# Management Algorithm for Resuscitative Thoracotomy (RT)

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

- **IMMEDIATE assessment.** Clinical signs of life?

  - **YES**
    - Palpable carotid pulse? **YES**
      - Check auscultatable BP, proceed with resus. per standard protocols for specific injuries
    - Palpable carotid pulse? **NO**
      - Begin CPR, establish airway, IV access
      - Connect to EKG monitor, FAST of pericardium
      - **YES**
        - EKG => NON FLOW RHYTHM
          - FAST => neg. for tamponade, no cardiac activity AND BLUNT TRAUMA? **NO**
            - Consider bilat. needle thoracostomy. STOP RESUSCITATION!!! (Call the coroner)
          - EKG => PEA AND BLUNT TRAUMA? **NO**
            - IMEDIATE resus thoracotomy via Left (always left) 5th interspace. 4/5th rib parasternal ‘trap door’ often needed to facilitate exposure.
      - EKG => NON-FLOW RHYTHM or FAST => no cardiac activity AND PENETRATING TRAUMA*? **NO**
        - PEA + FAST evidence of pericardial tamponade OR massive hemothorax
          - **NO**
            - Pt. presumed to have PEA without tamponade or massive hemothorax.
    - EKG => NON FLOW RHYTHM
      - FAST => neg. for tamponade, no cardiac activity AND BLUNT TRAUMA? **NO**
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      - EKG => NON-FLOW RHYTHM or FAST => no cardiac activity AND PENETRATING TRAUMA*? **NO**
        - PEA + FAST evidence of pericardial tamponade OR massive hemothorax
          - **NO**
            - Pt. presumed to have PEA without tamponade or massive hemothorax.
  - **NO**
    - Immediate O-neg blood administration, return of carotid/fem pulse? **NO**
      - RT with aortic X-clamping. Forward flow rhythm established within 15 minutes utilizing full resuscitative measures? **NO**
        - STOP RESUSCITATION!!! (Call the coroner)
    - Immediate O-neg blood administration, return of carotid/fem pulse? **YES**
      - Continue resuscitation. Proceed directly to the OR for definitive management
    - 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

**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

**Isolated, 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