

Iranian Heart Association Task Force on Cardiopulmonary Resuscitation Guidelines on the COVID-19 Outbreak

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NECESSITY

Healthcare precautions during an epidemic constitute a formidable challenge that requires profound consideration. For instance, some common procedures for cardiopulmonary resuscitation (CPR) known as aerosol-generating procedures (AGPs) highly increase the risk of transmission and infection with COVID-19 in healthcare workers and treatment environments.^[1]

Treating patients in need of CPR and protecting them against COVID-19 while preventing the infection from spreading to other patients and their relatives, as well as the hospital staff, require an accurate set of predictions and preparations.^[1,2]

OBJECTIVES

The guidelines presented herein aim to inform healthcare workers of the prerequisites and considerations to be taken heed of during and after CPR until the end of the COVID-19 pandemic. Table 1 the standard CPR guidelines seeking to enhance the conduct of safe CPR by all healthcare workers (if need be), and Table 2 contains recommendations on the conduct of more secure intubation by anesthesia specialists, residents, and technicians.

TARGET AUDIENCE

The exigencies of epidemic-specific care necessitate swift, but calculated changes. To that end, the present guidelines endeavor to impart the significance of such objectives to all healthcare workers involved in CPR, whether directly (e.g., physicians and nurses) or indirectly (e.g., nurse aides, technicians, infection control committee, hospital housekeepers, and security staff).

UTILITY

- All patients presenting with cardiorespiratory arrest to the emergency departments should be considered suspicious cases and be administered CPR on the basis of the present guidelines
- All patients presenting with cardiorespiratory arrest to health centers, clinics, and similar treatment facilities should be considered suspicious cases and be administered CPR on the basis of the present guidelines
- All patients needing CPR in specific or suspected wards for COVID-19 should be resuscitated in accordance with the present guidelines
- All patients needing CPR with suspected symptoms for COVID-19 in other hospital wards should be resuscitated in accordance with the present guidelines.

ADDITIONAL SUGGESTIONS

- We urge that different centers, commensurate with their equipment and human resources, apply the maximum principles of the present guidelines
- We recommend that treatment centers' directors attach due significance to the presentation and teaching of the present guidelines, as well as other essential guides and directives, to their personnel
- We suggest that the main table of the present guidelines be printed and placed in full view of the staff involved in the CPR process

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Table 1: Resuscitation guidelines for patients with known or suspected coronavirus disease 2019

Before CPR

1. In each ward, especially the emergency department, preferably, a separate room or area should be allocated to CPR so as to avoid resuscitation in other areas
2. Patient companions should be kept out of the zone reserved for CPR during and after the procedure
3. A minimum number of staff members should be used for CPR^(3,4): Only the physician in-charge of the CPR team and an airway supervisor (often a technician, resident, or anesthesiologist), together with another physician and two nurses (at least 4 and maximum 5 staff members). Less experienced personnel such as students should not be involved in CPR as much as possible
4. The physician in-charge of the CPR team should obtain the necessary information before embarking upon the resuscitation process from patient companions and previous hospital files so as to reduce toing and froing to areas outside the zone designated for CPR
5. It is advisable that before wearing PPE, the CPR team members remove items that they may need during the CPR process (e.g., cellphones and stamps) from their white-coat pockets to obviate the need to touch their pockets
6. Complete PPE packages should be placed in locations specified in each ward. PPE should be worn before CPR commencement. The package should include at least the following items: one long surgical gown or one waterproof one-piece gown, two pairs of gloves, one N95 or one FFP2 or FFP3 mask, one hat, one pair of goggles or one face shield, and one pair of shoe covers. CPR should never be attempted before the team members have worn these items.^(1,3,4) (This may delay the start of the resuscitation process slightly; however, keeping the staff members safe is a priority.) The delay in CPR can be minimized through the provision of sufficient numbers of PPE packages in specific locations (e.g., emergency trollies)

During CPR

7. Intubation should be performed only by a trained CPR team member (airway supervisor) and, if possible, with the help of a video-laryngoscope. If respiratory support is required before the airway supervisor's arrival, a mask or a bag-valve mask should be utilized only as passive fixation. In other words, the mask is kept on the patient's face for oxygen supply without ventilation and bagging. Due to the risk of infection spread, during the use of masks and bag-valve masks, as much as feasible, CPR should be performed via chest compression and defibrillation if needed (chest compression-only CPR). During chest compression, the mask should be fixed on the patient's face so as to limit aerosol spread.^(5,6) If the AutoPulse (ZOLL, CA) or LUCAS (LUCASTM2 Chest Compression System, JOLIFE AB Inc., Lund, Sweden) devices are available, their use for chest compression is recommended.
8. For heart or lung auscultation, only stethoscopes that have been designated for cases with known or suspected COVID-19 should be used. On the termination of CPR, stethoscopes should be placed alongside other equipment in need of disinfection/sterilization. The use of personal stethoscopes should be avoided
9. During and after CPR, contaminated pieces of equipment, particularly those with respiratory secretions (e.g., laryngoscopes and patient masks), should be placed on a designated tray or container and not on the patient's bedside⁽³⁾

After CPR

10. On the termination of CPR, all reusable equipment such as laryngoscopes and stethoscopes should be sterilized in accordance with the infection control protocol of the hospital. In addition, all nonreusable equipment such as chest leads and endotracheal tubes should also be considered infectious waste and disposed of in special bins⁽¹⁾
11. On the termination of CPR, all PPE should be removed in accordance with the relevant protocol and be placed in the nearest bin for infectious waste (yellow). Toing and froing outside the area designated for CPR while wearing PPE should not be permitted
12. PPE removal should be followed by handwashing preferably with soap and water and if not available, with alcohol-based solutions
13. On the termination of CPR, whether successful or unsuccessful, the physician in-charge of infection control (e.g., the infectious disease specialist and the internist) should be contacted for decision-making, as regards pathologic evaluations, transfer of the patient or the deceased, and other necessary measures

CPR: Cardiopulmonary resuscitation, PPE: Personal protective equipment, COVID: Coronavirus disease

Table 2: Intubation-specific recommendations for anesthesiologists

1. While the patient is conscious, intubation should be avoided. Atomized local anesthetic can aerosolize the virus; therefore, the GlideScope or similar devices should be utilized instead, if feasible
2. In prearrest cases, RSIs should be employed to induce anesthesia. This technique should be performed by an experienced physician. RSI should be altered to accommodate the patient's condition (e.g., presence of severe hypoxia, intolerance of apnea for 30 s, and contraindications to the use of neuromuscular paralyzers). If manual ventilation is performed, a low tidal volume is recommended⁽⁶⁾
3. It is advisable to administer 5 min of preoxygenation with 100% oxygen, followed by RSI, to avoid manual ventilation as much as possible. Manual ventilation can potentially cause aerosol spread
4. A high-efficiency hydrophobic filter should be placed between the face mask and the respiratory tract or the respiratory mask or the bag-valve mask (e.g., the laerdal resuscitation bag)

RSI: Rapid sequence induction

- We advocate “prone CPR” provided that CPR personnel have the benefit of previous experience in this regard

and the situation is appropriate with a view to lessening the risk for aerosol transmission. In brief, the patient is positioned prone for cardiac compression to be applied at the midthoracic vertebrae (T7 level), between the two scapulae. Compression can be bolstered with a stiff board placed between the patient's chest and the mattress. If defibrillation is needed, one pad should be placed at the left midaxillary line and the other on the right scapula.

OTHER ESSENTIAL GUIDES

Next to the present guidelines, we recommend that the following guides be available in healthcare centers in order that necessary educational programs can be devised:

- Standard CPR guidelines
- Instructions for wearing and removing personal safety equipment
- Handwashing tutorials.

Archive of SID

Review Committee

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Conflicts of interest

There are no conflicts of interest.

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