A Collaborative Clinical Protocol for Elderly Trauma Patients with Rib Fractures

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• **What is the problem or challenge you identified?**
  - During routine deliberations of the Trauma Performance Improvement and Patient Safety Committee (Trauma PIPS), patients were identified who had multiple rib fractures but were not evaluated by the trauma service.
  - Several of these patients required extended hospital stays. As a result, trauma surgeons and emergency physicians collaboratively developed and implemented an emergency department rib fracture protocol.

• **Describe the intervention you developed/change you implemented to address the problem.**
  - Elderly patients found to have three or more fractures, hemodynamic abnormality, or hemopneumothorax, were automatically referred to the trauma service.
  - Patients not meeting these criteria but with risk factors for morbidity and mortality including age greater than 64, fall from higher than ground level, or recent use of warfarin or clopidogrel were also referred to the trauma service.
  - The treatment and disposition of patients with two or fewer rib fractures not meeting the above criteria were carried out according to the emergency physician’s discretion.
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**Study Design**
- Retrospective chart review performed to evaluate results
- Protocol implemented late 2008, dividing data into two time periods.
  - Pre-Protocol January 1, 2007-December 31, 2008
  - Post Protocol January 1, 2009-December 31, 2010
- Outcome variables were hospital and ICU length of stay

**Rib Fracture Protocol**

- Clinically Suspected Rib Fractures or Rib Fractures on CXR / Plain Films
- Abnormal Hemodynamics or + PTX / HTX / "Pleural Effusion" or ≥ 3 Rib Fractures
- ER Provider Eval and Dispo
- *High Risk Group?

**High Risk Group**
- Higher than ground level fall
- Age > 65
- Coumadin / Plavix

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• How did you measure the effects of the change?
  • The initiation of the protocol provided the clinical care team the ability to predict hospital length of stay based on the number of ribs fractured.
  • Prior to the implementation of the protocol the amount of variability in LOS accounted for by the number of ribs fractured was only 2%.
  • After protocol initiation the amount of variability in LOS accounted for by the number of ribs fractured increased to 24% and the regression model revealed the ability to significant predict LOS based on the number of ribs fractured.
  • In the post-protocol initiation phase LOS increased by 1.24 days for each fractured rib. No other research was found that documented this predictive incremental relationship.

• How did you sustain the change?
  • Change has been sustained through maintaining protocol compliance at or above 90%.
Rib Fracture Triage Protocol

Hospital Length of Stay

- Less than 3 Rib Fractures
- 3 or More Rib Fractures

Pre Protocol
Post Protocol