill patients.

3. For those for whom resuscitation would be inappropriate, decisions must be made and communicated. Patients with severe COVID-19 respiratory failure who would not be deemed suitable for tracheal intubation and mechanical ventilation or multiple organ support are extremely unlikely to survive attempted resuscitation after cardiac arrest. For such patients, a do not attempt CPR (DNACPR) decision is likely to be appropriate.
4. Personal Protective Equipment (PPE) must be available to protect staff during resuscitation attempts. It is acknowledged that this may cause a brief delay to starting chest compressions, but the safety of staff is paramount.
5. Chest compressions have the potential to generate aerosols and airway interventions are aerosol-generating procedures (AGPs). Healthcare staff should therefore don (put on) airborne-precaution personal protective equipment (PPE) before starting chest compressions and /or airway interventions; as a minimum a FFP3 mask (FFP2 or N95 if FFP3 not available), eye and face protection, long-sleeved gown, and gloves before undertaking these procedures.
6. Ensure there is a viral filter (heat and moisture exchanger (HME) filter or high-efficiency particulate air (HEPA) filter) between the self-inflating bag and airway (mask, supraglottic airway, tracheal tube) to filter exhaled breaths.
7. Applying defibrillator pads and delivering a shock from an AED/defibrillator is unlikely to be an aerosol-generating procedure and can be undertaken with the healthcare provider wearing a fluid-resistant surgical mask, eye protection, short-sleeved apron and gloves.

Sequence of actions for in-hospital cardiac arrest of a patient with confirmed or suspected COVID-19

1. If a patient is unresponsive and not breathing normally shout for help/pull emergency bell.
2. Check for signs of life/pulse. DO NOT listen for breaths or place your cheek near to the patient's face.
3. Send someone to place a COVID cardiac arrest call (2222 or equivalent local number), and to bring a defibrillator.
4. If a defibrillator is immediately available, switch it on, apply the defibrillator pads and deliver a shock if the rhythm is ventricular fibrillation/ pulseless ventricular tachycardia (VF/pVT). If the patient remains in VF/pVT, and if you are wearing airborne-precaution PPE, start chest compressions. If not, give up to two additional shocks (if indicated) while other healthcare workers are putting on airborne-precaution PPE.
5. If using an AED, follow the prompts and deliver a shock if indicated; do not start chest compressions until you are wearing airborne-precaution PPE for AGPs.

6. Don (put on) airborne-precaution PPE (if not already on).
7. Do not proceed with chest compressions or airway interventions without airborne-precaution PPE.
8. Restrict the number of staff in the room or at the bedside. Allocate a gatekeeper to do this. All personnel not immediately needed should keep their distance from the patient and remain protected.
9. If no signs of life, start chest compressions (continuous until bag-mask device arrives).
10. If not on the patient already, place an oxygen mask and give oxygen. Leave the mask on the patient until a bag-mask device arrives.
11. Once a bag-mask device arrives, proceed with a compression:ventilation ratio of 30:2. Ensure there is a viral filter (HME filter or HEPA filter) between the self-inflating bag and airway (mask, supraglottic airway, tracheal tube) to filter exhaled breaths.
12. Manual ventilation with a bag-mask should be minimised and be performed only by experienced staff using a 2-person technique because an ill-fitting mask/poor seal will generate an aerosol. The person doing compressions can pause to squeeze the bag.
13. Experienced airway staff should insert a supraglottic airway or intubate the trachea early so that the period of bag-mask ventilation is minimised. Consider videolaryngoscopy for tracheal intubation by providers familiar with its use – this will enable the intubator to remain further from the patient’s mouth.
14. If a supraglottic airway has been inserted, use a 30:2 chest compression ventilation ratio, pausing the chest compressions to enable ventilation. This will minimise the risk of aerosol generation caused by gas leaking from the seal between the supraglottic airway and larynx.
15. Consider stopping CPR early if treatable reversible causes of cardiac arrest have been addressed.
16. If there is a need for prolonged CPR, consider the use of a mechanical chest compression device in those settings that are familiar with its use.
17. Ensure the safe removal (‘doffing’) of PPE to prevent self-contamination.
18. Undertake a team debrief.

Resuscitation in intubated patients at the time of cardiac arrest

1. Rescuers should wear airborne-precaution PPE.
2. In the event of cardiac arrest in an intubated and mechanically ventilated patient, to avoid aerosol generation, in general, do not disconnect the ventilator circuit when starting CPR.

3. Increase the FiO₂ to 1.0 and set the ventilator to deliver 10 breaths a minute.
4. Quickly check the ventilator and circuit to ensure that they have not contributed to the cardiac arrest, e.g. blocked filter, breath-stacking with high auto-PEEP, or mechanical failure. Follow local guidance regarding ventilator disconnection to minimise aerosol generation e.g. clamping the tube prior to disconnection, use of viral filters etc.

Resuscitation in patients in the prone position

COVID-19 patients are often managed in the prone position because this can improve oxygenation. Most of these patients will be intubated, but in some cases awake unintubated COVID-19 patients may also be nursed in the prone position. In the event of cardiac arrest in the unintubated, prone patient, whilst wearing the correct PPE, immediately turn the patient supine before starting chest compressions. In the event of cardiac arrest in an intubated patient who is prone, it is possible to deliver chest compressions by pressing the patient's back. This can provide some perfusion of vital organs while a team prepares to turn the patient supine, as follows:

1. Rescuers should wear airborne-precaution PPE.
2. Compress between the scapulae (shoulder blades) at the usual depth and rate (5 to 6 cm at 2 compressions per second).
3. Turn patient supine if:
 - a. ineffective compressions – look at arterial line and aim for diastolic pressure greater than 25 mmHg
 - b. interventions require the patient supine, e.g. for airway problems
 - c. unable to restore a circulation rapidly (minutes)
4. Turning the patient supine requires additional help – plan this early.
5. Defibrillator pad placement options in the prone position include:
 - a. Anterior-posterior (front and back), or
 - b. Bi-axillary (both armpits).

— Out-of-hospital cardiac arrest

Most of the principles described for the management of in-hospital cardiac arrest in adults with confirmed or suspected COVID-19 also apply to ALS for such patients in cardiac arrest out-of-hospital.

In the context of COVID-19, early recognition of cardiac arrest by the dispatcher will enable emergency medical services (EMS) staff to put on airborne-precaution PPE as soon as possible.

REFERENCES

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