Evaluation of reintubation in patients in the SICU after implementation of an extubation protocol

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**Background**

- Reintubation in the surgical intensive care unit (SICU) is associated with significant morbidity and mortality.
- Because of this, it is important to identify reasons for reintubation to establish preventative action to reduce reintubation in the future.
- Our quality improvement (QI) initiative to reduce reintubations by identifying patients who are high risk for reintubation lowered the reintubation rate from 17% pre-intervention to 9% post-intervention.
- Secondary study to evaluate why patients are reintubated.

**Research Objectives**

- To determine the clinical causes of reintubation
- To refine our ability to prevent and reduce reintubations

**Methods**

- All adult patients at Northwestern Memorial Hospital who underwent reintubation in the SICU
- March 2018 to March 2020

**Table 1. Failure versus non-failure of extubation patients**

<table>
<thead>
<tr>
<th>Age (years)</th>
<th>Pre-Intervention</th>
<th>Post-Intervention</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>66 [63–72]</td>
<td>68 [59–73]</td>
<td>0.94</td>
<td></td>
</tr>
<tr>
<td>Sex (female)</td>
<td>16 (47)</td>
<td>14 (37)</td>
<td>0.47</td>
</tr>
<tr>
<td>Prior Need for Emergency Intubation</td>
<td>18 (53)</td>
<td>11 (29)</td>
<td>0.05</td>
</tr>
<tr>
<td>Duration of Intubation</td>
<td>3 [2–5]</td>
<td>2 [1–4]</td>
<td>0.33</td>
</tr>
<tr>
<td>Hx of Primary Pulmonary Condition</td>
<td>18 (53)</td>
<td>14 (37)</td>
<td>0.24</td>
</tr>
<tr>
<td>Days from Extubation to Reintubation</td>
<td>3 [2–4]</td>
<td>6 [4–9]</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Survival to Discharge</td>
<td>28 (82)</td>
<td>23 (61)</td>
<td>0.07</td>
</tr>
</tbody>
</table>

**Results**

- There were no basic demographic or clinical differences between failure of extubation versus non-failure of extubation patients and primary versus secondary respiratory insufficiency patients.
- Pre- vs post-intervention showed reduction in failure of extubation by 22%, from 58% to 36%
- Post-intervention, only 65% of reintubations were due to primary respiratory failure.

**Conclusions**

- Findings suggest our QI intervention reduced failure of extubation in the post-intervention cohort. Because this is related to the extubation process, this is something that we can improve upon.
- >1/3 of patients are reintubated for secondary respiratory insufficiency, which is unrelated to the extubation process

**Next Steps?**

- Explore methods to reduce the 47% of patients who are reintubated for failure of extubation.
- Should large database studies distinguish between failure and non-failure of extubation?
- Should this reporting differ from primary and secondary respiratory insufficiency?