ZapVAP Decreased Ventilator-Associated Pneumonia with an Interdisciplinary Bundle

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BACKGROUND

Ventilator-Associated Pneumonia (VAP) is the development of pneumonia 48 hours after endotracheal intubation.

- VAP increases morbidity and mortality due to prolonged ventilator dependence and increased length of stay.
- Evidence supported VAP bundles as a means to reduce VAP.
- Oral care, clean suctioning techniques, equipment management, positioning with head of bed elevation, and hand hygiene

National VAP benchmark is 1.8 per 1000 ventilator days (National Health and Safety Network).

METHODS

This Nursing and Respiratory Therapy (RT) quality improvement project, implemented a VAP bundle in a 19-bed Pediatric Intensive Care Unit in an urban, academic medical center.

- Introduction: Team Mobilization
  - Registered Nurses (RN), RTs, nurse assistants (NA), medicine, pharmacy, infectious disease were introduced to bundle.
- Preparation: Education and Resource Mobilization
  - Education competency
  - Post-test validation for RNs, RTs, & NAs
  - 100% of bundle supplies obtained
- Pre-Implementation: roll-out of one bundle component/week
  - Ineffective oral care – oral care algorithm developed to improve effectiveness of oral care with tooth brushing.
- Full Implementation: all VAP bundle components implemented
  - Bedside, observations of bundle adherence tracked daily by RN/RT champions using checklist
  - Real-time feedback given at bedside
  - RN/RT monthly lottery with prizes for bundle adherence
  - Bi-weekly stakeholder communication of outcomes

RESULTS

VAP Bundle Adherence:

- Champions used observational checklist daily to measure staff adherence to VAP bundle (one tool per bed; scored yes/no)
- Adherence achieved when all bundle components were met

VAP Rate:

- VAP Rate ≤ # ICD-10 code (for VAP) tracked in 2018/2019 and used to calculate a VAP rate

Positive Tracheal Culture (TC) Rate:

- Positive tracheal cultures tracked over the same months in 2018/2019
- Positive tracheal culture rate = (# of positive tracheal cultures obtained greater than >48 hours after intubation) / # of ventilated patients x 100

Adherence to Components:

- VAP bundle adherence increased from 10% to 94%
- Positive tracheal cultures decreased 30%.
- TC Rate decreased 18.2%

OUTCOMES

Following VAP bundle implementation:

- Median staff adherence to the entire bundle was 78%, while itemized adherence ranged from 94-99.7%.
- VAP rate decreased from 6:1000 VD to 0:1000 VD.
- Tracheal culture rate decreased 18.2%
- Positive tracheal cultures decreased 30%
- Total tracheal cultures decreased 16%

An interdisciplinary, evidence-based VAP bundle can improve care and was effective in reducing VAP rates.

- A ZERO VAP rate is attainable and best achieved through staff education, bedside observation, and evidence-based care that prevents VAP. This means less work/cost to obtain, process and treat VAP, which reduces bacterial exposure and required antibiotics.
- Outcome findings are consistent with prior literature that supported VAP bundles as a means to improve care and patient outcomes.
- Limitations include inability to control for alternative explanations or outcomes.
- Given the low patient risk and cost/benefit analysis, a VAP bundle is recommended as a feasible, high-value practice change.

REFERENCES


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