



Pediatric Bradycardia With a Pulse



History

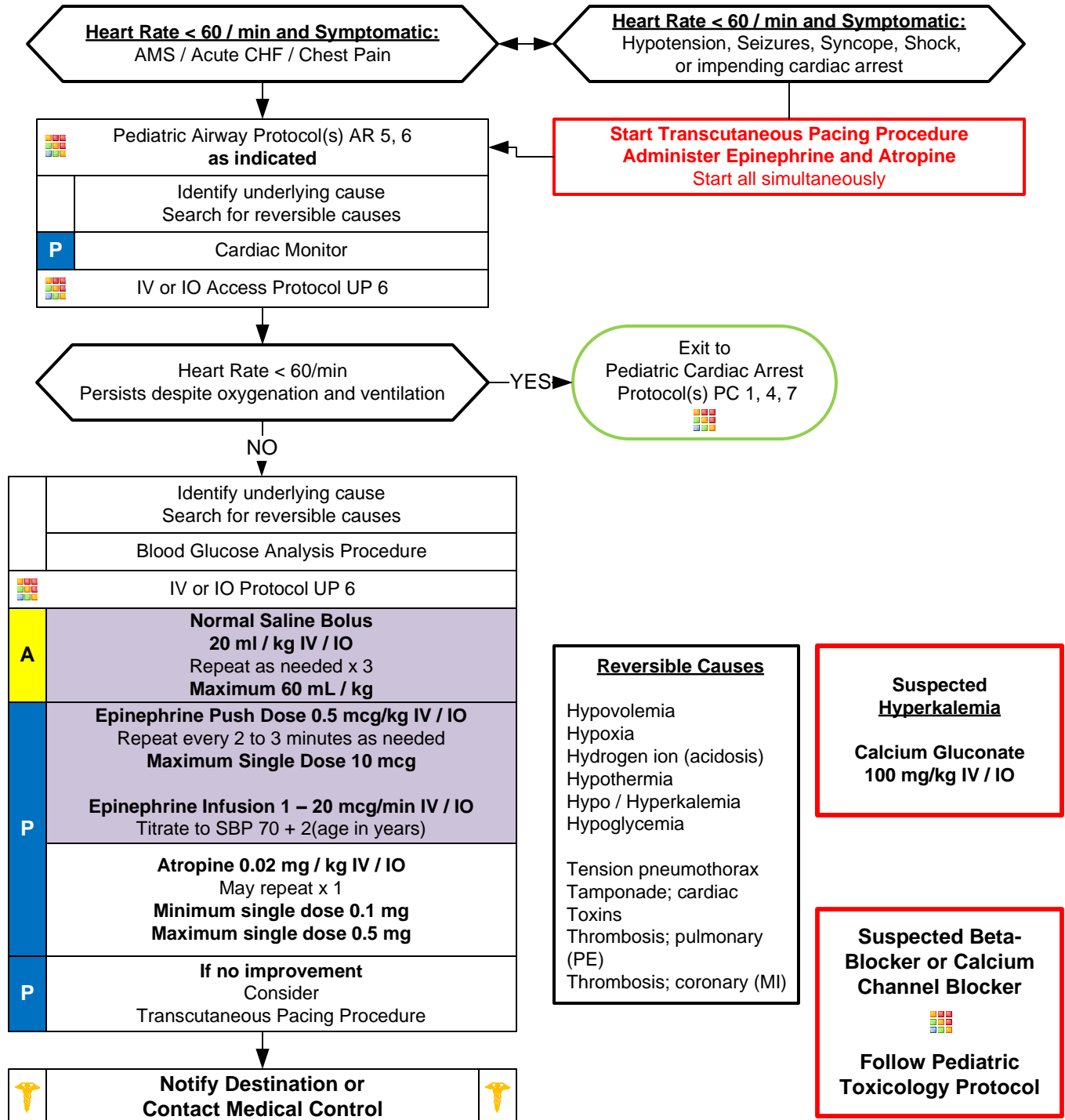
- Past medical history
- Foreign body exposure
- Respiratory distress or arrest
- Apnea
- Possible toxic or poison exposure
- Congenital disease
- Medication (maternal or infant)

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





Pediatric Bradycardia With Poor Perfusion



ECG and rhythm information should be interpreted in context of the entire patient assessment.

- For example if you have a patient which is ill with a likely infection and fever and is bradycardic there overall symptoms are unlikely related to bradycardia and more likely related to overwhelming sepsis and potentially hypoxia.

Bradycardia is defined as heart rate < 60 but rarely causes symptoms unless < 50 in the pediatric patient. The most important decision point in care is whether the patient is stable or unstable.

HYPOXEMIA IS A COMMON CAUSE OF BRADYCARDIA IN PEDIATRIC PATIENTS.

Unstable:

Refers to patient condition in which a vital organ function is acutely impaired or cardiac arrest is ongoing or imminent.

Symptomatic:

Symptomatic implies the arrhythmia is causing the presenting symptoms but the patient may be stable and not in imminent danger. This situation allows you more time to decide on the most appropriate intervention which often is supportive care only.

TCP Settings

Symptomatic:

- mA = 50
- HR = 80

Unstable/ near arrest:

mA = 100
HR = 80

Push-Dose Vasopressors:

Epinephrine

Mix 1:1000 (1mg in 1mL) into 1000 mL of NS.

Yields a concentration of 1 mcg/mL of Epinephrine. Give **0.5 mcg/kg** every 2 – 3 minutes to titrate SBP > 70 + 2(Age).

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.**