Compliance with VAP prevention bundle reduces VAP rate to 0

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Objective of the intervention

The objective was to ensure compliance with all ventilator bundle processes, including routine q2 hour oral care, in order to reduce the rate of ventilator-acquired pneumonia (VAP) at the Medical Center of McKinney to 0.

Inspiration behind the intervention

In 2003, the VAP rate spiked to 16.20 at the Medical Center of McKinney. The implementation of processes to ensure compliance with a comprehensive q2 hour oral care protocol decreased the VAP rate to 0 from the first quarter of 2004 to 2005 (21 consecutive months). A subsequent Division Office recommended change to q4 hour oral care packaging with q2 hour supplementation was made; however, a concomitant increase was noted in VAP rates. A thorough review of the process and records indicated that a q4 hour oral care product was being purchased instead of a q2 hour oral care product. Additional review of the processes indicated that, in an effort to avoid wasting the oral care product, the staff had been using products leftover from a previous patient on subsequent patients. The aim of this quality-improvement project was to ensure staff compliance with good infection-control practices in the ventilated patient population, including the q2 hour oral care protocol, and to ensure the adequate purchase of appropriate products to meet this goal.

Background

◆ 10-20% of patients receiving mechanical ventilatory support for ≥48 hours develop VAP—the most serious nosocomial infection.[1,2]

◆ VAP results in longer hospital stays and in an increase in hospital costs of approximately $40,000 per case.[3]

◆ A "ventilator bundle" is a series of interventions identified by the Institute for Healthcare Improvement (IHI) to reduce the incidence of VAP, including elevation of the head of the bed to 30°, daily breaks in sedation, daily assessment of the readiness to extubate, peptic ulcer disease prophylaxis, and deep venous thrombosis prophylaxis.[4,5]

◆ Proper education of the healthcare staff and daily monitoring of compliance with the ventilator bundle are crucial to the success of this intervention program.[6-8]

◆ The addition of routine oral care q2 hours to the ventilator bundle, with the use of a prepackaged oral care kit, has been shown to further reduce VAP rates.[9,10]

◆ The Medical Center of McKinney in McKinney, Texas, USA implemented a comprehensive oral care protocol in ventilated patients in an effort to eliminate VAP, and noted variability in VAP rates which spiked during periods of time when q4 hour oral care packaging was utilized vs q2 hour oral care packaging.

Intervention methods

◆ The outcome measure for this performance-improvement initiative was the VAP rate per 1000 ventilator days.

◆ The medical records of VAP patients were routinely reviewed by Infection Prevention & Control and the Director of Respiratory Therapy to ensure compliance with the ventilator bundle.

◆ Each time that a spike in the VAP rate occurred, all products, records, and processes were thoroughly reviewed to identify the cause.

◆ The ventilator bundle and q2 oral care protocol were strictly enforced, which included the purchase of a q2 hour oral care kit rather than a q4 hour oral care kit.

◆ The healthcare staff were educated by Infection Prevention & Control and the Director of Respiratory Therapy to avoid poor infection-control practices, which can result in increased VAP rates.

◆ q2 hour oral care packaging was purchased and stored at the patients' bedside to ensure that it was readily available (one package per individual patient per ventilator day).

Results

This quality-improvement program was initiated in 2004, and quantitative and qualitative metrics indicated that compliance with the protocol over the 4-y evaluation period improved patient outcomes.

◆ Implementation of a comprehensive q2 hour oral care protocol resulted in a VAP rate of 0 over 21 consecutive months; however, VAP rates spiked again.

◆ Identification of breaches in protocol compliance and inappropriate product use/infection control care gaps resulted in a re-institution of the q2 hour oral care protocol leading to 0 VAP for 1 year.

◆ Aggressive review of medical charts and infection-control processes after a third spike in VAP rates indicated the lack of bedside availability of the product and product purchasing inconsistencies, which led to noncompliance with the q2 hour oral care protocol.

◆ Rigorous and comprehensive process changes were implemented to ensure respiratory staff had products available for q2 hour oral care, and intensive communication and educational efforts (related to VAP prevention and oral care) between infection control and respiratory therapy staff resulted in 0 VAP rates from February 2008 through end-September 2008.
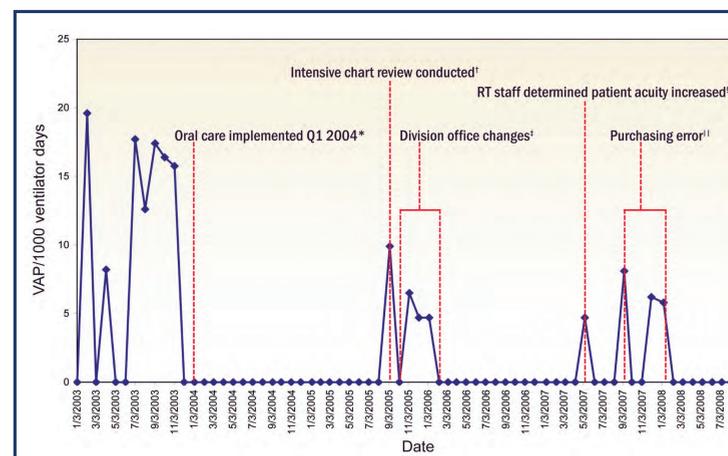
VAP per 1000 Ventilator Days: 2003-2008

Sample size:
2003 total ventilator days = 1310; 2004 total ventilator days = 1380; 2005 total ventilator days = 1699; 2006 total ventilator days = 2007; 2007 total ventilator days = 1811; 2008 total ventilator days = 1380 (Jan-Sept)

* Abstract titled "Annihilating Ventilator-Associated Pneumonia With a Respiratory Therapy Emphasis on Oral Care" presented December 2005 at the 51st International Respiratory Congress.

† Intensive review with ICU RN. New staff was the only correlation. Handwashing signage added to each door.

‡ Changes were being made from the division office regarding oral care packaging for q 4 hours with extra supplies brought to the room to make q 2 hours. Division decision to keep SAGE q 2 hour packaging. Based on MCM data.

§ RT staff reviewed the medical records of VAP patients. The only common thread identified was the overall increase in patient acuity.

|| Discovered that RT had not been purchasing the 2 hour Oral Care Product. Material Management now stores that product so it will always be available. No VAP Feb thru September 2008.

Lessons learned

◆ Comprehensive and concise data tracking enabled effective tracking of strengths and weaknesses of process-improvement interventions.

◆ Comprehensive chart review and staff collaboration helped to identify the weaknesses responsible for the spike in VAP rates and to subsequently eliminate them.

◆ Absolute compliance with the q2 hour oral care protocol resulted in a VAP rate of 0 for a sustained period of time.

◆ Constant measurement of qualitative metrics allowed Infection Prevention & Control and the Director of Respiratory Therapy to identify and address the root cause of protocol noncompliance that resulted in a spike in the VAP rate.

◆ The hospital staff strived to improve problematic processes to achieve 100% compliance with the VAP-prevention oral care protocol and improve patient outcomes.

◆ Ongoing education of staff regarding appropriate infection-control practices related to the q2 hour oral care protocols was beneficial in preventing VAP.

◆ Intensive and ongoing q2 hour oral care in addition to the VAP ventilator bundle resulted in a VAP rate of 0 at the Medical Center of McKinney for a sustained period of time.

Medical Center of McKinney SM

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