Simple and Cost-Effective Strategies to Reduce the Occurrence of Ventilator-Associated Pneumonia

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Abstract

Background/Objectives: Ocala Health is an acute care facility with 4 critical care units located in Florida. In 2004, they initiated the Institute for Healthcare Improvement ventilator bundle. Although the ventilator bundle proved somewhat successful, during the first quarter of each calendar year it became apparent that re-education was necessary to ensure consistent bundle compliance. By January 2008, VAP rates were above the HCA frontline of 2.7 (Ocala Regional Medical Center, unpublished data, 2008), despite ongoing education about the ventilator bundle since 2004 and care every 4 hours (q4h) for 1.5 years. A multi-disciplinary VAP prevention team, comprised of critical care bedside nurses, convened to examine the peer-reviewed evidence and to determine a clinical pathway for improving VAP rates.

Methods: A preliminary VAP prevention team assembled to review the evidence and determine the most appropriate methods for improving VAP rates. After reviewing the most recent peer-reviewed evidence, the VAP prevention team determined that a multi-faceted infection prevention project was necessary. The intervention, which was initiated in March 2008, was aggressive and included:

- active surveillance for methicillin-resistant Staphylococcus aureus (MRSA) infection
- the VAP prevention bundle (Figure 2)
- q4h oral care with cetylpyridinium chloride
- active mobility program

This intervention is known as the ABCD protocol (Figure 1) in conjunction with a “30 To Do List.” Extensive staff education on the protocol and a to-do list began before the intervention.

Results: A review of compliance with the ABCD protocol in June 2008 showed that the q4h oral care protocol was associated with a reduced increase in cost per day and proved to be more labor-intensive for the nursing staff; therefore, the protocol was changed so that a q4h oral care with CHG was placed on the electronic medical administration record (eMAR). In 06/08, the oral care protocol was changed to q4h care with CHG, and the product was active surveillance for methicillin-resistant S. aureus (MRSA) infection.

Conclusion: The intervention, which is known as the ABCD protocol (Figure 1) in conjunction with a “30 To Do List.” Extensive staff education on the protocol and a to-do list began before the intervention.

Introduction

Epidemiology

Ventilator-associated pneumonia (VAP) is a major hospital-acquired health problem that affects high-risk patients. The Centers for Disease Control and Prevention (CDC) define VAP as pneumonia with specific diagnostic criteria occurring in intubated and ventilated patients at the time of, or within 48 hours before, the onset of the event. VAP is often suspected when a patient is found to have tachypnea, purulent tracheobronchial secretions, and a new or progressive pulmonary infiltrate and fever. The most recent National Healthcare Safety Network report indicates that VAP rates range from 2.3 to 2.7 infections per 1,000 ventilator days. Furthermore, VAP is associated with longer periods of mechanical ventilation, an increased length of stay in the intensive care unit, longer hospitalization stay, and an increased direct economic expenditure.

Background of the Critical Care/Infection Prevention Project 2007-2008

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Methods

Intervention Designed by Multidisciplinary VAP Prevention Team

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Conclusions

Clinical implications

Our goal was to create a process for preventing VAP infections and the associated costs.

- patients are at the center of the multidisciplinary team
- the multidisciplinary team consists of several key staff, each of whom has a clear role and all whom work cooperatively
- patients are screened for MRSA infection and isolated if infected
- a staff education protocol is ongoing in which patient outcomes and the effectiveness of staff’s efforts to improve patient care are highlighted
- compliance with the process is tracked to ensure positive outcomes and to identify possible problems

A cost analysis was conducted in 2009. The average number of ventilation days from 2008 was 90 per month, which was used to determine which product was the most cost-effective while still providing the results needed for VAP prevention. The results indicated the following:

- the q4h oral care product without CHG cost $23.50/day (average annual cost: $30,780)
- the q4h oral care product with CHG cost $23.35/day (average annual cost: $33,058)
- the use of the q4h oral care product with CHG rather than the q4h oral care product without CHG resulted in an annual savings of more than $7,722.

On the basis of the cost analysis and because the q4h oral care product with CHG is included in the eMAR, which allows compliance to be easily monitored, this product was the clear choice.