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# Evaluating Bundle Adherence in Ventilated Patients: A Quality Improvement Project

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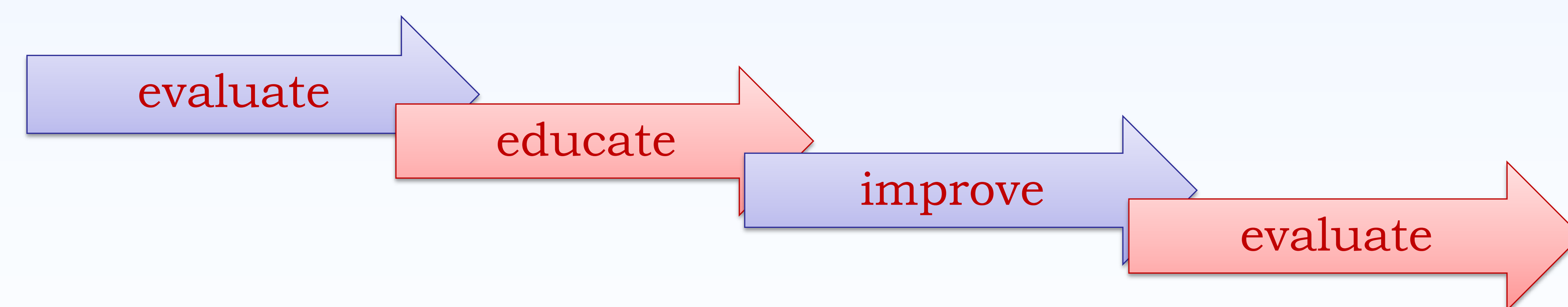
## BACKGROUND

- Complications of mechanical ventilation preclude a restoration of health that is being increasingly measured by quality of life, morbidity, functional status, and costs of continued care. Despite evidence-driven protocolized care bundles that aim to optimize management and reduce complications in ventilated patients, routine adherence to the ABCDE bundle for the management of pain, agitation, and delirium in ventilated patients is inconsistent.

## PURPOSE

- The quality improvement project was designed to evaluate patterns of sedation and analgesia management and coordinated ventilator weaning in critically ill adult patients. Data was analyzed to inform the development and implementation of targeted educational intervention that was designed to synergize nursing, respiratory therapy and medical disciplines within the critical care units, with subsequent reevaluation




## METHODS

- The project included a comparison group and an intervention group. A retrospective chart review was undertaken to identify specific challenges of bundle adherence in adult ventilated patients. Measures of evaluation included: Sedation scoring and titration, pain scoring and treatment, rates of over sedation, rates of spontaneous awaking trials with coordinated trials of spontaneous breathing, and adequacy of analgesia during ventilator weaning. An analysis of the data informed an educational module that was presented to nursing and respiratory staff. A subsequent reevaluation of identical data points in adult ventilated patients was gathered 2-4 weeks after the education intervention to assess for improvement in adherence to the ABCDE bundle.

## DISCUSSION

- The two groups were similarly sized, but with less average hours of ventilation in the post-intervention group. There were several areas of improvement. Routine pain assessments on day shift showed significant improvement (p=0.0007), as did the documentation of SBT, which was achieved in 95% of patients. The documentation of the SAT improved significantly (p=0.0019), although still only accomplished in 1/3 of patients. The frequency of analgesic given without pain assessment on night shift was improved, but not to a statistically significant level. Rates of over sedation (RASS -3 to -5) were documented with similar frequency in both groups (9% days, 12% nights).

## RESULTS

| | Pre-Intervention | | Post-Intervention | | p-value |
|---|---|---|---|---|---|
| | N | Mean | N | Mean | |
| Avg Ventilation (h) | 27 | 86.7 (71.73) | 25 | 67.92 (42.66) | 0.2535 |
| # CPOT / Ventilation time Days | 26 | 0.16 (0.12) | 25 | 0.28 (0.11) | 0.0007 |
| # CPOT / Ventilation time Nights | 26 | 0.26 (0.23) | 25 | 0.31 (0.13) | 0.3188 |
| # RASS -3 to -5 / Total RASS Assessment Days | 26 | 0.07 (0.09) | 25 | 0.09 (0.16) | 0.5205 |
| # RASS -3 to -5 / Total RASS Assessment Nights | 26 | 0.16 (0.31) | 25 | 0.12 (0.18) | 0.5679 |
| Analgesic given without pain score Days | 27 | 1.07 (1.86) | 25 | 0.96 (1.51) | 0.8087 |
| Analgesic given without pain score Nights | 27 | 1 (1.04) | 25 | 0.48 (1) | 0.0724 |
| Sedation restarted at 50% reduction Days | 13 | 0.17 (0.33) | 8 | 0.19 (0.27) | 0.8781 |
| SAT/SBT paired DAYS | 27 | 0.85 (0.33) | 25 | 0.95 (0.21) | 0.2156 |
| SBT documented in resp tab by RT DAYS | 27 | 0.7 (0.47) | 25 | 0.95 (0.21) | 0.0187 |
| Pain assessment within one hour SBT DAYS | 27 | 0.61 (0.48) | 25 | 0.71 (0.41) | 0.4133 |
| SAT Documentation Day | 27 | 0 (0) | 25 | 0.31 (0.44) | 0.0019 |

## NEXT STEPS

- Despite ABCDE bundle components that show cumulative efficacy in ventilator liberation, adherence continues to be problematic. Reduction of sedation after weaning, minimization of over-sedation, pain management, and documentation of awakening trial tolerance require relentless and unremitting commitment by members of the interdisciplinary team. Recognition and mitigation of obstacles that impede bundle adherence is requisite for improved patient outcomes.