

**SECTION: T-05**

**TITLE: Traumatic Cardiac/Respiratory Arrest**

**REVISED: January 01, 2018**

This protocol supplements protocol C-1 Adult Cardiac Arrest or PC-1 Pediatric Cardiac/respiratory arrest as appropriate.

**BLS-Specific Care: See General Trauma Care Protocol T-1**

- Initiate Basic cardiac arrest care (See protocol C-1 Adult Cardiac Arrest or PC-1 Pediatric Cardiac/respiratory arrest as appropriate). Perform high performance Cardiopulmonary Resuscitation (AKA “Pit Crew”, see *appendix 30*)
- Consider underlying causes of Traumatic cardiac arrest and treat accordingly **simultaneously with chest compressions**. These interventions may include:
  - Bleeding control
  - Pelvic Binding
  - Tourniquet application even in the absence of severe bleeding. (bleeding may be minimal due to arrest state)
  - Careful use of BVM, airway adjuncts and suction. Ventilations should occur over 1-2 seconds
- Notify responding ALS unit ASAP.
- Consider and apply cervical collar as appropriate (see *appendix 17: Selective Spinal Restriction*)

**AEMT/O.M. Specific Care: See General Trauma Care Protocol T-1**

- Consider underlying causes of Traumatic cardiac arrest and treat accordingly **simultaneously with chest compressions**. In addition to the above interventions, this may include:
  - Immediate Supra-glottic Airway as appropriate
  - Fluid Resuscitation: IV: 20 cc/kg ml crystalloid solution. Re-evaluate pulses after each bolus and repeat PRN to a maximum of 60 cc/kg.

**ALS-Specific Care: See General Trauma Care Protocol T-1**

- Consider underlying causes of Traumatic cardiac arrest and treat accordingly **simultaneously with chest compressions**. In addition to the above interventions, this may include:
  - Rapid and early advanced airway management as appropriate
  - Bilateral needle chest decompression
- **Epinephrine**, Rhythm-specific, other Pharmacological therapy: *Use of Epinephrine and other medications should be prioritized secondary to correcting the underlying causes of traumatic cardiac arrest, such as Tension Pneumothorax, hypovolemia, life threatening bleeding, and other “H’s and T’s”.*

**Physician Pearls:**

Traumatic cardiac arrest carries a very high mortality, but in those where ROSC can be achieved, neurological outcome in survivors appears to be similar to other causes of cardiac arrest.

The American College of Surgeons and the National Association of EMS physicians recommend withholding resuscitation in situations where death is inevitable or established and in trauma patients presenting with apnea, pulselessness and without organized ECG activity (asystole). However, neurologically intact survivors initially presenting in this state have been reported. These are patients who survived but whom otherwise may have not.

We therefore recommend the following approach: *Consider* withholding resuscitation in traumatic cardiac arrest in any of the following conditions:

- No signs of life within the preceding 15 min (down time best estimate) AND asytopic.
- Massive trauma incompatible with survival (e.g. decapitation, penetrating heart injury, loss of brain tissue).
- See appendix 26: IN-FIELD DEATH/POST/DNR for further guidance.

If CPR has been initiated *inappropriately* as outlined above, personnel may discontinue CPR without on-line Medical Control.

Outside of the guidelines above (see Appendix 26), In all cases where CPR efforts have been appropriately initiated, Paramedic consultation with the on-line Medical Control physician is **required** prior to discontinuation.

- In addition, BLS interventions, an advanced airway, needle chest decompression, bleeding control, and at least 20 minutes of rhythm-appropriate therapy should have been performed prior to considering termination of efforts
- If a patient's ETCO<sub>2</sub> remains less than 11 mm Hg, despite 20 minutes of rhythm-appropriate therapy with an advanced airway placement, needle chest decompression (if appropriate), and bleeding control interventions, then efforts are likely futile. Conversely, higher ETCO<sub>2</sub> may be cause to consider ongoing resuscitation efforts. Clinical judgement is essential in determining whether to continue resuscitation.

Use waveform ETCO<sub>2</sub> as a gauge for effectiveness of resuscitation as well as monitoring ETT placement.

Continuous use of a LSB, scoop stretcher, or similar device in an extrication/patient movement function is permissible to minimize scene time. Similarly, providers should not wait for arrival of the LUCAS to initiate transport.

Immediate resuscitative efforts in traumatic cardiac arrest focus on treatment of reversible causes, **which occur simultaneously with chest compressions as early as possible**. These causes (*and possible interventions*) include:

- Hypoxia
  - Basic and advanced airway management at appropriate.
- Tension Pneumothorax
  - Bilateral needle chest decompression
- Cardiac Tamponade
- Hypovolemia/Uncorrected Bleeding.
  - Aggressive bleeding control, tourniquet use, and wound packing.
  - Judicious fluid resuscitation

As a general rule, cardiac arrest patients should have their airway managed without induction agents (RSI/MAI), however if ROSC occurs anticipate the need for IV sedation and analgesia.

A substantial portion of traumatic cardiac arrest are caused by tension pneumothorax. *If there is suspected trauma (blunt or penetrating) to the trunk of the patient*, and unless the possibility of tension pneumothorax can be reliably and rapidly excluded, bilateral decompression should be performed.

Special Trauma Situations:

*Pediatrics*: The therapeutic priorities during traumatic cardiac arrest are the same in children as in adults.

*Pregnancy*: Patients in the second half of pregnancy (uterine fundus above the umbilicus) should be resuscitated in the left lateral tilt position at least 15 degrees to minimize uterocaval compression. An long spine board or similar device may facilitate this. As an alternative, constant uterine displacement may be employed if sufficient manpower is on scene.

*The 'medical' arrest in the trauma setting*: Patients without obvious major injury or those involved in low energy mechanisms should be suspected of having had a primary cardiac arrest prior to injury. In such situations it would be appropriate to follow standard resuscitation algorithms (see Protocol C-1 ).

Protocol  
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