Prevention of Ventilator Associated Pneumonia in Skilled Nursing Facilities

Presented by: Amber Griffin, RN, MSN, PHN
Assistant Program Specialist
Acute Communicable Disease Control Program
Objectives

- Review the epidemiology and pathogenesis of pneumonia and Ventilator-associated pneumonia (VAP), targeted towards modifiable risk factors
- Discuss evidence-based VAP prevention strategies applicable to skilled nursing facilities
- Discuss adherence monitoring practices for VAP prevention
Ventilator-Associated Pneumonia (VAP)

• Up to 50% of patients with VAP die
  – Varies with patient population and organism type
  – Highest mortality occurs in patients with severe illness and infection with non-fermentative Gram negative bacilli (e.g. Acinetobacter or Burkholderia species)

• Increases length of stay >6 intensive care unit (ICU) days
  – Cost is $10,000-$40,000
Etiology of VAP

• Early onset
  – Occurs within the first 4 days of hospitalization
  – More likely to be associated with non-multidrug-resistant organisms such as *E.coli*, *Klebsiella spp.*, *Proteus spp.*, *S.aureus*, *H. influenzae*, and *S. pneumoniae*

• Late onset
  – Occurs 5 or more days into hospitalization
  – Often caused by Gram-negative bacilli, multi-drug resistant organisms such as *Psuedomonas aeruginosa*, MRSA, and *Acinetobacter spp.*
Pathogenesis of VAP

Results from:
• Aspiration of secretions
• Colonization of aero-digestive tract
• Contaminated respiratory or other medical equipment
Common VAP Pathogens

- *Staphylococcus aureus* - 24.7%
- *Pseudomonas aeruginosa* - 16.5%
- *Enterobacter spp* - 8.3%
- *Acinetobacter spp.* - 6.1%
- *Klebsiella pneumoniae/oxy* – 10.2%

NHSN Antimicrobial Resistance Report: Distribution of all Pathogens Reported by HAI Type, Appendix to Table 4, 2011-2014
Identifying VAP

• Monitor ventilated residents for:
  – Positive cultures
  – Changes in WBC’s
  – Temperature chart/log
  – Pharmacy reports of antimicrobial use
  – Change in respiratory secretions
Challenges in VAP Prevention

• Pre-existing conditions (Non-modifiable risk factors)
  – Head trauma
  – Coma
  – Nutritional deficiencies
  – Immunocompromised
  – Multi organ system failure
  – Acidosis
  – Co-morbidities
  – History of smoking or pulmonary disease
VAP Prevention Strategies (Modifiable Risk Factors)

• Prevent aspiration of secretions
  – Maintain elevation of head of bed (HOB) 30-45 degrees
  – Avoid gastric over-distention
  – Avoid unplanned extubation and re-intubation
  – Use cuffed endotracheal tube with in-line or subglottic suctioning
  – Encourage early mobilization of patients with physical/occupational therapy

• Reduce duration of ventilation
  – Conduct “sedation vacations”
  – Assess readiness to wean from vent daily
  – Conduct spontaneous breathing trials
VAP Prevention Strategies cont.

- Reduce colonization of aero-digestive tract
  - Use non-invasive ventilation methods when possible (i.e. CPAP, BiPAP)
  - Use oro-tracheal over naso-tracheal intubation
    - Naso-tracheal may cause sinusitis, which increases VAP risk
  - Use cuffed Endotracheal Tube (ETT) with inline or subglottic suctioning
    - Minimizes secretions above cuff; prevents contamination of lower airway
  - Avoid acid suppressive therapy for patients not at high risk for stress ulcers or stress gastritis
    - Increases colonization of the digestive tract
VAP Prevention Strategies cont.

- Reduce colonization of aero-digestive tract (continued)
  - Perform regular oral care with an antiseptic agent (i.e. chlorhexidine gluconate)
  - Reduce the opportunities to introduce pathogens into the airway
    - Practice good hand hygiene
    - Ensure glove use for contact with respiratory secretions or contaminated objects; follow with hand hygiene
    - Educate staff to avoid contaminating the ETT from the patient’s mouth, HCW’s hands, introducing pathogens from patient’s other body sites or the environment
VAP Prevention Strategies cont.

• Prevent exposure to contaminated equipment
  – Use sterile H2O to rinse reusable respiratory equipment
  – Remove condensate from ventilator circuits
  – Change ventilator circuit only when malfunctioning or visibly soiled
  – Store and disinfect respiratory equipment effectively
Measuring Adherence to VAP Prevention Practices

• Engage leadership
• Implement VAP bundle in your facility
• Ensure staff are competent to care for ventilated residents by:
  – Providing ongoing trainings
  – Clarifying roles
  – Point-of-care coaching for the application of the VAP bundle
  – Skills validation
  – Providing real-time feedback for improvement
Consider monitoring adherence for:
  - Compliance with hand hygiene
  - Compliance with daily sedation vacation/interruption and assessment of readiness to wean, if possible (e.g. may not be feasible for patients on long term ventilator support)
  - Compliance with regular antiseptic oral care
  - Compliance with semi-recumbent position of all eligible patients
References and Resources


• Institute for Healthcare Improvement (IHI):
  • http://www.ihi.org/resources/Pages/Tools/HowtoGuidePreventVAP.aspx
References and Resources cont.


Questions?

• Contact Information
  – Acute Communicable Disease Control Program
  – Phone: 213-240-7941
  – Email: Agriffin@ph.lacounty.gov