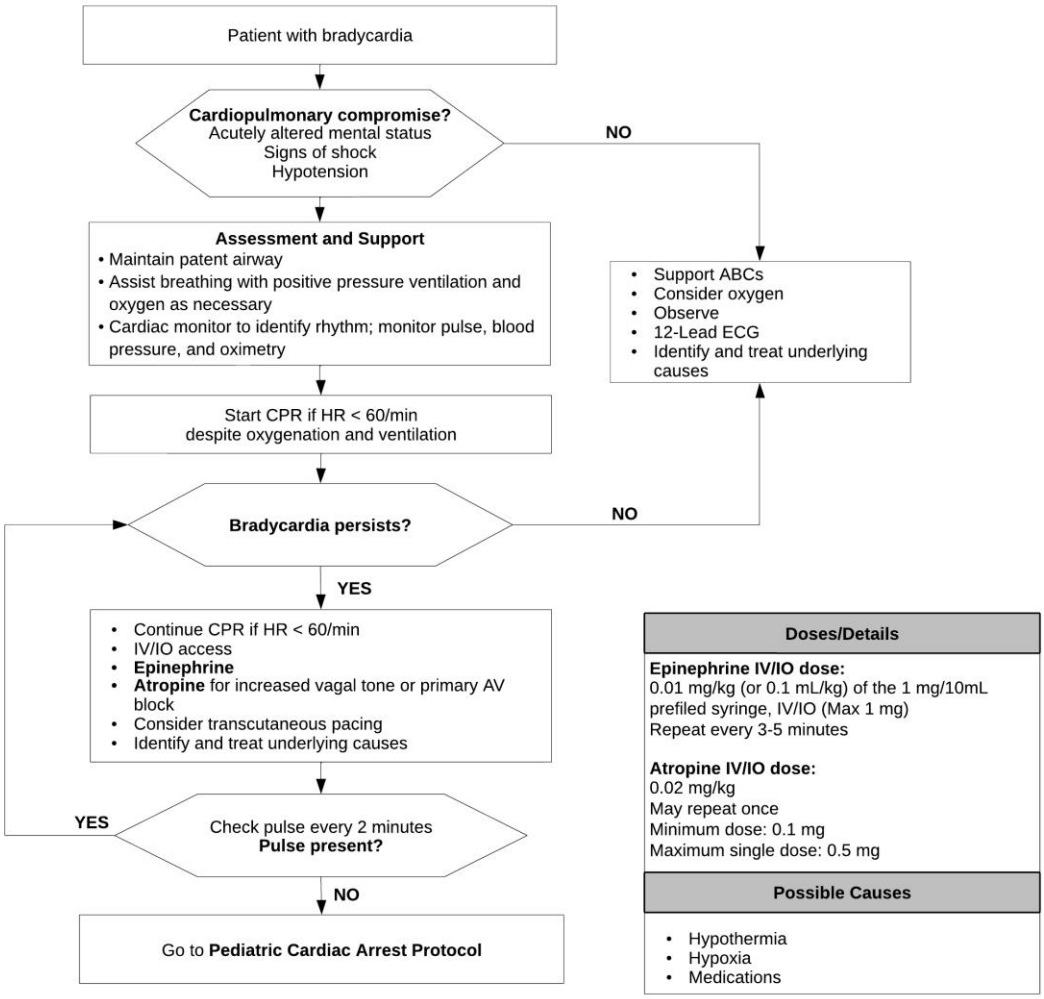
REGION 11 CHICAGO EMS SYSTEM PROTOCOL	Title: Pediatric Bradycardia – BLS/ALS
	Section: Cardiovascular
	Approved: EMS Medical Directors Consortium
	Effective: March 6, 2025

PEDIATRIC BRADYCARDIA – BLS/ALS



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I. PATIENT CARE GOALS

1. Maintain adequate perfusion.

2. Treat underlying cause:

    a. Hypoxia
    b. Shock
    c. Second or third-degree atrioventricular (AV) block
    d. Toxin exposure (beta-blocker, calcium channel blocker, organophosphates, digoxin)
    e. Electrolyte disorder
    f. Hypoglycemia
    g. Increased intracranial pressure (ICP)
    h. Other

II. PATIENT PRESENTATION

A. Inclusion Criteria

1. Pediatric patient with bradycardia and either symptoms of altered mental status chest pain, congestive heart failure, syncope, shock, pallor, diaphoresis or evidence of hemodynamic instability.

2. The major ECG rhythms classified as bradycardia include:

    a. Sinus bradycardia
    b. Second degree AV block
        - Type I- Wenckebach/Mobitz I
        - Type II- Mobitz II
    c. Third-degree AV block, complete heart block
    d. Ventricular escape rhythms

B. Exclusion Criteria

None

III. PATIENT MANAGEMENT

A. Pediatric Management

Treatment is only indicated for patients who are symptomatic (pale/cyanotic, diaphoretic, altered mental status, hypoxic).

1. For infants and newborns, initiate chest compressions for heart rate less than 60 beats per minute and signs of poor perfusion (altered mental status, hypoxia, hypotension, weak pulse, delayed capillary refill, cyanosis).

2. Manage airway and assist ventilations as necessary with minimally interrupted chest compressions using a compression-to-ventilation ratio 15:2 (30:2 if single clinician is present).

3. Administer oxygen as appropriate with a target of achieving 94–98% saturation.

4. Initiate monitoring and perform 12-lead ECG.

5. Establish IV access.

6. Check blood glucose and treat hypoglycemia.

7. Consider the following additional therapies if bradycardia and symptoms or hemodynamic instability continue:

    a. Administer atropine 0.02 mg/kg IV with minimum dose of 0.1 mg to maximum initial dose of 0.5 mg (maximum total dose of 3 mg).
    b. If atropine is ineffective, initiate Transcutaneous Pacing Procedure with analgesia per Pain Management Protocol
    c. Epinephrine may be used for bradycardia and poor perfusion unresponsive to ventilation and oxygenation, the dose is 0.01 mg/kg (or 0.1 mL/kg) of the 1 mg/10 mL prefilled syringe, IV/IO (Max 1 mg).

IV. NOTES/EDUCATIONAL PEARLS

A. Key Considerations

1. Evaluate for signs of decreased end-organ perfusion: chest pain, shortness of breath, decreased level of consciousness, syncope, or other signs of shock/hypotension.

2. Consider the effect of medications causing bradycardia including beta-blockers, calcium channel blockers, sodium channel blockers/anti-depressants, digoxin, and clonidine.

3. There are many potential causes of bradycardia including: myocardial infarction (MI), hypoxia, hypothermia, sinus bradycardia, athletes, head injury with increased intracranial pressure (ICP), stroke, spinal cord lesion, AV blocks, overdose, and cholinergic nerve agents.

4. Consider hyperkalemia in the patient with wide complex bradycardia.

5. Bradycardia should be managed via the least invasive manner possible, escalating care as needed.

    a. Third-degree heart block may not respond to atropine, and in these cases proceed quickly to chronotropic agents (such as epinephrine) or transcutaneous pacing.
    b. In cases of impending hemodynamic collapse, proceed directly to transcutaneous pacing.

6. Be aware of acute coronary syndrome as a cause of bradycardia in adult patients.

7. When dosing medications for pediatric patients, dose should be weight-based for non-obese patients and based on ideal body weight for obese patients.