Implementing Best Practices to Decrease Ventilator-Associated Pneumonia

LTC Mona Bingham, PhD, RN, AN
Brooke Army Medical Center

Problem

Ventilator-Associated Pneumonia (VAP) rates at two large military medical centers were consistently above National Nosocomial Infection Surveillance (NNIS) median rates. Would a tailored educational intervention improve staff compliance with prevention strategies for VAP?

Evidence

Literature was searched; evidence reviewed and graded using the United States Preventive Task Force (USPTF) criteria.

Policy Change

Based on the evidence, a Clinical Practice Guideline (CPG) and policy for clinical management of VAP was developed and implemented

Strategies

- Leveraged expertise from nationally recognized experts
- Baseline evaluation of current practices
- An evidence summary of a systematic literature review
- Assisting multiple teams with implementation of the CPG
- Measuring CPG implementation
- Evaluating the results with clinicians at each site at scheduled intervals

Practice Change

- Improved education for hand hygiene.
- Created Standard Order Set (SOS) for ventilator patients to monitor
  - HOB at >30 degrees.
  - Created SOS for oral care on ventilator patients to include tooth-brushing at least BID.

Evaluation

Pre and post intervention measures were obtained for

- VAP rates using NNIS criteria
- Staff clinical practice behaviors including:
  - hand hygiene as appropriate by CDC guidelines (pre, during, & post patient care)
  - oral care
  - Degree of HOB on selected ventilator patients

Results

Change is difficult to sustain without constant reinforcement by leadership. Oral care and HOB showed improvement due to continued reinforcement. There was inconsistency in hand hygiene practices across time. VAP rates did not show a sustained improvement.

Recommendations

Practice change requires ongoing reinforcement from leadership to convey importance of individual practices, such as hand hygiene. Staff must feel involved and share in establishing outcomes and evaluating performance feedback.

References

Akca, O., Koltka, K., Uzel, S., Cakar, N., Pembeci, K., Sayan, M. A., et al. (2000). Risk factors for early-onset, ventilator-associated pneumonia in critical care patients: selected multiresistant versus nonresistant bacteria. *Anesthesiology, 93*(3), 638-645.

Babcock, H. M., Zack, J. E., Garrison, T., Trovillion, E., Jones, M., Fraser, V. J., et al. (2004). An educational intervention to reduce ventilator-associated pneumonia in an integrated health system: a comparison of effects. *Chest, 125*(6), 2224-2231.

CDC guidelines focus on prevention of nosocomial pneumonia. (1997). *Am J Health Syst Pharm, 54*(9), 1022, 1025.

Collard, H. R., Saint, S., & Matthay, M. A. (2003). Prevention of ventilator-associated pneumonia: an evidence-based systematic review. *Ann Intern Med, 138*(6), 494-501.

Combes, A., Figliolini, C., Trouillet, J. L., Kassis, N., Wolff, M., Gibert, C., et al. (2002). Incidence and outcome of polymicrobial ventilator-associated pneumonia. *Chest, 121*(5), 1618-1623.

Cook, D. J., Meade, M. O., Hand, L. E., & McMullin, J. P. (2002). Toward understanding evidence uptake: semirecumbency for pneumonia prevention. *Crit Care Med, 30*(7), 1472-1477.

Drakulovic, M. B., Torres, A., Bauer, T. T., Nicolas, J. M., Nogue, S., & Ferrer, M. (1999). Supine body position as a risk factor for nosocomial pneumonia in mechanically ventilated patients: a randomised trial. *Lancet, 354*(9193), 1851-1858.

Garcia, L., Jendresky, L., & Colbert, L. (2004). Reduction of microbial colonization in the oropharynx and dental plaque reduces ventilator-associated pneumonia. http://www.sageproducts.com/education/vstudy.asp.

Harris, J. R., Joshi, M., Morton, P. G., & Soeken, K. L. (2000). Risk factors for nosocomial pneumonia in critically ill trauma patients. *AACN Clin Issues, 11*(2), 198-231.

Ibrahim, E. H., Tracy, L., Hill, C., Fraser, V. J., & Kollef, M. H. (2001). The occurrence of ventilator-associated pneumonia in a community hospital: risk factors and clinical outcomes. *Chest, 120*(2), 555-561.

Kollef, M. H. (1993). Ventilator-associated pneumonia. A multivariate analysis. *Jama, 270*(16), 1965-1970.

Larson, E. L., Aiello, A. E., Bastyr, J., Lyle, C., Stahl, J., Cronquist, A., et al. (2001). Assessment of two hand hygiene regimens for intensive care unit personnel. *Crit Care Med, 29*(5), 944-951.

Munro, C. L., & Grap, M. J. (2004). Oral health and care in the intensive care unit: state of the science. *Am J Crit Care, 13*(1), 25-33; discussion 34.

Schleder, B., Stott, K., & Lloyd. (2002). The effect of a comprehensive oral care protocol on patients at risk for ventilator-associated pneumonia. *Journal of Advocate Health Care, 4*(1), 27-30.

Tablan, O., Anderson, L., Besser, R., Bridges, C., & Hajjeh, R. (2004). Guidelines for prevention of health-care-associated pneumonia. [Electronic Version]. http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5303al.htm. Retrieved May 26, 2004.

Trieger, N. (2004). Oral care in the intensive care unit. *Am J Crit Care, 13*(1), 24.

Zack, J. E., Garrison, T., Trovillion, E., Clinkscale, D., Coopersmith, C. M., Fraser, V. J., et al. (2002). Effect of an education program aimed at reducing the occurrence of ventilator-associated pneumonia. *Crit Care Med, 30*(11), 2407-2412.