

Key Points

Most chest injuries in children require non operative treatment

Unstable patients with significant haemothorax will require thoracotomy

Thoracotomy should be performed in operating theatre whenever possible

Penetrating injuries resulting in cardiac arrest in ED, within 15 minutes prior to arrival or peri-arrest may require thoracotomy in ED

All penetrating or high energy / significant chest injuries should by-pass directly to MTC. Any such injury presenting to a TU should be transferred ED to ED without delay if patient condition allows.

A patient who presents to a TU ED *in extremis* should be managed as outlined below by the most senior surgeon/clinician available.

Penetrating chest trauma

JCUH

Call vascular surgeon on-call and thoracic surgeon on-call.

RVI

Call Paediatric Surgery on-call team, on-call consultant thoracic surgeon and PINC anaesthetist. Alert cardiac on-call surgeon.

TU

A patient who presents to a TU ED *in extremis* should have resuscitative surgery performed by the most senior surgeon/clinician available.

- 1. If patient arrests in ED, is peri-arrest or has arrested prior to hospital arrival but has electrical cardiac activity or CPR <15mins AND there is penetrating chest injury then a thoracotomy in ED is indicated.**

ED consultants, Paediatric Surgery consultants, General surgery consultants most orthopaedic consultants and certain trainees are trained in emergency thoracotomy

Consultant Paediatric surgeon and thoracic surgeon must be called

Ensure appropriate equipment is in ED and staff know where to access it

- 2. Unstable patients with significant haemothorax will require a thoracotomy. Thoracotomy should be performed in operating theatre if patient's condition allows transfer.**
- 3. A decision on surgery in the more stable patient with on-going blood loss to be taken between paediatric surgery consultant and thoracic surgeon**
- 4. In patients in whom there is a suspicion of cardiac injury but who have not arrested, trauma team leader to confer with paediatric surgery and cardiac surgery consultants to determine best course of action.**
- 5. Activate major haemorrhage protocol if signs of on-going blood loss**

See Penetrating Traumatic Cardiac Arrest treatment pathway below

Blunt chest trauma:

Evidence shows there is no advantage to emergency thoracotomy in ED for a patient without vital signs

Final decision lies with ED Consultant and paediatric surgery / thoracic surgery consultant if present

Unstable patient with blunt chest trauma and with vital signs can be considered for thoracotomy to be performed in operating theatre if possible.

See Blunt Traumatic Cardiac Arrest treatment pathway below

Thoracostomy:

Most chest injuries in children do not require operative treatment.

Tube thoracostomy may be required in children with pneumothorax, tension pneumothorax or haemothorax. Please follow standard process for tube thoracostomy insertion.

With thanks to Dr Dave Bramley for input

Paediatric Blunt Traumatic Cardiac Arrest Treatment Pathway

- Gather Information
- Ensure Safety using PPE
- Activate Trauma Team (Consultant presence)
- Perform calculations based on estimated weight
- Call For Help Early
- Set up To receive Patient and designate Roles
- **CODE RED-- Activate MHP**
- Predetermine age / weight specific interventions

Cardiac Arrest/ peri-arrest situation in a Trauma Patient

If non- traumatic cause leave pathway and follow APLS guidelines, and de-escalate team

Simultaneously address reversible causes and perform life saving interventions:

Hypovolaemia

Control external exsanguinating haemorrhage- apply pelvic binder/splints as necessary
Rapid volume replacement (IV/IO) with blood. (10ml/kg Hartmann's if no blood available)

Hypoxia

Control airway and maximise oxygenation and ventilation.

Tension Pneumothorax

Bilateral thoracostomies (formal drain not required)

Tamponade

BEDSIDE US- Is tamponade present???

De-prioritise
Chest compressions
Perform LSI first

SHOCKABLE RHYTHM
Simultaneously perform
LSI and Cardioversion

If you are considering a
**Resuscitative
Thoracotomy for
haemorrhage control.**

Do you have the expertise to perform the procedure??

Do you have surgical assistance??

Did you witness the cardiac arrest/loss of vital signs?- **if no do not perform**

Is there evidence of severe head injury? **If yes do not perform**

Do not consider thoracotomy if more than 10 mins post arrest or loss of vital signs

ROSC Achieved

- Consider Imaging
- Transfer to theatre for Damage Control Surgery if haemorrhage control required
- Arrange ITU transfer (liaise with NECTAR/GNCH early)

ROSC not Achieved

consider the following to aid decision making re terminating resuscitation.

- Duration of cardiac arrest
- ETCO2 level
- Lack of response to interventions
- Cardiac Standstill on US

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Chest compressions
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prioritise cardioversion

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