

**GREATER THAN 300 BEDS
FIRST PLACE WINNER – TIE:**

FLOYD MEDICAL CENTER

VENTILATOR-ASSOCIATED PNEUMONIA PROJECT

According to the New England Journal of Medicine, nosocomial pneumonia is a leading cause of death from hospital-acquired infections, with an associated crude mortality rate of ~30%. The mortality rate is as high as 50% when ventilator-associated pneumonia (VAP) is caused by a virulent strain of infection.

In July 2003, we experienced an all-time peak of 10 cases of VAP per 1000 ventilator days (90th percentile in the National Nosocomial Infection Surveillance System—NNIS). With increasing concern surrounding patient safety issues, our hospital classified ventilator-associated pneumonia as a top priority, and a performance improvement team began work to decrease the rate. This team was composed of the Medical Director of Cardiopulmonary Services, the Director of Cardiopulmonary Services and Cardiopulmonary Services personnel, Critical Care Nurse Educator, ICU Nursing personnel, Epidemiological personnel, the Director of Quality Management and a Quality Management nurse screener.

We followed evidence-based guidelines that have been proven efficacious and safe. These involve basic infection control practices to reduce the transmission of organisms from patient to patient, including many practices surrounding safe use of equipment. We chose the non-pharmacologic approach to prevent VAP, specifically targeting prevention of aspiration through patient positioning and other measures. It is more easily applied, and many think it is less expensive, than the pharmacologic approach with its focus on prevention of colonization with pathogenic bacteria.

We conducted in-service education and 1:1 bedside training to continuously address sixteen key areas including: Semi-recumbent positioning of patients at the 30-degree angle to prevent aspiration; changing breathing ventilator circuits only when visibly soiled or mechanically malfunctioning, changing the heat moisture exchangers no more frequently than every 48 hours; using protective gloves and gowns; hand hygiene; avoidance of unnecessary manipulation/changes of the ventilator circuit; use of sterile water for irrigation of active humidification and cleaning of equipment; use of non-invasive ventilation to reduce the duration of endotracheal intubation when feasible and not medically contraindicated; non-nasal intubation; draining ventilator circuit condensate; continuous subglottic suctioning as applicable; giving patients “sedation vacation” and other steps to facilitate readiness-to-wean, management of ambient air during construction above ICU; and making daily rounds to check for best practice measures and to offer assistance. Policies and procedures were updated to reflect the latest recommendations of the Centers for Disease Control and the Infectious Disease Society of America.

Six quarters of data since the study inception show a steady and significant decline in VAP (from 10.1 per 1000 ventilator days (90th NNIS percentile) in July 2003 to 3.7 per 1000 ventilator days in December 2004 (38th NNIS percentile). Annualized figures convert to a decline from approximately 16 cases per year to 6 cases per year. This ten-case reduction translates to ~3 to 5 saved lives per year and a reduction of health care costs from \$792,832 (\$49,552 additional cost per case of VAP) to \$297,312. Annual savings = \$495,520 (or, half a million dollars).

This improvement project should be undertaken by any hospital that offers mechanical ventilatory services.