1. Introduction
   1.1. Cardiac arrest refers to the combination of pulselessness and the absence of signs of life.
   1.2. Survival rates from traumatic cardiac arrest are poor but comparable with published survival rates for out-of-hospital cardiac arrest of any cause.\(^1\).

2. Objectives
   2.1. To optimise the approach to the management of pre-hospital traumatic cardiac arrest by pre-hospital critical care teams.

3. Scope
   3.1. Clinical crew

4. Process
   4.1. Airway Management
       4.1.1. All cardiac arrest patients should be intubated without anaesthetic drugs.
       4.1.2. Quantitative capnometry should be used to confirm tracheal tube placement, to assess the effectiveness of resuscitation and to inform prognosis\(^2\).

   4.2. Respiratory Management
       4.2.1. Unless the possibility of tension pneumothorax can be reliably excluded, bilateral open thoracostomies should be made\(^3\). Needle thoracocentesis may be performed initially for reasons of access or expediency but these should not be considered to provide definitive pleural drainage.
       4.2.2. Inadequate peripheral perfusion prevents reliable pulse oximetry so this method of monitoring should be omitted.
4.3 Circulatory Management
4.3.1 Significant external haemorrhage should be arrested with appropriate combinations of elevation, pressure dressing, and tourniquet use.
4.3.2 Overt long bone or pelvic disruption should be splinted.
4.3.3 A 500ml intravenous or intraosseous fluid bolus should be given followed by reassessment of pulses. Blood is the resuscitation fluid of choice. Hartmann's may be infused as an alternative. More fluid may be given if there is no return of spontaneous circulation (ROSC), titrated to the presence of a palpable radial pulse (blunt trauma) or central pulse (penetrating trauma)\(^4\).
4.3.4 In pulseless electrical activity or in the presence of obvious thoracic trauma, external cardiac compressions may be omitted at the discretion of the treating physician, since the theoretical mechanisms of action of this intervention are unlikely to be useful in these scenarios\(^5\).

4.4 Drug therapy
4.4.1 There is no evidence that intravenous drugs such as adrenaline improve survival from cardiac arrest, but there is an association between vasopressor use and worse outcome in major trauma patients\(^6\). Intravenous adrenaline may therefore be omitted.

4.5 Beginning and discontinuing Resuscitation
4.5.1 Resuscitation need not be attempted on patients with clearly unsurvivable injuries or who on examination are unequivocally dead. If there is doubt as to the timing of cardiac arrest, resuscitation should be commenced while a more thorough historical and physical assessment is made.
4.5.2 Cessation of resuscitation attempts may be appropriate if there is no response to therapy. However sensitivity should be shown to environmental and human factors (particularly the casualty’s family) on scene. In some cases it may be appropriate to transfer to hospital with ongoing resuscitation. This should be the default action in all paediatric cases in whom resuscitation has commenced, regardless of therapeutic futility.

4.6 Special Circumstances
4.6.1 Paediatrics
4.6.1.1 The therapeutic priorities during traumatic cardiac arrest are the same in children as in the adults.
4.6.1.2 If resuscitation has been commenced on a child it should be continued until the patient has been transferred from the scene regardless of futility (see 4.5.2 above).

4.6.2 The pregnant patient
4.6.2.1 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 minimise uterocaval compression. An extrication board may facilitate this\(^7\).
4.6.2.2 Survival of both mother and baby may be dependent on perimortem caesarean delivery being undertaken within four minutes of arrest\(^8\). It may be necessary and appropriate therefore to
undertake this in the pre-hospital environment if human resources are available to conduct simultaneous adult and neonatal resuscitation.

4.6.3. **Penetrating Trauma**

4.6.3.1 Thoracic or upper abdominal penetrating injury resulting in cardiac arrest should initially be managed as in 4.1.1 and 4.2.1 above. If there are signs of life within a 10 min window prior to team arrival and there is no response to intubation / bilateral thoracostomy, a clamshell thoracotomy should be made with the specific purpose of relieving cardiac tamponade, controlling a cardiac wound(s) and providing internal cardiac massage. A detailed description of this technique is beyond the scope of this HOP but is clearly explained elsewhere 9.

4.6.4 **The 'Medical' Arrest**

4.6.4.1 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.

5. **References**


6. Review Date: 01 July 2011