Clinical Practice Guidelines: Resuscitation/Traumatic

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Resuscitation – Traumatic

March, 2026

Often the result of motor vehicle accidents, falls from height or instances of interpersonal violence, traumatic out-of-hospital cardiac arrests (OHCA) are inherently associated with poor survival outcomes.[1–3] Typically, these events are precipitated and attributable to hypovolaemia, hypoxaemia, tension pneumothorax or pericardial tamponade.[4] The primary objective of resuscitation in this setting is to immediately address these physiological processes.

Annually, the Queensland Ambulance Service (QAS) attends approximately 500 OHCA that occur secondary to traumatic causes. This represents 8.5% of all cardiac arrest presentations state-wide. Successful resuscitation from traumatic OHCA is reliant on an interlinked team-based approach that concomitantly targets the following reversible causes, in order of perceived clinical need:

Hypovolaemia

- The correction of hypovolaemia is a two-step process, involving immediate haemorrhage control and subsequent volume replacement.
- External haemorrhage control can be achieved through the application of arterial tourniquets, direct pressure, haemostatic dressings or emergency bandaging.[5]
- Internal haemorrhage can be more difficult to address in the prehospital environment. In patients that present with suspected pelvic injury the application of a pelvic splint should be performed without delay. In undifferentiated blunt trauma, application may be performed after other interventions have occurred.
- Aggressive fluid resuscitation is a central determinant of reversing hypovolaemia and restoring homeostasis. This should be commenced using 20 mL/kg of sodium chloride 0.9% or Packed Red Blood Cells (if available). Further fluid boluses of 5–10 mL/kg may be required.

Hypoxaemia

- In patients presenting in traumatic OHCA, hypoxaemia may occur as a result of airway obstruction (partial or complete), asphyxia or respiratory failure secondary to a reduced ventilatory drive. Interventions to correct this may include basic airway manoeuvres, the insertion of airway adjuncts and supplementary oxygenation. The insertion of an advanced airway (SGA or ETT) should be performed by the most experienced clinician present on scene.
- Impact Brain Apnoea (IBA), is characterised by concussive trauma to the brainstem that results in the cessation of spontaneous respirations. This condition may aggravate the clinical course of patients with a traumatic brain injury and lead to asphyxiation if untreated. Patients suspected to present with IBA should be provided immediate ventilatory support.
- In patients that are entrapped or encapsulated but can be safely accessed, ambulance clinicians should provide the patient with high flow oxygenation and basic airway adjuncts until fully accessible.

Tension pneumothorax

- In patients presenting with obvious or suspected chest trauma immediate bilateral chest decompression should be considered.
- Ambulance clinicians should have a low threshold for performing this intervention as the identification of a pneumothorax in the prehospital environment is difficult. The perceived benefit of performing chest decompression in this setting significantly outweigh any negatives; if conjecture exists decompress.

Cardiac tamponade

- Cardiac tamponade is characterised by bleeding within the pericardial sac that results in coagulated blood impeding the pumping action of the myocardium. This more commonly occurs secondary to penetrating trauma rather than blunt force.
- Ambulance clinicians should have a high index of suspicion of this injury in patients presenting with penetrating trauma to the torso, regardless of the perceived size of the wound.
- In patients presenting with suspected cardiac tamponade, resuscitative thoracotomy is required. A favourable outcome is rarely possible if this intervention is initiated more than 10 minutes after the onset of the cardiac arrest. Early involvement of the High Acuity Response Unit or conveyance to the closest hospital facility should be considered.

Clinical features

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

- **No signs of life:**
  - Unresponsive
  - Inadequate respirations
  - Carotid pulse cannot be confidently palpated within 10 seconds, **OR**
- **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) or adult

Risk assessment

- Unless the patient presents with injuries obviously incompatible with life (decapitation, cranial/cerebral destruction, incineration), resuscitative measures must be commenced.

Additional information

Injuries inconsistent with traumatic arrest

- If the severity of injures appear inconsistent with traumatic causes, a non-traumatic aetiology (e.g. AMI) should be suspected. Patients meeting this criteria should be managed in accordance with *CPG – Resuscitation: Non-traumatic*. Similarly, patients presenting with suspected commotio cordis (direct force to the anterior chest during myocardium repolarisation) should be managed under these guidelines.

External chest compressions

- The performance of external cardiac compressions provides no benefit to patients presenting in traumatic OHCA until circulatory blood volume has been restored. Compressions may be performed simultaneously when sufficient resources are present on scene but must not interfere or take priority over addressing reversible causes.

Adrenaline (epinephrine)

- The administration of adrenaline for patients in traumatic cardiac arrest should not occur until all reversible causes have been addressed. In instances where a return of spontaneous circulation (ROSC) has been achieved, vasodilation or myocardial depression may require adrenaline or another vasoactive agent.

Defibrillation/Cardiac rhythm

- Only a small proportion of patients (7%) will present with an initial cardiac rhythm ammendable to defibrillation.[4] The presence of pulseless electrical activity in some patients represents a low output state due to hypovalemia or exsanguination. In these instances, focused assessment with sonography for trauma (FAST) may be used to determine the presence or absence of cardiac wall motion. This adjunct may be used to assist clinical decision making and govern patient care.

Cessation of resuscitation

- Resuscitation should be performed for a minimal of 20 minutes, with interventions aimed at correcting reversible causes. If after this time, no ROSC is achieved, resuscitation efforts should cease.

The following clinical flowchart was updated in collaboration with QAS ambulance clinicians and the Queensland Innovation Living Lab (QuiLL) as part of the 2025 Clinical Flowchart Redesign Project. We thank all participants for their valuable contributions and their ongoing commitment to delivering high quality patient care.

If history, injuries, or mechanism suggest a medical cause of cardiac arrest, manage as per *CPG: Resuscitation/Adult (Non-traumatic)*.
If injuries incompatible with life, manage as per *CPG: Verification of death & management of a deceased person*.

CPG: Clinician safety
CPG: Standard cares

- **Expose patient**
- **Attach defibrillation pads**

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

Start or continue CPR if resources permit

Simultaneously address reversible causes if resources permit.
Note: The sequence of the below interventions should be based on the patient's injuries and clinical priorities.

Hypovolaemia	***Consider:*** • Control catastrophic haemorrhage • Prometheus pelvic splint • Arterial tourniquet • IV/IO access • Sodium chloride 0.9%
Hypoxia	***Consider:*** • Basic airway manoeuvre and adjuncts • Suction • Ventilate with capnography • SGA/ETT
Tension pneumothorax	***Consider:*** • Bilateral chest decompression
Tamponade	***Consider:*** • FAST • Resuscitative thoracotomy • Transport to definitive care if within 10 minutes transport time

ROSC?

Manage as per CPG:
Post ROSC management

20 minutes of resuscitation and general discontinuation criteria met?

Manage as per CPG:
Verification of death and management of a deceased person

Determine disposition pathway and pre-notify as appropriate