Ventilator Associated Pneumonia Protocol Design and Implementation in the ICU

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Problem: The Institute for Healthcare Improvement (IHI) identifies Ventilator Associated Pneumonia (VAP) one of the primary hospitals acquired infections requiring improvement, due to mortality rates as high as 43%, and estimated costs of $40,000 per case.

Evidence: There is research supporting the use of the VAP bundle to decrease VAP incidence in critical care units. Schumpert March VAP incidence of 12.5/1000 ventilator days is compared to the NNIS adult ICU mean of 5.1/1000 ventilator days.

Strategy: Christus Schumpert Health System, LA, identified poor diagnosis of VAP and developed a tool to identify the baseline VAP rate in the adult ICU based on CDC definitions.

Practice Change: The Adult ICU implemented a VAP bundle in May 2006. IHI's VAP bundle, comprised of sedation vacations, Peptic ulcer and deep vein thrombosis prophylaxis, and 30 degree HOB, was implemented in May, 2006, along with secondary elements of daily yankaurs changes, mouth care Q4h, endotracheal cuff checks, and suction catheter changes Q48h.

Evaluation: VAP incidence was monitored on every mechanically ventilated patient, and bundle compliance was assessed daily.

Results: In the improvement period of May through December, VAP bundle compliance increased from 3.5% to 89% while VAP incidence decreased to 4.47/1000 ventilator days. Chi Square analysis supported a statistically significant improvement in both VAP incidence and VAP bundle compliance in the improvement period with a p value of <0.001. Regression analysis did not support the decrease in VAP was a result of the bundle compliance, likely due to the small sample size.

Recommendations: Continued use of the bundle and tracking of VAP incidence should demonstrate the link between bundle compliance and decreased VAP. Additional research will support use of the VAP bundle, particularly in areas that have not been studied, such as pediatric and neonatal populations.

References

American Thoracic Society Documents. Guidelines for the management of adults with hospital-acquired, ventilator associated, and healthcare associated pneumonia. The official statement of the American Thoracic Society and the Infectious Diseases Society of America. *American Journal of Critical Care Medicine,* 2005,171, pp388-416.

Ellis, K. Success by the bundle. *ICT.* April, 2006; 10-16.

http://www.cdc.gov

http://www.ihi.org/IHI/Topics/CriticalCare/IntensiveCare/Changes/Implementtheventilat orbundle.htm

http://www.ihi.org/IHI/Topics/CriticalCare/IntensiveCare/Measures/Ventilatorbundle compliance.htm

Laux, L, Herbert, C. Decreasing ventilator-associated pneumonia: getting on board. *Critical Care Nursing Quarterly.* 2006;29:3:253-58.

Munro, C, Grap, M.J., Elswick, R.K., McKinney, J., Sessler, C., Hummel, R. Oral health status and development of ventilator-associated pneumonia: a descriptive study. *American Journal of Critical Care*, 2006.15:5, pp453-460.

Nates, J, Wakefield, C, Pravinkamar, E,Price, K, Perego, C, Hackett, B, Chemaly, R, Raad, I & Finch, C. Ventilator-associated pneumonia rates in surgical icu: surveillance and interventions in a comprehensive cancer center: *Critical Care Medicine.* Abstract supplement, Dec2006;34:12: A94.

NNIS, June 2004

Powers, J. Managing vap effectively to optimize outcomes and costs. *Nursing Management.* 2006; 37:11:48A-48G.

Seckel, M. Implementing evidence-based practice guidelines to minimize ventilator associated pneumonia. *AACN News*. 2007: 24:1: p. 8.

Statistical Analysis System, version 9.1, SAS Institute, Cary, NC.

Stockwell ,J, Rogers, K, Development & implementation of a ventilator associated pneumonia (vap) quality bundle in a pediatric intensive care unit. *Critical Care Medicine.* Abstract Supplement, 2005;33:12:A27.