



## CPR & Emergency Cardiovascular Care

### Purpose:

This information is intended to help pediatric healthcare providers reduce the risk for SARS-CoV-2 (the virus that causes COVID-19) transmission, especially with regards to resuscitation care. The information here is drawn primarily from [U.S. Centers for Disease Control \(CDC\)](#) recommendations. Please note that guidance may vary based on location. Outside of the U.S., consult the [World Health Organization \(WHO\)](#) and local health resources for the most up-to-date information about risk control in your area.

*Please note that the following guidance is intended specifically for when patients have known or suspected COVID-19. In all other cases, follow your standard protocols.*

### When caring for pediatric patients with known or suspected COVID-19:

1. Use Standard and Transmission-Based Precautions during the care of patients with suspected or confirmed COVID-19 (Source: [CDC](#), accessed 3/23/2020)
  - a. Aerosol-generating procedures (e.g., CPR, endotracheal intubation, non-invasive ventilation) expose providers to a greater risk of disease transmission. These procedures should be performed in Airborne Infection Isolation Rooms (AIIRs) and personnel should use respiratory protection. Limit the number of providers present during the procedure to only those essential for patient care and procedural support. The room should be cleaned and disinfected following the procedure. (Source: [CDC](#), accessed 3/23/2020)
  - b. Patients with known or suspected COVID-19 should be cared for in a single-person room with the door closed. **AIIRs should be reserved for patients undergoing aerosol-generating procedures.** (Source: [CDC](#), accessed 3/23/2020)
  - c. Hand hygiene
  - d. Personal Protective Equipment (PPE)
    - Respiratory protection: Put on a respirator or facemask (if a respirator is not available) before entry into the patient room or care area. **N95 respirators or respirators that offer a higher level of protection should be used instead of a facemask when performing or present for an aerosol-generating procedure.** When the supply chain is restored, facilities with a respiratory protection program should return to use of respirators for patients with known or suspected COVID-19. (Source: [CDC](#), accessed 3/23/2020)
    - Eye protection
    - Gloves
    - Gowns: **If there are shortages of gowns, they should be prioritized for aerosol-generating procedures, care activities where splashes and sprays are anticipated, and high-contact patient care activities that provide opportunities for transfer of pathogens to the hands and clothing of providers.**

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2. Additional considerations for aerosol-generating procedures
  - a. If intubation is needed, use rapid sequence intubation with appropriate PPE.
  - b. If possible, avoid procedures which generate aerosols (e.g., bag-valve mask, nebulizers, non-invasive positive pressure ventilation).
  - c. Due to the risk of disease transmission with non-invasive ventilation, consider proceeding directly to endotracheal intubation in patients with acute respiratory failure, weighing the potential for ventilator shortages.

### Guidance for EMS and other first responders (Source: [CDC](#), accessed 3/23/2020)

1. Emergency medical dispatchers should question callers and determine the possibility that this call concerns a child who may have signs or symptoms and risk factors for COVID-19. The query process should never supersede the provision of pre-arrival instructions to the caller when immediate lifesaving interventions (e.g., CPR or the Heimlich maneuver) are indicated.
2. When COVID-19 is suspected in a patient needing emergency transport, prehospital care providers and healthcare facilities should be notified in advance that they may be caring for, transporting, or receiving a patient who may have COVID-19 infection.
3. EMS clinician practices should be based on the most up-to-date COVID-19 clinical recommendations and information from appropriate public health authorities and EMS medical direction. Modifications may include:
  - a. If dispatchers advise that the patient is suspected of having COVID-19, EMS clinicians should follow Standard Precautions, including the use of eye protection, and should put on appropriate PPE before entering the scene. Appropriate PPE includes:
    - Respiratory protection: N95 or higher-level respirator or facemask (if a respirator is not available). **N95 respirators or respirators that offer a higher level of protection should be used instead of a facemask when performing or present for an aerosol-generating procedure.** When the supply chain is restored, fit-tested EMS clinicians should return to use of respirators for patients with known or suspected COVID-19. (Source: [CDC](#), accessed 3/23/2020)
    - Eye protection (i.e., goggles or disposable face shield that fully covers the front and sides of the face)
    - A single pair of disposable patient examination gloves
    - Gowns: **If there are shortages of gowns, they should be prioritized for aerosol-generating procedures, care activities where splashes and sprays are anticipated, and high-contact patient care activities that provide opportunities for transfer of pathogens to the hands and clothing of EMS clinicians (e.g., moving patient onto a stretcher).**



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- b. If information about potential for COVID-19 has not been provided by the dispatcher, EMS clinicians should exercise appropriate precautions when responding to any patient with signs or symptoms of a respiratory infection. Initial assessment should begin from a distance of at least 6 feet from the patient, if possible. Patient contact should be minimized to the extent possible until a face mask is on the patient. Explain to the parent/caregiver why the child needs a face mask.
      - c. If COVID-19 is not suspected, EMS clinicians should follow standard procedures and use appropriate PPE for evaluating a patient with a potential respiratory infection.
      - d. A facemask should be worn by the patient for source control. If a nasal cannula is in place, a facemask should be worn over the nasal cannula. Alternatively, an oxygen mask can be used if clinically indicated.
      - e. During transport, limit the number of providers in the patient compartment to essential personnel to minimize possible exposures.
4. Aerosol-generating procedures (e.g., CPR, endotracheal intubation, non-invasive ventilation) expose providers to a greater risk of disease transmission and require additional precautions.
  - a. BVMs, and other ventilatory equipment, should be equipped with HEPA or other viral filter, if available, to filter expired air.
  - b. EMS organizations should consult their ventilator equipment manufacturer to confirm appropriate filtration capability and the effect of filtration on positive-pressure ventilation.
  - c. If possible, the rear doors of the transport vehicle should be opened, and the HVAC system should be activated during aerosol-generating procedures. This should be done away from pedestrian traffic.
5. Special considerations for transport of patients who may have COVID-19
  - a. EMS clinicians should notify the receiving healthcare facility if the patient has an exposure history and signs and symptoms suggestive of COVID-19 so that appropriate infection control precautions may be taken prior to patient arrival.
  - b. Keep the patient separated from other people as much as possible.
    - i. Family members and other contacts of patients with possible COVID-19 should not ride in the transport vehicle, if possible. If riding in the transport vehicle, they should wear a facemask.
    - ii. Isolate the ambulance driver from the patient compartment and keep pass-through doors and windows tightly shut.
  - c. If a vehicle without an isolated driver compartment and ventilation must be used, open the outside air vents in the driver area and turn on the rear exhaust ventilation fans to the highest setting. This will create a negative pressure gradient in the patient area.
  - d. After the transport is completed, the ambulance must be completely cleaned.

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### Resuscitation Training

The American Heart Association and American Academy of Pediatrics support following the existing recommendations for mass gatherings outlined on the [World Health Organization \(WHO\) website](#), and in the U.S. refer to the [Center for Disease Control \(CDC\)](#) recommendations, as well as the proposals and suggestions of the national public health authorities which will have the most up-to-date facts and will provide information on basic protective measures against COVID-19. In the U.S., at the current time, we do not recommend mass training events. Also, anyone who does not feel comfortable gathering for events should not attend mass trainings. And, we urge anyone feeling ill to stay home.

If resuscitation trainings are held, the following guidance may be helpful.

- Practice good hand hygiene
- Decontaminate the mannequins after each student practices using an alcohol-based solution per CDC recommendations
- Face shields should not be used, and direct mouth to mouth ventilations should not be practiced.
- Each student should be provided with a pocket mask and a one-way valve when practicing one-rescuer skills. Pocket masks should not be shared during the course.
- Bag-masks should be used when practicing two rescuer skills, and participants should wear gloves and clean bag-mask devices between practices with an alcohol-based solution per CDC recommendations
- When possible, manikins should be placed 6 feet apart per CDC social distancing recommendations