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Patient Safety Tip of the Week

May 30, 2023

Non-Ventilator-Hospital-Acquired Pneumonia Finally Gets Attention

Our June 2022 What's New in the Patient Safety World column "Guideline Update Preventing Hospital-Acquired Pneumonia" noted an update (Klompas 2022) from several organizations on prevention of ventilator-acquired pneumonia (VAP). But that update was unique in that, for the first time, it also addressed non-ventilator-hospital-acquired pneumonia (NV-HAP). Results of a survey published in 2018 (Magill 2018) showed that pneumonia was the most common health care-associated infection. The Magill study noted that its results showed success in reducing CAUTI's (catheter-associated urinary tract infections) and SSI's (surgical site infections) but little change in hospital-acquired pneumonia. Hospital-acquired pneumonia is associated with high morbidity, mortality, and health care use.

In 2020 a group of U.S. healthcare leaders issued a call to action to address NV-HAP (Munro 2021), noting it is one of the most common and morbid healthcare-associated infections, but it is not tracked, reported, or actively prevented by most hospitals. Most hospitals only have surveillance and prevention programs for VAP but not for NV-HAP.

Researchers (Jones 2023) analyzed EHR data drawn from 284 acute care hospitals in the Veterans Affairs (VA) health care system and HCA Healthcare networks to assess the incidence and outcomes of NV-HAP. They found the overall incidence of NV-HAP was 0.54 per 100 admissions and 0.96 per 1000 patient-days.

Patients with NV-HAP were older (median age 69 vs 66 years among all hospitalized patients) and most had multiple comorbidities (median 6), most commonly congestive heart failure (29.5%), neurologic disease (25.2%), chronic lung disease (19.6%), and cancer (16.7%). Most cases (74.9%) occurred outside intensive care units. The inpatient mortality rate was 22.4% among admissions meeting the NV-HAP surveillance definition vs 1.9% among all other admissions.

Median length-of-stay for patients with NV-HAP was 17 days vs 4 days for the general hospital population. Patients with NV-HAP were also less likely to be discharged to home and more likely to be discharged to hospice care.

The authors note that the incidence and crude individual mortality of NV-HAP in this study were within the range reported in previous studies using point prevalence, manual, or semi-automated approaches.

The authors conclude that the high incidence and mortality rate associated with NV-HAP suggests it is an important hospital complication that warrants the development and testing of prevention programs. They note there is very little consensus on how best to prevent NV-HAP.

The 2022 guideline update (Klompas 2022) also acknowledges that little robust data exist on interventions to prevent NV-HAP. Most studies are nonrandomized, and many do not report the impact on objective outcomes such as length of stay, mortality, or antibiotic utilization.

That new section in that guideline on NV-HAP emphasizes oral care, recognizing and managing dysphagia, early mobilization, and implementing multimodal approaches to prevent viral infections (since 20-40% of NV-HAP are due to viral infections). It also notes there is insufficient evidence regarding any recommendations about bed positioning or stress-ulcer prophylaxis and it states that systemic antibiotic prophylaxis is not generally recommended. As neurologists, we've long recognized the importance of dysphagia as a leading cause of hospital-acquired pneumonia so we routinely **screen patients for impaired swallowing** prior to allowing them anything by mouth. The guideline discusses uncertainties about the best methods for oral care but concludes that **daily toothbrushing** makes sense. Similarly, early mobilization has been part of many "bundles" that were associated with reduced pneumonia rates. While the specific contribution of **early mobilization** to those reduced rates is unknown, it makes sense to include early mobilization in your NV-HAP programs. It also notes the many interventions in the COVID-19 era to **prevent viral infection transmission** (screening, surveillance, masking, etc.).

One of the biggest problems in surveillance for NV-HAP has been lack of a consensus definition. Jones et al. also note that discharge diagnosis codes do not provide reliable estimates of NV-HAP incidence and outcomes because they too are neither sensitive nor specific. The definition used in the Jones study requires a decrease in oxygen saturation or increase in supplemental oxygen sustained for 2 or more days after 2 or more days of stable or improving oxygenation, plus an abnormal temperature (≤36 °C or ≥38 °C) or white blood cell count (<4000 or ≥12 000 cells/mm3), plus completion of chest imaging (x-ray or computed tomography), plus administration of 3 or more days of new antimicrobials starting on the first or secondary day of oxygen deterioration. The study does show that, using this definition, electronic medical record data can provide reasonable identification of NV-HAP that can be used to follow trends over time.

The time has come to recognize NV-HAP as a leading hospital-acquired condition and develop and implement programs to prevent it.

Some of our prior columns on HAI's (hospital-acquired infections):

December 28, 2010	"HAI's: Looking In All The Wrong Places"
October 2013	"HAI's: Costs, WHO Hand Hygiene, etc."
February 2015	"17% Fewer HAC's: Progress or Propaganda?"
April 2016	"HAI's: Gaming the System?"
September 2016	"More on Preventing HAI's"
November 2018	"Privacy Curtains Shared Rooms and HAI's"
December 2018	"HAI Rates Drop"
January 2019	"Oral Decontamination Strategy Fails"
February 2019	"Infection Prevention for Anesthesiologists"
March 2019	"Does Surgical Gowning Technique Matter?"
May 2019	"Focus on Prophylactic Antibiotic Duration"
July 2019	"HAI's and Nurse Staffing"
February 2020	"NICU: Decolonize the Parents"
June 16, 2020	"Tracking Technologies"
August 2020	"Surgical Site Infections and Laparoscopy"
December 2020	"Do You Have These Infection Control Vulnerabilities?"
May 2021	"CLABSI's Up in the COVID-19 Era"
August 2021	"Updated Guidelines on C. diff"
October 2021	"HAI's Increase During COVID-19 Pandemic"
June 2022	"Guideline Update: Preventing Hospital-Acquired Pneumonia"
June 21, 2022	"Preventing Post-op Pneumonia"
June 28, 2022	"Pneumonia in Nervous System Injuries"
August 2022	"Resistant Infections Up During COVID-19 Pandemic"
November 15, 2020	"Which Antiseptic?"
December 2022	"Game Changer to Prevent SSI's in Abdominal Surgery?"

References:

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