Pediatric; Bradycardia With a Pulse



History

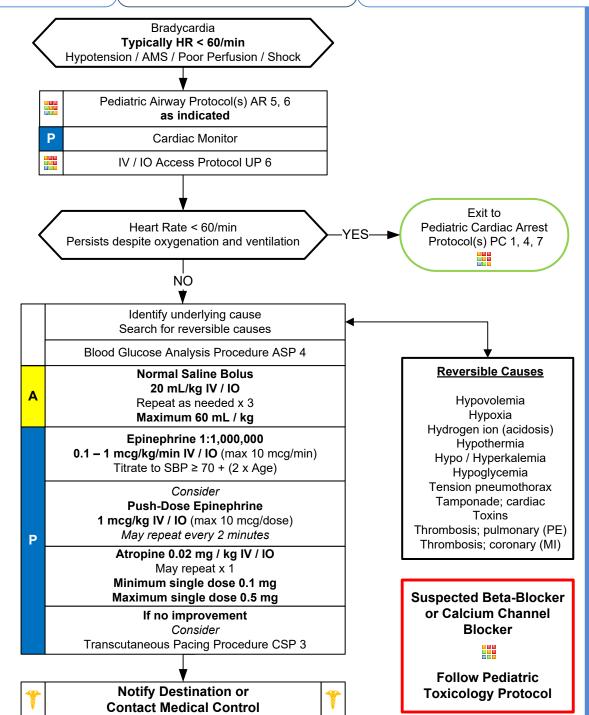
- Past medical history
- Foreign body exposure
- Respiratory distress or arrest
- Apnea
- Possible toxic or poison exposure
- Congenital disease
- Medication (maternal or infant)

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



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Epinephrine Drip Rates

A mixture of 1mg of Epinephine in 1,000 mL = 1 mcg/mL Rates based on MACRO drip set (10 gtts/mL)

Desired Dose (mcg/min)	1 mcg/min	2 mcg/min	3 mcg/min	4 mcg/min	5 mcg/min	6 mcg/min	7 mcg/min	8 mcg/min	9 mcg/min	10mcg/min
Drip Rate (Drops/min)	10 gtts/min	20 gtts/min	30 gtts/min	40 gtts/min	50 gtts/min	60 gtts/min	70 gtts/min	80 gtts/min	90 gtts/min	100 gtts/min

Epinephrine Infusion Preparation

- 1) Draw up 1 mg epinephrine, preferably 1:1,000 epinephrine (1 mg/mL)
- 2) Add 1 mg of epinephrine to 1,000 mL bag of normal saline, this yields epinephrine 1 mcg/mL solution
- 3) Connect and prime a 10 gtts/mL IV set for medication administration
- 4) Using high contrast sticker, label IV bag with medication name, amount added, date/time added, resulting concentration and provider initials

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.

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* 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.