MANAGEMENT ALGORITHM FOR RESUSCITATIVE THORACOTOMY (RT)

Prehospital report of BP < 80, absence of palp BP, or "full arrest"

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IMMEDIATE assessment. Clinical signs of life?

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Palpable carotid pulse? — YES →→ Check auscultatable BP, proceed with resus. per standard protocols for specific injuries

↓ NO

Begin CPR, establish airway, IV access
Connect to EKG monitor, FAST of pericardium

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EKG=> NON FLOW RHYTHM
FAST => neg. for tamponade, no cardiac activity
AND
BLUNT TRAUMA? — YES →→ [Bilat needle thoracostomy] STOP RESUSCITATION!!! (Call the coroner)

↓ NO

EKG => PEA
AND
BLUNT TRAUMA? — YES →→ Consider bilat. needle thoracostomy. Stop resuscitation if evidence of massive head injury WITH major abdominal or thoracic injuries. Continue otherwise.

↓NO

EKG => NON-FLOW RHYTHM or FAST => no cardiac activity
AND
PENETRATING TRAUMA*? — YES →→ [Bilat needle thoracostomy]. STOP. Consider continuing resus thoracotomy **only** evidence/suspicion of tamponade or VS lost in ED or just PTA

↓ NO

PEA + FAST evidence of pericardial tamponade OR massive hemothorax — YES →→ IMMEDIATE resus thoracotomy via Left (always left) 5th interspace. 4/5th rib parasternal 'trap door' often needed to facilitate exposure.

↓ NO

Pt. presumed to have PEA without tamponade or massive hemothx.

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Immediate O-neg blood administration, return of carotid/fem pulse ? — YES → Continue resuscitation. Proceed directly to the OR for definitive management

↓ NO

RT with aortic X-clamping. Forward flow rhythm established within 15 minutes utilizing full resuscitative measures? — YES →→ Continue resuscitation. Proceed directly to the OR for definitive management

↓ NO

STOP RESUSCITATION!!!
(Call the coroner)

REV. 5/21/07

COMMENTS

- Assessment under these circumstances should be performed as soon as possible, even during transport from the ambulance bay.
- The assumption in this algorithm is that non-flow cardiac rhythms and PEA have resulted from end-stage hemorrhagic shock cardiac tamponade, or tension pneumothorax.

- Volume resus. should utilize type 'O' PRBCs
- Mass. trans. protocol is usually activated
- Correct placement of EKG leads MUST BE VERIFIED (CPR deflection, etc.)

NON FLOW RHYTHMS: (NFR)
- Asystole
- V-fib
- Agonal, wide complex bradycardia, HR < 40

- ISOLOATED, PULSELESS (EMD) massive head injuries should be resuscitated in the event they are eligible as organ donors.
- RT occasionally indicated for blunt PEA w/ transient response to BP, or sustained PEA

- On rare occasions, cardiac arrest is caused by or exacerbated by tension pneumothorax. Although survival is still extremely low, bilat. needle thoracostomies are recommended.

Technical Maneuvers for RT Include:
- Open cardiac massage
- Aortic X-clamping
- Pulmonary hilar X-clamp for severe pulm ing
- Direct cardiac injection of drugs in needed.
- Pericardial decompression & control of heart wounds for cardiac tamponade
- Open chest defibrillation if needed.

- Resuscitative thoracotomy may be deferred in carefully selected patients bleeding from known, easily controlled sources (e.g. scalp lacs, amputations) IF they are not RELATIVELY bradycardic

The Ultimate Success of RT will Depend on the:
- Extent and duration of the shock state
- Rapidity of flow restoration to heart & brain
- "Fixability" of the traumatic lesion