Created: June 2024

Reviewed: March 2025

Revised: March 2025

Deaconess REGIONAL TRAUMA CENTER

Rib Fracture Management

Purpose: To standardize the treatment of rib fracture patient to improve chest wall stability, respiratory function, and secretion clearance

Guidelines:

A. Initial treatment of rib fractures
   a. Incentive spirometry (IS) and secretion clearance measures to be started on admission
      i. Aerobika (secretion clearance) every 4 hours while awake
      ii. Incentive spirometry 10 breaths every 2 hours while awake
   b. Head of bed >30º
   c. Early mobility
   d. Multimodal pain control

B. Open Reduction Internal Fixation (ORIF)
   a. If indicated, should be completed within 72 hours of admission as able
   b. Indications
      i. Patients with fractures of ribs numbered 3 through 10 and
         1. >18 years of age
         2. Flail chest
         3. 3 or more ribs with at least 2 of the following
            a. Respiratory rate >20
            b. IS <50% predicted
            c. Uncontrolled pain
            d. Poor cough/poor secretion clearance

   c. Contraindications
      i. Shock or ongoing resuscitation
      ii. Fracture of ribs 1, 2, 11, 12
      iii. Sepsis
      iv. Severe TBI
      v. Anatomic location considerations
      vi. Risk outweighs benefit
         1. Trauma Surgeon to document

C. Technique
    a. Appropriate pre-operative optimization
    b. Use of muscle sparing exposures
    c. Thoracoscopic or open techniques as appropriate
    d. Irrigate and evacuate pleural space when hemothorax present

D. Post-Operative Care
    a. Chest tube management as appropriate
    b. Maximize pulmonary hygiene
    c. Pain control
        i. Nerve block/pain catheter per anesthesia
        ii. Schedule Tylenol and NSAID unless clinically contraindicated
        iii. Consider Lidoderm patch

References:

- Chest Wall Injury Society
- Chen Zhu, R., de Roulet, A., Ogami, T. & Khariton, K. (2020). Rib fixation in geriatric trauma: Mortality benefits for the most vulnerable patients. *Journal of Trauma and Acute Care Surgery, 89* (1), 103-110. doi: 10.1097/TA.0000000000002666.
- Shiroff, A., Wolf, S., Wu, A., Vanderkarr, M., Anandan, M., Ruppenkamp, J., Galvain, T. & Holy, C. (2023). Outcomes of surgical versus nonsurgical treatment for multiple rib fractures: A US hospital matched cohort database analysis. *Journal of Trauma and Acute Care Surgery, 94* (4), 538-545. doi: 10.1097/TA.0000000000003828.
- Simmonds, A., Smolen, J., Ciurash, M., Alexander, K., Alwatari, Y., Wolfe, L., Whelan, J., Bennett, J., Leichtle, S., Aboutanos, M. & Rodas, E. (2023). Early surgical stabilization of rib fractures for flail chest is associated with improved patient outcomes: An ACS-TQIP review. *Journal of Trauma and Acute Care Surgery, 94* (4), 532-537. doi: 10.1097/TA.0000000000003809.