

Addressing Respiratory Complications in an Effort to Reduce ICU Re-Admissions

A Successful Intervention

Jo Ann Miller MSN, CRNP, CCRN, TCRN

Trauma Program Manager

Penn Medicine Lancaster General Health

Trauma and Acute Care Surgery

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Disclosure Statement

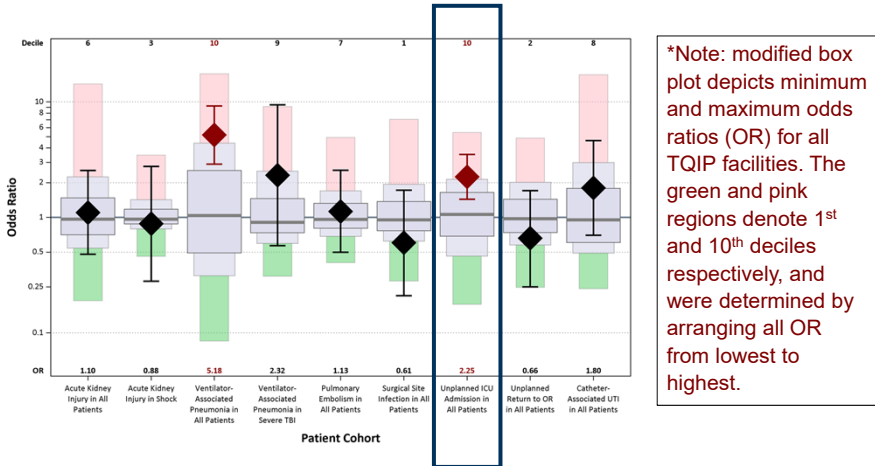
- ◆ The authors have no conflicts of interest or sources of funding to disclose

Background

- ◆ Penn Medicine Lancaster General Hospital Trauma Center identified unplanned admissions/readmissions to the intensive care unit (ICU) or “bouncebacks” (ICUBB) as a major issue
- ◆ **Objective:** To determine the effect of ICUBB on mortality, identify predictors of ICUBB and subsequently develop a tool to decrease ICUBB
- ◆ **Hypothesis:** ICUBBs have increased mortality and decreased FSD when compared to non-ICUBBs


3

Background





4

Figure 1. Risk-adjusted complications at Penn Medicine Lancaster General Hospital, Fall 2017. Source: TQIP Fall 2017 Report

Method and Preliminary Results

- ♦ **Pennsylvania Trauma Outcome Study (PTOS) was retrospectively queried (2011-2015) for all ICU patients**
 - Mortality rates and FSD scores compared between ICUBB and non-ICUBB
 - Statistical models run to assess the adjusted impact of ICUBB on mortality and FSD
- ♦ **FSD=score (1-4) assigned based on capacity in five domains**
 - Maximum score=20; minimum=5
- ♦ **72,331 met inclusion criteria**
- ♦ **2070 ICUBBs identified [3% of all ICU admissions]**
- ♦ **ICUBB had significantly increased mortality (12% vs 8%, p<0.001) and significantly lower mean unadjusted FSD scores (15.0±4.6 vs 17.0±3.9, p<0.001) compared to non-ICUBBs**

Predictors and Protocol Development

Variable	AOR (95% CI)	UAR p
Age	1.02 (1.01-1.02)	<0.001
Gender (Male)	1.20 (1.08-1.33)	0.001
Acute Respiratory Failure	4.25 (3.66-4.94)	<0.001
Pulmonary Embolism	3.12 (2.42-4.03)	<0.001
Sepsis	2.46 (1.98-3.06)	<0.001
Myocardial Infarction	1.96 (1.45-2.66)	<0.001
Pneumonia	1.67 (1.43-1.95)	<0.001
Central Line	1.66 (1.47-1.87)	<0.001
Deep Vein Thrombosis	1.53 (1.23-1.90)	<0.001
Lower Extremity Fracture	1.38 (1.22-1.55)	<0.001
Chronic Obstructive Pulmonary Disease	1.28 (1.13-1.45)	<0.001
Obesity	1.17 (1.00-1.36)	0.045
ICU Length of Stay	1.13 (1.11-1.14)	<0.001
Ventilator Days	0.88 (0.86-0.89)	<0.001
Head Injury (AIS Head ≥3)	0.76 (0.68-0.86)	<0.001
		AUROC: 0.83
*Controlling for TMPM, Systolic Blood Pressure, Injury Year		*Non-significant variables not displayed

- ♦ **Protocol developed to reduce ICUBBs secondary to respiratory compromise in patients with rib/sternal fractures**
- ♦ **Incorporation of PIC Scoring Tool**
 - Pain, Inspiratory Capacity, Cough

PIC Scoring Tool

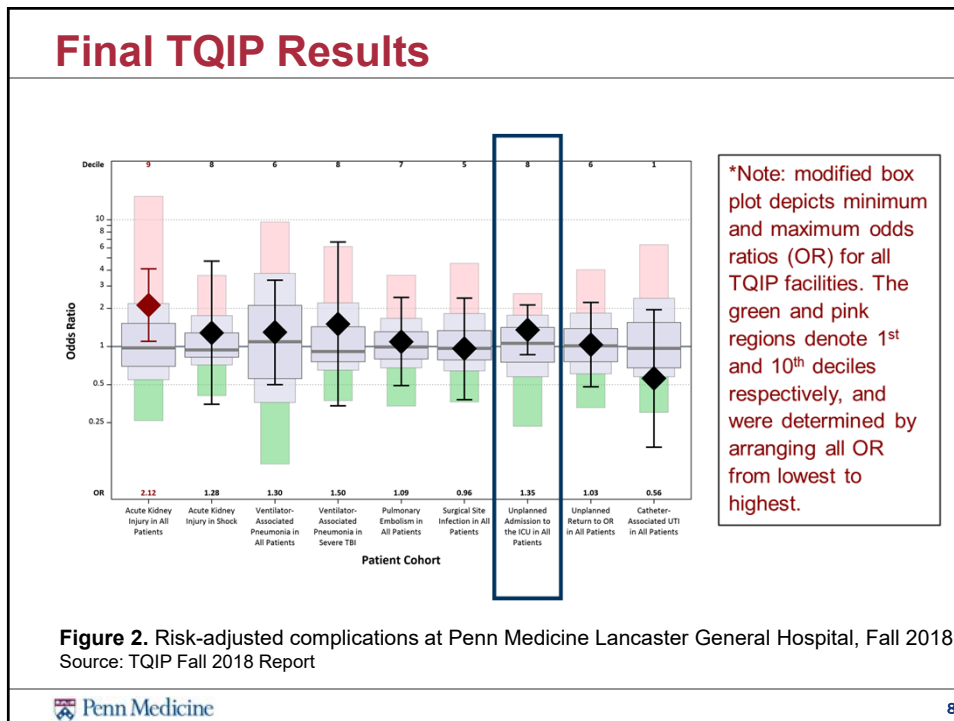
PIC Score

1
2
3
4
5
6
7
8
9
10

Pain	Inspiration	Cough
Patient-reported, 0-10 scale	Inspiratory spirometer; goal and alert levels set by respiratory therapist	Assessed by provider/nurse
3 – Controlled <small>(Pain intensity scale 0-4)</small>	4 – Above goal volume	3 – Strong
2 – Moderate <small>(Pain intensity scale 5-7)</small>	3 – Goal to alert volume	2 – Weak
1 – Severe <small>(Pain intensity scale 8-10)</small>	2 – Below alert volume	1 – Absent
	1 – Unable to perform incentive spirometry	

Patient Name: _____ Date: _____ IS Goal: _____

7



Conclusion

- ◆ ICUBB is associated with worse outcomes in trauma patients
- ◆ TQIP is useful for identifying institutional problems
- ◆ By identifying patients at risk for bouncing back and implementing the PIC Scoring Tool, the frequency of these occurrences was reduced
- ◆ Future focus: validate the PIC Scoring Tool through a multi-institution study

Conclusion

- ◆ Questions?

