PRACTICE GUIDELINE

Effective Date: **4-16-04** Manual Reference: **Deaconess Trauma Services**

TITLE: EMERGENCY RESUSCITATIVE THORACOTOMY

PURPOSE: Emergency resuscitative thoracotomy may be necessary to treat patients who present *in extremis* and might otherwise die without aggressive therapy. Emergency thoracotomy is not indicated in the resuscitation of all trauma patients who present *in extremis*. The following protocol is intended to be a guide and is not intended to be all-inclusive or exclusive. Additional patients not covered by this protocol who might benefit from emergency thoracotomy will be rare and case-specific. The procedure is performed in conjunction with other resuscitative efforts and should not be employed in isolation. Under certain conditions, resuscitative efforts might best be accomplished in the Operating Room.

DEFINITIONS: Signs of life include presence of blood pressure, cardiac electrical activity, and respiratory effort. Aggressive fluid resuscitation includes 2 units of packed red blood cells and 1-2 liters of LR.

GUIDELINES:

1. Indications:
    a. Penetrating thoracic trauma with systolic BP <40 mmHg and pre-hospital signs of life.
    b. Penetrating non-thoracic, non-cranial trauma with systolic BP <40 mmHg unresponsive to aggressive fluid resuscitation and pre-hospital signs of life.
    c. Cardiac arrest in blunt chest or abdominal trauma after arrival in the Emergency Department with an obtainable blood pressure.
    d. Suspected systemic air embolism.

2. Procedure:
    a. Rapid bilateral antero-lateral betadine prep while thoracotomy tray opened.
    b. Left antero-lateral thoracotomy incision located beneath nipple in males and inferior breast fold in females. Incision extends from left sternal border to anterior border of latissimus dorsi. Chest entered along the superior aspect of 4^{th} or 5^{th} rib. Care must be taken to avoid injury to heart and lung. A right antero-lateral thoracotomy may be preferred for primary right chest wounds.
    c. Additional exposure may be accomplished by extending thoracotomy incision across sternum into contralateral chest cavity.
    d. Insert rib spreader with handle located toward table laterally.
    e. Examine pericardium. If tense hemopericardium present (pericardium distended with maroon discoloration) then proceed to step “h” below.
    f. If system air embolism is suspected or massive hemorrhage from lung parenchyma or hilum is present, then place appropriate clamp across hilum medially.
    g. Retract left lung with left hand. Locate aorta by running right hand medially along posterior chest wall. Aorta located along lateral aspect of vertebral

bodies and will be postero-lateral to esophagus. Dissect around aorta inferior to pulmonary hilum and apply aortic cross-clamp.

h. Enter pericardium by longitudinally incising pericardium anterior and parallel to phrenic nerve. This is best accomplished by grasping pericardium with forceps and cutting with surgical scissors. Pericardial incision is carried inferiorly to diaphragmatic reflection and superiorly to level of superior pulmonary hilum. Care must be taken to avoid injury to left atrial appendage and phrenic nerve. This is best accomplished by lifting tip of scissors laterally as incision is made.

i. Manually lift heart from pericardial sac. If hemopericardium is present, then examine for cardiac perforation. Tamponade perforation if present. If hemopericardium is not present, then begin open cardiac compression. Aortic cross-clamping, if not previously performed, is indicated if no hemodynamic response is noted.

REFERENCES:

- ATLS 10th edition

REVIEWED DATE	REVISED DATE
JAN 05	JAN 08
JAN 06	MARCH 17
JAN 07	
OCT 11	
JULY 16	
JAN 18	
JAN 19	