**Purpose:** Injury to the chest, both blunt and penetrating mechanisms, is quite common in the trauma population. Treatment of pneumothorax and hemothorax involves placement of thoracostomy tubes. Inpatient management of these chest tubes has been based on experience in cardiothoracic surgery which may not reflect the pathology of these traumatic injuries. Thus there was considerable variability in management from provider to provider. Trauma Advanced Practice Providers (APP) created a chest tube management guideline utilizing evidence from trauma literature, to facility consistency of care. Implementation of a chest tube management guideline based on trauma literature would decrease variability in care, decrease chest tube days, and number of chest x-rays without increasing complications.

We performed a retrospective chart review of adult trauma patients admitted to Grant Medical Center who required placement of at least one chest tube and survived more than 24 hours. We compared one year prior to guideline creation (2016) to one year after full implementation of the APP created guideline (2018). Baseline characteristics, indication for chest tube, number of chest tube days, post-replacement chest x-ray and chest tube related complications were recorded.

236 patients with 461 chest tubes were included in the pre-guideline group, compared to 208 patients with 376 chest tubes in the post-implementation cohort. The groups were similar in age, sex and chest AIS (p > 0.03). In order to examine chest tubes managed by the APPs following our guideline, patients who were admitted to critical care or went to the OR were excluded from further analysis. This left 146 chest tubes in the pre-guideline and 74 in the post-guideline. There was a statistically significant decrease in chest tube days (4.1 vs 3.1, p < 0.03) and decrease in overall hospital length of stay (9.2 vs 7.0, p < 0.03). Also there was a significant decline in utilization of post-replacement chest x-rays, from 85.6% to 30.7% (p < 0.001).

The creation and employment of a chest tube management guideline by Trauma Advanced Practice Providers improved patient care by decreasing chest tubes days and hospital length of stay, as well as decreasing utilization of post-replacement chest x-rays.

**Resources:** We utilized the Trauma Advanced practice providers to be part of the process improvement team. They performed a literature search and created the chest tube management guideline. Approval and implementation of the guideline was by the group of Trauma surgeons. To evaluate the improvement in the process and clinical care, we utilized our Trauma Research team for help with the IRB process, data collection and analysis.

**Description:** Injury to the chest, both blunt and penetrating mechanisms, is quite common in the trauma population. Treatment of pneumothorax and hemothorax involves placement of thoracostomy tubes. Inpatient management of these chest tubes has been based on experience in cardiothoracic surgery which may not reflect the pathology of these traumatic injuries. Thus there was considerable variability in management from provider to provider. Trauma Advanced Practice Providers (APP) created a chest tube management guideline utilizing evidence from trauma literature, to facility consistency of care. The guideline was created in 2016 and fully approved January 2017. We believe that implementation of a chest tube management guideline based on trauma literature would decrease variability in care, decrease chest tube days, and number of chest x-rays without increasing complications.

**Effectiveness:** We were able to compare one year pre-guideline and one year after full implementation. In order to examine chest tubes managed by the APPs following our guideline, patients who were admitted to critical care or went to the OR were excluded from further analysis. This left 146 chest tubes in the pre-guideline and 74 in the post-guideline. There was a statistically significant decrease in chest tube days (4.1 vs 3.1, p < 0.03) and decrease in overall hospital length of stay (9.2 vs 7.0, p < 0.03). Also there was a significant decline in utilization of post-replacement chest x-rays, from 85.6% to 30.7% (p < 0.001).
Lessons Learned:

Pro: We were able to identify an area of clinical care that was frustrating to the team as there was so much variability in practice. Using available trauma literature, we created a guideline that was easy to use and allowed for consistency of care.

Con: Difficult to improve metrics of ICU patients as they have multi-system organ injuries, and often chest tube management is a lesser priority. Also the ICU care team at our institution is a frequently rotating group of residents so difficult to maintain consistency.

Conclusions: The creation and employment of a chest tube management guideline by Trauma Advanced Practice Providers improved patient care by decreasing chest tubes days and hospital length of stay, as well as decreasing utilization of post-removal chest x-rays.