Memorial EMS
Decatur Memorial EMS
Springfield Memorial EMS

Section 25

Pediatric Resuscitation

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Pediatric Cardiac Arrest Protocol

The successful resuscitation of a child in cardiac arrest is dependent of a systematic approach of initiating life-saving CPR, recognition of any airway obstructions, adequate oxygenation & ventilation, early defibrillation and transitioning care to Advanced Life Support providers in a timely manner. The majority of pediatric patients found in non-traumatic cardiac arrest are found to have some form of airway obstruction or respiratory failure. When good BLS care is provided by initiating CPR and/or relieving foreign body airway obstructions, pediatric patients have a better chance at a positive outcome. Adequate ventilation is the most important step in pediatric resuscitation. Always refer to your Broselow Tape.

EMR Care

EMR Care should be focused on confirming that the patient is in full arrest and in need of CPR. Resuscitative efforts should be initiated by opening the airway and initiating ventilations & chest compressions while attaching a defibrillator. It is important to assure that CPR is being performed correctly following AHA guidelines.

1. Determine unresponsiveness. Confirm that a transporting unit (and Paramedic intercept) has been activated).
2. Maintain patent airway and assess breathing. If breathing is absent or inadequate, give two (2) rescue breathes with a barrier device.
3. Check for a pulse (10 seconds). If pulseless, **begin CPR**. The patient should be ventilated at 20-30 breaths/min using oxygen at 15 L/min via BVM.
4. **Apply an AED** after 2 min of CPR to determine if defibrillation is needed.
    a. If PEDIATRIC PADS are available-apply as pictured on each of the AED electrodes with proper contact and without any overlap of the pads. If overlap of the pads occurs, use anterior (front)/ posterior (back) placement with cervical spine precautions if neck/back injury is suspected.
    b. If ADULT PADS only- apply anterior (front)/ posterior (back) with cervical spine precautions if neck/back injury is suspected.
        i. Placement of the anterior AED pad (electrode) on the front of the patient mid-chest and the posterior pad of the back of the patient mid-back. (Always follow manufacturer's recommendations and diagrams for pad placement). –see following diagram**

**Use the anterior/posterior pad placement if no pediatric pads are available and adult Quick Combos or Fast Patches are being utilized for a pediatric patient.

Pediatric Cardiac Arrest Protocol

EMR Care {Continued}

5. Continue CPR until the AED is attached and turned on. Stop CPR when the AED is analyzing:
    a. If the AED indicates "SHOCK ADVISED", call out "CLEAR!" check for the safety of others, and push the shock button (or stand clear if the AED device does not require shock activation).
    b. Immediately resume CPR for 2 minutes.
    c. Reassess the patient and allow the AED to analyze
    d. If the AED indicates "SHOCK ADVISED", call out "CLEAR!" check for the safety of others and push the shock button (or stand clear if the AED device does not require shock activation).
    e. Check for a pulse if the AED states "NO SHOCK ADVISED".
    f. Continue CPR if pulse is absent.
    g. Continue in 2-minute cycles. Defibrillate if indicated.
    h. If the patient regains a pulse at any time during resuscitation, then maintain the airway and assist ventilations.
    i. Re-analyze the patient' rhythm with the AED if the patient returns to a pulseless state. Shock if indicated.
6. Immediately transition patient care to the transporting provider or Paramedic intercept crew upon their arrival
7. Complete all necessary cardiac arrest documentation.

EMT Care

1. EMT Care includes all of the components of EMR Care.
2. Shocks delivered to the patient prior to the transporting unit arriving on scene should be taken into consideration during the transition of care. Transporting crews may want to utilize the AED used by the non-transporting First Responders if circumstances allow for exchange of equipment or personnel ride-along.
3. Call for Paramedic intercept and initiate transport as soon as possible.
4. Contact Medical Control.

A-EMT/EMT-I Care

1. A-EMT/EMT-I Care includes all components of EMT Care.
2. Apply Quick-Combo pads (or Fast Patches) and transfer patient to manual defibrillator.
3. **Evaluate rhythm**.
4. If V-fib or pulseless V-tach, immediately defibrillate at 2 J/kg based on appropriate protocol
5. Immediately resume CPR for 2 minutes.
6. Evaluate the patient rhythm and defibrillate if needed at 4J/kg. Continue CPR and reevaluate patient rhythm every 2 minutes.

Pediatric Cardiac Arrest Protocol

A-EMT/EMT-I Care {Continued}

7. **Obtain peripheral IV or IO access** when resources exist.
8. If BVM with OPA/NPA is adequately ventilating the patient, no additional airway is required If the patient is inadequately ventilated with a BVM and OPA/NPA then proceed with Supraglottic Airway insertion.
9. **Obtain peripheral IV or IO access**.

Paramedic Care

1. Paramedic Care includes all components of A-EMT/EMT-I Care.
2. **Identify and treat cardiac dysrhythmias** according to the appropriate protocol.
3. If BVM with OPA/NPA or a Supraglottic Airway is adequately ventilating the patient, no additional airway is required. If the patient is inadequately ventilated with a BVM and OPA/NPA or a Supraglottic Airway then proceed with intubation per the *Pediatric Advanced Airway Protocol*
4. Anterior/Posterior pad placement:

Critical Thinking Elements

- If the cardiac arrest is witness by EMS personnel, start CPR and defibrillate immediately after the Fast Patches or Quick Combos are placed.
- Treat the patient- not the monitor. A rhythm present on the monitor screen should NOT be used to determine pulse. If the monitor shows a rhythm and the patient has no pulse, begin CPR (the patient is in PEA- pulseless electrical activity.)

Resuscitation of Pediatric Pulseless Rhythms Protocols

The successful resuscitation of patients in cardiac arrest is dependent on a systematic approach to resuscitation. ACLS medications are an important factor in successful resuscitation of the pulseless patient when the initial rhythm is not ventricular fibrillation (V-fib) or in cases when defibrillation has been unsuccessful. It is important that BLS providers understand the value of effective CPR and a Paramedic intercept is providing the patient with ACLS therapy.

EMR/EMT Care

Not applicable. EMRs and EMT personnel are not equipped with ACLS medications and shall treat the patient in accordance with the Pediatric Cardiac Arrest Protocol.

Ventricular Fibrillation (V-fib) or Pulseless Ventricular Tachycardia (V-tach)

A-EMT/EMT-I Care

1. Initiate *Pediatric Cardiac Arrest Protocol*.
2. Evaluate the rhythm after 2 minutes of CPR. If V-Fib or pulseless V-Tach: **Defibrillate** at 2 J/Kg**
    a. If the patient converts to a perfusing rhythm at any time (with a heart rate > 80 bpm), administer **Lidocaine** 1mg/ kg IV/IO (with Medical Control order only).
3. Immediately resume CPR for 2 minutes and re-evaluate the patient/rhythm.
4. **Obtain IV/IO access**.
5. **Epinephrine 1:10,000** 0.01mg/kg IV/IO Minimum dose 0.1 mg (Max single dose: 1 mg) and repeat every 3 to 5 minutes as needed.
6. If pulseless F-fib/V-tach persists **Defibrillate** at 4J/kg.
7. Immediately resume CPR for 2 minutes and re-evaluate patient/rhythm every 2 minutes.
8. **Lidocaine** 1 mg/kg IV/IO. Repeat bolus: 1 mg/kg IV/IO in 3-5 minutes to a total of 3 mg/kg for refractory V-fib/ V-tach.
9. If pulseless V-fib/ V-tach persists: **Defibrillate** at 4J/ kg.
10. Immediately resume CPR and re-evaluate patient rhythm every 2 minutes.
11. **IV Fluid Therapy** 20 mL/kg fluid bolus for suspected hypovolemia.
12. If blood sugar is < 60mg/dL, refer to *Pediatric Altered Level of Consciousness Protocol*
13. If suspected narcotic ingestion, refer to *Pediatric Ingestion/Overdose Protocol.*
14. Initiate Paramedic intercept and transport as soon as possible.
15. Contact Medical Control as soon as possible.

** If the patient converts to a perfusing rhythm (with a heart rate > 80 bpm) following defibrillation, administer Lidocaine: 1mg/kg IV/IO (with Medical Control order only).

Paramedic Care

1. Paramedic Care includes all components of A-EMT/EMT-I Care.
2. **Amiodarone** 5mg/kg IV/IO. Max single does 300 mg.

Resuscitation of Pediatric Pulseless Rhythms Protocols

Pulseless Electrical Activity and Asystole

A-EMT/EMT-I Care

1. Initiate *Pediatric Cardiac Arrest Protocol*.
2. Evaluate rhythm after 2 minutes of CPR.
3. **Epinephrine 1:10,000** 0.01 mg/kg IV/IO (Minimum does 0.1mg) (Max single dose: 1mg) every 3-5 minutes as needed.
4. Continue CPR and re-evaluate patient/rhythm every 2 minutes.
5. **IV Fluid Therapy** 20 mL/kg fluid bolus for suspected hypovolemia.
6. If blood sugar is < 60mg/dL, refer to *Pediatric Altered Level of Consciousness Protocol*
7. If suspected narcotic ingestion, refer to *Pediatric Ingestion/Overdose Protocol*.
8. Initiate Paramedic intercept and transport as soon as possible.
9. Contact Medical Control as soon as possible

Paramedic Care

1. Paramedic Care includes all components of A-EMT/EMT-I Care.
2. **Needle chest decompression** for a patient in *traumatic* cardiac arrest with suspected tension pneumothorax. Use a 14ga angiocath 2 inches or less in length. Ensure that the specific safety mechanism will allow for the release of air.
3. **Sodium Bicarbonate** 1 mEq/kg IV/IO for:
    a. Known Pre-existing hyperkalemia
    b. Known overdose of tricyclic antidepressants or aspirin.
    c. Dialysis patients with suspected hyperkalemia
4. May repeat **Sodium Bicarbonate** every 5 minutes if rhythm persists, with Medical Control order only

Critical Thinking Elements

- Pediatric cardiac arrest is often related to hypoxia and poor ventilation. Ensure proper oxygenation and ventilation.
- CPR and good BVM are the only procedures needed initially.
- Broselow tapes are an effective means to estimate weight. Refer to the Memorial EMS protocols for medication doses.
- Consider H's, Ts and other reversable causes.

Pediatric Bradycardia Protocol

Pediatric bradycardia is defined as a heart rate less than the normal beats per minute for a given age group. Determining the stability of the pediatric patient with bradycardia is an important factor in patient care decisions. The assessment of the patient with bradycardia should include evaluation for signs and symptoms of hypoperfusion and hypoventilation. If at any time patient loses a pulse, please refer to *Pediatric Cardiac Arrest Protocol*.

EMR Care

1. Render initial care in accordance with the *Routine Pediatric Care Protocol*.
2. Assess the pediatric for signs and symptoms of hypoperfusion and possible causes, including:
    - Respiratory difficulty
    - Cyanosis
    - Cool/Cold Skin
    - Hypotension/ Lack of palpable blood pressure
    - Decreasing level of consciousness
3. **Oxygen** 15 L/min via BVM if the child has an altered level of consciousness and is in respiratory distress.
4. **Oxygen** If the child is alert with respiratory distress, 15 LPM via NRM or if unable to tolerate the mask, 4-6 LPM via nasal cannula.
    a. If no obvious respiratory distress is noted, **apply a pulse ox**. If > 94% and no signs/ symptoms of respiratory distress, no Oxygen is required. If <94%, apply nasal cannula at 2-6 lpm or via non-rebreather mask as needed to raise pulse ox >94%.
5. For children < 12 months of age: If, despite oxygen and ventilation, the child continues to appear hypo-perfused and has a pulse < 60 beats per minute, initiate chest compressions.
6. Immediately transition patient care to the transporting provider or Paramedic intercept upon their arrival.

EMT Care

1. EMT Care includes all components of EMR Care.
2. Place defib pads on those patients exhibiting S/S of hypoperfusion.
3. Apply **Waveform Capnography** (if equipped).
4. Initiate Paramedic intercept and transport as soon as possible. (Transport can be initiated at any time during this sequence.)
5. Contact Medical Control as soon as possible

Pediatric Bradycardia Protocol

A-EMT/EMT-I Care

1. A-EMT/EMT-I Care includes all components of EMT Care.
2. **IV Fluid Therapy** 20mL/kg bolus if hypovolemia is suspected.
3. **Epinephrine 1:10,000** 0.01mg/kg (Minimum does 0.1mg) (Max single dose: 1mg) (with Medical Control order only) and repeat every 3 to 5 minutes as needed.
4. **Atropine** 0.02mg/kg IV (with Medical Control order only) (Minimum dose: 0.1mg) (Max single dose: 1mg) for children greater than 6 months of age.

Paramedic Care

1. Paramedic Care includes all components of A-EMT/EMT-I Care.
2. Immediate **Transcutaneous Pacing i**f the patient remains bradycardic with continued signs of hypoperfusion
    a. Set the rate based on age-appropriate guidelines. Contact Medical Control if assistance is needed.
    b. Current should be set at minimum to start and increase until capture is achieved
    c. Refer to the Transcutaneous Pacing Procedure for additional information.
3. **Midazolam (Versed)** 0.1mg/kg IV/IO (Max single dose: 2.5mg) for patient comfort after pacing is initiated. Re-check vital signs 5 minutes after administration. May repeat dose one time if systolic BP > 100 mmHg and respiratory rate > 10 RPM. Additional doses require Medical Control order.
4. **Midazolam (Versed)** Versed Intranasal may also be used if unable to give IV/IO Versed. (See *Intranasal Dosing Sheet in the Pediatric Prehospital Care Manual*).
5. Contact Medical Control regarding destination choice.

Critical Thinking Elements

- Monitor the child's respiratory status, SPO2 and or Waveform Capnography if available.
- Assess for the possibility of foreign body.
- Hypothermia-warm the patient
- Assess for mechanical problems with oxygen delivery
- Hypoxemia
- Hypoglycemia, severe dehydration and narcotic effects may produce bradycardia
- Most maternal medication passes through breast milk to the infant.

Pediatric Narrow Complex Tachycardia Protocol

Tachycardia may be a nonspecific sign of fear, anxiety, pain, fever or shock in the pediatric patient. The heart rate needs to be assessed in conjunction with the PAT & ABCDEs. As with all cardiac dysrhythmias, assess the heart rate and EKG with knowledge based on PALS principles and normal ranges for children. Always ask the child/caregiver about history of illness, congenital heart disease or cardiac surgery. Pediatric Supraventricular Tachycardia (SVT) is defined as a narrow QRS (<0.08 seconds) and a heart rate greater than 220 BPM. In most situations, SVT is a symptom of another medical issue in the pediatric patient. Unless the patient presents with a previous cardiac history, consider SVT as a symptom of an underlying issue.

EMR/EMT Care

1. Render initial care in in accordance with the *Routine Pediatric Care Protocol*.

A-EMT/EMT-I Care

1. A-EMT/EMT-I Care includes all components of EMR/EMT Care.
2. **IV Fluid Therapy** 20 mL/kg fluid bolus.
3. **Vagal Maneuvers** if the patient is alert and oriented, has an age-appropriate BP, has a HR greater than 220 bpm, and is obviously not in atrial fib or atrial flutter. Having the patient attempt to move the plunger of a 12 or 20ml syringe by blowing from the small end is one technique. Splashing the face with ice cold water or carotid massage are other techniques for younger patients who may not be able to follow directions.
4. Contact Medical Control as soon as possible.
5. **Adenosine (Adenocard)** 0.1 mg/kg IV/IO {Rapid IV push} (Max single dose: 6 mg) (with Medical Control order only) if the child is alert and still has a HR greater than 220 BPM. If no response after 2 minutes, administer 0.2 mg/kg IV/IO {Rapid IV/IO push} (Max single dose: 12 mg) (with Medical Control order only).

Paramedic Care

1. Paramedic Care includes all components of A-EMT/EMT-I Care.
2. **Midazolam (Versed)** 0.1mg/kg IV/IO (Max single dose: 2mg) in preparation for synchronized cardioversion if the patient has a respiratory rate > 10 RPM. If the patient's respiratory rate is < 10 RPM, proceed to immediate synchronized cardioversion without sedation.
3. **Midazolam (Versed)** Versed Intranasal may also be used if unable to give IV/IO Versed. (See *Intranasal Dosing Sheet in the Pediatric Prehospital Care Manual*).
4. **Synchronized Cardioversion** If the patient has an altered level of consciousness, diaphoresis, pale/mottled skin and/or is hypotensive:
    a. Synchronized Cardioversion at 1 J/kg if tachycardia persists.
    b. Synchronized Cardioversion at 2 J/kg if tachycardia persists.
        i. Repeat as necessary. Reactivate Synchronizer before any subsequent attempt at Cardioversion. Contact Medical Control as soon as possible

Pediatric Wide Complex Tachycardia Protocol

Tachycardia should be assessed in conjunction with the PAT and ABCDEs. Pediatric ventricular tachycardia is defined as a wide complex QRS and a heart rate > 180 BPM. The child may have a history of serious systematic illness/ congenital heart defects.

EMR/EMT Care

1. Render initial care in in accordance with the *Routine Pediatric Care Protocol*.

A-EMT/EMT-I Care

1. A-EMT/EMT-I Care includes all components of BLS Care.
2. **IV Fluid Therapy** 20 mL/kg fluid bolus.
3. If the patient becomes pulseless at any time, refer to the *Resuscitation of Pediatric Pulseless Rhythms Protocol (V-Fib or Pulseless V-Tach).*
4. **Lidocaine** 1mg/kg IV/ IO slowly over 2 minutes if the child is alert (with Medical Control order only). If no response, administer Lidocaine 0.5mg/kg every 5 minutes as needed to a total of 3 mg/kg (with Medical Control order only).

Paramedic Care

1. Paramedic Care includes all components of A-EMT/EMT-I Care.
2. Contact Medical Control as soon as possible.
3. **Lidocaine**: 1 mg/kg IV/IO. Repeat bolus: 0.5 mg/kg IV/IO in 3-5 minutes to a total of 3 mg/kg for refractory V-fib/ V-tach, if not given by A-EMT/EMT-I provider.
    a. **Amiodarone**: 5mg/kg IV/IO. Max single dose 150 mg given IVP over 10 minutes, if Lidocaine has not been given.
4. **Midazolam (Versed)** 0.1 mg/kg IV/IO (max single dose: 2 mg) for patient comfort prior to cardioversion. Re-check vital signs 5 minutes after administration.
    a. Additional doses also require Medical Control order.
5. **Midazolam (Versed)** Versed intranasal may also be used if unable to give IV Versed. (See *Intranasal Dosing Sheet in the Pediatric Prehospital Care Manual*).
6. **Synchronized Cardioversion** If the patient has an altered level of consciousness, is in shock, and is in V-Tach with a heart rate > 180 BPM:
    a. Synchronized Cardioversion at 1 J/kg if tachycardia persists.
    b. Synchronized Cardioversion at 2 J/kg if tachycardia persists Reactivate Synchronizer before any subsequent attempt at Cardioversion.

Pediatric Wide Complex Tachycardia Protocol

Critical Thinking Elements

- Monitor the child's SPO2 and or Waveform Capnography if available.
- Cardiac dysrhythmias such as V-tach are rare in children. Ask the caregiver if the child has a chronic or genetic cardiac condition.
- V-tach with a pulse could be from a serious illness, hypoxia or dehydration

Pediatric Respiratory Distress Protocol

Respiratory Distress is common in the pediatric patient. The small airways of children are compromised more quickly during medical and traumatic problems. Identifying the degree of respiratory distress is crucial for stopping a process that can lead into respiratory failure. At that point, the child has lost the ability to compensate for the lack of oxygen. If not treated immediately, respiratory failure will lead to arrest.

EMR Care

1. Render initial care in accordance with the *Routine Pediatric Care Protocol*.
2. **Oxygen** 15 L/min via BVM if the child has altered level of consciousness and in is respiratory distress.
3. **Oxygen** If the child is alert with respiratory distress, 15 LPM via NRM or if unable to tolerate the mask, 4-6 LPM via nasal cannula.
    a. If no obvious respiratory distress is noted, **apply a pulse ox**. If > 94% and no signs/ symptoms of respiratory distress, no Oxygen is required. If <94%, apply nasal cannula at 2-6 lpm or via non-rebreather mask as needed to raise pulse ox >94%.
4. Utilize the Pediatric Assessment Triangle to gain a general impression.
5. Assess abnormal airway sounds.
6. If wheezing is noted and the child has their prescribed inhalers present, suggest and/or help with the self- administration of those medicines by the patient.
7. Place patient in a position of comfort.

EMT Care

1. EMT Care includes all components of EMR Care.
2. **DuoNeb** 0.5 mg Ipratropium Bromide and 2.5 mg Albuterol in 3 mL of normal saline via nebulizer. May repeat DuoNeb every 15 minutes as needed. In-line nebulizer may be utilized if patient is unresponsive or in respiratory arrest.
3. Apply **Waveform Capnography** (if equipped).
4. Initiate Paramedic intercept and transport as soon as possible.

ILS Care

1. A-EMT/EMT-I Care includes all components of EMT Care.
2. **Epinephrine 1:1,000** If < 30 kg 0.15 mg IM if the patient is suffering status asthmaticus and does not improve with nebulizer treatment. If > 30 kg 0.3 mg IM. May repeat every 20 minutes.
    a. Administer based on Medication Administration Procedure
3. **Obtain peripheral IV or IO access**.

Pediatric Respiratory Distress Protocol

Paramedic Care

1. Paramedic Care includes all components of A-EMT/EMT-I Care.
2. In-line nebulizer may be utilized if the patient is unresponsive or in respiratory arrest.
3. Contact Medical Control as soon as possible.
4. Consider, in patients with persistent respiratory distress, **Magnesium Sulfate** 50 mg/kg IV in 100 ml 0.9% NaCl (normal saline) IV over 10-15 minutes. Maximum dose: 2 gm WITH Medical Control order
   only

**Epi IM Kits, as an alternative to Epi-Pen auto-injectors, use epinephrine IM injection kits. These kits contain an ampule or vial of 1mg of 1:1000 epinephrine, syringes, IM needle and filter needle, and alcohol swabs as well as instructions for adults and children.

Critical Thinking Elements

- The thigh is the preferred site for IM medication administration in the infant patient population.

Pediatric Respiratory Distress Protocol

Epiglottitis

Symptoms of epiglottitis may include:

- ALOC
- Fever
- Hoarseness
- Brassy cough
- Inspiratory stridor
- Drooling
- Tripod position

If Epiglottitis is suspected:

EMR Care, EMT Care, A-EMT/EMT-I Care

1. Initiate *Routine Pediatric Care Protocol*.
2. Do not look in the child's mouth or attempt to visualize the interior of the throat.
3. Do not agitate the child. He/she should be kept as calm as possible- do not attempt to obtain IV access.
4. **Oxygen** 10-15 L/min via non-rebreather mask or by best means tolerated by the patient (i.e. blow-by or 4-6 L/min via nasal cannula).
5. Apply **Waveform Capnography** (if equipped) and as tolerated.
6. Transport the child sitting up.

Paramedic Care

1. Paramedic Care includes all components of A-EMT/EMT-I Care.
2. **Epinephrine 1:1,000** If < 30 kg 0.15 mg IM if the patient is suffering severe S/S of Epiglottitis. If > 30 kg 0.3 mg IM. May repeat every 20 minutes.

Critical Thinking Elements

- The thigh is the preferred site for IM medication administration in the infant patient population

Pediatric Tracheostomy Protocol

With today's technology and improving home health care, more critical care patients are being sent home earlier. Home health care professionals and family members can duplicate the care the patient receives in the hospital. This allows the patient to return home, spending less time in the hospital. EMS is activated when there is a problem with complex medical equipment, or the patient relapses into a more critical condition.

EMR Care

1. Render initial care in accordance with the *Routine Pediatric Care Protocol*.
2. **Oxygen** 15 L/min via tracheostomy collar.
3. Assess work of breathing.
4. Assess for abnormal airway sounds.
5. Place patient in a position of comfort.
6. If the tracheostomy tube is obstructed with secretions, direct the caregiver to:
    a. Suction with an appropriately sized whistle-tip catheter.
    b. Repeat suction after removing inner cannula of tracheostomy tube.
    c. Change the tracheostomy tube.
7. If the airway continues to be obstructed or if ventilatory effort is inadequate, ventilate with 100% oxygen by attaching a BVM to the tracheostomy tube.
8. If the tracheostomy tube is still not patent, ventilate in standard fashion while covering the stoma.
    a. The balloon on the trach must be deflated prior to attempting ventilation.
9. Take patient's tracheotomy care bag with the patient.
10. Initiate Paramedic intercept as soon as possible.

EMT Care

1. EMT Care includes all components of EMR Care.
2. EMT level and above caregivers may **suction with a whistle-tip catheter**.
    a. Pass the suction device through the tube
    b. If unable to pass suction, concern for obstruction vs false passage.
3. If BVM ventilations, then apply in-line waveform capnography (if equipped).
4. Initiate paramedic intercept and transport as soon as possible

Pediatric Tracheostomy Protocol

A-EMT/EMT-I Care, Paramedic Care

1. Care includes all components of EMT Care.
2. If unable to pass suction, remove the inner cannula and visually inspect for evidence of obstruction, attempt ventilation w/o the inner cannula in place.
    a. If breathing is inadequate and a spare tracheostomy is available, attempt to reposition/replace tracheostomy tube. DO NOT PERFORM IF TRACHEOSTOMY STOMA IS LESS THAN TWO WEEKS OLD.
        i. Insert bougie through tracheostomy tube and advance to Carina (approx. 10cm).
        ii. Deflate balloon.
        iii. Remove tracheostomy tube over bougie while ensuring that bougie remains in the stoma and trachea to serve as a guide.
        iv. Feed the new tracheostomy tube over bougie and into the stoma. Inflate balloon.
        v. Remove the bougie.
        vi. Secure tracheostomy tube in place.
    b. If spare tracheostomy tube is unavailable, follow the above procedure for tracheostomy tube replacement using an ET tube the same size as the tracheostomy or 0.5 size smaller (e.g., for a 6.0 Shiley tracheostomy, use a 6.0 or 5.5 cuffed ET tube). Be sure not to force the ET tube and remain mindful of how deep you are inserting the tube to prevent mainstem intubation.
        i. If the size of tracheostomy tube is unknown, contact Medical Control.
    c. If unsuccessful, orally intubate the patient (unless known Laryngectomy).
3. Consider **DUONEB** by nebulizer. May repeat X2 if needed for continued symptomatic relief.

Critical Thinking Elements

- Know the difference between a tracheostomy and a laryngectomy.
    a. **Tracheostomy** patient airways connect all the way to the mouth
    b. **Laryngectomy** patient airways terminate at the stoma at base of neck
- **Oral attempts at intubation of a laryngectomy patient will always result in esophageal intubation** because the upper portion of the airway has been surgically removed.
- It is important to obtain history as to why the patient has a tracheostomy - if for head/neck cancer beware of likely abnormal anatomy making attempts at oral intubation very difficult if not impossible

Pediatric Respiratory Arrest Protocol

When the pediatric patient enters respiratory arrest or cardiac arrest, a poor outcome is sure to follow. Assisted ventilations with a BVM can be the most useful skill in resuscitation of the child in respiratory arrest. Remember- the pediatric patient responds to oxygen very favorably. Therefore, it is important to try to identify the cause of the respiratory arrest after securing the patient airway and providing proper ventilation.

EMR Care

1. Assess airway. If agonal respirations are present or the child is not breathing at all
    a. Perform jaw thrust
    b. Suction airway
    c. Insert oropharyngeal or nasopharyngeal airway
2. Administer 100% **oxygen** using appropriately sized BVM
3. If chest rise in inadequate:
    a. Relieve upper airway obstruction
    b. Reposition airway
    c. Refer to Basic Airway Management of the Pediatric Patient Protocol.
5. Refer to *Pediatric Respiratory Distress Protocol* if breathing resumes.
6. If hypoperfusion is present, refer to *Pediatric Shock Protocol*.
7. Follow *Routine Pediatric Care Protocol* for general treatment guidelines.
8. Ensure Paramedic unit has been dispatched.

EMT Care

1. EMT Care includes all components of EMR Care.
2. **Apply pulse oximetry** and document oxygen saturation.
3. Apply **Waveform Capnography** (if equipped).
4. Transport as soon as possible.

Pediatric Respiratory Arrest Protocol

A-EMT/EMT-I Care

1. A-EMT/EMT-I Care includes all components of EMT Care.
2. Consider underlying etiologies and treat according to the appropriate protocol:
    - Airway obstruction
    - Cardiac dysrhythmias
    - CNS injury
    - Anaphylaxis
    - Poisoning/Overdose
    - Suffocation
    - Metabolic (refer to Pediatric ALOC Protocol)
    - Hypovolemia (refer to Pediatric Shock Protocol)
    - Near Drowning
    - Carbon monoxide exposure
3. **Initiate IV access**, if possible.
4. Initiate Paramedic intercept and transport as soon as possible.
5. If BVM with OPA/NPA is adequately ventilating the patient, no additional airway is required. If the patient is inadequately ventilated with a BVM and OPA/NPA then proceed with Supraglottic Airway insertion.

Paramedic Care

1. Paramedic Care includes all components of A-EMT/EMT-I Care.
2. If BVM with OPA/NPA or a Supraglottic Airway is adequately ventilating the patient, no additional airway is required. If the patient is inadequately ventilated with a BVM and OPA/NPA or a Supraglottic Airway then proceed with intubation.
3. Needle chest decompression of the affected side with a 14g angiocath (< 2inch in length) if tension pneumothorax is suspected. (With Medical Control order only)
4. Contact Medical Control as soon as possible.

Critical Thinking Elements

- Gastric distention is very common in pediatric patients and may cause poor compliance.
- Ventilating too fast or giving too much tidal volume are the top two reasons for distention.
- Use proper ventilation techniques and an appropriately sized BVM for the pediatric patient.

Pediatric Brief Resolved Unexplained Event

Brief Resolved Unexplained Events/BRUEs (formerly Apparent Life-Threatening Events or ALTEs) are challenging for both parents and emergency providers. Infants with these events are defined as having an episode that is frightening to the observer and characterized by some combination of apnea, color change, change in muscle tone, and choking or gagging that requires vigorous stimulation. Typically, the patient has returned to baseline upon EMS arrival. The EMS care for a suspected pediatric BRUE patient will be based upon presentation and the signs/ symptoms that are discovered during assessment. These patients should be evaluated at the closest appropriate facility. The EMS provider must not dismiss the caregivers' story and should reiterate the danger of not getting this patient evaluated by a physician.

EMR Care

1. Render initial care in accordance with the *Routine Pediatric Care Protocol*.
2. **Oxygen** 10-15 L/min via non-rebreather mask or 4-6 L/min via nasal cannula if the patient cannot tolerate a mask.
3. **Perform blood glucose level test**. If blood glucose <60mg/dL, follow protocol for *Pediatric Altered Level of Consciousness.*

EMT Care

1. EMT Care includes all components of EMR Care.
2. Patient should be placed on **pulse oximeter**

A-EMT/EMT-I Care

1. A-EMT/EMT-I Care includes all components of EMT Care.
2. **Place patient on cardiac monitor** with pulse oximetry.

Paramedic Care

1. Paramedic Care includes all components of A-EMT/EMT-I Care.

Critical Thinking Elements

- Over 50% of these patients are admitted to the hospital after evaluation in the Emergency Department.
- The consistent result of an emergency room visit for BRUE is a complex evaluation that typically results in no clear answer as to what caused the BRUE in most cases.
- We still do not know what causes BRUEs.