

# Pediatric Bradycardia (age <14) Administrative Guideline



<b>History</b> <ul style="list-style-type: none"> <li>• Past medical history</li> <li>• Foreign body aspiration</li> <li>• Respiratory distress</li> <li>• Apnea</li> <li>• Possible toxic exposure or ingestion</li> <li>• Congenital diseases</li> <li>• Medication (maternal or infant)</li> </ul>	<b>Signs and Symptoms</b> <ul style="list-style-type: none"> <li>• Decreased heart rate</li> <li>• Delayed capillary refill or cyanosis</li> <li>• Mottled, cool skin</li> <li>• Hypotension or arrest</li> <li>• Altered level of consciousness</li> </ul>	<b>Differential</b> <ul style="list-style-type: none"> <li>• Respiratory failure</li> <li>• Foreign body/secretions</li> <li>• Infection (croup, epiglottitis)</li> <li>• Hypovolemia (dehydration)</li> <li>• Congenital heart disease</li> <li>• Trauma</li> <li>• Hypothermia</li> <li>• Toxin, medication</li> <li>• Hypoglycemia</li> </ul>
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**Bradycardia (HR<60)**  
causing ALOC, hypotension,  
poor perfusion, or shock (usually <50 BPM)

B	Open airway Provide supplemental oxygenation and ventilation as indicated FSBG analysis Search for reversible causes (see differential above)
P	IV/IO access, pulse ox, cardiac monitor 12 lead ECG (do not delay initiating treatment)

**Bradycardia (HR<60)**  
causing ALOC, hypotension,  
poor perfusion, or shock despite adequate  
oxygenation and ventilation

Apneic or pulseless at  
any time, follow  
[Cardiac Arrest AG](#)

Age <28 days begin  
chest compressions and  
refer to [Neonatal  
Resuscitation AG](#)

<1 yr begin chest  
compressions and refer to  
[Cardiac Arrest AG](#)

Age > 1 yr

P	First line: administer <b>epinephrine 0.01 mg/kg (1 mg/10 mL) IV/IO</b> <b>Max single dose 1 mg</b> <b>May repeat every 3-5 minutes</b> OR If vagally mediated: administer <b>atropine sulfate: 0.02 mg/kg IV/IO rapid push</b> <b>(min dose 0.1 mg) max initial dose 1 mg</b> May repeat every 3-5 minutes <b>Max total dose 3 mg</b> Administer <b>NS/LR 20 mL/kg IV/IO fluid bolus</b> , assess for signs of fluid overload
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**Continued bradycardia**  
causing ALOC, hypotension,  
poor perfusion, or shock (usually <50 BPM)

B Begin chest compressions

Transport according to **SAEMS Critical Pediatric Triage Protocol**  
Notify receiving facility or contact Medical Direction



## Education/Pearls

The majority of pediatric bradycardia is caused by respiratory failure and hypoxia. Evaluate for signs of respiratory distress in all pediatric patients. Medication overdose is also a common cause of pediatric bradycardia, often due to unintentional ingestion of parental medications; in the setting of a breastfeeding child, consider overdose or intoxication via maternal breast milk.

- Hypoglycemia, severe dehydration, and opioids may produce bradycardia. Many other agents a child ingests can cause bradycardia, often in a single dose.
- Age appropriate minimal SBP =  $70 + (2 \times \text{Age in Years})$

## Medications:

- Epinephrine is the drug choice for persistent, symptomatic bradycardia in pediatric patients.
- Atropine:
  - Although atropine is effective in a broader range of patients and provides a greater amount of hemodynamic support, it can cause or worsen bradycardia.
  - It is **second choice in pediatric patients** unless there is evidence of increased vagal tone or a primary AV conduction block. It is safer to use epinephrine in pediatric patients.
  - Increased vagal tone can be caused by nasal or esophageal stimulation, coughing, sleep apnea, esophageal reflux, increased intracranial pressure.
  - The paradoxical effects are the reason for the minimum dose and recommendation for rapid administration.
- 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.**
  - Not indicated for asystole or bradycardia due to postarrest hypoxic / ischemic myocardial insult or respiratory failure.