Clinical Practice Guidelines:
Resuscitation/Paediatric (Non-traumatic)

Policy code	CPG_RE_RP_0125
Date	January, 2025
Purpose	To ensure consistent management of paediatric patients who require resuscitation from non-traumatic causes.
Scope	Applies to Queensland Ambulance Service (QAS) clinical staff.
Health care setting	Pre-hospital assessment and treatment.
Population	Applies to all ages unless stated otherwise.
Source of funding	Internal – 100%
Author	Clinical Quality & Patient Safety Unit, QAS
Review date	January, 2028
Information security	UNCLASSIFIED – Queensland Government Information Security Classification Framework.
URL	https://ambulance.qld.gov.au/clinical.html

While the QAS has attempted to contact all copyright owners, this has not always been possible. The QAS would welcome notification from any copyright holder who has been omitted or incorrectly acknowledged.

All feedback and suggestions are welcome. Please forward to: Clinical.Guidelines@ambulance.qld.gov.au

Disclaimer

The Digital Clinical Practice Manual is expressly intended for use by appropriately qualified QAS clinicians when performing duties and delivering ambulance services for, and on behalf of, the QAS.

The QAS disclaims, to the maximum extent permitted by law, all responsibility and all liability (including without limitation, liability in negligence) for all expenses, losses, damages and costs incurred for any reason associated with the use of this manual, including the materials within or referred to throughout this document being in any way inaccurate, out of context, incomplete or unavailable.

Resuscitation – Paediatric (Non-traumatic)

January, 2025

In comparison with adult out-of-hospital cardiac arrests (OHCA), paediatric incidents are relatively infrequent and are typically precipitated by non-traumatic causes.[1] Common causative aetiologies include respiratory disease, sudden unexpected death in infancy (SUDI) and submersion/drowning.[2–4]

The Queensland Ambulance Service (QAS) attends approximately 80 non-traumatic paediatric OHCA cases annually (defined as involving patients 12 years of age or less). This represents 1.4% of all cardiac arrests attended per year.

As there are discernible differences in the pathophysiological processes involved in adult and paediatric OHCA, there are subtle differences in resuscitation priorities. In paediatrics, presentations of a shockable cardiac rhythm are rare with global hypoxia the dominant attributable cause.

The priorities of paediatric resuscitation are:

- Airway patency
- Adequate oxygenation
- Two-person operated (where possible) bag valve mask ventilation (BVM)
- High-quality continuous CPR (depth, rate and recoil)
- Correction of reversible causes
- Minimisation of on-scene times

Clinical features

History or presenting injury suggests a suspected medical cause of cardiac arrest; characterised by:

- **No signs of life:**
  - Unresponsive
  - Inadequate respirations
  - Pulse cannot be confidently palpated within 10 seconds
- **Signs of inadequate perfusion:**
  - Unresponsive
  - Pallor or central cyanosis
  - Pulse less than:
  - 60 BPM in an infant (less than 1 year)
  - 40 BPM in a paediatric (1–12 years)

Additional information

- Incidences of foreign body airway obstruction are significantly higher in paediatrics cohorts. If collateral history provided on scene is suggestive of possible obstruction ambulance clinicians should perform immediate laryngoscopy.

Additional information *(cont.)*

- In comparison with advanced airway adjuncts, BVM ventilation has been demonstrated as a non-inferior means of providing oxygenation in paediatric patients.[5–8] Where scene resourcing permits, BVM ventilation should be performed using the two-person technique to ensure appropriate oxygenation occurs.[9,10]
- Advanced airway adjuncts may be considered in instances where resuscitation may occur during transport or if prolonged resuscitation is anticipated.
- As previous paediatric exposure is often limited, the decision to intubate should always be considered against the associated risks of the procedure. During intubation, chest compressions should only be briefly paused when the tube is passed through the vocal cords. Clinicians should aim to minimise **all interruptions to 5 seconds or less**.
- Following the insertion of an advanced airway device, ventilations should be performed concomitantly with continuous chest compressions (pausing for rhythm checks, as required). Ventilations should be performed at an age-dependant frequency which reflects the lower limit of the patients expected respiratory rate e.g. 25 (< 1 year), 20 (> 1 year), 15 (> 6 years).[9]
- Ventilations should be performed over a one second period, ensuring appropriate chest rise occurs.
- Ambulance clinicians should consider placing appropriate padding (i.e. towel or blanket) behind the shoulder blades of young paediatric patients (< 8 years of age) when performing airway management. This corrects neck flexion that occurs as a result of the disproportionately sized occipital region unique to this age group.
- The palpation of a perfusing pulse is difficult in paediatric patients. The determination of adequate circulation should also include other parameters such as EtCO2, pulse oximetry, cardiac monitoring and prehospital ultrasound.
- If peripheral intravenous (IV) access cannot be easily obtained within 60 seconds, ambulance clinicians should have a low threshold for progressing to intraosseous cannulation.
- Sodium chloride 0.9% administration should be limited to flush dosages only. High volume administration must be avoided.
- While rare, sudden collapse in older paediatrics often occurs secondary to underlying congenital heart disease. The presence of a shockable rhythm is discernibly higher amongst this cohort.
- Patients may present with an infrequent, irregular, gasping inspiratory respiratory effort (agonal respirations). This is common in the first few minutes of a cardiac arrest and must not delay the commencement of resuscitation efforts.
- In patients presenting in OHCA due to suspected SUDI, ambulance clinicians should determine the following scene findings:
  - the position of the paediatric when found;
  - presence of bedding material obstructing the airway;
  - evidence of shared sleeping;
  - location of any blanching or lividity throughout the body (if present).
- This information must be provided during the clinical handover at hospital and be noted within clinical documentation.

Additional information *(cont.)*

- Ambulance clinicians should accurately describe and denote the scene findings following attendance at a paediatric OHCA, both during clinical handover and within clinical documentation.
- The first rhythm analysis for paediatrics ≥ 1 year must be conducted using the corpuls or ZOLL X Series Advanced defibrillator in AED mode. If a shock is recommended, appropriately trained ambulance clinicians have the option of switching to manual mode to select the appropriate weight-based joule setting prior to defibrillation. The defibrillator mode (AED or manual) for all subsequent analyses is at the discretion of the clinician.
- The use of AED mode in paediatrics less than 1 year of age is not recommended.

UNCONTROLLED WHEN PRINTED
UNCONTROLLED WHEN PRINTED
UNCONTROLLED WHEN PRINTED

Suggested medical aetiology OHCA (history, injuries or mechanism do not suggest traumatic cause of cardiac arrest)

Potential airway obstruction (foreign body)

Y → Manage as per CPG: Foreign body airway obstruction

N

Note: *Clinicians must only perform procedures for which they have received specific training and authorisation by the QAS.*

Commence continuous chest compressions
(single officer 30:2, two officers 15:2)
& apply defibrillation pads

Initiate rhythm analysis
(1st analysis in AED if ≥ 1 year)

Shockable rhythm (VF/VT)

Deliver single DCCS

- MANUAL MODE:
  - ≥ 6 years (25 kg) – 200 J (adult pads)
  - < 6 years – 4 J/kg (paediatric pads)
- AED MODE:
  - ≥ 6 years (25 kg) – 200 J (adult pads)
  - ≥ 1 year – 50 J (paediatric pads)

Resume chest compressions for 2 minutes

If refractory to 3 x DCCS, CONSIDER:

- Access (if IV not obtainable in < 1 minute consider IO)
- Amiodarone (PRIORITY)
- Adrenaline (epinephrine)
- Special circumstances

No signs of life → Manage as per CPG: ROLE

Return of spontaneous circulation

Manage as per CPG: Post-ROSC cares

Transport to hospital
Pre-notify as appropriate

Non-shockable rhythm (PEA/asystole)

Resume chest compressions for 2 minutes

CONSIDER:

- Access (if IV not obtainable in < 1 minute consider IO)
- Adrenaline (epinephrine) (PRIORITY)
- Reversible cause*

If refractory to standard resuscitation measures, CONSIDER:

- Contact the *QAS Clinical Consultation and Advice Line* for case specific management advice
- Special circumstances

No signs of life → Manage as per CPG: ROLE

*** Reversible causes:**

- Hypoxia
- Hypothermia
- Hypokalemia/Hyperkalemia
- Hydrogen ion (acidosis)
- Toxins
- Thrombus (coronary/pulmonary)