
BWH/MGH Emergency Medicine Guidelines for Out-of-hospital Cardiac Arrest During COVID-19 pandemic

Purpose:

This document outlines practices that should be used to provide the best care to patients in cardiac arrest during the COVID-19 pandemic while at the same time ensuring staff safety.

Principles:

- The overall goals remain the same: To administer high quality CPR and early defibrillation, the only two therapies that have been shown to improve outcomes in cardiac arrest.
- There are a few modifications to standard ACLS that we recommend to ensure staff safety.¹
- During the COVID-19 pandemic we will treat **all** OHCA as potential COVID-19 patients

Preparation:

- If possible, the patient's code status should be confirmed prior to beginning the code.
- If available, patient should be placed in a negative pressure room.
- First responders and members of the code team should assess the patient and provide care **only after donning the strict isolation PPE (gloves, gown, N95 respirator, face shield)**.
- A surgical face-mask should also be placed **on the patient prior to chest compressions and intubation** to limit transmission during compressions.
- **The need to don PPE may delay CPR in patients with COVID-19, but staff safety is paramount.**

Staffing:

- Code team should prioritize keeping the **minimum number of staff members** in the room at all times.
 - **Code Team Members Inside the Patient's Room (no more than 6 people)**
 - Code Leader – (Senior resident or Attending) (1)
 - Code RN (1)
 - Respiratory Therapist (1)
 - Intubating/procedure physician – (Senior resident or Attending) (1)
 - 2 chest compressors – (ESA, RN, resident, PA) (2)
 - **Code Team Members Outside the Patient's Room (should not don PPE unless called upon in the room)**
 - Code Cart with nursing staff (1) mixing medications and passing supplies to RN in room

- Pharmacist (1)
- Scribe RN (1)
- Order Resident/PA (1) on computer outside the room placing orders, calling consults, and providing code leader with patient information
- Outside ESA (1) to collect necessary supplies for Code team (IV, ultrasound, etc.)

Circulation:

- **Until a definitive airway is obtained, initiate compression-only CPR. If available, preferentially apply LUCAS to minimize manual CPR and personnel exposure.**
- Multiple studies have shown that compression-only CPR is non-inferior to standard CPR
- If patient has shockable rhythm (VF/VT), defibrillate as soon as possible.

Airway/oxygenation/ventilation management:

- Apply oxygen with **non-rebreather mask** at 15 L/min without humidification for passive oxygenation.
- **Avoid bag valve mask ventilation, high flow nasal cannula, and non-invasive ventilation (CPAP, BiPAP) to minimize aerosolized virus.**
- If the patient does not have a shockable rhythm, proceed with intubation as early as possible. Once the patient is intubated with a HEPA filter in place, the risk of droplet transmission decreases.
- Endotracheal intubation is the procedure that subjects the rescuer to the highest risk of infection during resuscitation. Airway interventions should be carried out by experienced individuals (Attending/senior resident). Attempts to maximize first pass success rate is important (refer to BWH/MGH Emergency Medicine Guideline for Intubating Patients with nCoV-19).
- **During cardiac arrest, chest compressions should be paused during intubation procedure. This may deviate from usual cardiac arrest care, and lead to longer than usual pauses in chest compressions to maintain staff safety and maximize efforts to achieve a safe airway.**
- Chest compressions should not resume until the endotracheal tube cuff is inflated and is connected to the bag valve mask or ventilator, so that the patient's respiratory tract is isolated from the room.
- If the pause in chest compressions is excessive and endotracheal intubation does not seem likely, consider LMA or other extraglottic airway device. A HEPA filter should be placed between the extraglottic device and BVM.

Etiologies to consider:

- Patients may have a cardiac arrest that is caused directly by COVID-19 or because of a co-existing illness.
- Patients with severe COVID-19 are at high risk of respiratory failure, cardiac arrhythmia, cardiogenic shock, and cardiac arrest.
- Data from a [retrospective study in Wuhan](#) revealed cause of death to be respiratory failure (53%), heart failure with respiratory failure (33%) myocardial damage (7%) and unknown cause (7%) amongst 68 patients.²
- It is important to attempt to identify and treat reversible causes (5H's, 5T's) before stopping the code.

Terminating resuscitative efforts:

- Avoid prolonged resuscitation if no easily reversible etiology is identified.
- No one factor alone or in combination is clearly predictive of outcome during an arrest. An important factor associated with poor outcome is time of resuscitative efforts.

- It is reasonable to stop resuscitation efforts if return of spontaneous circulation (ROSC) has not been achieved by 30 minutes.
- In intubated patients, **failure to achieve an ETCO₂ of greater than 10 mm Hg** by waveform capnography **after 20 minutes of CPR** should be considered as one component of a multimodal approach to decide when to end resuscitative efforts³
- Data suggest that unwitnessed arrests with asystole as initial rhythm have <2% chance of survival to hospital discharge. **Recommend rapid decision after 10 min resuscitation care to cease efforts on unwitnessed, asystolic events.**
- At this time, ECPR is a relative contraindication to ECMO for all patients, given the risks of emergency cannulation in a possible COVID-19 patient.

Post-resuscitation:

- Dispose of, or clean, all equipment used during CPR. Any work surfaces used for airway/resuscitation equipment will also need to be cleaned.
- After the resuscitation has ended adhere to strict doffing steps including hand hygiene. Refer to that specific units doffing policy.
- If ROSC is achieved, provide usual post-resuscitation care, such as targeted temperature management.

References:

¹Resuscitation council UK. Guidance for the resuscitation of COVID-19 patients in hospital. March 19, 2020. Retrieved March 19, 2020. <https://www.resus.org.uk/media/statements/resuscitation-council-uk-statements-on-covid-19-coronavirus-cpr-and-resuscitation/covid-healthcare>

²Ruan, Q., Yang, K., Wang, W. et al. Clinical predictors of mortality due to COVID-19 based on an analysis of data of 150 patients from Wuhan, China. Intensive Care Med (2020). <https://doi-org.ezp-prod1.hul.harvard.edu/10.1007/s00134-020-05991-x>

³Mancini ME, Diekema DS, Hoadley TA, Kadlec KD, Leveille MH, McGowan JE, Munkwitz MM, Panchal AR, Sayre MR, Sinz EH. Part 3: Ethical Issues: 2015 American Heart Association Guidelines Update for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care. Circulation. 2015 Nov 3;132(18 Suppl 2):S383-96