Resuscitation in traumatic cardiac arrest

Aliases

Traumatic Cardiac Arrest (TCA)

Patient care goals

1. Return of spontaneous circulation.
2. Treatment and resolution of the underlying pathophysiology leading to the traumatic cardiac arrest.
3. When appropriate, transport to the closest and most capable hospital within the defined trauma system.

Patient presentation

Inclusion criteria

Patients suffering blunt or penetrating trauma with cardiac arrest after arrival of EMS clinicians or shortly prior to EMS arrival (recent arrest with continued signs of life).

Exclusion criteria

1. When the mechanism of injury does not correlate with the clinical condition, suggesting a nontraumatic cause of cardiac arrest, standard resuscitative measures should be followed. In such cases, refer to the Resuscitation Section**.**
2. In victims of blunt or penetrating trauma with pulses or other signs of life on EMS clinician assessment refer to the General Trauma Management Guideline**.**
3. In victims of blunt or penetrating trauma with rigor mortis, lividity, or evidence of injuries incompatible with life (including decapitation, hemicorporectomy). In such cases, refer to Determination of Death/Withholding Resuscitative Efforts Guideline**.**
4. Resuscitation efforts may be withheld in any **blunt** trauma patient who, based on thorough primary assessment, is found apneic, pulseless, and asystolic on an EKG or cardiac monitor upon arrival of emergency medical services at the scene. In such cases, refer to the Determination of Death/Withholding Resuscitative Efforts Guideline**.**
5. Resuscitation efforts may be withheld in victims of **penetrating** trauma found apneic, pulseless, and without other signs of life including pupillary reflexes, respiratory effort, spontaneous movement, response to pain, and electrical activity on EKG. In such cases, refer to the Determination of Death/Withholding Resuscitative Efforts Guideline**.**

Patient management

Assessment

1. Management of traumatic cardiac arrest requires a balance of rapid, focused evaluation followed by prompt treatment of reversible life threats, including management of massive hemorrhage, airway management, decompression of tension pneumothorax, and resuscitation.
2. Assess for signs of life, including pulses, respiratory effort, and evaluation of other signs of life.
3. Assess for evidence of massive hemorrhage.
    a. Including evidence of massive external hemorrhage
    b. Evidence of pelvic injury (such as instability)
4. Assess the patient's airway.
5. Assess the patient's respiratory effort, if present, or for evidence of tension pneumothorax.
6. Assess vital signs (pulse, blood pressure, respiratory rate, neurologic status assessment).

Treatment and interventions

1. Manage massive hemorrhage. Refer to General Trauma Management Guideline for complete list of therapies for the treatment of massive hemorrhage, including the following:
    a. Place tourniquets for wounds amenable to tourniquet placement [EMR].
    b. Use a combination of wound packing [EMR-O, EMT-R]and direct pressure [EMR] for junctional wounds or junctional tourniquets if available.
    c. Place a pelvic binder [EMR] on all patients with blunt or blast trauma suffering traumatic

arrest.

2. Manage the patient's airway. Refer to the Airway Management Guideline.
3. Perform bilateral, rapid chest decompression [PARA].
4. Establish intravenous access [AEMT].
5. Initiate volume resuscitation [AEMT] and adjunctive hemorrhage control measures (such as tranexamic acid (TXA)) [PARA].

Patient safety considerations

None noted

Notes and educational pearls Key considerations

1. Survival from traumatic cardiac arrest requires careful coordination between rapid prehospital assessment, EMS clinician treatment of reversible causes of traumatic cardiac arrest and transport that is rapid, but also allows maintenance of necessary therapies in a manner that is effective for patients as well as safe for EMS clinicians.
2. Evidence for the benefit of CPR in traumatic cardiac arrest is limited. Treatment priorities should initially focus on control of massive hemorrhage (including management of pelvis fractures), airway management, and consideration of bilateral needle thoracostomy.
3. Unless there is an immediate and correctable cause, patients suffering penetrating traumatic cardiac arrest have the best chance for survival when arrival time to a trauma center hospital is within 10 to 15 minutes from the loss of pulses.
4. If transport is initiated, patients should be transported to the closest appropriate hospital within the defined trauma system.
5. To reduce on-scene time, consider IV/IO access and initiation of resuscitation during transport.
6. Optimal choices for resuscitation are (in descending order as available) as follows: whole blood, balanced blood products (red blood cells (RBC), plasma), packed red blood cells alone, liquid, or freeze-dried plasma alone, no fluid resuscitation. Excessive crystalloid and colloid have little to no value and may in fact be harmful in
hemorrhagic shock.
7. Consider the duration of resuscitation and transport, contact online medical direction if available to discuss. If termination of resuscitation is advised, refer to the Termination of Resuscitation Efforts Guideline.

Pertinent assessment findings

1. Evidence of injuries incompatible with life
2. Evidence of signs of life