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:**

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; 9th edition, 2012; Chapter 4, pg 108-109.

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; 2014; www.uptodate.com/contents/initial-evaluation-and-management-of-rib-fractures Reviewed 12/11/2014

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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.