



Southern Minnesota Regional Trauma Advisory Committee (SMRTAC)

Regional Practice Management Guideline

Initial Management of Potential Rib Fractures in level III and IV Trauma Centers

Adult Practice Management Guideline	Effective: 01/2015
Contact: SMRTAC Coordinator	Last Reviewed: March 13, 2020 Approved: August 4, 2020

Purpose

To address the evaluation and treatment of trauma patients with known or suspected rib fractures.

Definitions

1. Adult trauma patient – any patient age fifteen (15) or older suffering an injury. For the purposes of this guideline the definition is any injured patient who may be at risk for a rib fractures.
2. Flail chest–Fractures of three or more adjacent ribs in two or more places.

Policy Statements

1. Rib fractures occur in approximately 75% of blunt chest trauma cases. Rib fractures may not be evident on routine radiographic studies. The incidence of rib fractures increases with age.
2. Thirty percent of patients over the age of 65 have markedly increased morbidity from isolated rib fractures.
3. Ground level falls commonly result in rib fractures, particularly in patients who have osteopenia, arthritis, or decreased mobility of the chest wall.
4. Fractures of ribs #1-3 require a high energy mechanism. Injuries to the great vessels, lungs, and myocardium should be suspected.
5. Ribs #9-12 surround the upper abdominal viscera. Fractures of these ribs may be associated with underlying organs such as the liver and spleen.
6. Flail chest is associated with significant respiratory compromise, due to underlying pulmonary contusion and impaired respiratory mechanics.
7. Rib belts/binders or maneuvers to wrap the chest are not recommended as they can worsen hypoventilation, atelectasis and pneumonia.
8. In patients with rib fractures, adequate pain control allows for the patient to effectively cough and deep breathe.
 - a. Patients who do not demonstrate effective cough and deep breathing do not have adequate pain control.

Procedure Statements

1. Care in ED
 - i. Cardiac monitoring
 - ii. Pulse oximetry
 - iii. Pain management
 - iv. Treat pneumo/hemothorax with chest tube thoracostomy as needed
 - v. Incentive spirometer, bi-pap and c-pap as needed
 - vi. Manage airway and resuscitate as needed
 - vii. Obtain imaging as appropriate

2. Strongly consider Chest CT if patient meets any of the following criteria
 - i. Fall greater than 20 feet
 - ii. MVC at greater than 40 mph
 - iii. Chest pain or tenderness not adequately explained by x-ray findings
 - iv. Intoxication
 - v. GCS<15
 - vi. Distracting painful injury
 - vii. Age greater than 65

Note: if patient meets Red or Yellow TTA criteria, transfer guidelines should be followed without a delay of transport

3. Isolated rib fractures without associated injuries may be managed on an outpatient basis with oral analgesics. Start with NSAIDS, if not contraindicated, and progress to narcotics as needed. Respiratory treatment with an incentive spirometer should be considered.

4. Consider admission for:
 - i. Intractable pain
 - ii. Compromised pulmonary function
 - iii. Obtain trauma consult if available for patients with >3 rib fractures before considering admission. Patients who require admission may be best served by transfer to tertiary care trauma center
 - iv. Elderly patient greater than 65 years

5. Consider transfer to tertiary trauma care facility for the following high risk patients:
 - i. Fracture of ribs 1-3
 - ii. Pneumothorax, pneumomediastinum or pulmonary contusion, flail chest
 - iii. Elderly patients >65 years
 - iv. Fractures of 3 or more ribs
 - v. Patients on *anticoagulation therapy* (increased risk of delayed hemothorax)
 - vi. Flail chest

Note: above patients may benefit from rib stabilization surgery

6. Consider discharge from ED if
 - i. No underlying pulmonary injury
 - ii. No significant comorbidities (COPD, neuromuscular disease, etc)

- iii. Adequate pain control with oral analgesics (see policy statement 8)
7. Follow up:
- i. If dismissed from the ED, the patient should have follow up with PC within two weeks with repeat chest X-ray.
 - ii. ED patient discharge instructions should include the need to seek medical treatment if patient has any of the following physical signs:
 - a. Fever
 - b. Productive cough
 - c. Worsening pain
 - d. Shortness of breath

Resources/Links

Advanced Trauma Life Support; 10th edition, 2018; Chapter 4, pg 78 and 221.

Calland,J., Ingraham, A., et. Al., Evaluation and management of geriatric trauma: An Eastern Association for the Surgery of Trauma practice management guideline. *J Trauma Acute Care Surg.* 2012;73:S345-S350.

Eastern Association for the Surgery of Trauma (EAST) Practice Management Guideline: Blunt Thoracic Trauma (BTT), Pain Management in Link to EAST.ORG/resources

Karlson, Kristine A; Initial evaluation and management of rib fractures; 2019; www.uptodate.com/contents/initial-evaluation-and-management-of-rib-fractures Reviewed Jul 2020.

Prepared by: SMRTAC leadership
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Disclaimer: This is a general guideline and is not intended as a substitute for clinical judgment or as a protocol for the management of all trauma patients.