State of Michigan
OBSTETRICS AND PEDIATRICS
PEDIATRIC CRASHING PATIENT/IMPENDING ARREST

Initial Date: 01/27/2023
Revised Date: 05/25/2023 Section 4-9

Purpose: EMS frequently encounters patients that are critically ill and quickly deteriorating to the point of cardiac or respiratory arrest. Deterioration can often occur while packaging and loading these patients. It is important to rapidly recognize the deteriorating patient and taking immediate action to stabilize the condition prior to loading and transporting. The following timeline provides a prioritization of the goal-directed treatments to stabilize the patient and prevent deterioration.

1. **Criteria: Patient ≤ 14 years of age**
   a. Inclusion:
      i. Patient in whom cardiac or respiratory arrest appears imminent
      ii. Patient with provider impression of critical illness, including new onset altered mental status, airway compromise or severe respiratory distress/failure,(cyanosis, severe retractions, head bobbing,grunting, respiratory rate extremes per age-adjusted normal MI-MEDIC), and/or signs and symptoms of shock/poor perfusion. (capillary refill greater than 3 seconds, tachycardia or hypotension per age-adjusted normal on MI-MEDIC).
   b. Exclusion:
      i. Life-threatening trauma that has not been corrected (i.e., exsanguination, pneumothorax, etc.)
2. **Critical Actions (within First 5 Minutes)**
   a. Airway
      i. Open airway manually. For child <2 years old, place padding under shoulders (align auditory meatus with sternal notch).
      ii. Insert nasopharyngeal or oropharyngeal Airway as indicated/tolerated if not following commands (GCS motor <6), as indicated/tolerated if GCS <9, or no response to verbal stimuli per the **Airway Management-Procedure Protocol**.
   b. Breathing
      i. If respiratory failure or distress, sit patient up if tolerated and not contraindicated by suspected spine injury. keep the patient calm and allow them to maintain a position of comfort, if possible.
      ii. Provide high-flow oxygen per the **Oxygen Administration-Procedure Protocol.**
         A. If respirations are <10 per minute, ventilate by BVM at 15LPM. Two-person, two-handed technique is most effective and is highly recommended if the number of providers allows.
         B. If respirations are inadequate, ventilate by BVM at 15LPM. Administer ventilations guided by chest rise. Two-person, two-

handed technique is most effective and is highly recommended if the number of providers allows.

iii. If respirations are >10 but inadequate, apply CPAP for respiratory distress/hypoxia if appropriate size CPAP available. Refer to **CPAP-Procedure Protocol** for age/size requirements.

iv. Respirations may be assisted with BVM in sitting position if patient tolerates.

v. Consider PPV by BVM if not following commands or SpO2 <90%

vi. If respirations appear adequate, but the patient is not following commands or SpO2 persistently less than 90%, consider ventilation by BVM with 15LPM oxygen

vii. Administer ventilations guided by chest rise. Two-person, two-handed technique is most effective and is highly recommended if the number of providers allows.

S vii. Consider waveform capnography if appropriate per **End Tidal Carbon Dioxide Monitoring-Procedure Protocol**

c. Circulation

i. Reference MI-MEDIC cards for age-adjusted expected blood pressure and heart rate ranges.

ii. If bradycardic (HR <60), optimize ventilation/oxygenation. Refer to the **Pediatric Bradycardia-Treatment Protocol.**

S iii. Emergent IV/IO access - Limit IV attempts to 2 total. For unresponsive or severely compromised pediatrics, IO can be the initial attempt.

d. Monitoring

i. NIBP (cycle every 3 minutes)

ii. SpO2

S iii. Continuous capnography per **End Tidal Carbon Dioxide-Procedure Protocol**.

iv. EKG

3. Immediate actions within First 10 Minutes

a. Circulation

S i. If evidence of poor perfusion, administer **NS** or **LR** 20 mL/kg bolus (unless cardiogenic shock suspected i.e., JVD, hepatomegaly, abdominal distension, crackles, etc.).

S A. If suspected cardiogenic shock, administer 5-10 mL/kg **NS** bolus instead and contact Medical Control.

ii. If dysrhythmia is thought to be primary cause of shock, contact Medical Control to discuss further interventions (electrical therapy with cardioversion or pacing, etc.).

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4. **Actions within First 15 Minutes**
    a. Re-assess response to treatments, including capillary refill with vital signs
        i. Recheck vitals and listen to lungs following fluid bolus.
        A. If decreasing oxygen saturations, crackles, or worsening respiratory distress —STOP fluid bolus and contact Medical Control immediately.
            i. Consider starting vasopressors per **Shock-Treatment Protocol**.
    b. Circulation
        i. Repeat **NS** or **LR** 20 ml/kg bolus if indicated, maximum total dose 40 ml/kg.
        ii. If bradycardia (HR <60), optimize ventilation/oxygenation and refer to the **Pediatric Bradycardia-Treatment Protocol**
        iii. If no response to fluids, follow **Shock-Treatment Protocol**
5. **Actions within First 20 Minutes**
    a. Re-assess response to treatments
    b. Circulation
        i. Continue fluids as indicated by **Shock-Treatment Protocol** or contact Medical Control
        ii. Continue vasopressors (push-dose) as indicated by **Shock-Treatment Protocol** or contact Medical Control
    c. Airway
        i. Insert advanced airway, if indicated and appropriate size available, per **Airway Management-Procedure Protocol.**
6. Once critical and immediate actions have been completed: move the patient to ambulance for transport. Transport may be initiated earlier per provider discretion.

Notes:

1. The specific lengths of time listed are approximate to provide a sense of urgency and to prioritize actions. Provider safety is of utmost importance. Care for these patients should be given as quickly as possible, but safety considerations and the scene environment may lead to times that are longer than these stated goals. When conditions make it impossible to meet these goals, the reasons should be documented.

2. Actions listed should be simultaneous and not in any specific order. As critical actions are performed, transport may be initiated. However, transport should not supersede initiation of life saving intervention.

3. The concepts/actions listed can also be used in conjunction with the **Pediatric Return of Spontaneous Circulation (ROSC)-Treatment Protocol** to prioritize key interventions prior to transport of cardiac arrest patients with ROSC.

MCA Quality Improvement Performance Parameters:

1. Review all cases of cardiac arrest witnessed by (in presence of) EMS providers for compliance with this protocol.

2. Ensure that specific treatments also follow other appropriate protocols, e.g., Airway Management, Shock, Tachycardia, Bradycardia, etc.