ANNIHILATING VENTILATOR-ASSOCIATED PNEUMONIA WITH A RESPIRATORY THERAPY EMPHASIS ON ORAL CARE

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ABSTRACT

BACKGROUND
Each case of ventilator-associated pneumonia (VAP) increases ventilator days, critical care and hospital lengths of stay, and results in additional facility costs of over $40,000. An increase in the VAP rate at the Medical Center of McKinney led to formation of a Performance Improvement (PI) team to assess the impact of prevention interventions. The PI team, which included Respiratory Therapy, Nursing, and Infection Control, conducted a review of current literature regarding processes to decrease VAP risk and increase patient safety. Based on the latest evidence-based research, the team developed a plan that included awareness, education and a comprehensive oral care protocol.

METHOD
The PI team implemented the plan in the first quarter of 2004, notifying Critical Care and Respiratory staff of the VAP rate and its impact on patient outcomes. Respiratory Therapy accepted responsibility for implementing oral care every two hours and documenting the process. The oral care protocol addressed oropharyngeal colonization, oral secretions management, and dental plaque formation through brushing, cleansing, suctioning and moisturizing. For further reinforcement of VAP prevention strategies, staff attended an additional off-site education seminar.

RESULTS
Due to the protocol intervention, McKinney's annual VAP rate in 2003—8.2 per 1000 vent days—was reduced to 0 for 2004. McKinney avoided an estimated 11 cases of VAP, along with over $440,000 in facility costs for treatment. The facility continues to maintain a VAP rate of zero to this date.

CONCLUSIONS
This dramatic improvement in patient safety may be attributed to the implementation of heightened staff awareness, increased staff education regarding VAP, and compliance to a comprehensive oral care protocol. The sustained improvement of patient outcomes is credited to the Respiratory Therapy staff’s diligence in making VAP prevention a priority.

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It is estimated that in 10 hospitalized patients will acquire an infection after admission, which will result in a prolonged length of stay while incurring additional diagnostic and therapeutic interventions that add substantial economic costs.1-4

“Ventilator-associated pneumonia (VAP) is the most common and lethal form of hospital-acquired pneumonia. It occurs in up to 28% of patients who need mechanical ventilation for more than 48 hours.”5 Additional direct costs to a hospital can range from $29,000 to more than $57,000 for each case of VAP.6-7 while prolonging time on mechanical ventilation and hospital stay by more than 9 days each.5

The CDC’s Guidelines for Preventing Health-Care–Associated Pneumonia, 2003, published in 2004, makes practice recommendations based on the strength of evidence available.1-2 However, these guidelines were not available to us during the second half of 2003, when our facility noted a sustained increase in the rate of VAP. We were prompted to form a multidisciplinary Process Improvement team to investigate care practices and potential interventions that could reverse this trend. The team—which included Respiratory Therapy, Nursing, and Infection Control—conducted a review of current literature. Based on the latest evidence-based research, the team developed a plan that included awareness, education, and a comprehensive oral care protocol.

The comprehensive oral care protocol (Figure 2) consists of q2-hour care to address the risk factors of oropharyngeal colonization through frequent cleansing and moisturizing of the oral cavity, management of orofacial secretions (that can be aspirated) through oral and deep oropharyngeal suctioning, and the removal of bacteria-laden dental plaque through tooth brushing. Respiratory staff also took responsibility for documentation of oral care and monitoring of semi-recumbent positioning (HOB >30 degrees).

Implementation of the Process Improvement plan has resulted in a dramatic impact on the rate of VAP. The annual rate of VAP for 2003 was 8.2 per 1000 ventilator days. This was reduced to 0 in 2004 and still remains 0 through the second quarter of 2005. Based on 2003 numbers, 11 cases of VAP were avoided in 2004. This resulted in a financial benefit to the facility of $319,000 to $627,000 for that year alone. Monitoring of documentation to the oral care protocol reveals a >95% rate of compliance.

The success of our protocol is demonstrated by the fact that we have had no ventilator-associated pneumonias for 21 consecutive months. This dramatic improvement in patient safety may be attributed to the implementation of heightened staff awareness, increased staff education regarding VAP, and compliance to a comprehensive oral care protocol.1-2 The sustained improvement of patient outcomes is credited to the Respiratory Therapy staff’s diligence in making VAP prevention a priority.

Our success with the “amplification of ventilator-associated pneumonia” is a direct result of our Respiratory Therapists and ICU Nursing staff’s enthusiasm and belief that q2-hour oral care is important to provide quality patient care. Our hospital’s Medical Director and Administration supported this intervention. Communication and interdependence between RT and Nursing staff fostered a culture conducive to creating and sustaining a new standard of care.

The education and support by the product manufacturer was instrumental in creating a heightened awareness of the importance of oral care. The product and its packaging facilitated compliance to the protocol.

ACKNOWLEDGMENTS

Our success is a direct result of the dedication of our Respiratory Therapists and ICU Nursing staff to provide the ultimate in quality patient care. Well done! We would also like to acknowledge the support of our Hospital Administrative team and Medical Director. Thank you Sage Products Inc. for creating the story board necessary to display our success and diligent effort.

REFERENCES

9. Administrative support was provided by the product manufacturer through the creation and support of a new standard of care.
10. Interdependence between RT and Nursing staff was facilitated by the product manufacturer.

CONCLUSION

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METHODS AND MATERIALS

Medical Center of McKinney is a full-service acute care hospital with over 200 patient beds and two campuses in McKinney, TX. Our ICU has 16 beds with an average daily census of 9.5. We initiated the Process Improvement plan in December 2003 with a component to increase staff awareness of VAP and the number of patients it affected over the past year. We communicated the plan through staff meetings and posters.

In February 2004, Nursing and Respiratory staff attended an off-site educational seminar. The seminar covered epidemiology and etiology of VAP along with discussion of various prevention strategies. This included the rationale for oral care interventions and the risk factors they address.

Staff received additional education during implementation of the oral care protocol and product inservice for the 24-hour oral care kits they would be using (Figure 1). Special emphasis was made to stress effective communication between the ICU Nursing staff and Respiratory Therapists to work toward the common goal of reducing VAP.

FIGURE 2

FIGURE 1
RESULTS

Implementation of the Process Improvement plan has resulted in a dramatic impact on the rate of VAP in our ICU. The annual rate of VAP for 2003 was 8.2 per 1000 vent days. This was reduced to 0 in 2004 and still remains 0 during the second half of 2003, when our facility noted a sustained increase in the rate of VAP. We were prompted to form a multidisciplinary Process Improvement team to investigate care practices and potential interventions that could reverse this trend. The team—which included Respiratory Therapy, Nursing, and Infection Control—conducted a review of current literature. Based on the latest evidence-based research, the team developed a plan that included awareness, education, and a comprehensive oral care protocol.

It is estimated that 1 in 10 hospitalized patients will acquire an infection after admission, which will result in a prolonged length of stay while incurring additional diagnostic and therapeutic interventions that add substantial economic costs.1,2 “Ventilator-associated pneumonia (VAP) is the most common and lethal form of hospital-acquired pneumonia. It occurs in up to 25% of patients who need mechanical ventilation for more than 48 hours.”3 Additional direct costs to a hospital can range from $29,000 to more than $57,000 for each case of Associated Pneumonia, 2003, published in 2004, makes more than 48 hours.”2 Additional direct costs to a hospital can occur from the care of patients with VAP. Additionally, management of oral secretions (that can be aspirated) through frequent cleansing and moisturizing of the oral cavity, through oral care kits they would be using, resulted in a dramatic impact on the rate of VAP in our ICU.

The success of our protocol is demonstrated by the fact that we have had no ventilator-associated pneumonias for 21 consecutive months. This dramatic improvement in patient safety may be attributed to the implementation of heightened staffing awareness, increased staff education regarding VAP, and compliance to a comprehensive oral care protocol.1 The sustained improvement of patient outcomes is credited to the Respiratory Therapy staff’s diligence in making VAP prevention a priority.

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