<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Cardiac Arrest – Unknown Rhythm (i.e. BLS)</td>
<td>Protocol 8 - 1</td>
</tr>
<tr>
<td>2.</td>
<td>General – Cardiac Arrest</td>
<td>Protocol 8 - 2</td>
</tr>
<tr>
<td>4.</td>
<td>Medical – Supraventricular Tachycardia (including atrial fibrillation) Medical – Tachycardia Medical – Ventricular Tachycardia with a Pulse</td>
<td>Protocol 8 - 4</td>
</tr>
<tr>
<td>5.</td>
<td>Medical - Bradycardia</td>
<td>Protocol 8 - 5</td>
</tr>
</tbody>
</table>
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BLS Healthcare Provider
Pediatric Cardiac Arrest Algorithm for 2 or More Rescuers—2015 Update

Verify scene safety.

Victim is unresponsive. Shout for nearby help. First rescuer remains with victim. Second rescuer activates emergency response system and retrieves AED and emergency equipment.

Monitor until emergency responders arrive.

Normal breathing, has pulse

Look for no breathing or only gasping and check pulse (simultaneously). Is pulse definitely felt within 10 seconds?

No normal breathing, has pulse

No breathing or only gasping, no pulse

Provide rescue breathing: 1 breath every 3-5 seconds, or about 12-20 breaths/min.
- Add compressions if pulse remains <60/min with signs of poor perfusion.
- Activate emergency response system (if not already done) after 2 minutes.
- Continue rescue breathing; check pulse about every 2 minutes. If no pulse, begin CPR (go to “CPR” box).

CPR
First rescuer begins CPR with 30:2 ratio (compressions to breaths). When second rescuer returns, use 15:2 ratio (compressions to breaths). Use AED as soon as it is available.

AED analyzes rhythm. Shockable rhythm?

Yes, shockable
Give 1 shock. Resume CPR immediately for about 2 minutes (until prompted by AED to allow rhythm check). Continue until ALS providers take over or victim starts to move.

No, nonshockable
Resume CPR immediately for about 2 minutes (until prompted by AED to allow rhythm check). Continue until ALS providers take over or victim starts to move.
### Possible Causes of Pulseless Arrest

<table>
<thead>
<tr>
<th>A</th>
<th>Alcohol, Abuse, Acidosis</th>
<th>T</th>
<th>Toxidromes, Trauma, Temperature, Tumor</th>
</tr>
</thead>
<tbody>
<tr>
<td>E</td>
<td>Endocrine, Electrolytes, Encephalopathy</td>
<td>I</td>
<td>Infection, Intussusception</td>
</tr>
<tr>
<td>I</td>
<td>Insulin</td>
<td>P</td>
<td>Psychogenic, Porphyria, Pharmacological</td>
</tr>
<tr>
<td>O</td>
<td>Oxygenation, Overdose, Opiates</td>
<td>S</td>
<td>Space occupying lesion, Sepsis, Seizure, Shock</td>
</tr>
<tr>
<td>U</td>
<td>Uremia</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Pearls:

1. If airway is maintainable initially with a BVM, delay rescue airway insertion until after initial defibrillation. The best airway is an effective airway with the least potential complications.
2. Continue CPR while AED is charging.
3. CPR should not be stopped for any reason, if at all avoidable, other than to check rhythm immediately prior to defibrillation. Any stop of compressions should kept as short as possible, preferably a maximum of 10 seconds. Alternate airway placement should be performed during compressions.
4. Pay close attention to rate of manual ventilation. Hyperventilation produces decrease in preload, cardiac output, coronary perfusion, and cerebral blood flow.
5. AED’s may be used for patients all ages. For children less than 8 years of age, use an AED equipped with a pediatric attenuator. If an AED with pediatric attenuator is not available, use a standard AED.
**OVERVIEW:**
During cardiac arrest, there is no effective pumping activity, pulse, or blood pressure. Most commonly, the rhythms that cause pulseless arrest are: ventricular fibrillation, ventricular tachycardia, pulseless electrical activity or asystole. The ECG of ventricular fibrillation shows a fine to coarse zigzag pattern without discernible P waves or QRS complexes. Ventricular fibrillation / ventricular tachycardia is most commonly seen in patients with severe ischemic heart disease and is the most frequently encountered rhythm in sudden cardiac death in adults. Defibrillation is required to stop VF / VT. It constitutes the most important aspect of therapy for VF / VT. The sooner the shocks are given, the more likely they are to be successful.

<table>
<thead>
<tr>
<th>HPI</th>
<th>Signs and Symptoms</th>
<th>Considerations</th>
</tr>
</thead>
</table>
| • Estimated down time  
• Past medical history  
• Medications  
• Events leading to arrest  
• Renal failure / dialysis  
• DNR or living will | • Unresponsive, apneic, pulseless  
• Ventricular fibrillation or pulseless ventricular tachycardia on ECG | • Asystole  
• Artifact / Device failure  
• Cardiac  
• Endocrine / metabolic  
• Drugs  
• Respiratory Arrest |

### POSSIBLE CAUSES OF PULSELESS ARREST

<table>
<thead>
<tr>
<th>A</th>
<th>Alcohol, Abuse, Acidosis</th>
<th>T</th>
<th>Toxidromes, Trauma, Temperature, Tumor</th>
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<tbody>
<tr>
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<td>Insulin</td>
<td>P</td>
<td>Psychogenic, Porphyria, Pharmacological</td>
</tr>
<tr>
<td>O</td>
<td>Oxygenation, Overdose, Opiates</td>
<td>S</td>
<td>Space occupying lesion, Sepsis, Seizure, Shock</td>
</tr>
<tr>
<td>U</td>
<td>Uremia</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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### Infant Dosing Chart

<table>
<thead>
<tr>
<th>Age</th>
<th>Term</th>
<th>6 months</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Weight (lb/kg)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.6 lb</td>
<td>3 kg</td>
<td>17.6 lb</td>
</tr>
<tr>
<td>9.6 lb</td>
<td>4 kg</td>
<td>20.2 lb</td>
</tr>
<tr>
<td>12.6 lbs</td>
<td>5 kg</td>
<td>23.4 lbs</td>
</tr>
<tr>
<td>15.6 lbs</td>
<td>6 kg</td>
<td>25.6 lbs</td>
</tr>
<tr>
<td>18.6 lbs</td>
<td>7 kg</td>
<td>27.6 lbs</td>
</tr>
<tr>
<td>21.6 lbs</td>
<td>8 kg</td>
<td>30.6 lbs</td>
</tr>
<tr>
<td><strong>Defibrillation</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 joules / kg</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6 joules</td>
<td>1.5 kg</td>
<td>16 joules</td>
</tr>
<tr>
<td>10 joules</td>
<td>2 kg</td>
<td>22 joules</td>
</tr>
<tr>
<td>14 joules</td>
<td>2.5 kg</td>
<td>26 joules</td>
</tr>
<tr>
<td>18 joules</td>
<td>3 kg</td>
<td>30 joules</td>
</tr>
<tr>
<td>22 joules</td>
<td>3.5 kg</td>
<td>32 joules</td>
</tr>
<tr>
<td><strong>Epinephrine</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1:10,000 (1 mg / 10 ml)</td>
<td>0.01 mg / kg</td>
<td></td>
</tr>
<tr>
<td>0.03 mg</td>
<td>0.01 mg / kg</td>
<td>0.08 mg</td>
</tr>
<tr>
<td><strong>Amiodarone</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5 mg / kg</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15 mg</td>
<td>1 kg</td>
<td>40 mg</td>
</tr>
<tr>
<td><strong>Magnesium Sulfate</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25 - 50 mg / kg</td>
<td></td>
<td></td>
</tr>
<tr>
<td>75 mg</td>
<td>2.5 kg</td>
<td>200 mg</td>
</tr>
</tbody>
</table>
PEARLS:
1. If airway maintainable initially with BVM, delay advanced airway insertion until after initial medication administration. The best airway is an effective airway with the least potential complications.
2. Do not stop CPR to give ventilations once advanced airway has been secured.
3. CPR should not be stopped for any reason, if at all avoidable, other than to check for rhythm change. Any stop of compressions should kept as short as possible, preferably a maximum of 10 seconds. IV / IO access and advanced airway placement should be performed while compressions are being performed.
4. Pay close attention to rate of manual ventilation. Hyperventilation produces decrease in preload, cardiac output, coronary perfusion, and cerebral blood flow.
Pediatric Cardiac Arrest Algorithm—2015 Update

1. Start CPR
   - Give oxygen
   - Attach monitor/defibrillator

2. Rhythm shockable?
   - Yes: VF/pVT
   - No: CPR 2 min

3. Shock
   - CPR 2 min
     - IO/IV access

4. Rhythm shockable?
   - Yes: CPR 2 min
     - IO/IV access
     - Epinephrine every 3-5 min
     - Consider advanced airway
   - No: CPR 2 min
     - IO/IV access
     - Amiodarone or lidocaine
     - Treat reversible causes

5. Shock
   - CPR 2 min
     - IO/IV access
     - Epinephrine every 3-5 min
     - Consider advanced airway

6. Rhythm shockable?
   - Yes: CPR 2 min
     - IO/IV access
     - Epinephrine every 3-5 min
     - Consider advanced airway
   - No: CPR 2 min
     - IO/IV access
     - Treat reversible causes

7. Shock
   - CPR 2 min
     - IO/IV access
     - Epinephrine every 3-5 min
     - Consider advanced airway

8. Rhythm shockable?
   - Yes: CPR 2 min
     - IO/IV access
     - Epinephrine every 3-5 min
     - Consider advanced airway
   - No: CPR 2 min
     - IO/IV access
     - Treat reversible causes

9. Asystole/PEA

10. CPR 2 min
    - IO/IV access
    - Epinephrine every 3-5 min
    - Consider advanced airway

11. Rhythm shockable?
    - Yes: CPR 2 min
          - IO/IV access
          - Epinephrine every 3-5 min
          - Consider advanced airway
    - No: CPR 2 min
          - Treat reversible causes

12. Asystole/PEA → 10 or 11
    - Organized rhythm → check pulse
    - Pulse present (ROSC) → post-cardiac arrest care

CPR Quality
- Push hard (>3 cm of anteroposterior diameter of chest) and fast (100-120/min) and allow complete chest recoil.
- Minimize interruptions in compressions.
- Avoid excessive ventilation.
- Rotate 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 ≥ J/kg, maximum 10 J/kg or adult dose

Drug Therapy
- Epinephrine IO/IV dose: 0.01 mg/kg (0.1 mL/kg of 1:10 000 concentration). Repeat every 3-5 minutes.
- If no IO/IV access, may give endotracheal dose: 0.1 mg/kg (0.1 mL/kg of 1:1000 concentration).
- 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).

Advanced Airway
- 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

Return of Spontaneous Circulation (ROSC)
- Pulse and blood pressure
- Spontaneous arterial pressure waves with intra-arterial monitoring

Reversible Causes
- Hypovolemia
- Hypoxia
- Hyperkalemia
- Metabolic acidosis
- Hypothermia
- Tension pneumothorax
- Tamponade, cardiac
- Toxins
- Thrombosis, pulmonary
- Thrombosis, coronary

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OVERVIEW:
The majority of newborns will require only warmth, stimulation, and occasionally some oxygen after birth. That treatment is recommended before attempting the more aggressive interventions of positive-pressure ventilation (PPV) and chest compressions. Remember that a newborn’s cardiac output is rate dependent. Bradycardia usually is the result of hypoxia. Once the hypoxia is corrected, the heart rate may spontaneously correct itself. A "newborn" is defined as within one month of age post delivery.

1. If obvious obstruction to spontaneous breathing or requires positive pressure ventilation, gently suction the newborn’s mouth, then nostrils, with a bulb syringe for 3 to 5 seconds. Don’t routinely suction an active baby.

2. If meconium staining is present:
   a. If the newborn is vigorous (strong respiratory effort, good muscle tone, and a heart rate greater than 100 bpm), no routine suctioning is required.
   b. If the newborn is NOT vigorous (poor or absent respiratory effort, flaccid, lethargic), consider immediate MECONIUM ASPIRATION via endotracheal suctioning. Suctioning of meconium should not distract from the need for emergent oxygenation and ventilation of the newly born. In the patient with meconium aspiration and respiratory failure or apnea, quickly suction meconium and then begin BVM ventilations.

3. If meconium staining is not present, rub the newborn’s back vigorously. Simultaneously begin drying and warming measures.

4. KEEP THE NEWBORN WARM AND DRY.

5. Evaluate respirations, heart rate (apical pulse or pulse at the base of the umbilical cord), and state of oxygenation. Obtain 1 minute APGAR.

6. If respirations are inadequate, HR > 100 bpm:
   a. Initiate positive-pressure ventilation with a BVM NOT attached to oxygen. Deliver 40 to 60 breaths per minute. Use only enough volume to make the newborn’s chest rise.

7. If respirations are inadequate and HR less than 100 bpm:
**Protocol 8-3**

Continued

**NEONATAL RESUSCITATION**

**APGAR Score – 1st and 5th Minute Post Birth**

<table>
<thead>
<tr>
<th>Sign</th>
<th>0 Points</th>
<th>1 Point</th>
<th>2 Points</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Activity</strong> (Muscle Tone)</td>
<td>Flaccid</td>
<td>Some Flexion</td>
<td>Active Motion</td>
</tr>
<tr>
<td><strong>Pulse</strong></td>
<td>Absent</td>
<td>&lt; 100</td>
<td>&gt; 100</td>
</tr>
<tr>
<td><strong>Grimace</strong> (Reflex Irritability)</td>
<td>No Response</td>
<td>Some</td>
<td>Vigorous</td>
</tr>
<tr>
<td><strong>Appearance</strong> (Skin Color)</td>
<td>Blue, Pale</td>
<td>Blue Extremities</td>
<td>Fully Pink</td>
</tr>
<tr>
<td><strong>Respirations</strong></td>
<td>Absent</td>
<td>Slow, Irregular</td>
<td>Strong Cry</td>
</tr>
</tbody>
</table>

**Supportive Care**

- Maintain airway. Suction as needed with bulb syringe.
- Obtain blood glucose sample. If BGL is < 40 mg/dL, administer Dextrose 10% 2cc/kg (0.5 g/kg) slow IV / IO push. Repeat as necessary.
- Maintain warmth via blankets and Porta-Warm mattress or skin-to-skin.

**Procedure for making Dextrose 10%**

In 50 ml syringe, mix 10 ml of Dextrose 50% with 40 ml Normal Saline. Mixture will yield 50 ml of Dextrose 10%

<table>
<thead>
<tr>
<th>Age</th>
<th>Pre-Term</th>
<th>Term</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight (lb / kg)</td>
<td>3.3 lbs</td>
<td>6.6 lbs</td>
</tr>
<tr>
<td></td>
<td>1.5 kg</td>
<td>3.0 kg</td>
</tr>
<tr>
<td>Epinephrine 1:10,000</td>
<td>0.015 mg</td>
<td>0.03 mg</td>
</tr>
<tr>
<td>(1 mg / 10 ml)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.01 mg / kg</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dextrose 10%</td>
<td>3.0 ml</td>
<td>6.0 ml</td>
</tr>
<tr>
<td>2.0 ml / kg</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**PEARLS:**

1. The primary measure of adequate initial ventilation is prompt improvement in heart rate.
2. In the presence of thick meconium and an infant who is limp, aggressive suctioning is required.
3. A 3:1 ratio of compressions to ventilations with 90 compressions and 30 breaths should be used to achieve approximately 120 events per minute to maximize ventilation at an achievable rate. Each event should be allotted approximately $\frac{1}{2}$
second, with exhalation occurring during the first compression following, each ventilation.

4. Arterial saturations of a term infant at birth can be as low as 60% and can require more than 10 minutes to reach saturations of > 90%. Hyperoxia can be toxic, particularly to the preterm baby.
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OVERVIEW:
Tachycardia is an abnormally fast rhythm of the heart. It is most commonly caused by a reentry mechanism that involves an accessory pathway or the AV conduction system. SVT is the most common tachyarrhythmia producing cardiovascular compromise during infancy.

<table>
<thead>
<tr>
<th>HPI</th>
<th>Signs and Symptoms</th>
<th>Considerations</th>
</tr>
</thead>
</table>
| • Past medical history | • Heart rate:  
  o Child > 180 / min  
  o Infant > 220 / min  
  • QRS < 0.08 seconds  
  • Pale or cyanosis  
  • Diaphoresis  
  • Tachypnea  
  • Vomiting  
  • Hypotension  
  • Altered mental status  
  • Pulmonary congestion  
  • Syncope | • Heart disease  
  (congenital)  
  • Hypo / hyperthermia  
  • Hypovolemia  
  • Anemia  
  • Electrolyte imbalance  
  • Anxiety, pain, emotional stress  
  • Fever, infection, sepsis  
  • Hypoxia  
  • Hypoglycemia  
  • Medication, toxin, drugs  
  • Pulmonary embolus  
  • Trauma |
| • Medications, toxin ingestion  
  (aminophylline, diet pills, thyroid supplements, decongestants, digoxin) | | |
| • Drugs (nicotine, cocaine) | | |
| • Respiratory distress | | |
| • Congenital heart disease | | |
| • Syncope, near syncope | | |

Infant Dosing Chart:

<table>
<thead>
<tr>
<th>Weight (lb / kg)</th>
<th>Defibrillation 2 joules / kg</th>
<th>Defibrillation 4 joules / kg</th>
<th>Epinephrine 1:10,000 (1 mg / 10 ml) 0.01 mg / kg</th>
<th>Amiodarone 5 mg / kg</th>
<th>Magnesium Sulfate 25 - 50 mg / kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.6 lb 3 kg</td>
<td>6 joules</td>
<td>12 joules</td>
<td>0.03 mg</td>
<td>15 mg</td>
<td>75 mg</td>
</tr>
<tr>
<td>17.6 lb 8 kg</td>
<td>16 joules</td>
<td>32 joules</td>
<td>0.08mg</td>
<td>40 mg</td>
<td>200 mg</td>
</tr>
</tbody>
</table>

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**PEARLS:**

1. SVT is often diagnosed in infants because of symptoms of congestive heart failure. SVT usually presents differently in older children. Common signs and symptoms of SVT in infants include: poor feeding, rapid breathing, irritability, unusual sleepiness, pale or blue skin color, and vomiting. SVT is initially well tolerated in most infants and older children. It can, however, lead to heart failure and clinical evidence of shock, particularly if baseline myocardial function is impaired by congenital heart disease or cardiomyopathy. It can ultimately cause cardiovascular collapse.

2. Approved vagal maneuvers include coughing, bearing down as if attempting a bowel movement. *Carotid sinus massage and/or ocular massage is not approved.*
Pediatric Tachycardia With a Pulse and Poor Perfusion Algorithm

1. Identify and treat underlying cause
   - Maintain patent airway; assist breathing as necessary
   - Oxygen
   - Cardiac monitor to identify rhythm; monitor blood pressure and oximetry
   - IO/IV access
   - 12-Lead ECG if available; don't delay therapy

2. Evaluate QRS duration
   - Narrow (<0.09 sec)
   - Wide (>0.09 sec)

3. Evaluate rhythm with 12-lead ECG or monitor

4. Probable sinus tachycardia
   - Compatible history consistent with known cause
   - P waves present/normal
   - Variable R-R; constant PR
   - Infants: rate usually <220/min
   - Children: rate usually <180/min

5. Probable supraventricular tachycardia
   - Compatible history (vague, nonspecific); history of abrupt rate changes
   - P waves absent/abnormal
   - HR not variable
   - Infants: rate usually ≥220/min
   - Children: rate usually ≥180/min

6. Search for and treat cause
7. Consider vagal maneuvers (No delays)

9. Possible ventricular tachycardia
10. Cardiopulmonary compromise?
    - Hypotension
    - Acutely altered mental status
    - Signs of shock

11. Synchronized cardioversion

12. Consider adenosine if rhythm regular and QRS monomorphic

13. Expert consultation advised
    - Amiodarone
    - Procaainamide

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Doses/Details

- Synchronized Cardioversion
  - Begin with 0.5-1 J/kg; if not effective, increase to 2 J/kg.
  - Sedate if needed, but don't delay cardioversion.

- Drug Therapy
  - Adenosine IO/IV dose:
    - First dose: 0.1 mg/kg rapid bolus (maximum: 6 mg).
    - Second dose: 0.2 mg/kg rapid bolus (maximum second dose: 12 mg).
  - Amiodarone IO/IV dose:
    - 5 mg/kg over 20-60 minutes
  - Procaainamide IO/IV dose:
    - 15 mg/kg over 30-60 minutes
    - Do not routinely administer amiodarone and procaainamide together.
OVERVIEW:
Bradycardia is the most common dysrhythmia in the pediatric population. Bradycardia, in pediatric patients, typically is the result of some form of respiratory depression and initial treatment should be directed to ensuring that the patient is breathing adequately and providing supplemental oxygenation and ventilation as needed. Since the etiology of bradycardia is usually hypoxemia, initial management is ventilation and oxygenation while perfusion is maintained with chest compressions in children with a heart rate of less than 60 beats per minute. Symptomatic bradycardia is defined in pediatrics as hypotension or other signs and/or symptoms of poor perfusion, with a (relative to age) bradycardia. Most bradycardia is hypoxia related, and will usually respond to oxygenation.

<table>
<thead>
<tr>
<th>HPI</th>
<th>Signs and Symptoms</th>
<th>Considerations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Past medical history</td>
<td>Heart rate &lt; 60 bpm</td>
<td>Respiratory effort</td>
</tr>
<tr>
<td>Foreign body exposure</td>
<td>Delayed capillary refill or cyanosis</td>
<td>Respiratory obstruction</td>
</tr>
<tr>
<td>Respiratory distress or arrest</td>
<td>Mottled, cool skin</td>
<td>Foreign body, secretions</td>
</tr>
<tr>
<td>Apnea</td>
<td>Hypotension or arrest</td>
<td>Croup, epiglottitis</td>
</tr>
<tr>
<td>Possible toxic or poison</td>
<td>Altered mental status</td>
<td>Hypovolemia</td>
</tr>
<tr>
<td>Environmental exposure</td>
<td></td>
<td>Hypothermia</td>
</tr>
<tr>
<td>Congenital disease</td>
<td></td>
<td>Infection, sepsis</td>
</tr>
<tr>
<td>Medication (maternal or infant)</td>
<td></td>
<td>Medication, toxin</td>
</tr>
</tbody>
</table>

PEARLS:
1. Pharmacological treatment of bradycardia is based upon the presence or absence of significant signs and symptoms (symptomatic vs. asymptomatic).
2. Although noninvasive pacing may be attempted, typically bradycardias of hypoxic etiology do not respond. First line therapy is prompt airway support, ventilation and oxygenation. 
3. Capture thresholds in children are similar to those in adults. Studies indicate no relationship between body surface area, weight, and capture thresholds and although many children will achieve capture between 50 - 100 mA, higher current requirements are possible. The pacing rate must be set high enough to perfuse the patient. 
4. Electrical capture during transcutaneous pacing is defined as an electrical stimulus marker followed by a wide QRS complex, with no underlying intrinsic rhythm, followed by a T-wave. This should occur for each electrical complex. 
5. Mechanical capture is confirmed when the patient’s pulse matches the displayed pace rate. Because pacing stimuli generally causes muscular contractions that can be mistaken for a pulse, you should never take a pulse on the left side of the body to confirm mechanical capture. Pectoral muscle contractions due to pacing also do not indicate mechanical capture. To avoid mistaking muscular response to pacing stimuli for arterial pulsations, use ONLY the (1) Femoral artery or (2) Right brachial or radial artery for confirming mechanical capture.
Pediatric Bradycardia With a Pulse and Poor Perfusion Algorithm

1. Identify and treat underlying cause
   - Maintain patent airway; assist breathing as necessary
   - Oxygen
   - Cardiac monitor to identify rhythm; monitor blood pressure and oximetry
   - IO/IV access
   - 12-Lead ECG if available; don’t delay therapy

2. Cardiopulmonary compromise?
   - Hypotension
   - Acutely altered mental status
   - Signs of shock

3. CPR if HR <60/min with poor perfusion despite oxygenation and ventilation

4a. If yes:
   - Support ABCs
   - Give oxygen
   - Observe
   - Consider expert consultation

4b. If no:
   - Bradycardia persists?

5. Yes
   - Epinephrine
   - Atropine for increased vagal tone or primary AV block
   - Consider transthoracic pacing/transvenous pacing
   - Treat underlying causes

6. If pulseless arrest develops, go to Cardiac Arrest Algorithm

Doses/Details

Epinephrine IO/IV dose:
0.01 mg/kg (0.1 mL/kg of 1:10 000 concentration). Repeat every 3-5 minutes. If IO/IV access not available but endotracheal (ET) tube in place, may give ET dose: 0.1 mg/kg (0.1 mL/kg of 1:1000).

Atropine IO/IV dose:
0.02 mg/kg. May repeat once. Minimum dose 0.1 mg and maximum single dose 0.5 mg.

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