

# Paediatric cardiac arrhythmias

**Assess with ABCDE approach – recognise and treat reversible causes**

Oxygen if  $\text{SpO}_2 < 94\%$ , respiratory rate, heart rate, CRT, cardiac monitoring, blood pressure, vascular access, AVPU

## Decompensated – seek expert help

**Signs of vital organ perfusion compromise:**  
 Reduced conscious level, tachypnoea, bradycardia / tachycardia, BP < 5th centile\*, CRT > 2 secs, weak or impalpable peripheral pulses

## Signs of circulation?

### Compensated

Normal conscious level,  
 +/- respiratory distress  
 and signs of circulatory compromise, BP > 5th centile\*

### Bradycardia

< 1 year < 80 min<sup>-1</sup>  
 > 1 year < 60 min<sup>-1</sup>

- Optimal oxygenation with positive pressure ventilation if required
- If unconscious and HR < 60 min<sup>-1</sup> despite oxygenation, start chest compressions
- No response to oxygenation:
  - If vagal stimulation possible cause – atropine
  - If no response to oxygenation or atropine consider adrenaline
  - Pacing – very rarely required and guided by aetiology

### Tachycardia

Narrow complex

**Sinus tachycardia**  
 Infant typically 180–220 min<sup>-1</sup>  
 Child typically 160–180 min<sup>-1</sup>  
 Gradual onset

**SVT**  
 Infant > 220 min<sup>-1</sup>  
 Child > 180 min<sup>-1</sup>  
 Abrupt onset

- Treat the cause:
  - Physiological response:
    - Crying
    - Exercise
    - Anxiety/fear
    - Pain
  - Identify precipitant**  
 Compensatory mechanism:  
    - Respiratory/circulatory failure
    - Hypovolaemia
    - Sepsis
    - Anaemia
- Consider amiodarone before 3rd shock

Broad complex

**VT**  
 Could be VT or SVT, if unsure treat as VT

- If conscious:**
  - Synchronised cardioversion with appropriate sedation + analgesia (e.g. IM/intranasal ketamine if delay in IV access)
  - Chemical cardioversion may be 1st choice if suitable IV access is in place and delay in synchronised cardioversion
  - Adenosine
  - Consider amiodarone before 3rd shock
- If unconscious:**
  - Immediate synchronised cardioversion
  - Consider amiodarone before 3rd shock

Follow  
 ADVANCED  
 LIFE SUPPORT  
 ALGORITHM

NO

### Compensated

Normal conscious level,  
 +/- respiratory distress  
 and signs of circulatory compromise, BP > 5th centile\*

Monitor for clinical deterioration and seek expert help

- Treat the cause:
- If bradycardia, consider oxygenation and vagal tone manoeuvres
  - Reassess
  - Consider adenosine

Age	5th centile
1 month	50 mmHg
1 year	70
5 years	75
10 years	80

\*Systolic BP 5th centile mmHg

Drug	Atropine	Adrenaline	Amiodarone	Synchronised cardioversion	Magnesium
Treatment	Up to 11 years: 20 mcg kg <sup>-1</sup> (max. 0.5 mg)	For bradycardia: 1-2 mcg kg <sup>-1</sup> or continuous infusion	Infants > 1 month & children up to 17 years: 0.1–0.2 mg kg <sup>-1</sup> (100–200 mcg kg <sup>-1</sup> ) <b>If the SVT persists:</b> give a 0.3 mg kg <sup>-1</sup> (300 mcg kg <sup>-1</sup> ) (max. 12–18 mg) after at least 1 min.	With appropriate sedation + analgesia (e.g. IM/intranasal Ketamine if delay in IV access + airway management) – IV access attempts must not delay cardioversion in discussion with paediatric cardiologist/expert	25–50 mg kg <sup>-1</sup> (max. 2 g) to be given over 10–15 min, may be repeated once if necessary, in Torsades de pointes VT
	12–17 years: 300–600 mcg, larger doses may be used in emergency			<b>1st shock:</b> 1 J kg <sup>-1</sup> <b>Subsequent shocks:</b> doubling the energy with each subsequent attempt up to a max of 4 J kg <sup>-1</sup>	