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, epiglotitis)
- Hypovolemia (dehydration)
- Congenital heart disease
- Trauma
- Tension pneumothorax
- Hypothermia
- Toxin or medication
- Hypoglycemia
- Acidosis

Suspected Beta-Blocker or Calcium Channel Blocker

Follow Pediatric Toxicology Protocol

Bradycardia
Causing Hypotension / AMS
Poor Perfusion / Shock
Typically HR < 50/min

Pediatric Airway Protocol(s) AR 5, 6
as indicated

Identify underlying cause

Blood Glucose Analysis Procedure

Exit to Appropriate Pediatric Protocol(s)

P Cardiac Monitor

Search for reversible causes

IV / IO Procedure

A **Normal Saline Bolus**
20 ml / kg IV / IO
Repeat as needed x 3
Maximum 60 mL / kg

Reversible Causes

Hypovolemia
Hypoxia
Hydrogen ion (acidosis)
Hypothermia
Hypo / Hyperkalemia

Tension pneumothorax
Tamponade; cardiac
Toxins
Thrombosis; pulmonary (PE)
Thrombosis; coronary (MI)

P **Epinephrine 0.1 – 1 mcg / kg / min IV / IO**
Or
Dopamine 5 – 20 mcg / kg/ min IV / IO
Titrate to age appropriate
SBP ≥ 70 + 2 x Age

Atropine 0.02 mg / kg IV / IO
May repeat x 1
Minimum single dose 0.1 mg
Maximum single dose 0.5 mg

Consider
Cardiac Pacing Procedure

Bradycardia / Heart Rate < 60 Persists
AND
Poor Perfusion / Shock
Cardiac arrest?

YES → Exit to Pediatric Cardiac Arrest Protocol PC 1, 4, 6

NO

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**
- **Use Length-based Resuscitation Tape for drug dosages if applicable.**
- **Ensure patent airway, breathing, and circulation as needed. Administer oxygen. Reassess if bradycardia persists after adequate oxygenation and ventilation.**
- **Bradycardia with adequate pulses, perfusion, and respirations requires no emergency intervention. Monitor and continue evaluation with reassessments.**
- **With HR < 60 / min and poor perfusion despite adequate ventilation and oxygenation, begin CPR immediately.**
- **Epinephrine is first drug choice for persistent, symptomatic bradycardia.**
- **Atropine is second choice, unless there is evidence of increased vagal tone or a primary AV conduction block, then given Atropine first.**
- **Transcutaneous pacing:**
  - **Indicated if bradycardia is due to complete heart block or other AV blocks which are not responsive to oxygenation, ventilation, chest compressions, or medications. Indicated with known congenital or acquired heart disease.**
  - Transcutaneous pacing is not indicated for asystole or bradycardia due to postarrest hypoxic / ischemic myocardial insult or respiratory failure.
  - Pediatric patients requiring external transcutaneous pacing require the use of pads appropriate for pediatric patients per the manufacturers guidelines.
- **Do not delay therapy when bradycardia is evident and no ECG monitor is available.**
- **Vasopressor agents:**
  - **Dopamine 2 – 20 mcg / kg / min IV / IO**
  - **Epinephrine 0.1 – 1 mcg / kg / min IV / IO**
  - **Norepinephrine 0.1 – 2 mcg / kg / min IV / IO**
  - **Dose Calculation: mL / hour = kg x dose(mcg / kg / min) x 60 (min / hr) / concentration (mcg / mL)**
- The majority of pediatric arrests are due to airway problems.
- 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.