



Guidelines for Prevention of Ventilator Associated Pneumonia

Tammy DeRouen, RN, CCRN and Cecile Broussard, RN, MS

Our Lady of Lourdes Regional Medical Center, 611 St. Landry Street, Lafayette, LA 70506

OUR LADY OF LOURDES
REGIONAL MEDICAL CENTER
Franciscan Missionaries of Our Lady Health System
Healthcare to the HIGHEST Power.™

Introduction



Problem

Ventilator Associated Pneumonia (VAP) is a common nosocomial infection that is associated with poor clinical patient outcomes. VAP leads to a significant increase in ventilator days and ICU length of stay, and substantially increases hospital costs.

- "VAP is defined as an inflammation of the lung parenchyma caused by infectious agents not present or incubating at the time mechanical ventilation was started" (Chastre & Fagon, 2002, p. 868).
- A patient with an endotracheal tube in place for more than 48 hours is at risk for VAP.
- The mechanism of the endotracheal tube raises the risk of VAP up to 20 times by allowing bacteria access to the lungs.
- Patients with VAP require an increase in mechanical ventilation from 5 to 13 days.
- The cost of one VAP episode adds a substantial increase to hospital cost of \$57,000 per occurrence.
- ICU length of stay is increased by 5 to 7 days.
- A VAP in a critically ill patient may lead to a mortality rate as high as 70%.

Evidence

The Institute for Healthcare Improvement (IHI) started the "100,000 Lives Campaign" to engage U.S. hospitals to implement changes in care with evidence based guidelines. VAP initiatives include elements such as head of the bed elevation and oral hygiene. Research findings demonstrate VAP initiatives for mechanically ventilated patients reduce the incidence of VAP's.

Strategy

The intensive care units initiated a "ZAP the VAP" program in June 2005 involving all ICU RN's, and Certified Nurse Assistant. Interdisciplinary team of nursing, pharmacy, infection control, case management, and dietary included initiatives in the patient's plan of care.

Zap the VAP Campaign

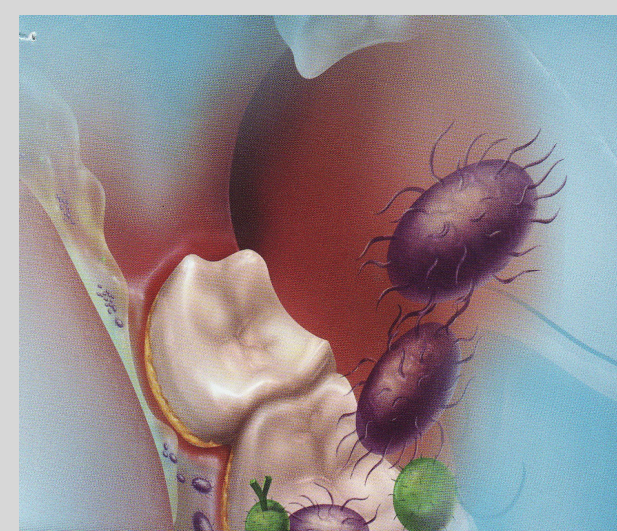


Practice Change:

Implementation of initiatives in ventilator patients in both the Medical and Surgical Intensive

Care Units:

- Oral Hygiene every 4 hours (kits included oral cleansing tools, cleansing solutions, and suctioning systems)
- Elevation of the Head of Bed to 30 degrees



Oral Hygiene Program

The oral cavity is assessed by the nurse.

Mechanically ventilated patients are provided oral care every 4 hours and as necessary.

Mechanically ventilated patients are assessed to determine the need for removal of oropharyngeal secretions every 12 hours as well as prior to repositioning the tube or deflation of the cuff.

Procedures

- Set up suction equipment by designated employee on each unit and place 24-hour supply kit at head of bed.
- Position patient's head to the side or place in Semi-Fowlers.
- Provide deep suction, as needed, in patients to remove oropharyngeal secretions that have migrated down the tube and settled on top of the cuff.
- Brush teeth twice a day using suction toothbrush with an antiplaque solution.
 - Brush for approximately one to two minutes. Note: Do not open suction line until antiplaque solution is distributed throughout the oral cavity.
 - Exert gentle pressure while moving in short horizontal or circular strokes.
- Gently brush the surface of the tongue.
- Use suction swab with Peroximint solution between brushing to clean the oral cavity and stimulate the oral mucosa.
 - Place swab perpendicular to gum line, applying gentle mechanical action for one to two minutes.
 - Turn swab in clockwise rotation to remove mucous and debris.
- Apply mouth moisturizer inside mouth after each cleaning.
- Apply balm if needed.



Q-Care – Oral Care Product

Elevation of Head of Bed

- Position HOB at 30-45° angle.
- Aim to prevent reflux and aspiration of bacteria from the stomach into the airway.
- Potentially improves ventilation.
- A simple device measuring the bed angle is a recommended best practice method to increase rates of compliance in maintaining 30-degree head of bed (HOB) elevation.



Position HOB at 30-45° angle



Simple measurement device

Evaluation

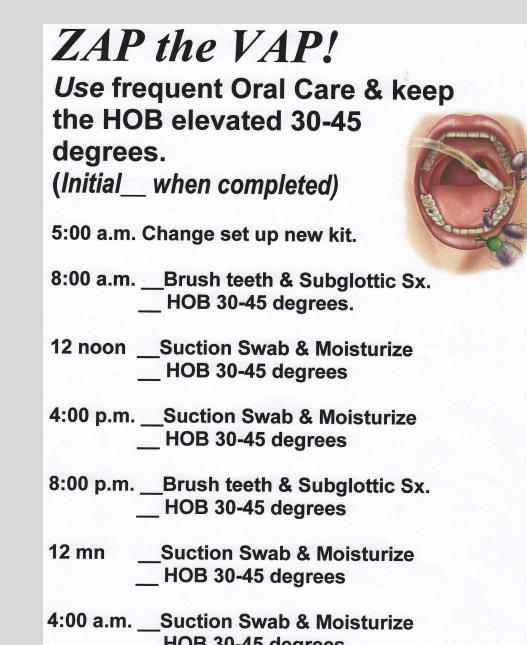
Measurements include:

- Frequency of documented interventions of oral hygiene
- Daily assessment of the head of bed elevation
- Utilization of oral care supplies
- Data graphs compilation with staff
- VAP rate

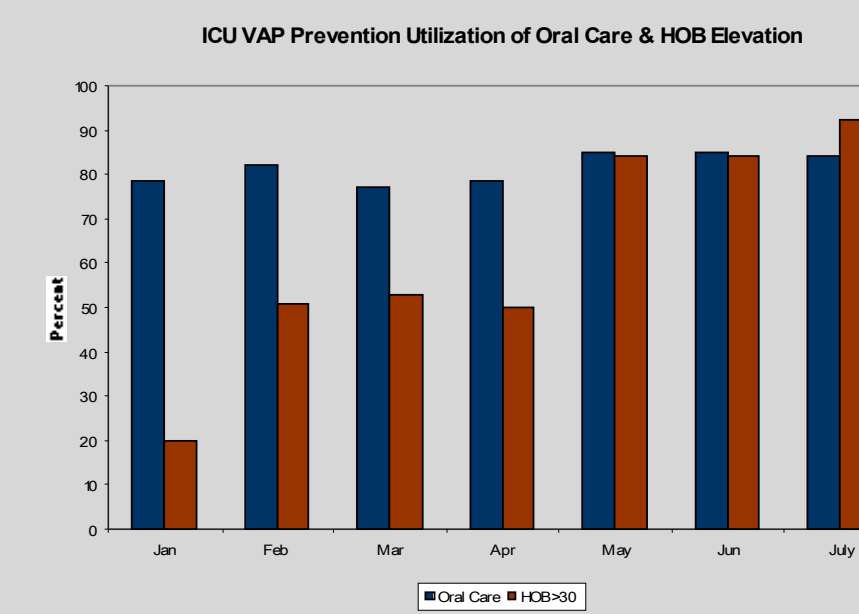
Audit Tool & Measurements

"ZAP the VAP" Audit Tool for compliance of Oral Hygiene and HOB Elevation placed at bedside. Nurse and/or Certified Nurse Assistant documents frequency of intervention at specified intervals.

Quality Department completed analysis of utilization of stocked oral hygiene supplies.



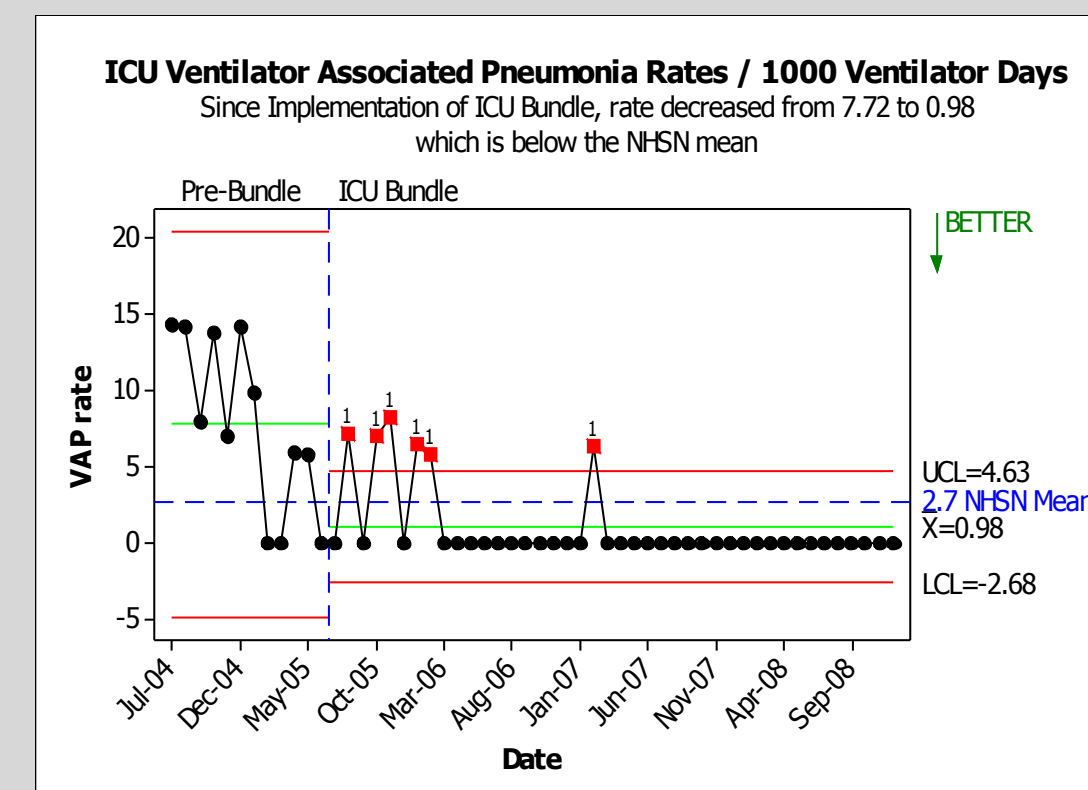
Audit Tool for Compliance of Oral Hygiene and HOB Elevation



Frequency of Documented Oral Hygiene and HOB Elevation.

VAP Rate

VAP definitions and benchmarks are defined by the National Nosocomial Infection Surveillance System (NNIS) division of the center for Disease Control and Prevention (CDC).



Control chart of ICU VAP Rates / 1000 ventilator days

Results

The "ZAP the VAP" initiative has decreased the rate of ventilator associated pneumonia from 7.72 per 1000 ventilator patient days in June 2005 to 0.98 per 1000 ventilator patient days in December 2008. Success demonstrates a current rate of 23 months with no VAP's.

Conclusion

Recommendation

- Ongoing education and follow up of ICU RNs, and Nursing Assistants.
- Ventilator patient's plan of care must include 30 degree head of bed elevation and vigorous oral hygiene.
- Interdisciplinary team care planning should model best practice guidelines.
- Staff recognition and reward for achievement of excellent patient outcomes.

Lesson Learned:

Nursing empowerment to change practice and improve patient outcomes based on clinically proven research findings.

Bibliography

- Cocanour, C. S., Ostrosky-Zeichner, L., Peninger, M., Garbade, D., Tidemann, T., Domonoske, B. D., Li, T., Allen, S. J., & Luther, K. M. (2005). Cost of a Ventilator-associated pneumonia in a shock trauma intensive care unit. [Electronic Version]. *Surgical Infections*, 6, no 1, 65-72. Retrieved March 3, 2009 from <http://www.liebertonline.com/doi/abs/10.1089/sur.2005.6.65>.
- Drakulovic MB, Torres A, Bauer TT, Nicolas JM, Nogue S, Ferrer M. Supine body position as a risk factor for nosocomial pneumonia in mechanically ventilated patients: A randomized trial. *Lancet*. Nov 27, 1999;354(9193):1851-1858. Retrieved March 6, 2009. <http://www.ihl.org/IHI/Topics/CriticalCare/IntensiveCare/Changes/IndividualChanges/Elevationoftheheadofthebed.htm>
- Institute for Healthcare Improvement. Implement the ventilator bundle: Elevation of the head of the bed. Retrieved March 6, 2009 from www.ihl.org/IHI/Topics/CriticalCare/IntensiveCareChanges/IndividualChanges/Elevationoftheheadofthebed.htm.
- Kollef, M. H., Shorr, A., Tabak, Y. P., Gupta, V., Liu, L. Z., & Johannes, R. S. (2005). Epidemiology and outcomes of health-care-associated pneumonia. [Electronic version]. *Chest*, 128,3854-3862. Retrieved March 3, 2009 from www.chestjournal.org.
- Rello, J., Ollendorf, D., Oster, G., Vera-Llonch, M., Bellm, L., Redman, R., & Kollef, M.H. (2002). Epidemiology and outcomes of ventilator-associated pneumonia in a large us database. [Electronic version]. *Chest*, 122,2115-2121. Retrieved March 3, 2009 from www.chestjournal.org.
- Schleder, B., Stott, K. (2002). The effect of a comprehensive oral care protocol on Patients at risk for ventilator-associated pneumonia. [Electronic version]. *Journal of Advocate Health Care*, 4, no 1, 27-30. Retrieved March 3, 2009 from http://www.sagepub.com/documents/pdf/education/studies_articles/vap/20303C_Oral_care_of_the_mechanically_ventilated_patient_you_can_make_a_difference_in_five_minutes_poster.pdf
- Tablan, O. C., Anderson, L. J., Besser, R., Bridges, M., Hajjeh, R. Guidelines for preventing health-care-associated pneumonia, 2003. *MMWR recommendations and reports*. Retrieved March 2, 2009 from <http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5303a1.htm>.

Contact information

www.lourdes.net
Healthcare to the HIGHEST Power.™

Tammy DeRouen
Our Lady of Lourdes RMC
611 St. Landry Street
Lafayette, LA 70506

T: 337.289.2557
F: 337.289.2690
E: DerouenT@lourdesrmc.com