Evaluation of a Sedation Vacation Protocol

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Disclosures

- The authors (Georgianne Summer, Pricilla Hartley, and Autumn Schumacher) have no conflicts of interest to disclose. No financial support was received for this clinical improvement project.
- This project was completed in fulfillment of Dr. Summer's Doctor of Nursing Practice (DNP) degree at Augusta University, College of Nursing, Augusta, GA, USA under the advisement of professors Dr. Hartley and Dr. Schumacher.
- Internal Review Board (IRB) approval was received for this project prior to data collection.

Learning objectives:

1. The learner will be able to discuss the evaluation of an adopted evidence-based sedation vacation protocol involving intubated mechanically-ventilated adult patients.
2. The learner will be able to describe the benefits of using a specific location in the electronic medical record to document all aspects of the nursing care associated with a sedation vacation protocol.

Introduction

- Mechanical ventilation is a medical intervention to assist or replace spontaneous breathing when the natural respiratory effort is insufficient to sustain life.
- Estimated cost of mechanical ventilation ~ $1,522 per day in the United States.
- In 2003, American hospitals spent $16 billion on patients requiring prolonged acute mechanical ventilation (PAMV) ≥ 96 hours.
- By 2020, ~ 625,298 patients will require PAMV, escalating the cost to $60 billion.
- Standardized nursing protocols help reduce costs of caring for PAMV patients.

(Sole et al., 2013; Zilbergerg et al., 2012)

Background

- Goals of mechanical ventilation include: maintain gas exchange, reduce myocardial oxygen consumption, attain lung expansion, and stabilize thoracic wall motion.
- Dependency on mechanical ventilation may linger after resolution of the initial gas exchange and/or impaired ventilation problem, resulting in PAMV.
- PAMV stimulates a continuous stress response in the body, requiring administration of sedation medications to promote relaxation and ventilator synchrony.

(Chlan et al., 2011; Danckers et al., 2013)

Sedation Vacation

- Nurses use a sedation vacation (SV) protocol to purposely interrupt the sedation medication used with a mechanically-ventilated patient.
- An established national clinical practice guideline, daily use of the SV protocol:
  - Allows evaluation of patient's readiness for spontaneous respiration and weaning from mechanical ventilation;
  - Decreases duration of mechanical ventilation;
  - Promotes early weaning from the ventilator;
  - Prevents PAMV.

(Burry et al., 2014; Kahn et al., 2014; Mehta et al., 2012)

Clinical Improvement Project

- **Problem**: Although several healthcare institutions have implemented SV protocols during the past decade, little evidence was found in the literature documenting if nurses effectively used this protocol for patient care.
- **Purpose**: This clinical improvement project evaluated the use of a SV protocol in a medical intensive care unit (MICU) of a academic medical center.
- **Specific Aim**: The electronic medical records of mechanically-ventilated MICU patients were reviewed over a 12-month period to determine if the SV protocol was 1) ordered by the physicians and 2) used by nurses.

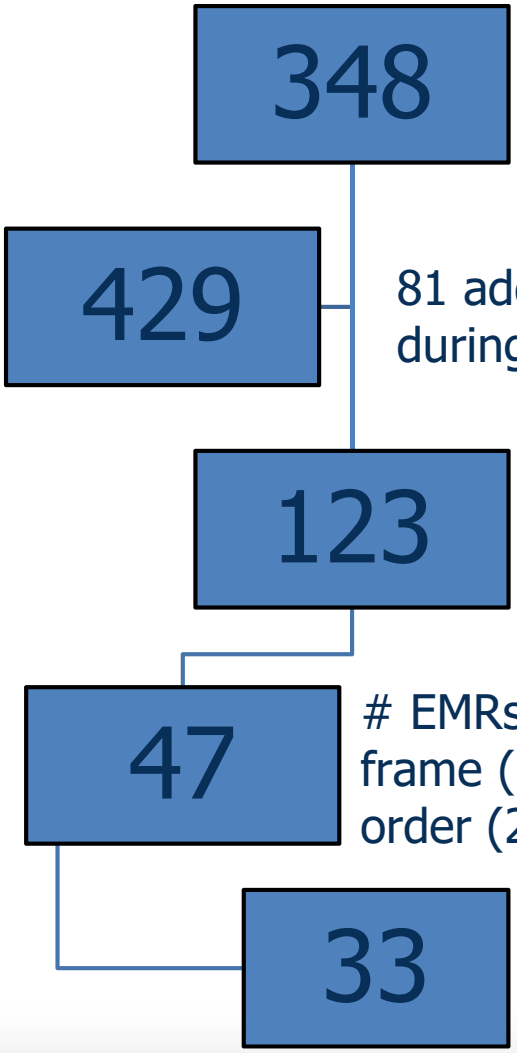
Methodology

- **Design:**
  - Retrospective chart review
- **Setting:**
  - 550-bed academic medical center located in southeastern portion of the United States
  - Adult, inpatient, 24-bed MICU
- **Sample:**
  - Endotracheal intubated, mechanically-ventilated MICU patients
  - Hospitalized sometime during the 12-month period of January 1, 2014 to December 31, 2014
  - Electronic medical records (EMRs) selected by ICD-9 and V codes using the I2B2 data mining tool

Methodology (continued)

Inclusion Criteria	Exclusion Criteria
Adult patients > 18 years of age	Diagnosis of pneumonia upon admission to hospital
Admitted to the Medical Intensive Care Unit (MICU)	Diagnosis of pneumonia upon admission to MICU
Endotracheally intubated and mechanically ventilated for ≥ 24 hours	Diagnosis of acute severe laryngeal edema or upper airway obstruction
Receiving a continuous infusion of sedative medication	Diagnosis of severe acute respiratory distress syndrome or status asthmaticus

Results of Data Mining Search Strategy



EMRs during 2014 searched using ICD-9 Codes for Respiratory-related and Mechanical Ventilation diagnoses

81 additional EMRs added with V code for using a respirator during 2014

EMRs matched to MICU admissions

EMRs after excluding no ventilator (7), tracheostomies (7), outside time frame (22), pre-existing pneumonia (14), Do Not Resuscitate/no intubation order (2), MICU patient located in another unit (4), incomplete chart (7)

Final # EMRs after excluding no ventilator (1), chronic ventilator (1), multiple intubations, Do Not Resuscitate order (2), pre-existing pneumonia (9)

Statistical Analyses

- Descriptive statistics
- Nonparametric Chi-square test
- Nonparametric Cochran's Q test
- Level of Significance = .05

Results: Demographic Information

n = 33 patients		
Gender	Female	51%
	Male	49%
Mean age		62 ± 13.6 years
Race	Caucasian	55%
	African American	33%
	Hispanic	3%
	Other/Unknown	9%
Mean MICU length of stay		9.6 ± 9.9 days
Mean number of days for endotracheal intubation		6.1 ± 4.8 days

Results: MICU Admitting Diagnosis

Diagnosis	# EMR
Respiratory Decompensation	14 (43%)
Known Infectious Process	8 (24%)
Acid-Base Imbalance	2 (6%)
GI Bleed	3 (9%)
Liver Failure	2 (6%)
Cardiovascular Decompensation	3 (9%)
Miscellaneous	1 (3%)
Total	33

EMR = electronic medical record

Results: SV Protocol Documentation

	# of EMR	*p* value	Statistical Significance
Sedation Protocol Physician Order in EMR	33 (100%)		
SV use documented in nursing notes of EMR	22 (67%)	.056	No significant statistical difference found between EMRs containing SV documentation and those that did not

EMR = electronic medical record

Results: EMR indicators used to determine if SV protocol used, but not documented

Sample Size n=33	Frequency	*p* value	Statistical Significance
Richmond Agitation Sedation Scale Documented	33 (100%)		
Spontaneous Breathing Trial Documented	23 (70%)	.024	Significant statistical difference found between EMRs containing SV documentation and those that did not
Sedation Titration Documented	23 (70%)	.024	Significant statistical difference found between EMRs containing SV documentation and those that did not

Cochran's Q test revealed no statistical significant association was found among these three SV protocol indicators ($p = .92$).

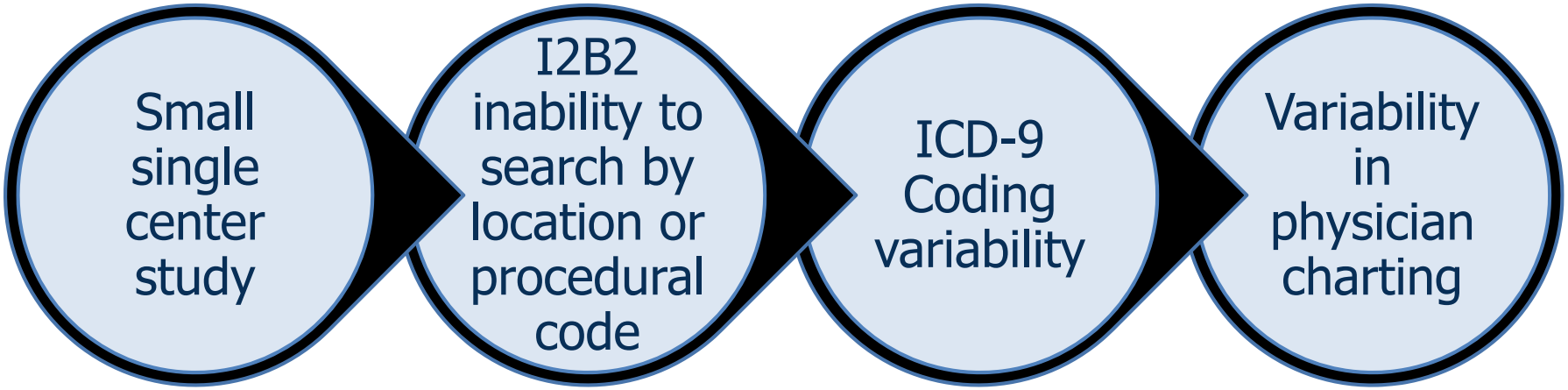
Discussion

- Protocol Compliance Results:
  - Physicians ordering protocol: 100%
  - Nurses' formal documentation of SV protocol use: 67%
  - Nurses performing SV indicators, but not documenting use of SV protocol: 70%
- These results suggest that nurses either may not have applied the SV protocol to their mechanically-ventilated patients or they did not document this particular patient care activity.
- This lack of complete compliance exhibited by these MICU nurses demonstrate the need for additional education as to the importance of formally documenting SV usage.

Discussion (continued)

- This project showed that evaluating the actual use of a clinical protocol for a specific unit over a specific timeframe was difficult, because the hospital does not maintain a database documenting inpatient locations.
  - Hence, the ICD-9 and V codes were used to search for the appropriate patients and their EMRs.
- This project exposed deficiencies in the SV protocol documentation, which may be an example of the failure to transform evidence into practice (Miller et al., 2012).
- Before this clinical improvement project, no standardized EMR location existed to document the completion of the SV protocol.
  - This situation has since been rectified with a specific EMR location now designated for the nurses to document completion of the SV protocol when caring for their mechanically-ventilated MICU patients.

Limitations



Implications for Practice:

- Educational Opportunities
  - Critical Care education on sedation medication with sedation vacation protocol
  - Significance of the sedation weaning and daily interruption
  - Importance of documenting rationale for patients excluded from sedation vacation

Conclusions

- While literature evidence supports the use of a SV protocol for improved outcomes of mechanically-ventilated patients, no clear conclusion could be made with this project's findings concerning the effectiveness of the SV protocol in this particular MICU.
- More precise documentation is needed so that EMR reviews could better evaluate the effectiveness of a SV protocol for reducing intubation duration, MICU length of stay, use of sedation medications, and the incidence of hospital-acquired infections.

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