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"To advance the health of our communities by ensuring quality emergency and disaster medical services."

April 9, 2020

MEMORANDUM

TO: **See Distribution**

FROM: **Marianne Gausche-Hill, MD**
Medical Director, EMS Agency

SUBJECT: **OUT-OF-HOSPITAL CARDIAC ARREST (OHCA) CARE DURING THE COVID-19 CRISIS**

This memo is to clarify current policy regarding OHCA care during the COVID-19 pandemic. The goal is to continue to provide the same quality patient care, while protecting all healthcare providers.

Cardiopulmonary resuscitation (CPR) is an aerosolizing procedure. Given the community spread of COVID-19, patients in cardiac arrest may have COVID-19 infection. COVID-19 causes viral pneumonia with significant hypoxia and is also associated with myocarditis, both of which could lead to cardiac arrest.

At the current time, paramedics shall continue to manage patients with non-traumatic out-of-hospital cardiac arrest by TP 1210, Cardiac Arrest. In addition, they shall follow TP 1245, Potential COVID-19 Patients for all cardiac arrest resuscitations. This guidance may change as this outbreak develops.

Ref. 814, Determination/Pronouncement of Death in the Field, has been updated to provide guidance during the current COVID-19 pandemic. If resuscitative efforts are unsuccessful and the patient does not meet criteria for Termination of Resuscitation (TOR) in Section II.A., Paramedics shall continue to contact Base to consult with Base Physician. This has not changed.

We do not advise transport of patients without Return of Spontaneous Circulation (ROSC).

The physician guidelines for transport versus termination has been clarified to emphasize this recommendation. The Base Physician, per policy, should be involved in **ALL** decisions to transport patients without ROSC. Early transport confers no benefit to the patient; achieving ROSC on scene results in the best chance of good neurologic outcome. Further, transport increases risk of exposure to providers by prolonging resuscitation in a confined space, regardless of whether a mechanical compression device is used. Finally, interruptions in resuscitation are anticipated with early transport, since chest compressions must pause when maneuvering the patient and while moving through the hospital hallways to avoid aerosolizing the virus. Interruptions in chest compressions reduce patients' chances of a good outcome.

The frequency of re-arrest after ROSC is approximately 60%. EMS providers should anticipate possible deterioration after ROSC as the epinephrine

administered during the resuscitation begins to lose effect. Initiating post-resuscitation care, including fluids and preparing push-dose epinephrine for use as needed, can prevent re-arrest, thus it is critical to stabilize on scene after ROSC prior to transport. This has been added to TP 1210, and it is a consideration for pediatric patients per TP 1210-P depending on the circumstances of the arrest and transport time. For adult patients, if the patient re-arrests prior to transport and ROSC cannot be sustained, the Base Physician should determine when TOR or transport is indicated.

For all patients with OHCA who require transport, notification of the SRC in advance Is essential to facilitate the transition of care.

Currently, the Arrive Alive pilot has been suspended, and implementation of the expanded ECMO pilot is also on hold. This pilot involved the early transport of patients with refractory ventricular fibrillation (VF) OHCA, for consideration of extra-corporeal membrane oxygenation (ECMO). Given the COVID-19 pandemic, there are inadequate resources to initiate ECMO on patients with OHCA. Patients with refractory VF shall be managed on scene according the TP 1210 and the decision for TOR per Ref. 814. Special consideration #7 has been revised due to the suspension of ECMO use for patients with OHCA. We continue to recommend longer resuscitation refractory VF patients, as long as resources allow, given these patients can have survival with good neurologic outcome despite prolonged resuscitation.

It is further advised that all EMS and hospital-based healthcare personnel wear personal protective equipment for airborne and contact precautions during management of patients in cardiac arrest until COVID-19 can be excluded. Prehospital providers should don PPE prior to arrival on scene. Once on scene, family and bystanders will anticipate rapid action, but it is most important to protect oneself first in order to stay healthy and continue to treat patients.

Thank you for your assistance and considerations during this difficult time. Please do not hesitate to contact the EMS Agency if you have any questions.

Attachments: TP 1210, 1210-P, 1245

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Treatment Protocol: CARDIAC ARREST **Ref. No. 1210**

Base Hospital Contact: Required prior to transport for all patients in cardiac arrest who do not meet criteria for determination of death per *Ref. 814*.

1. For patients meeting *Ref. 814* Section I criteria for determination of death in the field – document Provider Impression as *DOA – Obvious Death*

2. Resuscitate cardiac arrest patients on scene ❶

3. Initiate chest compressions at a rate of 100-120 per min, depth 2-3 inches ❷
   Minimize interruptions in chest compressions

4. Assess airway and initiate basic and/or advanced airway maneuvers prn ❸❹ *(MCG 1302)*
   Monitor waveform capnography throughout resuscitation ❺

5. Administer high-flow **Oxygen** (15L/min) *(MCG 1302)*

6. Initiate cardiac monitoring *(MCG 1308)*
   Briefly assess rhythm every 2 minutes, minimizing pauses, or continuously via rhythm display technology ❻

V-FIB/PULSELESS V-TACH: ❼

7. **Defibrillate biphasic at 200J** immediately or per manufacturer's instructions
   Repeat at each 2-minute cycle as indicated

8. Establish vascular access *(MCG 1375)*
   Establish IO if any delay in obtaining IV access

9. Begin **Epinephrine** after defibrillation x2:
   Epinephrine (0.1mg/mL) administer 1mg (10mL) IV/IO
   Repeat every 5 min x2 additional doses; maximum total dose 3mg ❽

   CONTACT BASE to discuss additional epinephrine doses in cases where it may be indicated due to recurrent arrest or conversion to PEA

10. After defibrillation x3 (for refractory or recurrent V-Fib/V-Tach without pulses):
    Amiodarone 300mg (6mL) IV/IO
    Repeat **Amiodarone 150mg (3mL) IV/IO** x1 prn after additional defibrillation x2, maximum total dose 450mg

ASYSTOLE/PEA:

11. **Epinephrine (0.1mg/mL) administer 1mg (10mL) IV/IO**
    Repeat every 5 min x2; administer first dose as early as possible; maximum total dose 3mg ❽

    CONTACT BASE to discuss additional epinephrine doses in cases where it may be indicated due to refractory PEA or recurrent arrest

12. Consider and treat potential causes ❾

13. **Normal Saline 1L IV/IO rapid infusion**
    Repeat x1 for persistent cardiac arrest
    For suspected hypovolemia, administer both liters simultaneously

14. For patients with renal failure or other suspected hyperkalemia: ❿
    Calcium Chloride 1gm (10mL) IV/IO
    Sodium Bicarbonate 50mEq (50mL) IV/IO

TERMINATION OF RESUSCITATION:

15. If resuscitative efforts are unsuccessful and the patient does not meet ALL criteria for Termination of Resuscitation in *Ref. 814, Section II.A.*, **CONTACT BASE** to consult with Base Physician ❼

RETURN OF SPONTANEOUS CIRCULATION (ROSC): ⓫⓬

1. Initiate post-resuscitation care immediately to stabilize the patient prior to transport ⓭
2. Establish advanced airway prn ⓮
3. Raise head of stretcher to 30 degrees if blood pressure allows, otherwise maintain supine
4. Continue low volume ventilations at 10-12 per minute ⓯
5. Perform 12-lead ECG and transmit to the SRC ⓰
6. Immediately resume CPR if patient re-arrests
7. For SBP < 90 mmHg:
   Normal Saline 1L IV/IO rapid infusion

   If no response after **Normal Saline 250mL,** or worsening hypotension and/or bradycardia:

   Push-dose Epinephrine – mix 9mL Normal Saline with 1mL Epinephrine 0.1mg/mL (IV formulation) in a 10mL syringe. Administer **Push-dose Epinephrine (0.01mg/mL) 1mL IV/IO** every 1-5 minutes as needed to maintain SBP > 90mmHg ⓱
   CONTACT BASE concurrent with initial dose of **Push-dose Epinephrine**

8. Check blood glucose
   For blood glucose < 60mg/dL
   Dextrose 10% 125mL IV and reassess
   If glucose remains < 60mg/dL, repeat 125 mL for a total of 250 mL

9. For suspected narcotic overdose: ⑱
   Naloxone 2-4mg (2-4mL) IV/IO/IM/IN (For IN, 1mg per nostril or 4mg/0.1mL IN if formulation available)
   Maximum dose all routes 8 mg

SPECIAL CONSIDERATIONS

❶ Maintaining perfusion with continuous high-quality CPR throughout resuscitation is essential to ensuring good patient outcome. Transporting the patient in cardiac arrest causes interruptions in CPR and reduces CPR quality.

❷ Chest compressions are the most important aspect of cardiac arrest resuscitation. Maintaining continuous chest compressions should take priority over any medication administration or transport.

❸ Hyperventilation reduces venous return and worsens patient outcomes. Both continuous and interrupted (30:2) compressions/ventilations are acceptable. Regardless of ventilation method used, ventilations should be no more frequent than 10 per minute with a volume approximately 1/3 of the bag, just enough to see chest rise.

❹ Bag-mask ventilation (BMV) with a viral filter is the preferred method of airway management. BMV in cardiac arrest has been associated with improved patient outcomes and advanced airway placement should be deferred until after return of spontaneous circulation (ROSC) unless BMV is inadequate. If a decision is made to transport the patient in refractory cardiac arrest and inability to maintain effective ventilations with BMV is anticipated, consider advanced airway prior to transport.

❺ $ETCO_2$ should be > 10 with a “box-shaped” waveform during effective CPR. A flat or wavy waveform or $ETCO_2$ < 10 may indicate ineffective compressions or airway obstruction. A sudden increase in $ETCO_2$ is suggestive of ROSC. The waveform can also be used to confirm ventilation rate if an advanced airway or asynchronous ventilation with continuous compressions is used.

❻ If you are able to observe the underlying rhythm during compressions via rhythm display technology, do not pause for the rhythm check. In order to minimize pauses in chest compressions, pulse checks should only be performed during rhythm checks when there is an organized rhythm with signs of ROSC, such as normal capnography or sudden rise in capnography.

❼ Patients in persistent cardiac arrest with refractory V-Fib (3 unsuccessful shocks) or EMS-witnessed arrest of presumed cardiac etiology may have a good outcome despite prolonged resuscitation. For these patients, resuscitation may be continued on scene for up to 40 minutes, as long as resources allow, in order to maximize the chances for field ROSC, which is strongly associated with improved survival with good neurologic outcome.

❽ Epinephrine may improve outcomes if given early in non-shockable rhythms, but can worsen outcomes early in shockable rhythms, where defibrillation is the preferred initial treatment. Epinephrine is most likely to be effective if it is given early and after chest compressions have begun. The likelihood of meaningful survival declines after three (3) doses of epinephrine. Resuscitation should continue focused on quality CPR, defibrillation, and identifying reversible causes. Additional doses of epinephrine should only be administered with Base order.

❾ Potential causes that can be treated in the field include hypoxia, hypovolemia, hyperkalemia, hypothermia, toxins, and tension pneumothorax. Hypoglycemia is a very rare cause of cardiac arrest and should not be assessed until after ROSC. If hypothermia is suspected, resuscitation efforts should not be abandoned until the patient is re-warmed, or after consultation with the Base Physician.

❿ Treat suspected hyperkalemia with calcium and sodium bicarbonate as soon as possible. The

sooner it is administered, the more likely it is to be effective. Flush the line between medication administration.

⓫ Post cardiac arrest patients are at high risk for re-arrest during transport. Fluid resuscitation, vasopressor support, and avoidance of hyperventilation are recommended to decrease the risk of re-arrest.

⓬ All patients with ROSC shall be transported to the most accessible open SRC if ground transport is 30 minutes or less, as initiation of targeted temperature management and early coronary angiography in a specialty center have been shown to improve outcomes.

⓭ Approximately 60% of patients will re-arrest shortly after ROSC. Anticipate this decline as the epinephrine administered during the resuscitation begins to lose effect. Initiating post-resuscitation care, including fluids and preparing push-dose epinephrine for use as needed, can prevent re-arrest. These steps should be initiated immediately after ROSC and prior to transport to reduce chances of re-arrest en route.

⓮ In the ROSC patient, ETT is strongly preferred to King LT placement.

⓯ $ETCO_2$ can help guide your ventilation rate; target $ETCO_2$ 35-40 mmHg. Just after ROSC, the $ETCO_2$ may be transiently elevated. This will decrease appropriately with ventilation and does not require hyperventilation to normalize. Persistently elevated $ETCO_2$ and/or “sharkfin” waveform may indicate respiratory failure as cause of the cardiac arrest. Falsely low $ETCO_2$ measurements can occur if there is a leak with BMV or shock.

⓰ An ECG with STEMI after ROSC requires pre-notification of ECG findings to the SRC.

⓱ **Push-dose Epinephrine** is appropriate for non-traumatic shock including cardiogenic shock. Additional doses beyond 10mL may need to be prepared for prolonged transports.

⓲ Narcotic overdose should be suspected in cases where there is drug paraphernalia on scene or there is a witness report. Pinpoint pupils may be present, but hypoxia during cardiac arrest can cause mydriasis (dilated pupils) instead.

Treatment Protocol: CARDIAC ARREST **Ref. No. 1210-P**

Base Hospital Contact Required. ❶

1. For patients meeting *Ref. 814* Section I criteria for determination of death in the field – document *DOA – Obvious Death*

2. Assess airway and initiate basic airway maneuvers *(MCG 1302)*

3. Assist respirations with bag-mask-ventilations (BMV) with viral filter, using **high-flow Oxygen 15L/min;** Squeeze bag just until chest rise and then release - state "Squeeze, release, release" to avoid hyperventilation ❷

4. For suspected foreign body (no chest rise with BMV): ❸
   Perform direct laryngoscopy and use pediatric Magill forceps to remove visible obstruction(s)

5. Initiate chest compressions at a rate of 100-120 compressions per minute with a compression to ventilation rate of 15:2 ❹❺

6. Initiate cardiac monitoring *(MCG 1308)*
   Briefly assess rhythm every 2 minutes, minimizing pauses, or continuously via rhythm display technology ❻❼

7. Establish vascular access *(MCG 1375)* ❽

8. **CONTACT BASE** concurrent with ongoing management

ASYSTOLE/PEA

9. **Epinephrine (0.1mg/mL) 0.01mg/kg IV/IO**, dose per *MCG 1309*
   May repeat every 5 min x2, maximum single dose 1mg ❾

   CONTACT BASE for additional epinephrine doses

10. Consider and treat potential causes ❿

11. **Normal Saline 20mL/kg IV/IO** per *MCG 1309*
    May repeat x2

V-FIB/PULSELESS V-TACH

12. **Defibrillate at 2J/kg**, dose per *MCG 1309*
    Repeat at **4J/kg** at each 2-minute cycle as indicated

13. **Epinephrine (0.1mg/mL) 0.01mg/kg IV/IO**, dose per *MCG 1309*
    Begin after second defibrillation ❾
    May repeat every 5 min x2, maximum single dose 1mg

    CONTACT BASE for additional epinephrine doses

14. For persistent or recurrent V-Fib/V-Tach without pulses:
Amiodarone (50mg/mL) 5 mg/kg IV/IO, dose per *MCG 1309*

RETURN OF SPONTANEOUS CIRCULATION ⓫⓬

15. Initiate post-resuscitation care on scene to stabilize the patient prior to transport ⓭

16. Establish advanced airway prn ⓮

17. Raise head of stretcher to 30 degrees if blood pressure allows, otherwise maintain supine

18. Continue ventilation at 10-20 breaths per minute ⓮

19. For SBP < 70mmHg:
Normal Saline 20mL/kg IV/IO rapid infusion per *MCG 1309*
Repeat x1 for persistent poor perfusion

    If no response after **Normal Saline 20mL/kg,** or worsening hypotension and/or bradycardia:
Push-dose Epinephrine – mix 9mL Normal Saline with 1mL Epinephrine (0.1mg/mL) IV formulation in a 10mL syringe; administer **Push-dose Epinephrine (0.01mg/mL)** per *MCG 1309* every 1-5 minutes as needed to maintain SBP > 70mmHg ⓯

20. Check blood glucose ⓰
For blood glucose < 60mg/dL
Dextrose 10% 5mL/kg IV/IO per *MCG 1309*

21. For suspected narcotic overdose: ⓱
Naloxone (1mg/mL) 0.1mg/kg IM/IN/IO/IV, dose per *MCG 1309*

SPECIAL CONSIDERATIONS

❶ EMS Personnel are mandated reporters of child abuse and neglect, and a report should be made when suspected as per *Ref. 822*. Communicate suspicion for child abuse and/or neglect to accepting ED staff when home suggests children could be at risk for harm (e.g., unkept home, evidence of drug or alcohol abuse, unsafe living conditions, known or suspected domestic violence), when the history does not match with the severity of physical findings (e.g., child posturing after a roll off the couch), when patterned injury or burns or noted (e.g., circular burns as from a cigarette, whip marks on the skin, burns of both hands or feet), or when child reports physical or sexual abuse. Children < 3 years of age and those with developmental delay are at increased risk of abuse. This must also be accompanied by notification to the Department of Children and Family Services (DCFS).

❷ Bag-mask ventilation (BMV) with a viral filter is the preferred method of airway management. BMV in cardiac arrest has been associated with improved patient outcomes and advanced airway placement should be deferred until after return of spontaneous circulation (ROSC) unless BMV is inadequate.

❸ Children < 3 years of age are at high risk for foreign body aspiration. Foreign body aspiration should be suspected if there is a history of possible aspiration or when there is no chest rise with BMV after repositioning of the airway.

❹ Maintaining perfusion with continuous high-quality CPR throughout resuscitation is essential to ensuring good patient outcome. Chest compressions are the most important aspect of cardiac arrest resuscitation. Maintaining continuous chest compressions should take priority over any medication administration or transport.

❺ Hyperventilation reduces venous return and worsens patient outcomes. Both continuous and interrupted (15:2) compressions/ventilations are acceptable. Regardless of ventilation method used, ventilations should be no more frequent than 10 per minute with a volume just enough to see chest rise.

❻ If you are able to observe the underlying rhythm during compressions via rhythm display technology, do not pause for the rhythm check.

❼ $ETCO_2$ should be > 10 with a “box-shaped” waveform during effective CPR. A flat or wavy waveform or $ETCO_2$ < 10 may indicate ineffective compressions or airway obstruction. A sudden increase in $ETCO_2$ is suggestive of ROSC. The waveform can also be used to confirm ventilation rate if an advanced airway or asynchronous ventilation with continuous compressions is used.

❽ Peripheral venous access may be difficult to obtain in infants and small children. Consider IO placement as primary vascular access in patients for whom venous access is unlikely to be achieved rapidly. For older children, make two attempts at venous access and, if unsuccessful, place and IO for vascular access.

❾ Epinephrine may improve outcomes if given early in non-shockable rhythms, but can worsen outcomes early in shockable rhythms, where defibrillation is the preferred initial treatment. Epinephrine is most likely to be effective if it is given early and after chest compressions have begun. The likelihood of meaningful survival declines after three (3) doses of epinephrine. Resuscitation should continue focused on quality CPR, defibrillation, and identifying reversible causes. Additional

doses of epinephrine should only be administered with Base order if indicated, based on the individual patient.

⑩ Potential causes that can be treated in the field include hypoxia, hypovolemia, hyperkalemia, hypothermia, toxins, and tension pneumothorax. Hypoxia and Hypovolemia are common causes of PEA arrest in children. Hypoglycemia is a very rare cause of cardiac arrest and should not be assessed until after ROSC.

⑪ Post cardiac arrest patients are at high risk for re-arrest during transport. Fluid resuscitation, vasopressor support, and avoidance of hyperventilation are recommended to decrease the risk of re-arrest.

⑫ $ETCO_2$ can help guide your ventilation rate; target $ETCO_2$ 35-40 mmHg. Just after ROSC, the $ETCO_2$ may be transiently elevated. This will decrease appropriately with ventilation and does not require hyperventilation to normalize. Persistently elevated $ETCO_2$ and/or “sharkfin” waveform may indicate respiratory failure as cause of the cardiac arrest. Falsely low $ETCO_2$ measurements can occur if there is a leak with BMV or shock.

⑬ Re-arrest shortly after ROSC is common. Anticipate this decline as the epinephrine administered during the resuscitation begins to lose effect. Consider initiating post-resuscitation care prior to transport, if the scene allows, in order to reduce chances of re-arrest en route. Considerations include suspected cause of arrest and anticipated transport time to a Pediatric Medical Center.

⑭ In the ROSC patient, BMV is preferred method for ventilation; in a patient longer than the length-based resuscitation tape (e.g., Broselow tape) or > 40 kg body weight ETT is strongly preferred to King LT placement.

⑮ **Push-dose Epinephrine** is appropriate for non-traumatic shock including cardiogenic shock. Additional doses beyond 10mL may need to be prepared for prolonged transports. For patients < 10kg, transfer the diluted **Push-dose Epinephrine** to a smaller (1mL or 3mL) syringe in order to administer the dose accurately.

⑯ In pediatric patients, post-arrest hypoglycemia should be treated with Dextrose 10% half-the dose delivered (2.5 mL/kg) and then blood glucose rechecked, and if measured glucose > 60 mg/dL no additional dextrose should be delivered.

If the rechecked blood glucose is < 60 mg/dL then administer an additional Dextrose 10% 2.5 mL/kg IV/IO; Hyperglycemia > 180 mg/dL should be avoided to optimize outcome.

⑰ Narcotic overdose should be suspected in cases where there is drug paraphernalia on scene or there is a witness report. Pinpoint pupils may be present, but hypoxia during cardiac arrest more often causes mydriasis (dilated pupils) instead.

DEPARTMENT OF HEALTH SERVICES
COUNTY OF LOS ANGELES

Treatment Protocol: POTENTIAL COVID-19 PATIENTS **Ref. No. 1245**

Steps 1-4 apply to **all** patient contacts. For patients that have a positive prehospital screen for potential COVID-19 infection, the remainder of this protocol should be used in addition to the appropriate Treatment Protocol(s) based on Provider Impression(s).

Base Hospital Contact: Required for severe respiratory distress and respiratory failure.

1. Assume that all patients, regardless of dispatch complaint, may have COVID-19 ❶
   Minimum recommended PPE for all patient encounters is a surgical mask, eye protection, and gloves ❷

2. Perform initial assessment of all patients, including COVID-19 screen, from at least 6 feet away if possible ❸

3. If approaching the patient is required to complete the screening, have a single provider don PPE (including at minimum a surgical mask, eye protection, and gloves, and gown if available) and approach the patient to perform an assessment to determine what level of PPE is required ❹❺❻

4. For patients in cardiac arrest, all providers shall don the appropriate PPE (including N95 or P100 mask, eye protection, and gloves, and gown if available) prior to approaching the patient ❺

5. For any patient who screens positive for potential COVID-19 infection all providers shall: ❸
   Utilize this TP in addition to the appropriate TPs based on provider impression(s)
   Place a surgical mask on the patient❼
   Don PPE prior to approaching the patient, including surgical mask or N95 as appropriate, eye protection, and gloves, and gown if available ❺❻

6. Consider if the patient is appropriate for non-transport per Ref 834.1

7. Limit interventions to essential procedures only
   Routine auscultation of lung sounds, administration of nebulized medications and use of CPAP is discouraged except as outlined below

8. Assess airway and initiate basic and/or advanced airway maneuvers prn *(MCG 1302)*
   Aerosol-generating procedures (including suctioning, CPAP, bag-mask ventilation, and advanced airway placement) require N95 masks and gowns for all providers ❺
   If advanced airway is required, King Airway is preferred to endotracheal intubation
   Use of a viral filter is encouraged for all positive-pressure ventilation

9. Administer **Oxygen** for O_2 sat <90% at the lowest flow possible to achieve O_2 sat ≥90%
   Place a surgical mask on the patient over the oxygen delivery device

10. For none to mild respiratory distress
    Do not perform any field treatment
    Consider non-transport per Ref 834.1

11. For moderate respiratory distress
    Do not administer nebulized medications or apply CPAP
    For bronchospasm, assist patient with use of their own metered-dose inhaler (MDI) or administer albuterol via MDI if available (Adults: 5 puffs, Pediatrics: 2 puffs, may repeat in 15 minutes prn) ❽

12. For severe respiratory distress
    Utilize CPAP with appropriate PPE ❹
    For bronchospasm, administer albuterol via nebulizer with appropriate PPE or MDI with spacer preferred if available and tolerated by patient (Adults: 5 puffs, Pediatrics: 2 puffs, may repeat in 15 minutes prn) ❹❽

    For patients with known asthma presenting with severe bronchospasm, Epinephrine IM is the preferred treatment in addition to MDI as the initial intervention as per MCG 1309

    CONTACT BASE for guidance on use of CPAP and nebulized medications for patients with severe respiratory distress

13. For poor perfusion:
    Normal Saline 1L IV rapid infusion ❾
    Reassess after each 250mL increment for evidence of volume overload (pulmonary edema); stop infusion if pulmonary edema develops

14. During transport, restrict the number of providers in the patient compartment to only essential personnel to minimize possible exposures and, if possible, adjust the ventilation system air changes/hour to the highest rate and consider opening windows ❿

15. Notify the receiving hospital for any patient who screens positive for possible COVID-19
    Provide notification for all patients, including those who are transported BLS
    Prior to entry into the hospital, one provider should doff PPE and discuss plan for handoff with the triage RN
    You may be directed to an alternative triage area or handoff may occur outside the hospital

16. Discontinue all aerosol-generating procedures (including nebulized medication and/or CPAP prior to entry into the hospital triage area); discuss with the triage RN before entry for patients in severe distress requiring these interventions so that appropriate handoff can be arranged

17. For documentation:
    1) Document positive COVID-19 screening and level of PPE worn in your narrative summary
    2) Consider the following Provider Impressions and document as appropriate:

    Cold / Flu Symptoms (COFL) - For minor respiratory illness in a patient without shortness of breath or wheezing; must have normal respiratory rate and O_2 sat (if available).

    Respiratory Distress / Bronchospasm (SOBB) - For COPD/asthma exacerbations and any bronchospasms/wheezing not from pulmonary edema.

    Respiratory Distress / Other (RDOT) - For patients with pulmonary disease that is not edema or bronchospasm, includes suspected pneumonia, PE, pneumothorax and non-pulmonary and unknown causes of respiratory distress.

    Respiratory Arrest / Failure (RARF) - For patients requiring positive-pressure ventilation and/or hypoxia despite 100% oxygen.

Fever (FEVR) - For reported or tactile fever that is NOT suspected sepsis. For sepsis use PI Sepsis.

Sepsis (SEPS) - For patients with suspected sepsis (i.e., signs suggestive of sepsis including fever, tachycardia, suspected infection).

Other Provider Impressions may apply for patients with other primary complaints who also have signs and symptoms potentially consistent with COVID-19

SPECIAL CONSIDERATIONS

❶ Do not rely on dispatch pre-arrival screening to catch all possible screened positive patients, repeat screening yourself. Patients with COVID-19 may present with complaints other than shortness of breath or fever. In addition, there is documented community spread, so travel or contact with a known case is not required for a positive screen.

❷ This PPE is recommended as the supply chain allows. It is preferable to change the mask after every encounter with a patient who screens positive. Masks, including surgical masks and N95 masks, may be considered for limited reuse on up to 5 patient encounters unless it is visibly soiled, contaminated with bodily fluids, or used in a high-risk situation (i.e., aerosolizing procedures). More information on reuse and extended use can be found at:
https://www.cdc.gov/niosh/topics/hcwcontrols/recommendedguidanceextuse.html

❸ A positive screen is any patient with any ONE of the following:

Fever (reported or tactile), cough, or shortness of breath, OR

Under quarantine/isolation for potential or confirmed COVID-19, OR

Had any contact with a person who is undergoing testing or confirmed to have COVID-19, OR

Any domestic or international travel in the last 21 days; travel is **NOT** required to have a positive screen.

❹ If the patient is ambulatory in a home or residential building, consider asking them to come out to you to reduce exposure to surfaces in the home.

❺ Droplet and contact precautions should be taken for all potential COVID-19 patients. Airborne and contact precautions should be taken for all aerosolizing procedures including suctioning, CPAP, nebulized medications, bag-mask ventilation, advanced airway placement and chest compression, this includes an N95 or P100 respiratory and gown, in addition to the eye protection and gloves required for all patients screening positive for potential COVID-19. Goggles are the preferred eyewear. For airway management, a face shield worn over the eyewear of the operator can provide additional protection during this high-risk procedure. If no gowns are available, wear EMS issued raincoat; doff it in ambulance bay into a bio-container bag; prior to reuse, wipe it down with the same cleaners used to decon the ambulance and then rinse with water.

❻ There is no data to suggest that N95 masks are more effective than surgical masks for routine care of COVID-19 patients. Therefore, N95 masks should be reserved for use during high-risk aerosolizing procedures unless there is adequate supply.

❼ Patients may be contagious and transmit COVID-19 even before developing symptoms, consider masking ALL patients, not just those who have a positive COVID-19 screen, **if the supply chain allows**.

❽ Administration of albuterol via a metered-dose inhaler (MDI) with spacer is considered equivalent to nebulized albuterol; a spacer is typically required for this route to be effective in novice users. MDIs are single use and should be left with the hospital staff upon handoff of the patient; be sure to leave it with the hospital since MDIs are in short supply.

❾ Although COVID-19 patients can quickly develop pulmonary edema, potential COVID-19 patients should receive IVF if they have signs of poor perfusion. Patients with suspected sepsis should continue to managed with IVF per TP 1204, Sepsis. Patients remain undifferentiated in the field. If in doubt, it is reasonable to administer Normal Saline up to 1L.

❿ Family members and other contacts of patients with possible COVID-19 should NOT ride in the transport vehicle, if possible. Consider allowing one parent or caregiver of an infant or child to be transported. If riding in the transport vehicle, they should wear a surgical mask. All areas of the transport cabin are exposed (as well as the driver compartment if connected). The higher air changes/hour may reduce the concentration of infectious particles, but does not eliminate risk.