

Chest Wall Injury Practice Management Guidelines
Trauma, Emergency General Surgery, and Surgical Critical Care
Vanderbilt University Medical Center
Revised 2007

- I. Rib fracture protocol
 - II. Chest tube protocol
 - III. Flail chest stabilization protocol
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I. Rib fracture protocol

> 2 Fractures

- Admit
- Cardiac monitoring
- Continuous pulse oximetry
- Supplemental oxygen
- PCA + NSAIDs (e.g. Toradol) if no contraindication (e.g. splenic laceration, TBI)
- Frequent assessment of
 - Pain (pain scale)
 - Respiratory mechanics (incentive spirometer)
- Consider BiPAP
- Repeat CXR in 24h to evaluate for hemopneumothorax

>3 Fractures

- Acute Pain Service (APS) consult for epidural analgesia for age >64
- Consider for age >64 with lesser injuries or for age <64 with >3 rib fractures

At discharge:

- Lortab/Percocet + NSAIDs x 3-4 weeks if no contraindications

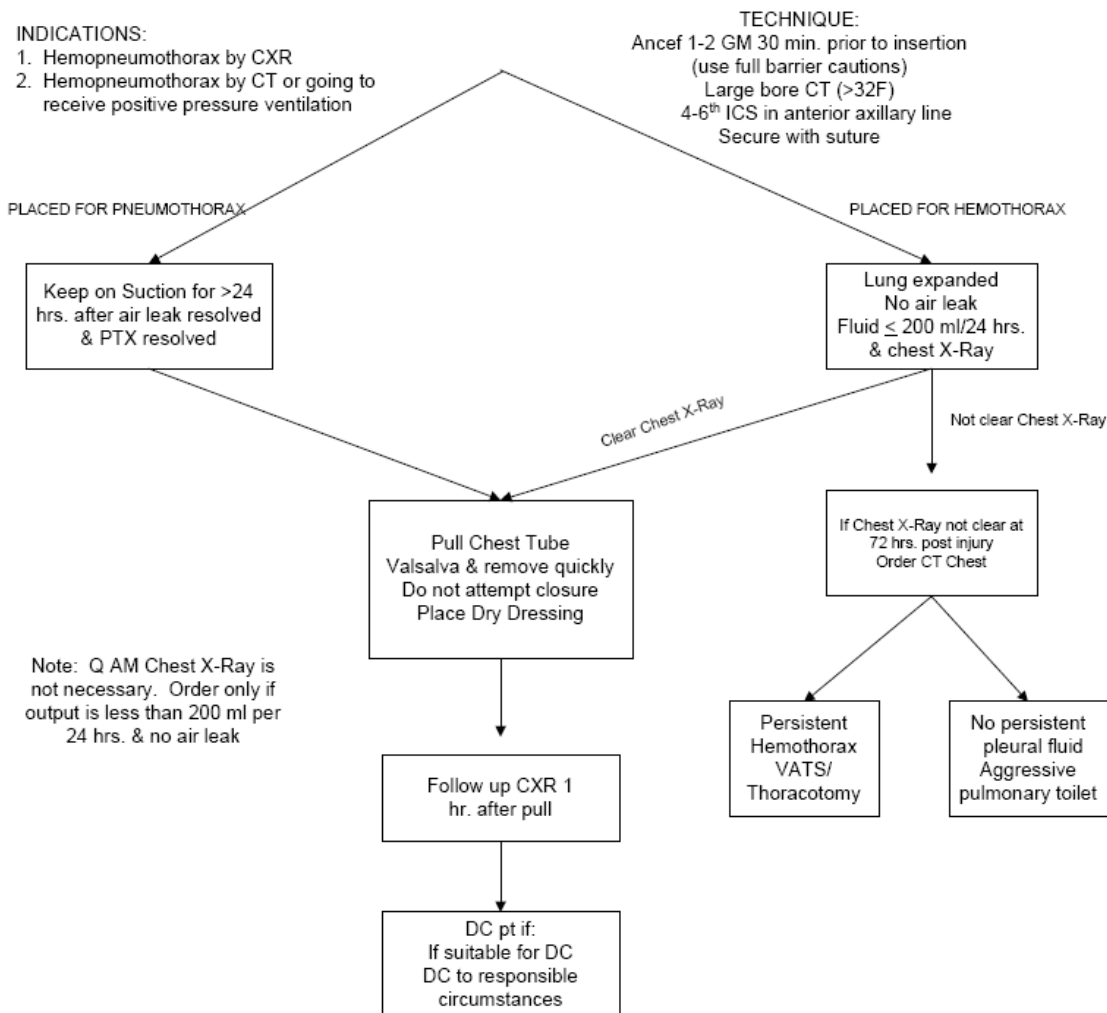
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II. Chest tube protocol

CHEST TUBE PRACTICE GUIDELINES



References:

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III. Flail chest stabilization protocol

Purpose: To define sternal fractures, flail chest injuries, and indications for early surgical stabilization.

(Decrease VAP, decrease LOS, Improve post injury Pulmonary function)

Sternal Fractures:

1. Non-displaced sternal fractures– do not require operative fixation
2. Distracting sternal fractures with respiration – require early operative fixation
3. Significantly overlapping sternal fractures may require operative debridement and fixation

Three categories of Flail Chest and Injury Patterns:

1. Anterolateral flail with respiratory failure requiring mechanical ventilation without severe pulmonary contusion
2. Patient with severe pulmonary contusion limiting the liberation from mechanical ventilation
3. Non-intubated patients with deteriorating pulmonary function.

Indications for stabilization:

1. 3 or greater contiguous rib levels with flail segments
2. plus significant chest wall collapse or deformation with paradoxical respiratory dysfunction
3. impalement of ribs into the lung parenchyma

Timing:

1. Early chest wall stabilization should be considered by post-injury day 2-3. (Prior to the development of VAP or respiratory failure requiring tracheostomy)
2. VTAS should be considered for evaluation of pulmonary parenchymal injury or evacuation of retained hemothorax.

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EAST Guidelines for Flail Chest / Pulmonary Contusion

Level II
1. Trauma patients with PC-FC should not be excessively fluid restricted, but rather should be resuscitated as necessary with isotonic crystalloid or colloid solution to maintain signs of adequate tissue perfusion. Once adequately resuscitated, unnecessary fluid administration should be meticulously avoided. A pulmonary artery catheter may be useful to avoid fluid overload.
2. Obligatory mechanical ventilation should be avoided.
3. The use of optimal analgesia and aggressive chest physiotherapy should be applied to minimize the likelihood of respiratory failure and ensuing ventilatory support. Epidural catheter is the preferred mode of analgesia delivery in severe flail chest injury. (see EAST PMG "Analgesia in Blunt Thoracic Trauma)
4. Patients with PC-FC requiring mechanical ventilation should be supported in a manner based on institutional and physician preference and separated from the ventilator at the earliest possible time. PEEP / CPAP should be included in the ventilatory regimen.
5. Steroids should not be used in the therapy of pulmonary contusion.
Level III
1. A trial of mask CPAP should be considered in alert, compliant patients with marginal respiratory status
2. Independent lung ventilation may be considered in severe unilateral pulmonary contusion when shunt cannot be otherwise corrected due to mal-distribution of ventilation or when crossover bleeding is problematic.
3. Diuretics may be used in the setting of hydrostatic fluid overload as evidenced by elevated pulmonary capillary wedge pressures in hemodynamically stable patients or in the setting of known concurrent congestive heart failure.
4. Surgical fixation may be considered in severe unilateral flail chest or in patients requiring mechanical ventilation when thoracotomy is otherwise required.

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