A Consortium Level Approach to Reducing Ventilator Dependence

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Significance Statement

We found that all but two institutions in our consortium were poor performing outliers for ventilator dependence, defined as on the ventilator greater than 48 hours. Ventilator dependence is a rare occurrence, so our goal was to identify those patients at highest risk and develop best practices to share for the region.

Figure 1: Hospital Specific Odds Ratios for Ventilator Dependence

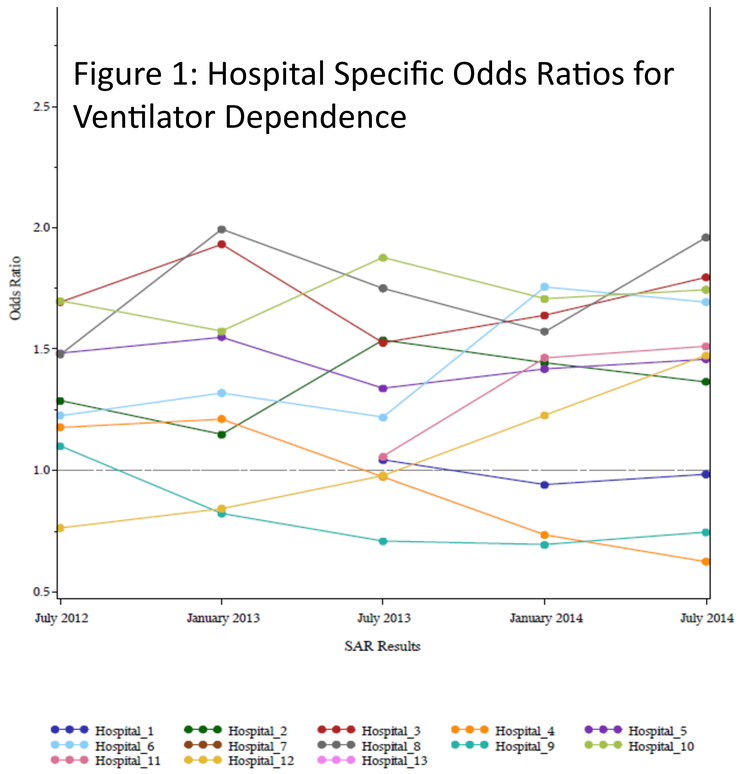

Table 1: Risk Factor	p-value	OR Estimate
Age (>65 years)	<0.001	1.61
Anesthesia (General)	0.001	4.35
Smoking	0.021	1.31
Dyspnea	0.006	1.38
Functional Status (At least some dependence)	<0.001	2.36
History of COPD	0.005	1.55
Preoperative Transfusion	0.017	2.20
Preoperative Sepsis/SIRS	<0.001	2.40
Preoperative Albumin (<3.5 mg/dL)	<0.001	1.91
Preoperative Sodium (>145 mEq/L)	0.001	2.17
ASA Class (≥3)	<0.001	4.09

Data Source/Population

We reviewed all patients sampled for ACS-NSQIP by each of the 13 institutions in the consortium of PA NSQIP since they joined between 2006 and 2013.

Results

We identified 11 risk factors independently associated with ventilator dependence (Table 1). A weighted risk score had a distribution of 4-23 and was able to identify the highest risk 1.5% of patients with a ventilator dependence rate of 10.4 (p-value <0.01). However, an R^2 of 0.10 suggests significant variability in outcomes not explained by the model.

Lessons Learned

- Rates of ventilator dependence vary widely between our institutions, but general and vascular patients have the highest rates and should be targeted for intervention.
- A strict multivariable risk score may not be widely applicable due to the heterogonous nature of our institutions and simplicity of variables.
- Future directions include further discussion to identify variations in practice and develop guidelines for reducing ventilator dependence.