

# 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, pulsox, cardiac monitor 12 lead ECG (do not delay initiating treatment)

Apneic or pulseless at any time, follow **Cardiac Arrest AG**

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

Age > 1 yr

Age <28 days begin chest compressions and refer to **Neonatal Resuscitation AG**

<1 yr begin chest compressions and refer to **Cardiac Arrest AG**

P	First line: administer <b>epinephrine (1mg/10 mL) 0.01 mg/kg 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 0.5 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
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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. 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 =  $70 + (2 \times \text{Age in Years})$

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** unless there is evidence of increased vagal tone or a primary AV conduction block.
  - 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.**
  - Transcutaneous pacing is not indicated for asystole or bradycardia due to postarrest hypoxic / ischemic myocardial insult or respiratory failure. Do not delay therapy when bradycardia is evident and no ECG monitor is available.