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**Surgery**

**Title**

Risk Factors Associated with Reintubation in Trauma Patients

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The data associated with this publication are not available for this reason: N/A



## Introduction

- Reintubation is associated with increased mortality, complications, hospital stay, and financial burden<sup>1-3</sup>.
- Most studies have focused on reintubation in medically ill ICU populations<sup>3</sup>.
- However, surgical ICU patients with traumatic injuries have different pathophysiology, comorbidities, and injury patterns.
- We evaluated comorbidities, injury patterns, and events leading up to extubation in trauma patients associated with reintubation.
- Elucidating risk factors leading to reintubation may help inform clinical practice in the surgical ICU.

## Methods

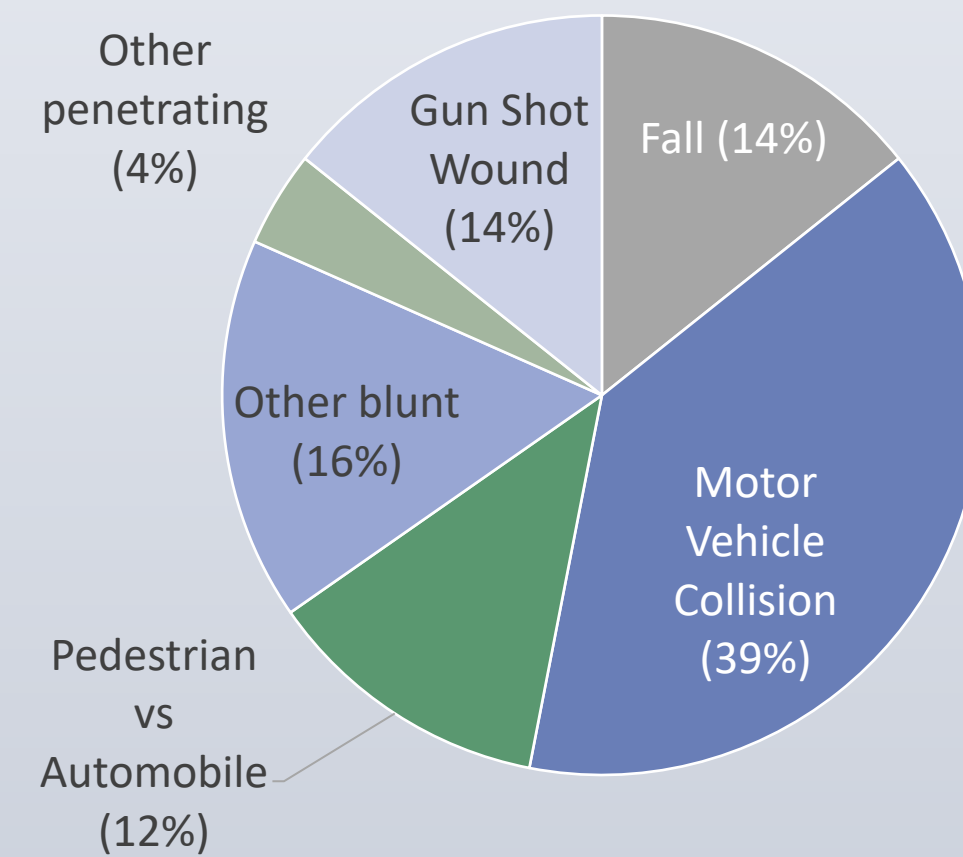
We performed a retrospective chart review of adult trauma patients admitted to the surgical ICU between October 2019 - December 2019 who underwent extubation from mechanical ventilation. Reintubation was defined as the need for mechanical ventilation, not secondary to a planned operation, within 7 days of extubation. Patients who required reintubation were compared to those who underwent successful extubation.

## Demographics

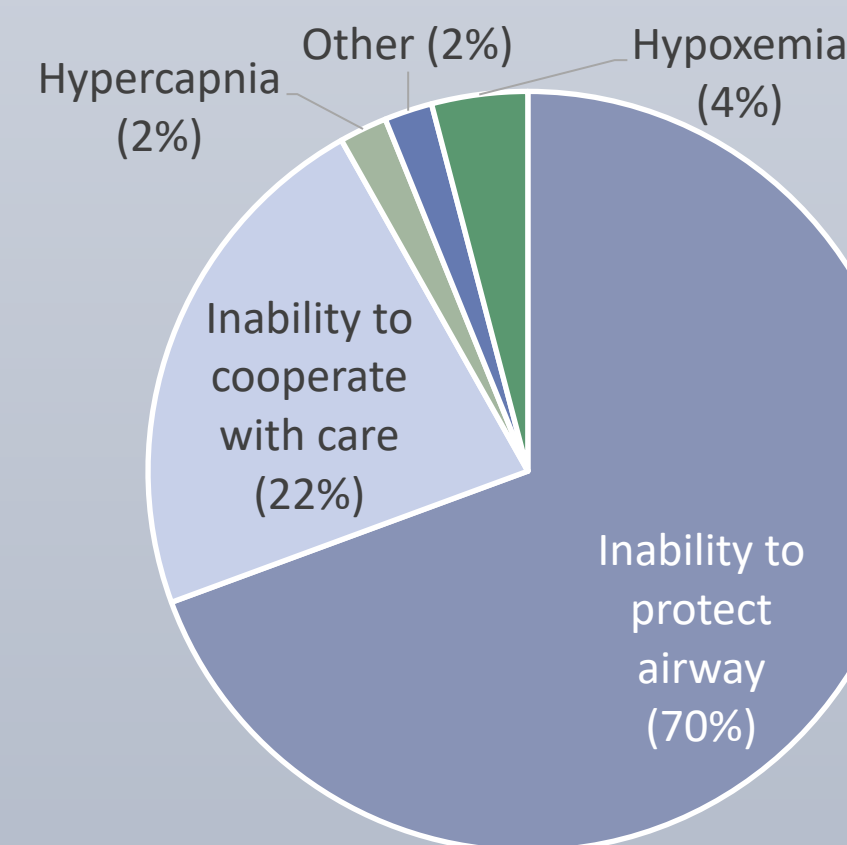
**Patient Population:** Fifty patients admitted to the Surgical ICU after sustaining traumatic injuries (82% blunt mechanism).

- Age: 45 ± 17
- Gender: 74% Male

**Figure 1. Patient Mechanism of Injury**



**Figure 2. Reason for Initial Intubation**



## Results

### Relationship between risk factors and odds of reintubation

#### Significant

	Odds Ratios
Sternum Fracture	30.8
Difficult Airway	13.5
Spine Fracture	6.5
Rib Fractures	5.6
Pulmonary Contusion	4.5

#### Not Significant

Mechanism of injury	Prior pulmonary embolism
Frequency of Suctioning	Post-extubation O <sub>2</sub> therapy
Acute Lung Injury	Tobacco use
COPD	BMI
Heart Failure	Age

**Table 1.** Various factors were evaluated against need for reintubation using Fisher's exact test, with significance set to p<0.05. Odds ratio of reintubation was calculated for significant factors.

Patients requiring reintubation had higher rates of tracheostomy (0% vs 27%, p=0.01), longer ICU length of stay (23 vs. 5, p=0.0001), and longer hospital length of stay (16 vs. 38, p=0.001).

## Conclusions

Pattern of injury is more likely to predict the need for reintubation as opposed to preexisting comorbidities or demographic factors in trauma patients. Injury patterns associated with need for reintubation in trauma patients included unilateral or bilateral pulmonary contusions and fractures of the ribs, sternum, or spine. As expected, reintubation is associated with need for tracheostomy and longer hospital stays.

## References

1. Ni YN, Luo J, Yu H, Liu D, Liang BM, Yao R, Liang ZA. Can high-flow nasal cannula reduce the rate of reintubation in adult patients after extubation? A meta-analysis. *BMC Pulm Med.* 2017 Nov 17;17(1):142. doi:10.1186/s12890-017-0491-6.
2. Acheampong, D., Guerrier, S., Lavarias, V., Pechman, D., Mills, C., Inabnet, W. and Leitman, I. (2018). Unplanned postoperative reintubation following general and vascular surgical procedures: Outcomes and risk factors. *Annals of Medicine and Surgery*, 33, pp.40-43.
3. Buppha P, Kusumaphanyo C, Chittawatanarat K. Outcomes and Risk Factors of Extubation Failure: A Multicenter Study of the THAI Surgical Intensive Care Units (SICUs). *Journal of the Medical Association of Thailand.* September 2016

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