Resuscitation Council UK

Paediatric cardiac arrhythmias

GUIDELINES 2021

Assess with ABCDE approach – recognise and treat reversible causes

Oxygen if SpO_2 < 94%, respiratory rate, heart rate, CRT, cardiac monitoring, blood pressure, vascular access, AVPU

Signs of circulation?

NO → Follow **ADVANCED LIFE SUPPORT ALGORITHM**

YES

Decompensated – seek expert help

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

Compensated

Normal LOC, +/- 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

If SVT, consider vagal manoeuvres

Reassess

Consider adenosine

Bradycardia

< 1 year < 80 min^{-1}
> 1 year < 60 min^{-1}

Optimal oxygenation with positive pressure ventilation if required

If unconscious and HR < 60 min^{-1} 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^{-1}
Child typically 160–180 min^{-1}
Gradual onset

Treat the cause:

Physiological response:
- Crying
- Exercise
- Anxiety/fear
- Pain

Identify precipitant

Compensatory mechanism:
- Respiratory/circulatory failure
- Hypovolaemia
- Sepsis
- Anaemia

SVT

Infant > 220 min^{-1}
Child > 180 min^{-1}
Abrupt onset

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

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, *do not delay cardioversion*).

If unconscious:
Immediate synchronised cardioversion

Consider amiodarone before 3rd shock

Drug	Atropine	Adrenaline	Adenosine	Amiodarone	Synchronised cardioversion	Magnesium
Treatment	**Up to 11 years:** 20 mcg kg^{-1}. **12–17 years:** 300–600 mcg, larger doses may be used in emergency.	**For bradycardia:** 10 mcg kg^{-1} repeat if necessary.	**Up to 1 year:** 150 mcg kg^{-1}, increase 50–100 mcg kg^{-1} every 1–2 min. Maximum single dose: Neonates 300 mcg kg^{-1}, Infants 500 mcg kg^{-1}) **1–11 years:** 100 mcg kg^{-1} increase 50–100 mcg kg^{-1} every 1–2 min. Maximum single dose: 500 mcg kg^{-1} (max. 12 mg) **12–17 years:** 3 mg IV, if required increase to 6 mg after 1–2 min, then 12 mg after 1–2 min	5 mg kg^{-1} – by SLOW IV infusion (> 20 min) before 3rd cardioversion in discussion with paediatric cardiologist/expert	With appropriate sedation + analgesia (e.g. IM/intranasal Ketamine if delay in IV access + airway management) – IV access attempts must not delay cardioversion **1st shock:** 1 J kg^{-1} **2nd shock:** 2 J kg^{-1}, consider up to 4 J kg^{-1}	25–50 mg kg^{-1} Maximum per dose 2 g to be given over 10–15 min, may be repeated once if necessary, in Torsades de pointes VT

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