

	<b>POLICIES &amp; PROCEDURES</b>  Number: <b>40-200</b>  Title: <b>Ventilator-associated Pneumonia (VAP) - Prevention</b>
<b>Authorization:</b> <input checked="" type="checkbox"/> SHR Infection Prevention & Control Committee <input type="checkbox"/> Facility Board of Directors	Source: <b>Infection Prevention &amp; Control</b> Date Initiated: June, 2003 Date Reaffirmed: Date Revised: May, 2007 Scope: SHR Agencies & Affiliates

### **Introduction**

Although patients receiving mechanically assisted ventilation do not represent a major proportion of patients who have nosocomial pneumonia, they are at highest risk for acquiring the infection. Ventilator associated pneumonia is the leading cause of death among hospital-acquired infections, exceeding the rate of death due to central line infections, severe sepsis, and respiratory tract infection in the non-intubated patient. Most bacterial nosocomial pneumonias occur by aspiration of bacteria colonizing the oropharynx or upper gastrointestinal tract of the patient. Because intubation and mechanical ventilation alter first-line defenses, they greatly increase the risk for nosocomial bacterial pneumonia.

Recognized risk factors for VAP include reintubation, head elevated less than 30°, aspiration of nasopharyngeal secretions, contamination of ventilator circuits by soiled hands or gloves, and prolonged intubation.

### **Policy**

1. Surveillance for VAP will be conducted to determine trends, evaluate efficacy of preventative protocols, and help identify outbreaks and other potential problems.
2. All health care workers providing ventilator-assisted care will be educated regarding the epidemiology of and infection prevention and control procedures for preventing VAP.

### **Purpose**

1. To reduce the risk of ventilator-associated pneumonia by following evidenced-based guidelines.

### **Procedure**

1. Education and Surveillance
  - The Infection Prevention & Control Professional (ICP) and Clinical Nurse Educator will provide education for health care workers regarding infection prevention and control measures to prevent occurrence of VAP.

- The ICP will conduct surveillance in ventilated or recently extubated ICU patients at high risk, to determine trends and identify potential problems.
  - The ICP will provide prepared VAP rates to ICU manager, and examine ways to further reduce rates of infection.
  - Any clustering of bacterial isolates in the ICU will be investigated by the ICP. If an outbreak is suspected the outbreak protocol will be implemented.
2. Sterilization or disinfection and maintenance of equipment and devices.
- Nursing and respiratory therapy staff will rinse with tap water or clean reusable equipment prior to sending to Materials Management for disinfection or sterilization.
  - Materials Management will sterilize or use high level disinfection for reusable semi-critical equipment or devices (items that come into direct contact with mucous membranes of the lower respiratory tract).
  - Use only sterile water to fill bubbling humidifiers/nebulizers.
  - Use only sterile fluids for nebulization and dispense fluids aseptically. Do not draw up in advance.
3. Mechanical Ventilators, breathing circuits humidifiers, heat and moisture exchangers and nebulizers.
- Do not routinely sterilize or disinfect the internal machinery of mechanical ventilators.
  - Do not change routinely, on the basis of duration of use, the ventilator circuit (ventilator tubing, exhalation valve, attached humidifier) that is in use on an individual patient. Change the circuit when it is visibly soiled or malfunctioning.
  - Periodically drain and discard any condensate that collects in the ventilator circuit, taking care not to allow condensate to drain toward the patient.
  - When cost-effective and unless medically contraindicated, use a heat-moisture exchanger to prevent pneumonia in a patient receiving mechanically assisted ventilation.
  - Before deflating the cuff of an endotracheal tube in preparation for tube removal, or before moving the tube, ensure that pooled secretions are cleared from above the subglottic region with the use of a specially designed endotracheal tube (EVAC).
4. Interruption of person-to-person transmission
- All staff must wash hands before and after contact with mucous membranes, respiratory secretions, ventilators or their circuits, or objects contaminated with respiratory secretions, even if gloves are used.
  - Wear gloves for handling respiratory secretions or objects contaminated by them.
  - Wear a gown when soiling with respiratory secretions is anticipated, and change the gown after such contact and before providing care to another patient (Refer to Standard Precautions).
  - If an open suction system is employed, use a sterile single-use catheter, sterile gloves and sterile water or saline for all suctioning of respiratory tract.
  - Rinse in-line catheters with sterile water or saline between suctioning attempts as necessary.
  - Mask/ Eye protection is recommended for any procedure where aerosols may be generated (e.g. any endoscopy, open suctioning etc.)

5. Modifying host risk for infection

- Maintain head of bed between 30 and 45° to reduce risk of aspiration, unless medically contraindicated via written orders.
- Verify appropriate placement of feeding tube with x-ray.
- Consider the use of oral versus nasal tubes for access to the trachea or stomach.
- Routinely assess patient's intestinal motility and adjust rate and volume of enteral feeding to prevent regurgitation.
- Where possible, it is desirable to use an agent for stress ulcer prophylaxis that does not raise the patient's gastric pH.
- Use only sterile water for flushing enteral feeding tubes.
- Daily altering of sedation (sedation vacation) in order to assess the patient's readiness to extubate by performing a spontaneous breathing trial (SBT).

6. Additional strategies for nursing and respiratory therapy for preventing ventilation-associated pneumonia

- Use aseptic suctioning technique to remove tracheal secretions. Instill sterile saline if secretions are thick or tenacious.
- Between patients, sterilize or subject to high level disinfection all reusable devices as per manufacturer's recommendations.

References:

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4. Collard HR et. al. Prevention of ventilator associated pneumonia: an evidence-based systematic review. *Ann Intern Med*, 2003: 138 (6): 494-501.
5. Institute for Healthcare Improvement, How-to-Guide: Prevent Ventilator-Associated Pneumonia, Safer Health Care Now! Campaign, 2005.