

Ventilator Associated Pneumonia Prevention in the Traumatically Injured Patient: Beyond the Bundle!


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Background

Ventilator associated pneumonia (VAP) is the most significant nosocomial infection impacting morbidity & mortality in critically ill patients.

Precursors to VAP in the traumatically injured patient:

- poor neurological function
- prolonged ventilator dependent days
- frank or silent aspiration due to prolonged recumbent position for tests, procedures or operations
- poor oral health



Interventions

2005

- Institute for Health Care Improvement (IHI) VAP prevention bundle implemented

2005-2008

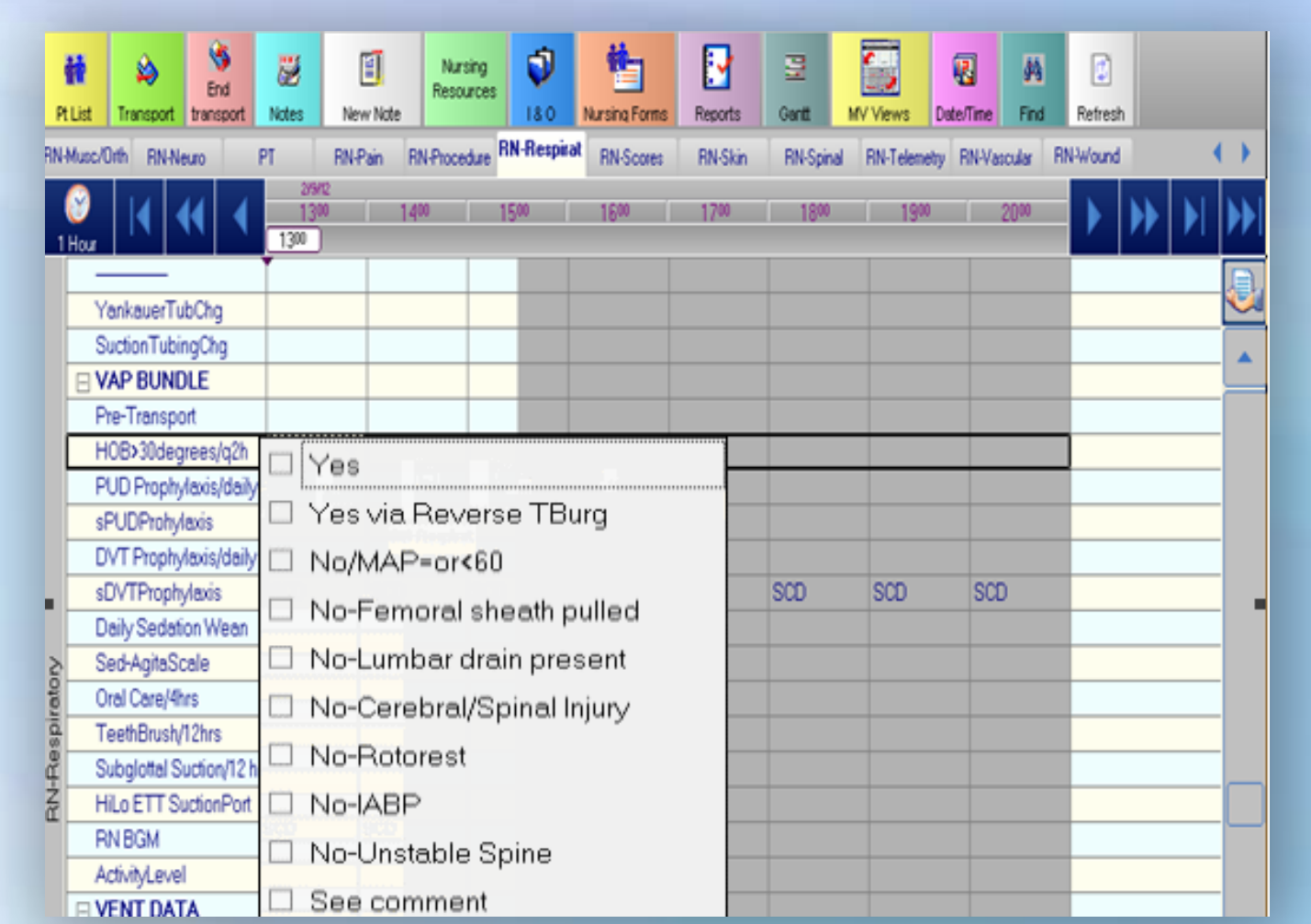
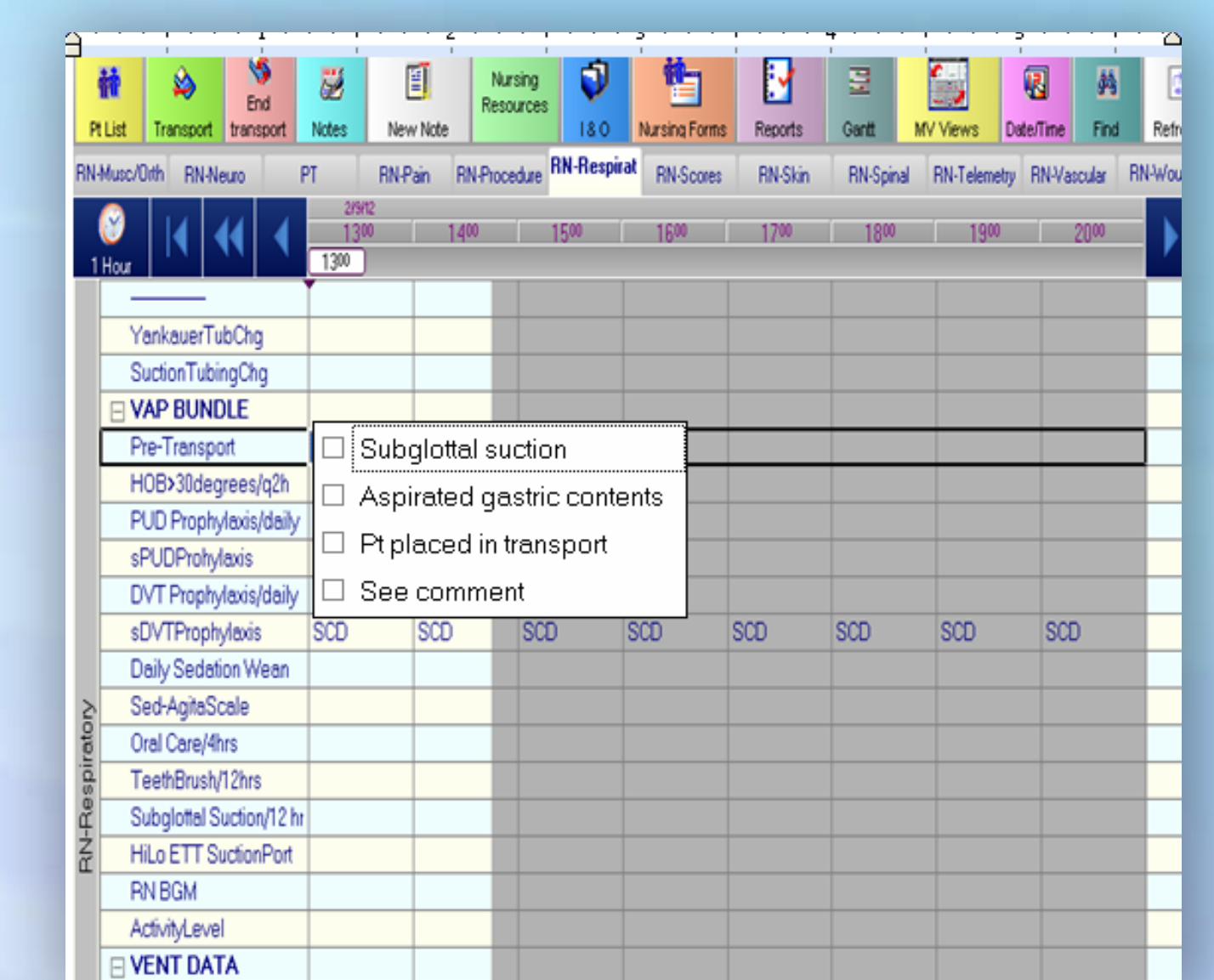
- Comprehensive and ongoing education to RNs and RTs in adult and pediatric critical care settings, emphasizing:
 - Analgesia and sedation weaning strategies
- Implementation of a standard pack for q 4 hour oral care
- Standardization of electronic documentation for all elements of IHI bundle and q 4 hour oral care
- Utilization of endotracheal tube with subglottal suction port for patients at high risk for VAP

2008

- Chlorhexidine 0.12% solution q 12 hours to reduce oral cavity bacterial load - all adult intensive care units
- Root cause analysis form developed by trauma ICU nurses, to review each VAP occurrence

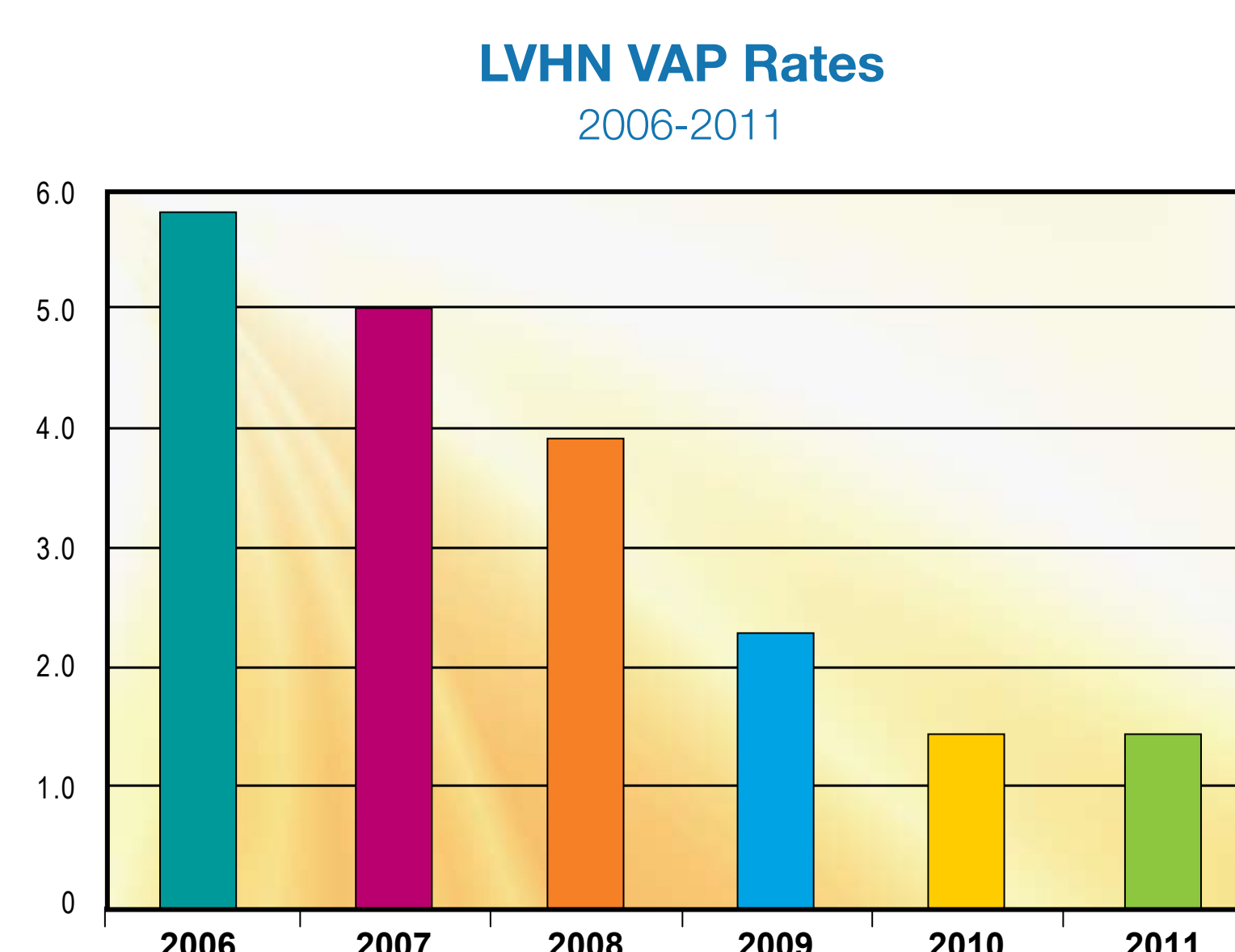
2009

- Product change to endotracheal tube with subglottal suction port enhanced with a conical cuff design to reduce incidence of silent aspiration and occurrence of late VAPs
- Chlorhexidine 2% disposable cloths for daily bath q 24 hours to reduce skin flora
- Aspiration of the gut prior to procedures to reduce the risk of aspiration
- Glycemic control maintained between 90-140 mg/dl
- Early mobility to promote muscle strength and early liberation from mechanical ventilation
- Virtual rounds by remote ICU nurses to assure proper head of bed elevation

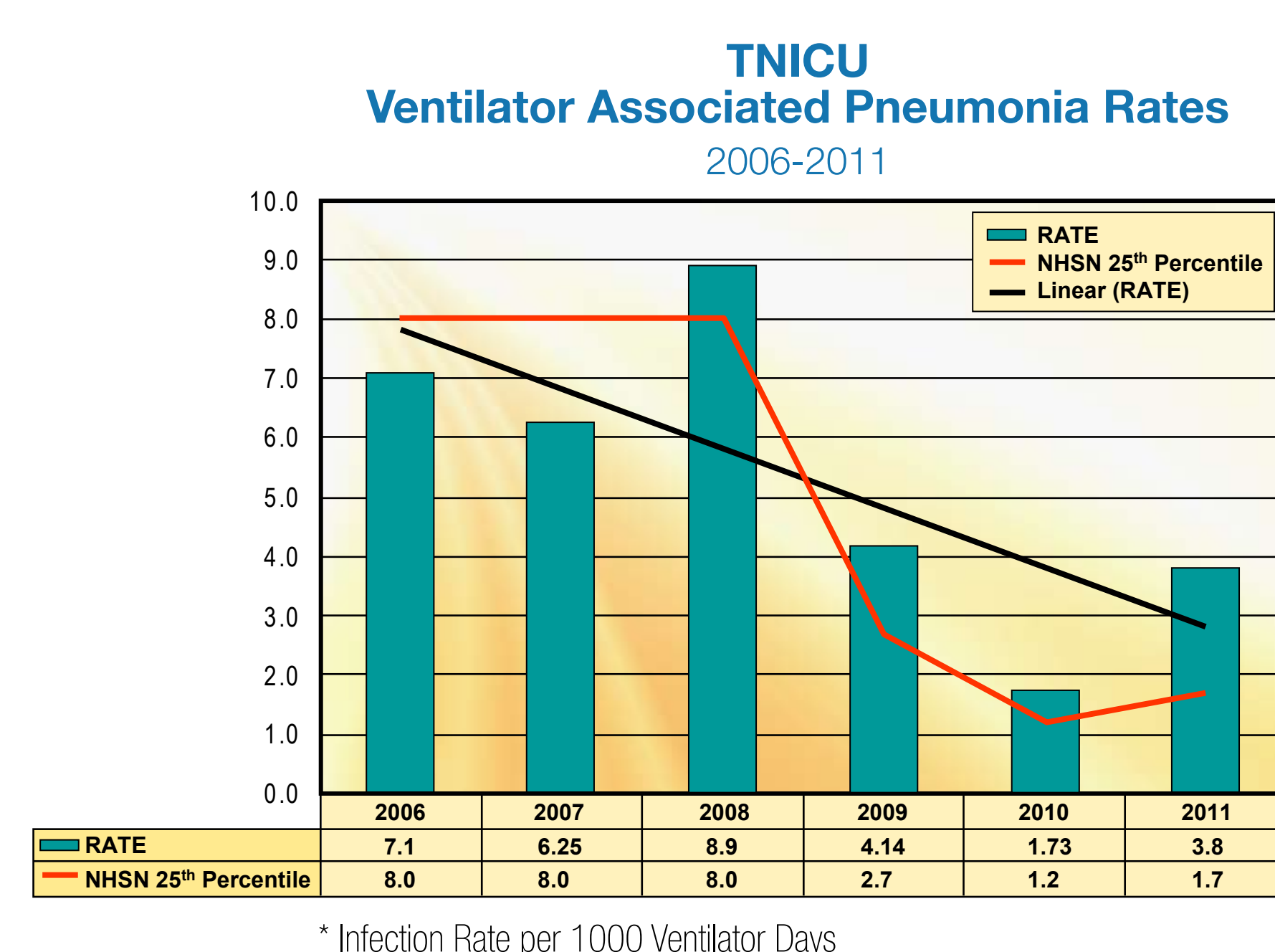


Outcomes

The hospital VAP rate has steadily declined from 5.7 (2006) to 1.4 (2010).



Within the 14 bed trauma ICU, the VAP rate went from 7.1 (2006) to 1.7 (2010).



Lessons Learned

- No single "Silver Bullet" to reduce VAPS
- Comprehensive, continuous campaign hits the target, to include:
 - Evidence based guidelines
 - Ongoing education using a variety of methods
 - Interprofessional stakeholder engagement and accountability
 - Leadership commitment and oversight
 - Use of a root cause analysis form, developed by the trauma ICU nurses, to review each VAP case.

Next Steps

- Concurrent monitoring of action items
- Transparent reporting through Quality Visibility Boards
- Development of electronic document for root cause analysis to capture and recognize actionable items