



# PEDIATRIC BRADYCARDIA WITH POOR PERFUSION

## History

- Past medical history
- Foreign body exposure
- Respiratory distress or arrest
- Apnea
- Possible toxic or poison exposure
- Congenital disease
- Medication (maternal or infant)

## Signs and Symptoms

- Decreased heart rate
- Delayed capillary refill or cyanosis
- Mottled, cool skin
- Hypotension or arrest
- Altered level of consciousness

## Differential

- Respiratory failure, Foreign body, Secretions, Infection (croup, epiglottitis)
- Hypovolemia (dehydration)
- Congenital heart disease
- Trauma
- Tension pneumothorax
- Hypothermia
- Toxin or medication
- Hypoglycemia
- Acidosis

Bradycardia  
Typically HR < 60/min  
Hypotension / AMS / Poor Perfusion / Shock

|          |   |
|----------|---|
|          | Pediatric Airway Protocol(s) AR 5, 6<br>as indicated      |
|          | Identify underlying cause<br>Search for reversible causes |
| <b>P</b> | Cardiac Monitor   |
|          | IV or IO Protocol UP 6                                    |

Heart Rate < 60/min  
Persists despite oxygenation and ventilation

YES → Exit to  
Pediatric Cardiac Arrest  
Protocol(s) PC 1, 4, 7

NO

|          |   |
|----------|---|
|          | Identify underlying cause<br>Search for reversible causes   |
|          | Blood Glucose Analysis Procedure  |
|          | IV or IO Protocol UP 6  |
| <b>A</b> | <b>NORMAL SALINE BOLUS</b><br>20 ml / kg IV / IO<br>Repeat as needed x 3<br>(Maximum 60 mL / kg)                      |
| <b>P</b> | <b>EPINEPHRINE 1:10,000</b><br>0.01 mg/kg IV / IO<br>(Maximum Single Dose 1mg)<br>Repeat every 5 minutes              |
| <b>P</b> | <b>ATROPINE</b><br>0.02 mg / kg IV / IO<br>May repeat x 1<br>Minimum single dose 0.1 mg<br>Maximum single dose 0.5 mg |
| <b>P</b> | If no improvement<br>Consider<br>Cardiac External Pacing Procedure CSP 3  |

|                            |
|----------------------------|
| <b>Reversible Causes</b>   |
| Hypovolemia                |
| Hypoxia                    |
| Hydrogen ion (acidosis)    |
| Hypothermia                |
| Hypo / Hyperkalemia        |
| Hypoglycemia               |
| Tension pneumothorax       |
| Tamponade; cardiac         |
| Toxins                     |
| Thrombosis; pulmonary (PE) |
| Thrombosis; coronary (MI)  |

|  |
|--|
| <b>Suspected Beta-Blocker or Calcium Channel Blocker</b> |
|  |
| <b>Follow Pediatric Toxicology Protocol</b>              |

**Notify Destination or Contact Medical Control**

Pediatric Cardiac Protocol Section



# PEDIATRIC BRADYCARDIA WITH POOR PERFUSION

## Pearls

- **Recommended Exam: Mental Status, HEENT, Skin, Heart, Lungs, Abdomen, Back, Extremities, Neuro**
- **Bradycardia is often associated with hypoxia so insure patent airway, breathing, and circulation as needed.**
- **Begin CPR immediately with persistent bradycardia and poor perfusion despite adequate oxygenation and ventilation.**
- **Use length-based or weight-based pediatric resuscitation system for medication, equipment, cardioversion, and defibrillation guidance. Pediatric paddles should be used in children < 10 kg.**
- **Rhythm should be interpreted in the context of symptoms and pharmacological treatment given only when symptomatic, otherwise monitor and reassess.**
- **Consider hyperkalemia with wide complex, bizarre appearance of QRS complex, and bradycardia.**
- **12-Lead ECG:**
  - **12 Lead ECG not necessary to diagnose and treat**
  - **Obtain when patient is stable and/or following rhythm conversion.**
- **Unstable condition**
  - **Condition which acutely impairs vital organ function and cardiac arrest may be imminent.**
  - **If at any point patient becomes unstable move to unstable arm in algorithm**
- **Epinephrine is first drug choice for persistent, symptomatic bradycardia.**
- **Atropine:**
  - **Second choice, unless there is evidence of increased vagal tone or a primary AV conduction block, then give atropine first.**
  - **Ineffective and potentially harmful in cardiac transplantation. May cause paradoxical bradycardia.**
- **Symptomatic bradycardia causing shock or peri-arrest condition:**
  - **If no IV or IO access immediately available, start Transcutaneous Pacing, establish IV / IO access, and then administer epinephrine.**
  - **Epinephrine should be administered followed Atropine if no response.**
- **Symptomatic condition**
  - **Arrhythmia is causing symptoms such as palpitations, lightheadedness, or dyspnea, but cardiac arrest is not imminent.**
  - **Symptomatic bradycardia usually occurs at rates < 50 beats per minute.**
  - **Search for underlying causes such as hypoxia or impending respiratory failure.**
- **Serious Signs / Symptoms:**
  - **Hypotension. Acutely altered mental status. Signs of shock / poor perfusion. Chest pain with evidence of ischemia (STEMI, T wave inversions or depressions.) Acute CHF.**
- **Transcutaneous Pacing Procedure (TCP)**
  - **Indicated with unstable bradycardia unresponsive to medical therapy.**
  - **If time allows transport to specialty center because transcutaneous pacing is a temporizing measure.**
  - **Transvenous / permanent pacemaker will probably be needed.**
  - **Immediate TCP with high-degree AV block (2d or 3d degree) with no IV / IO access.**
- **Most maternal medications pass through breast milk to the infant so maintain high-index of suspicion for OD-toxins.**
- **Hypoglycemia, severe dehydration and narcotic effects may produce bradycardia. Many other agents a child ingests can cause bradycardia, often is a single dose.**