

Madigan Army Medical Center Clinical Practice Guidelines

Emergency Thoracotomy Guidelines for the Trauma Patient

Department of Emergency Medicine
Madigan Army Medical Center
Maintained by Quality Services Division
Clinical Practice and Referral Guidelines Administrator

Last Review for this Guideline: **May 2010**
Clinical Guidelines require review every three years

Core Document

TITLE: Emergency Thoracotomy Guidelines for the Trauma Patient.

INDICATIONS FOR THE CLINICAL GUIDELINE: This algorithm is intended as a reminder and as a fundamental, acceptable guideline of care for the physician contemplating an emergency thoracotomy on a trauma patient with non-cranial penetrating or blunt trauma. This procedure is one that is used in an immediately life-threatening situation that requires expert management. The clinical guideline assumes a surgeon directs each step.

METRICS: THE KEY ELEMENTS OF THE CLINICAL GUIDELINE THAT WILL BE USED TO MONITOR PROVIDER ADHERENCE TO THE CLINICAL GUIDELINE. The metrics that will be used is presence of vital signs as an indicator for thoracotomy. If vital signs are present at the scene and in the ED then a thoracotomy is indicated. This metric will be added to the Collector Trauma Registry data points and reviewed on a quarterly basis.

DATE: Published: August 2001. Revised April 2010.

AUTHORS: Please contact the clinical guidelines administrator at 253-968-3013 for information regarding the authors of this clinical guideline

AREAS OF DISAGREEMENT: There remains significant disagreement about the role of ED thoracotomy in the patient who had vital signs or signs of life in the field but has no vital signs on arrival, and the final decision for ED thoracotomy in this case should be based on the patient's age, mechanism and nature of injuries, and time interval between loss of vital signs and arrival; timelines were derived from publications on this subject and recommendations from American College of Surgeons.

CONCURRENCE WITH OTHER MAMC CLINICAL PRACTICE RECOMMENDATIONS: There should be no impact to the institution. This is a procedure that is currently being done; the guideline may help providers in their decision-making.

PUBLISHED GUIDELINES OF CARE AND OTHER REFERENCES UPON WHICH THE CLINICAL GUIDELINE IS BASED: This guideline should be published on the MAMC Intranet. Surgical staff, residents and interns will be informed of the guideline once the Clinical Guidelines Committee gives final approval. The presence of this guideline will be reiterated from time to time in General Surgery Grand Rounds. The DEM will also be notified so their residents and staff are aware of its availability on the Intranet.

CLINICAL PRACTICE RECOMMENDATIONS: The clinical practice recommendation can be found in the following two algorithms:

Thoracotomy I (pts with non-cranial penetrating or any blunt injury who lose vital signs)

Thoracotomy II (pts with transmediastinal penetrating injury presenting with vital signs)

KEY POINTS: The two algorithms are both one-page handouts that contain the complete algorithm and key points on the same handout. The metrics that will be used is presence of vital signs as an indicator for thoracotomy. If vital signs are present at the scene or in the ED then a thoracotomy may be indicated. This metric will be added to the Collector Trauma Registry data points and reviewed on a quarterly basis.

IMPACT STATEMENT TO INSTITUTION: This Clinical Guideline only impacts the Emergency Department.

LINKS WITHIN THE MAMC INTRANET: This guideline should be published on the MAMC Intranet.

METHODS OF PROVIDER EDUCATION: Surgical staff, residents and interns will be informed of the guideline once the Clinical Guidelines Committee gives final approval. The presence of this guideline will be reiterated from time to time in General Surgery Grand Rounds. The DEM will also be notified so their residents and staff are aware of its availability on the Intranet.

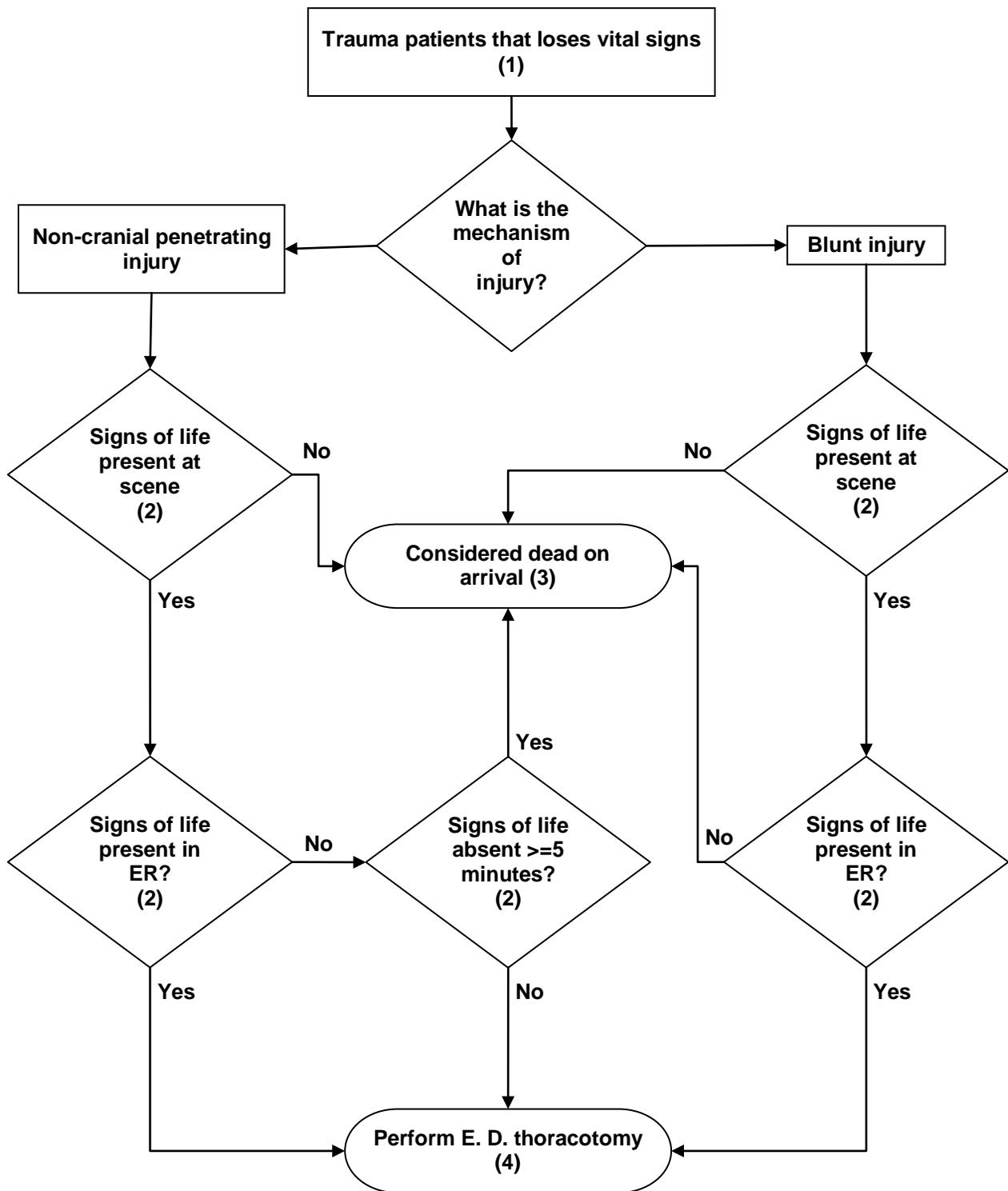
METHODS OF PATIENT EDUCATION: Not applicable.

REVISION FREQUENCY: The Trauma Committee will review the guidelines every three years or sooner, in concurrence with other trauma guidelines. The current Trauma Director will be the POC for this Clinical Guideline.

REFERENCES:

1. Jones TK et al. Cardiopulmonary Arrest Following Penetrating Trauma: Guidelines for Hospital Management of Presumed Exsanguination. *J Trauma* 1987; 27:24.
2. Boyd M et al. Emergency Room Resuscitative Thoracotomy: When is it indicated? *J Trauma* 1992; 33:714.
3. Feliciano et al. Liberal Use of Emergency Center Thoracotomy. *Am J Surg* 1986; 152:654.
4. Baxter et al. Emergency Department Thoracotomy Following Injury: Critical Determinants for Patient Salvage. *World J Surg* 1988; 12:671.
5. DeGennaro VA et al. Aggressive Management of Potential Penetrating Cardiac Injuries. *J Thorac Cardiovasc Surg* 1979; 80:833.
6. Hall BL. Buchman TG. A visual, timeline-based display of evidence for emergency thoracotomy. *Journal of Trauma-Injury Infection & Critical Care*. 59(3):773-7, 2005 Sep.
7. Grove CA. Lemmon G. Anderson G. McCarthy M. Emergency thoracotomy: appropriate use in the resuscitation of trauma patients. *American Surgeon*. 68(4):313-6; discussion 316-7, 2002 Apr.

Madigan Thoracotomy I Algorithm
 (For trauma patients with non-cranial penetrating or any blunt injury who loses BP, pulse, respiration and/or responsiveness)



Injury who loses BP, pulse, respiration and/or responsiveness)

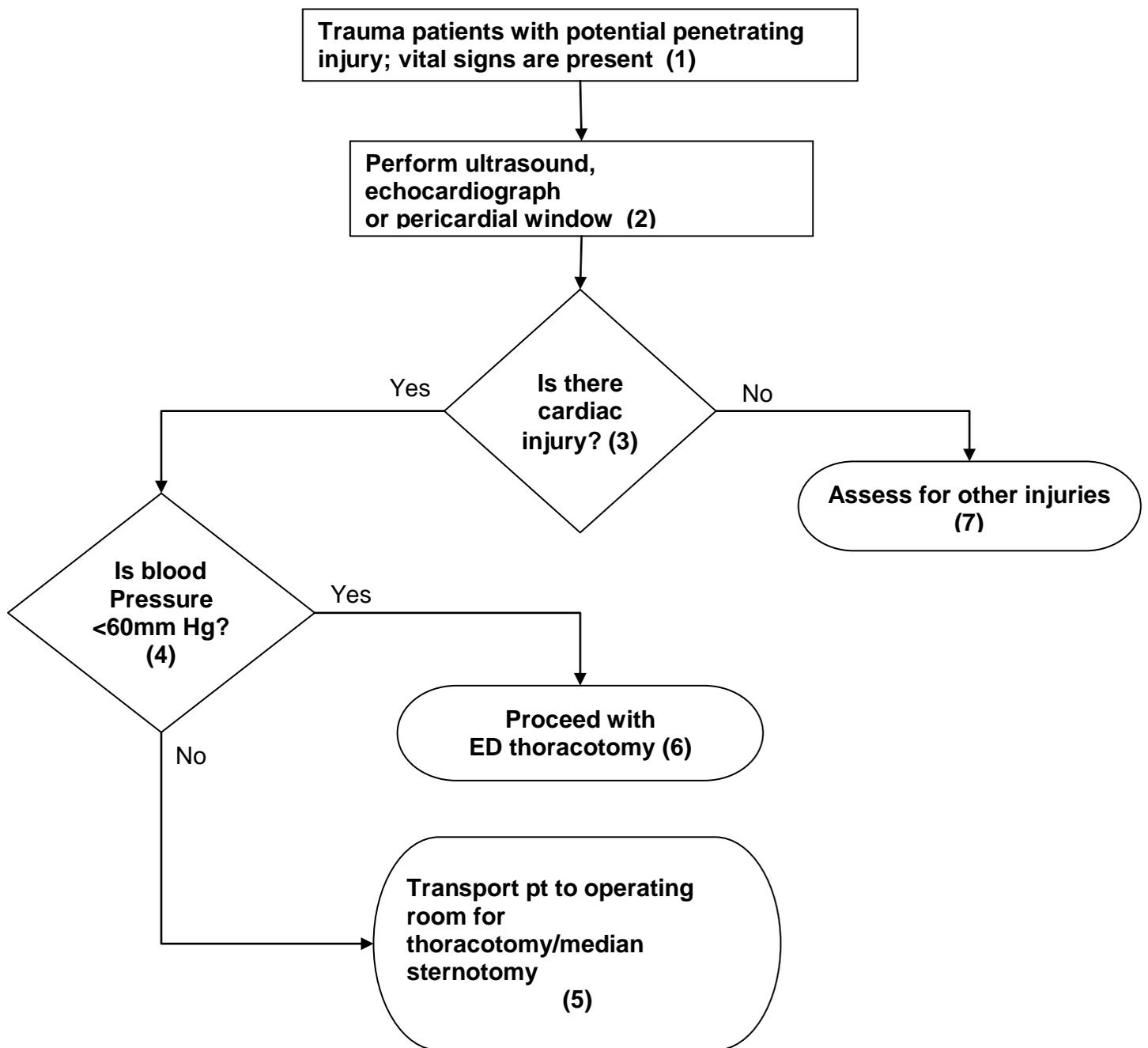
Annotations

- (1) Loses blood pressure, pulse, respiration and or responsiveness in the ED who had signs of life in the field
- (2) Defined as organized supraventricular cardiac activity and/or regular or agonal respirations.
- (3) At arrival to ED, if absent signs of life that have been absent greater than 5 minutes in the non-cranial penetrating trauma or on arrival for all blunt trauma, these patients are considered dead on arrival.
- (4) Left Anterolateral Thoracotomy Procedure
 - Insert rib spreader
 - Consider aortic cross clamp
 - Open pericardium, internal massage
 - Repair obvious cardiac defects
 - Control left chest hemorrhage
 - Clamp pulmonary hilum prn
 - Pack apex prn
 If no bleeding in left chest or heart
 - Consider transmediastinal extension to right chest
 - Consider laparotomy

Simultaneous Resuscitation Points

- The A, B, C's of resuscitation are followed by:
- Ensuring airway and intubating for Glasgow Coma Scale = < 9
 - Keeping O₂ saturation at least 94%, pulse oximetry is recommended
 - Keeping the systolic blood pressure at a minimum of 100mmHg
 - Controlling external hemorrhage
 - Obtaining IV access and administering 2 L NS and 2-4 units Type O uncrossmatched PRBC, using a high-volume rapid infuser is recommended
 - Placements of nasogastric tube and right chest tube concurrent with thoracotomy

Madigan Thoracotomy II Algorithm
 (For trauma patients with transmediastinal penetrating injury presenting to ED with vital signs)



Simultaneous Resuscitation Points

The A, B, C's of resuscitation are followed by:

- Ensuring airway and intubating for Glasgow Coma Scale \leq 9
- Keeping O₂ saturation at least 94%, pulse oximetry is recommended
- Keeping the systolic blood pressure at a minimum of 100mmHg
- Controlling external hemorrhage
- Obtaining IV access and administering 2 L NS and 2-4 units Type O uncrossmatched PRBC, using a high-volume rapid infuser is recommended

Call OR to prepare for emergent transfer and thoracotomy/laparotomy of trauma patient

Metrics

The metrics that will be used is presence of vital signs as an indicator for thoracotomy. If vital signs are present at the scene or in the ED then a thoracotomy may be indicated. This metric will be added to the Collector Trauma Registry data points and reviewed on a quarterly basis.

Key Points

The two algorithms are both one-page handouts that contain the complete algorithm and key points on the same handout. The metrics that will be used is presence of vital signs as an indicator for thoracotomy. If vital signs are present at the scene or in the ED then a thoracotomy may be indicated. This metric will be added to the Collector Trauma Registry data points and reviewed on a quarterly basis.