



A NATION-WIDE APPROACH TO RESPOND TO THE COVID-19 SPREAD IN LEBANON

Interim guidance on resuscitation of suspected or confirmed COVID-19 patients

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Rationale?



From the Emergency Cardiovascular Care Committee and Get With the Guidelines[®]-Resuscitation Adult and Pediatric Task Forces of the American Heart Association in Collaboration with the American Academy of Pediatrics, American Association for Respiratory Care, American College of Emergency Physicians, The Society of Critical Care Anesthesiologists, and American Society of Anesthesiologists:

**Patient
Needs**



**Rescuer
Safety**

COVID-19 Cardiovascular Impact



• Illness related:

- Hypoxemic respiratory failure from ARDS
- Myocardial injury
- Arrhythmias
- Shock

• Treatment related:

- QT prolongation from hydroxychloroquine & azithromycin

Healthcare Workers



- Highest exposure
- Shortage of PPE
- CPR highly aerosolizing:
 - Chest compressions
 - PPV
 - Intubation
- High stress events
- Immediate need for patient care → lapses in infection control practices

General principles in resuscitating COVID-19 patients



- Reduce provider exposure to COVID -19
- Prioritize oxygenation & ventilation strategies with lower aerosolization risk
- Consider appropriateness of resuscitation

Reduce provider exposure to COVID -19



- Rationale:
 - HC force is already strained
 - No need for additional burden
- Strategy:
 - All should wear proper PPE before entering
 - Limit number of personnel
 - Mechanical chest compression device
 - Clearly communicate COVID status to new personnel arriving at the scene

Prioritize oxygenation & ventilation with lower aerosolization risk



- Rationale:
 - Intubation w cuffed tube & HEPA filter carries a lower risk than any other form of PPV
- Strategies:
 - Attach HEPA filter in the path of the exhaled gas
 - Intubate at the *earliest* moment following rhythm analysis & defibrillation

Prioritize oxygenation & ventilation with lower aerosolization risk



- Minimize the likelihood of failed intubations:
 - Most skilled
 - Pausing chest compressions
 - Video laryngoscope whenever available
- Bag-mask + HEPA filter + tight seal, or passive oxygenation w non rebreather (surgical mask)
- LMA if intubation delayed
- Minimize disconnections

Consider the appropriateness resuscitation



•Rationale:

- Consider age, comorbidities, severity of illness
- Likelihood of success vs. risk to rescuers vs. resources diverted.

•Strategies:

- Discuss advanced directives ahead of time
- Risk stratification & communication with families
- Institute policies to guide determination of the appropriateness of starting and terminating resuscitation.

Situation specific considerations



- IHCA (for suspected or COVID +)
 - Pre-arrest:
 - Advanced directives
 - Preemptive intubation
 - Proactively move to negative pressure room
 - During arrest
 - close the door

Situation specific considerations



- During arrest
 - If intubated:
 - Leave on vent with filter
 - Increase FiO_2 to 1
 - Put on PCV targeting a 6ml/kg IBW TV
 - Adjust trigger to OFF
 - RR: adults: 10, up to 30 for neonates
 - Adjust PEEP balancing lung volumes and venous return
 - If prone:
 - If no advanced airway move to supine
 - If intubated proceed with CPR. If supine position necessary while intubated, avoid disconnections

Situation specific considerations



• Neonatal considerations:

- Unclear if newborns are likely to be infectious when mothers are COVID-19+ (providers PPE)
- Initial steps of neonatal resuscitation are unlikely to be AGPs
- Suction of the airway after delivery should not be performed routinely
- Endotracheal instillation of medications are AGPs, (uncuffed tube!). IV delivery ++
- Incubators do not protect from aerosolization

Situation specific considerations



•Maternal considerations:

- Changes of pregnancy may increase the risk of acute decompensation
- Preparation for perimortem delivery
 - After 4 minutes of resuscitation
 - Should be initiated early in the resuscitation (assembly of obstetrical & neonatal teams with PPE) even if ROSC is achieved and perimortem delivery is not required.



Figure 1. Summary of adjustments to CPR algorithms in suspected or confirmed COVID-19 patients.

Reduce provider exposure

- Don PPE before entering the room/scene
- Limit personnel
- Consider using mechanical CPR devices for adults and adolescents who meet height and weight criteria
- Communicate COVID-19 status to any new providers

Prioritize oxygenation and ventilation strategies with lower aerosolization risk

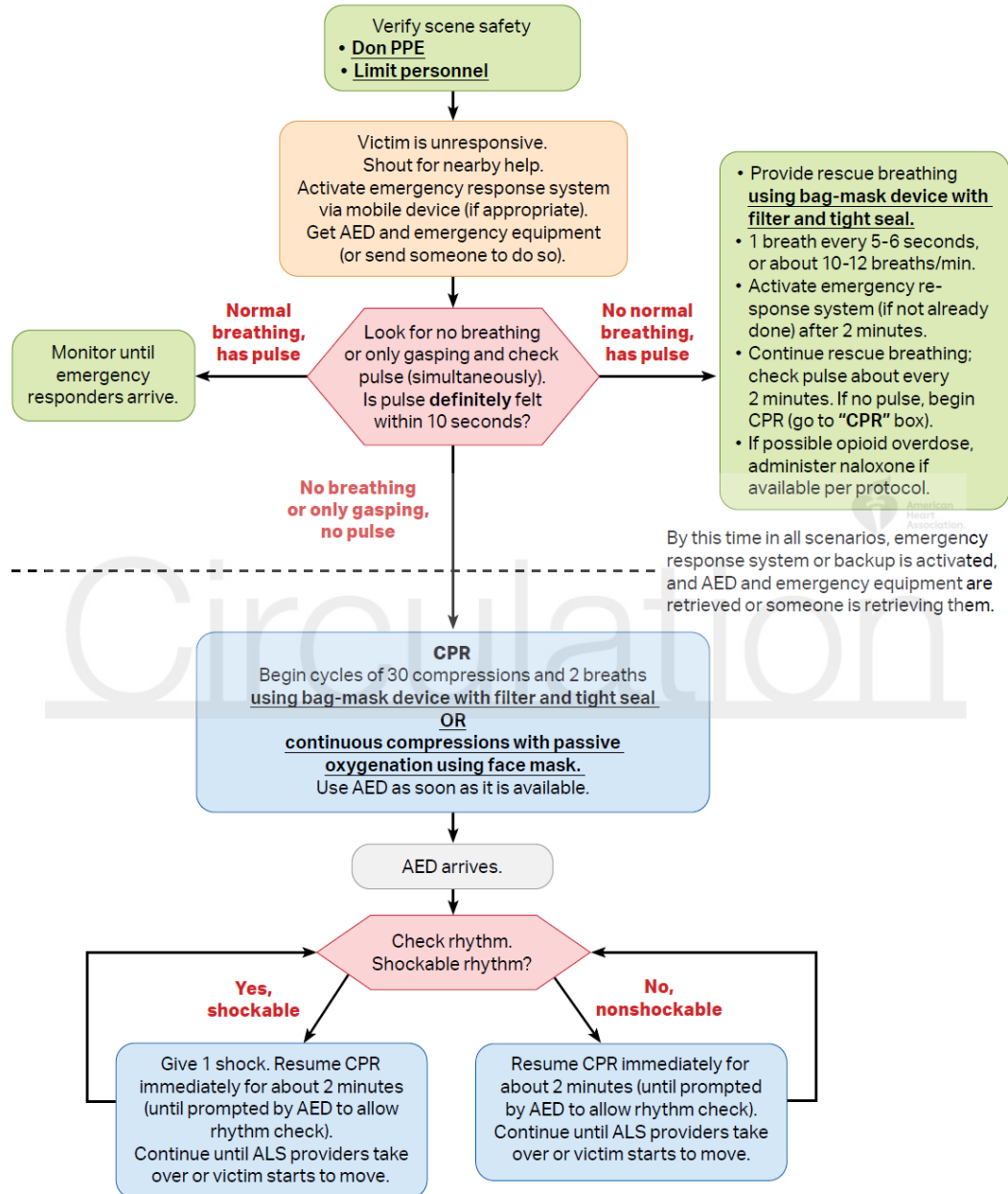
- Use a HEPA filter, if available, for all ventilation
- Intubate early with a cuffed tube, if possible, and connect to mechanical ventilator, when able
- Engage the intubator with highest chance of first-pass success
- Pause chest compressions to intubate
- Consider use of video laryngoscopy, if available
- Before intubation, use a bag-mask device (or T-piece in neonates) with a HEPA filter and a tight seal
- For adults, consider passive oxygenation with nonrebreathing face mask as alternative to bag-mask device for short duration
- If intubation delayed, consider supraglottic airway
- Minimize closed circuit disconnections

Consider resuscitation appropriateness

- Address goals of care
- Adopt policies to guide determination, taking into account patient risk factors for survival

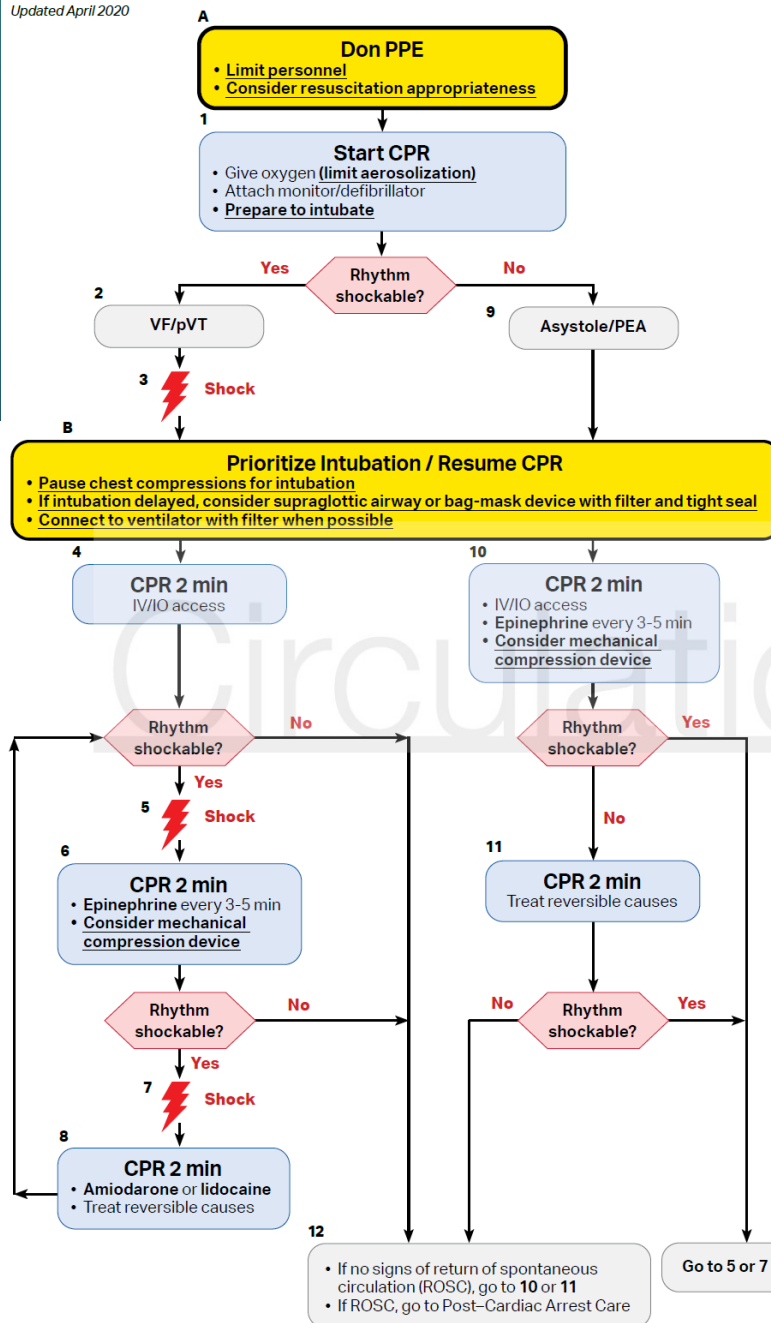
BLS Healthcare Provider Adult Cardiac Arrest Algorithm for Suspected or Confirmed COVID-19 Patients

Updated April 2020



ACLS Cardiac Arrest Algorithm for Suspected or Confirmed COVID-19 Patients

Updated April 2020



CPR Quality

- Push hard (at least 2 inches [5 cm]) and fast (100-120/min) and allow complete chest recoil.
- Minimize interruptions in compressions.
- Avoid excessive ventilation.
- Change compressor every 2 minutes, or sooner if fatigued.
- If no advanced airway, 30:2 compression-ventilation ratio.
- Quantitative waveform capnography
 - If PETCO₂ <10 mm Hg, attempt to improve CPR quality.
- Intra-arterial pressure
 - If relaxation phase (diastolic) pressure <20 mm Hg, attempt to improve CPR quality.

Shock Energy for Defibrillation

- **Biphasic:** Manufacturer recommendation (eg, initial dose of 120-200 J); if unknown, use maximum available. Second and subsequent doses should be equivalent, and higher doses may be considered.
- **Monophasic:** 360 J

Advanced Airway

- **Minimize closed-circuit disconnection**
- **Use intubator with highest likelihood of first pass success**
- **Consider video laryngoscopy**
- Endotracheal intubation or supraglottic advanced airway
- Waveform capnography or capnometry to confirm and monitor ET tube placement
- Once advanced airway in place, give 1 breath every 6 seconds (10 breaths/min) with continuous chest compressions

Drug Therapy

- **Epinephrine IV/IO dose:** 1 mg every 3-5 minutes
- **Amiodarone IV/IO dose:** First dose: 300 mg bolus. Second dose: 150 mg, or
- **Lidocaine IV/IO dose:** First dose: 1-1.5 mg/kg. Second dose: 0.5-0.75 mg/kg.

Return of Spontaneous Circulation (ROSC)

- Pulse and blood pressure
- Abrupt sustained increase in PETCO₂ (typically ≥40 mm Hg)
- Spontaneous arterial pressure waves with intra-arterial monitoring

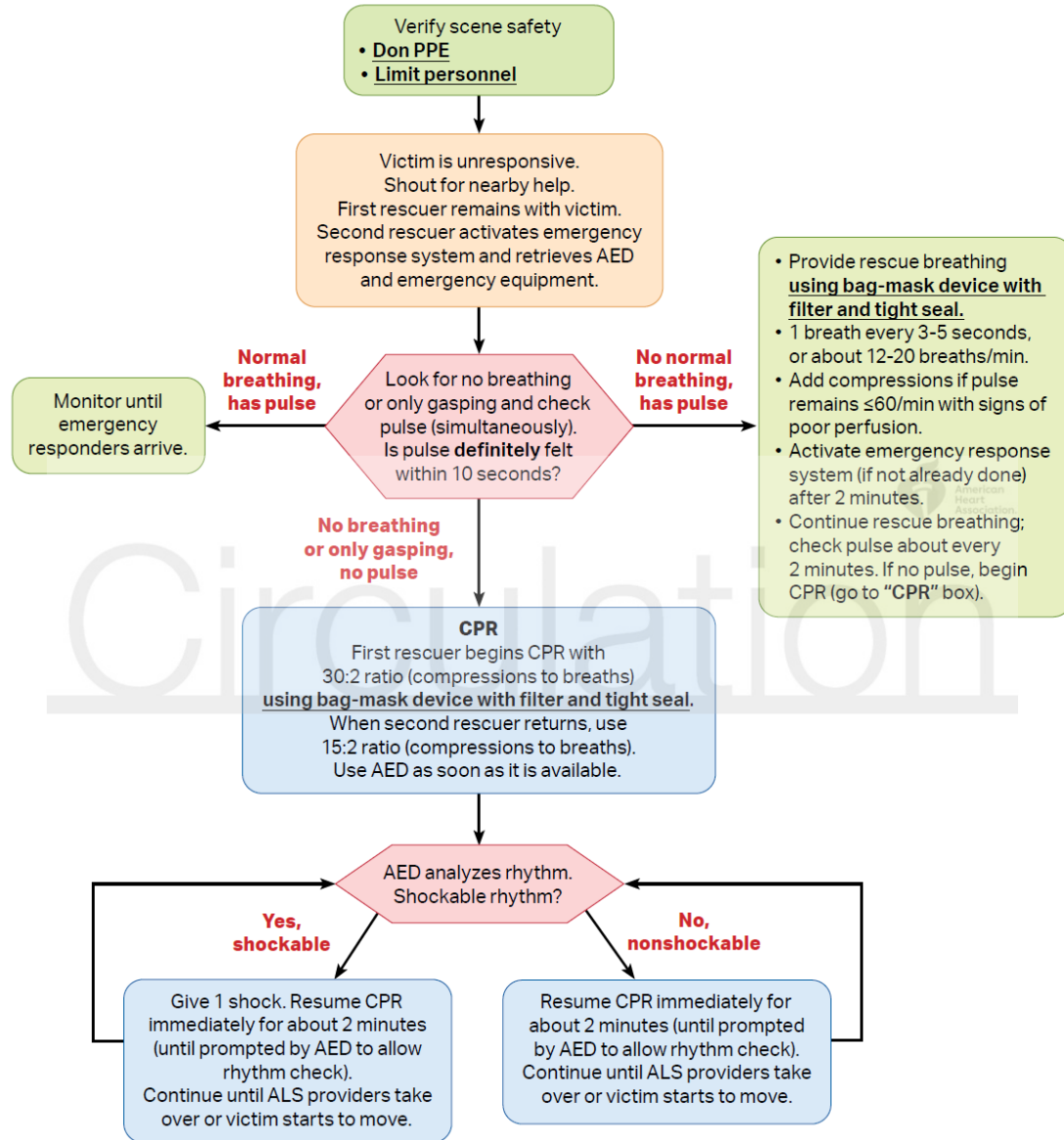
Reversible Causes

- Hypovolemia
- Hypoxia
- Hydrogen ion (acidosis)
- Hypo-/hyperkalemia
- Hypothermia
- Tension pneumothorax
- Tamponade, cardiac
- Toxins
- Thrombosis, pulmonary
- Thrombosis, coronary



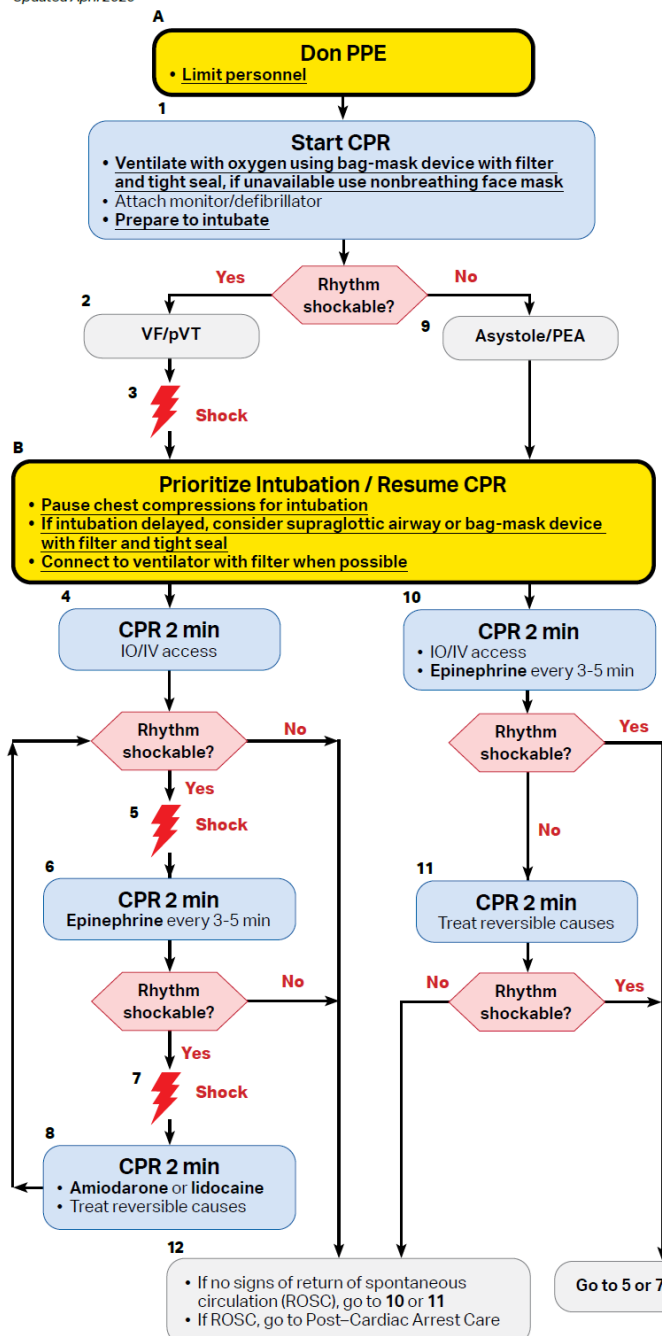
BLS Healthcare Provider Pediatric Cardiac Arrest Algorithm for 2 or More Rescuers for Suspected or Confirmed COVID-19 Patients

Updated April 2020



Pediatric Cardiac Arrest Algorithm for Suspected or Confirmed COVID-19 Patients

Updated April 2020



CPR Quality

- Push hard (≥1/3 of anteroposterior diameter of chest) and fast (100-120/min) and allow complete chest recoil.
- Minimize interruptions in compressions.
- Avoid excessive ventilation.
- Change compressor every 2 minutes, or sooner if fatigued.
- If no advanced airway, 15:2 compression-ventilation ratio.

Shock Energy for Defibrillation

First shock 2 J/kg, second shock 4 J/kg, subsequent shocks ≥4 J/kg, maximum 10 J/kg or adult dose

Advanced Airway

- **Minimize closed-circuit disconnection**
- **Use intubator with highest likelihood of first pass success**
- **Consider video laryngoscopy**
- **Prefer cuffed endotracheal tube if available**
- Endotracheal intubation or supraglottic advanced airway
- Waveform capnography or capnometry to confirm and monitor ET tube placement
- Once advanced airway in place, give 1 breath every 6 seconds (10 breaths/min) with continuous chest compressions

Drug Therapy

- **Epinephrine IO/IV dose:** 0.01 mg/kg (0.1 mL/kg of the 0.1 mg/mL concentration). Repeat every 3-5 minutes.
- **Amiodarone IO/IV dose:** 5 mg/kg bolus during cardiac arrest. May repeat up to 2 times for refractory VF/pulseless VT.
- **Lidocaine IO/IV dose:** Initial: 1 mg/kg loading dose. Maintenance: 20-50 mcg/kg per minute infusion (repeat bolus dose if infusion initiated >15 minutes after initial bolus therapy).

Return of Spontaneous Circulation (ROSC)

- Pulse and blood pressure
- Spontaneous arterial pressure waves with intra-arterial monitoring

Reversible Causes

- Hypovolemia
- Hypoxia
- Hydrogen ion (acidosis)
- Hypoglycemia
- Hypo-/hyperkalemia
- Hypothermia
- Tension pneumothorax
- Tamponade, cardiac
- Toxins
- Thrombosis, pulmonary
- Thrombosis, coronary



**Thank you
and stay safe!**