A Collaborative Approach to Weaning from Mechanical Ventilation

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Introduction

- The problem being addressed is weaning from mechanical ventilation (MV) in adult intubated patients within the intensive care unit (ICU).
- 1/3 of all ICU patients are intubated [1]
- Nearly 800,000 hospitalizations required MV in 2005 [2]
- Average duration of MV: 4 days [3]
- 40% of ventilator time is dedicated to weaning [2]
- MV mortality rate: 35% [2]
- MV morbidity: 31% of MV survivors discharge home [2]
- $600-$1500 per patient per ventilator day [2]
- Studies support using paired spontaneous awakening trials (SAT) & spontaneous breathing trials (SBT) showing reductions in duration of MV by 2.4 days, ICU length of stay (LOS) by 3 days, & hospital LOS by 6.3 days.[4, 5, 6]

Purpose

- **Purpose:** Implementation of evidence-based registered nurse (RN) & respiratory therapist (RT)-driven MV weaning protocol to improve ventilator-associated outcomes.
- **Objective 1:** Decrease duration of MV by 15%
- **Objective 2:** Decrease ICU LOS by 15%
- **Objective 3:** No increase in 24-hour failed extubations
- **Objective 4:** Adequate protocol participation (50%)
- **Objective 5:** Increased staff confidence (pre- & post-survey)

Methods

Setting: 16-bed ICU, St. Luke's Hospital, Cedar Rapids, IA
Population: Adult, medical/surgical intubated patients, no cardiothoracic protocoled patients
Staff: Medical Doctors (MD), RNs, & RTs
Participants: Pre- 52 Post- 58

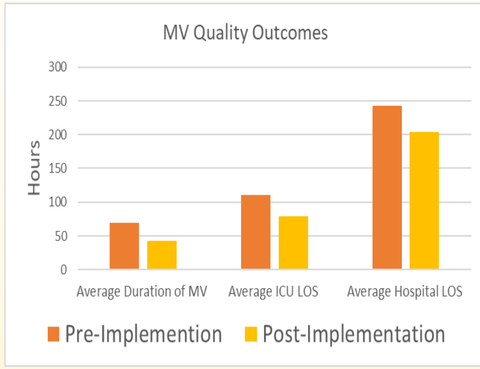
Identification
- The Iowa Model of Evidence-Based Practice to promote quality care
- Literature search through PubMed

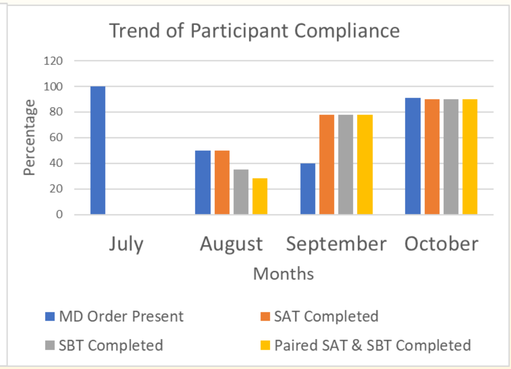
Development
- Protocol development utilizing Vanderbilt's protocol
- Hospital, IRB, & MD approval was obtained
- Staff education provided
- Tools were put into place
- Pre-project survey

Implementation
- Project roll-out July 1st 2019
- Re-education throughout project

Evaluation
- Monthly Data collection
- Data analysis: Wilcoxon rank-sum & Fischer's exact
- Post-project survey
- Project completion October 31st 2019

Outcomes



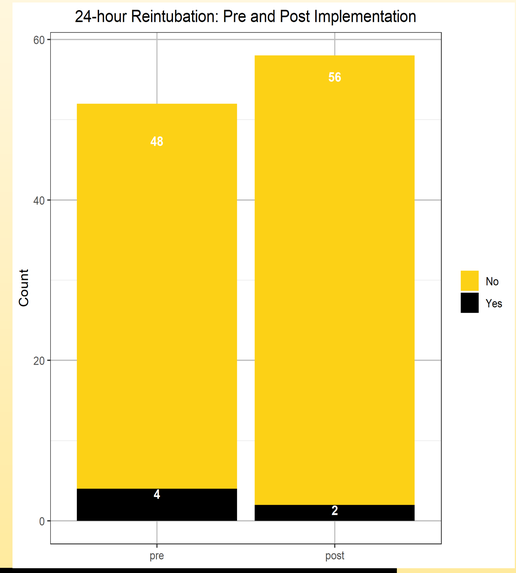


Pre-Implementation Average RASS: **-3 (Moderate Sedation)**

Post-Implementation Average RASS: **-2 (Light Sedation)**

Pre-Implementation Survey Average Score: **4 (Confident)**

Post-Implementation Survey Average Score: **5 (Very Confident)**



Evaluation

- Increased staff confidence from a score of "Confident- 4" (n=13) to "Very Confident- 5" (n=21).
- Average sedation level was decreased from RASS -3 to -2
- Average 49% RN/RT compliance & 70% MD compliance with end implementation compliance of 90%
- No increases in the number of 24-hour failed extubations (4:2), **p 0.419**.
- ICU LOS decreased by 32 hours or 27.9%, **p 0.01248**.
- MV decreased by 27 hours or 38.6%, **p 0.000802**.
- Hospital LOS decreased by 39 hours
- **Limitations:** Small participation in the pre- and post-confidence survey, wavering staff participation, short implementation time.
- **Sustainability:** Continuing to utilize and track protocol at St. Luke's Hospital with the potential to expand to other facilities

Conclusions

- RN & RT-driven protocol that was statistically and clinically significant in decreasing duration of MV, ICU, & hospital LOS without increasing risks to patients
- Decrease in the average level of patient sedation
- Increased staff confidence in implementing the protocol
- Average cost savings of $7,000 per patient
- Barriers were encountered, managed, & overcome
- All of the outcomes represent the importance of implementing a collaborative bedside staff driven protocol
- This protocol is feasible & has an opportunity to improve patient outcomes while leveraging autonomy & advancing the profession
- This project will be disseminated at an evidence-based practice poster presentation April 2020 & will be presented to St. Luke's Hospital's protocol committee.

References

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