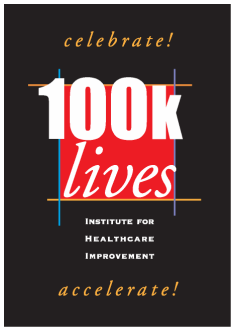

The Kids' Campaign

How-to-guide Pediatric supplement

Ventilator Associated Pneumonia

Pediatric Affinity Group

American Academy of Pediatrics
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National Association of Children's Hospitals and Related Institutions
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National Initiative for Children's Healthcare Quality
www.nichq.org

Working in concert with the following leadership hospitals: Arkansas Children's Hospital, Cincinnati Children's Hospital Medical Center, Johns Hopkins Children's Center, Children's Hospitals and Clinics of Minnesota, Children's Hospital of Philadelphia, Lucile Packard Children's Hospital at Stanford, Umass Memorial Health Care, and Mayo Clinic.

Pediatric Ventilator-Associated Pneumonia (VAP) Change Package

Summary of Evidence

The importance of preventing ventilator associated pneumonia in children mirrors that found in the adult population. VAP is the second most common nosocomial infection in pediatric intensive care unit (PICU) patients, accounting for 20% of such infections in this population. [1] In the National Nosocomial Infection Surveillance (NNIS) hospitals, the pooled mean VAP rate was 6/1000 ventilator days for PICU patients. The highest age-specific rates of VAP occurred in the 2-month to 12-month age group, and the most common causative organism was *P aeruginosa,* which accounted for 22% of cases. [1] The mortality and cost of VAP have not been well studied in pediatrics. [2]

Pediatric Modifications of IHI Adult Ventilator Bundle

1. Elevation of the bed to between 30 – 45 degrees. Recommended but modified slightly for peds. Use 15 – 30 degrees for neonates and 30 – 45 degrees for infants or above.
2. Daily "sedation vacation" and daily assessment of readiness to extubate. "Sedation vacation" not recommended in pediatrics due to high risk of unplanned extubation. Include daily assessment of readiness to extubate in care rounds or a check list to assure daily performance.
3. Peptic ulcer disease prophylaxis. As appropriate for the age and condition of the child.
4. Deep venous thrombosis (DVT) prophylaxis (unless contraindicated). As appropriate for the age and condition of the child.

Additional care aspects to consider:

1. Comprehensive mouth care appropriate to the age of the patient. Consider increasing frequency (q2h) for more "high risk" patients. Review the type of antiseptic included in the mouth care kits used in the organization and consider using a Chlorhexidiene product for children greater than 2 months of age.
2. Keep the vent circuit free from condensate by draining water away every 2 – 4 hours. Drain condensate away from the patient and especially prior to repositioning. Consider heated vent circuits which decrease the occurrence of condensate. Circuit changes should take place only when it is visibly soiled or mechanically malfunctioning. Use meticulous hand hygiene before and after contact with ventilator circuits.
3. Change in-line suction catheter systems only when soiled or otherwise indicated; open catheter systems should be considered single use.
4. Store oral suction devices in a clean non-sealed plastic bag when not in use

Tools:

1. Root Cause Analysis tool to assist in looking at each case (Attachment A)
2. VAP PICU Bundle from Cincinnati Children's (Attachment B)

Important References:

1. CDC Guidelines for Preventing Health-Care Associated Pneumonia, 2003. *MMWR* 2004;53:1 – 36. Available at: http://cdc.gov/mmwr/preview/mmwrhtml/rr5303a1.htm
2. Pediatric Node VAP presentation site access. http://www.chca.com/news/index.html

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[1] Richard MJ, et al. Nosocomial infections in pediatric intensive care units in the United States. Pediatrics 1999;103:e39.

[2] Elward, Alexis M, et al. Ventilator-Associated Pneumonia in Pediatric Intensive Care Unit Patients: Risk Factors and Outcomes. Pediatrics Vol.109 No.5 May 2002 758

Attachment A

Ventilator Association Pneumonia Laboratory-Confirmed Infection Evaluation Tool for Root Cause Analysis

Patient:	**M.R. No:**	**Infection Date:**
Diagnosis:		

	VAP Risk Factors		
1	**ET tube inserted by:**	**Date inserted:**	**Days ET present prior to onset of VAP:**
2	**ET Tube Type: ___Cuffed ___Uncuffed**	**____ Urgent ET tube placement ____ Non-urgent ET tube placement**	
3	**Inserter wore protective gear: ____Yes ___No ____NA**	**Assistant wore MSB: ____Yes ___No ____NA**	**ET tube insertion site: _____Oral ____Nasal**
4	**Intubation supplies kept clean/sterile during procedure: ____Yes ___No ____NA**	**No. of attempts at ET tube placement: _____**	**Patient on antibiotics when ET tube inserted: __Yes __No __NA**
5	**ET tube cuff pressure inflated to the appropriate pressure: __ YES__ NO__ N/A**	**Number of times patient intubated 72 hrs prior to infection: _____**	
	Patient Information & Ventilator Care Practices 72 Hours Prior to Infection		
6	**List patient's location/room number(s) during the 72 hours prior to infection.**		
7	**Indicate trips to O.R., Radiology, other areas 72 hours prior to infection.**		
8	**Estimated number of times patient was disconnected from the ventilator for these 72 hours.**		
9	**Date of last circuit change and circuit condition at that time.**		
10	**Date and time of last in-line suction catheter change and condition at that time**		
11	**Head of bed angle and type of bed used for 72 hours prior to infection**		
12	**Was mouth care provided every 4 hours per policy for the 72 hours prior to infection?**		
13	**Was oral and nasal suction provided prior to providing mouth care?**		
14	**Was the oral/nasal suction device stored in a non-sealed plastic bag?**		
15	**Was there water/condensate in the ventilator circuit at any time?**		
16	**Was water/condensate drained from the circuit prior to repositioning the patient?**		
17	**Additional comments:**		

Patient:	**M.R. No:**	**Infection Date:**
Diagnosis:		

Clinical Criteria that might be considered for patients wherein VAP is not really preventable:

1. **Patients on the ventilator $\geq$ 3 weeks**
2. **Patients s/p BMT or solid organ transplant and on ventilator for $\geq$ 2 weeks**
3. **Patients with diagnosis of SCIDs and on ventilator $\geq$ 2 weeks**

HELP Prevent Ventilator Associated Pneumonia in the ICU

Adhere to the Ventilator Care Package

Prevent Bacterial Colonization of oropharynx, stomach, sinuses

• Change ventilator circuits and/or in-line suction catheters only when visibly soiled
• Drain condensate from ventilator circuit at least every 2 - 4 hours
• Store oral suction **devices** (when not in use) in non-sealed plastic bag at the bedside
• Meticulous hand hygiene before and after contact with ventilator circuit
• When soiling from respiratory secretions is anticipated – wear gown before providing care to patient
• Follow the Unit Mouth Care Policy by keeping your patient's mouth clean.

Prevent Aspiration of Contaminated Secretions

• Elevate HOB 30 – 45 degrees, unless contraindicated and by written order
• Always drain ventilator circuit before repositioning patient
• When possible, for children > 12 years old, use endotracheal tube with dorsal lumen above endotracheal cuff to allow drainage by continuous or frequent suctioning