

WEST MICHIGAN REGIONAL PROTOCOL

BRADYCARDIA/HEARTBLOCK PROTOCOL

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Purpose: To provide a process for the management of the patient in bradycardia/heartblock with a pulse.

Definition: This protocol focuses on bradycardia, a heart rate <60 bpm, that is inadequate for the patients clinical condition.

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I. General Management Information

- A. Maintain patent airway; assist breathing as needed, administer oxygen
- B. Monitor EKG (identify rhythm), blood pressure, oximetry, obtain 12 lead if available
- C. Establish IV
- D. Assess for symptoms of poor perfusion caused by bradycardia

II. Specific Management

A. If perfusion is **ADEQUATE**:

1. Attempt to determine the cause of the bradycardia
2. Refer to the Acute Coronary Syndrome Protocol if indicated
3. If patient is in a second-degree type II AV block, or a third-degree AV block:
 - a. Prepare for pacing (place pads on the patient)
 - i. If the patient becomes symptomatic, begin transcutaneous pacing.
 - ii. Do not administer atropine in these patients until after approval from medical control.
4. Observe, monitor

B. If perfusion is **INADEQUATE**:

1. **PEDIATRICS:** Perform CPR if, despite oxygenation and ventilation, the HR remains <60/min with poor perfusion.
2. **ALL PATIENTS: Prepare for transcutaneous pacing (place pads on the patient)**
 - a. **Use without delay for high-degree block** (type II second-degree block or a third-degree AV block,)
 - i. Do not administer atropine in these patients until after approval from medical control.
 - b. **Contact Medical Control prior to pacing in Peds**
 - c. Consider sedation prior to, or concurrent with pacing

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3. Medication Administration - **ADULT**

- a. **Atropine:** 0.5 - 1mg IV/IO while awaiting pacer application
 - i. Repeat atropine every 3 - 5 minutes to a max of 3mg.
 - ii. **If ineffective, begin pacing.**
- b. **Post Radio Contact Medication if pacing and atropine are ineffective:**
 - i. Consider **epinephrine:** 2 to 10mcg/min
(1mg of 1:1000 in 250ml NS or D₅W: 30gtts/min = 2mcg/min, 150gtts/min = 10mcg/min)
 - ii. Consider **dopamine:** 2 to 10mcg/kg/min
(Mix 400mg/250ml = 1600mcg/ml)

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4. **Medication Administration – PEDIATRICS**
- a. Give **Epinephrine** IV/IO: 0.01mg/kg (1:10,000: 0.1mL/kg)
 - iii. **Repeat every 3 to 5 minutes.**
 - b. **If primary AV block, or if bradycardia is unresponsive to oxygenation, ventilation and epinephrine:**
 - i. In **pediatric patients**, bradycardia is usually a result of hypoxia, which must be corrected. **Atropine** should not be administered in bradycardic pediatric patients until the patient has been adequately ventilated and bradycardia persists.
 - ii. **Atropine** IV/IO: 0.02 mg/kg, may repeat.
(Minimum dose: 0.1mg; maximum single dose for a child 1mg: max total dose of 3mg)
 - c. Consider **pacing after medical control contact.**
5. **Search for and treat contributing causes:**
- a. Hypoxia – ventilate and oxygenate
 - b. Hypovolemia – fluid bolus (300 mL for adult and reevaluate)
(20 mL/kg in pediatrics and reevaluate)
 - c. H⁺ Ion (Acidosis) – ventilate
 - d. Hypo/Hyperkalemia
 - e. Hypoglycemia – D₅₀
 - f. Hypothermia – passive warming, warm IV fluids
 - g. Toxicity
 - i. For **beta-blocker** or **calcium channel blocker** overdose:
 - 1.) Atropine may be ineffective; proceed to pacing early in the adult patient
 - 2.) Consider Post Radio Glucagon (1mg)
 - 3.) Consider Dextrose – based on blood glucose
 - 4.) Consider Calcium chloride (0.5 – 1 Gm IVP)
 - 5.) Consider Post Radio Epinephrine infusion (2 to 10mcg/min)
 - ii. For **opiate** overdose with bradycardia
 - 1.) Nalaxone (adult 2mg) (peds 0.1mg/kg, max of 2mg)
 - iii. **Tricyclic antidepressant** overdose
 - 1.) Pace early
 - 2.) If known TCA overdose with widening of QRS, administer sodium bicarbonate (1MEq/kg); contact medical control for additional Bicarb or Bicarb infusion.
 - iv. For **carbamates, nerve agents and/or organophosphates:**
 - 1.) Refer to the Nerve agent Exposure Treatment Protocol
 - 2.) Atropine (higher doses)
 - 3.) 2 Pam Chloride (Together with atropine in Mark – 1 kit).
 - h. Tamponade, cardiac – rapid transport, CPR
 - i. Tension Pneumothorax – decompress
 - j. Thrombosis (coronary or pulmonary) – oxygenation, ACS protocol
 - k. Trauma (Hypovolemia, increased ICP)