
Spotlight On: Sutter Health Fights Pneumonia One Toothbrush at a Time



Pneumonia can be deadly in a hospital setting. Two main factors contribute to the approximately 20 percent mortality rate of this healthcare-associated infection (HAI). First, whatever condition brought the patient to the hospital in the first place has likely weakened them, making the patient more vulnerable to the illness. Plus, the germs that patients encounter in hospitals tend to be more aggressive and less responsive to antibiotics, resulting in more severe cases.

The good news is that hospitals are taking effective steps to combat pneumonia. Since 2008, when the CDC started to require hospitals to monitor for and put processes in place to prevent device-related pneumonia (pneumonia particularly in patients on ventilators, but also on blood lines and urinary lines) the incidence of device-related pneumonia has dropped significantly.

In 2010, two healthcare workers in Northern California noticed what they considered to be a gap in the literature on the subject. Barbara Quinn, Director of Professional Practice and Nursing Excellence for Sutter Health and Dian Baker PhD RN, a professor at the California State University, Sacramento School of Nursing, were concerned about a category of pneumonia that wasn't yet on the radar. They felt that, although device-related pneumonia was dropping, pneumonia in patients not on devices – particularly non-ventilator hospital-acquired pneumonia (NV-HAP) outside of the ICU – wasn't being addressed and presented a very serious threat to patients.

Pneumonia in patients on devices was a logical initial focus for hospitals, primarily because those patients are easy to target. "It's really obvious who's at risk – it's the patients with the tubes," says Quinn. "The attention has been on the ICU because that's where a lot of these patients are."

Baker and Quinn joined forces to research NV-HAP. Data from 21 hospitals showed that, of 1,300 incidents of NV-HAP, more than 70 percent of those patients acquired pneumonia outside of intensive care units. The study further concluded that NV-HAP occurred in every hospital unit, and in younger, healthy patients, indicating that although some patients are clearly at higher risk, all patients carry some NV-HAP risk.

Current CDC statistics are in line with the results of Baker and Quinn's study. A 2018 CDC report highlighted pneumonia as the number-one HAI (approximately 25 percent), with the majority of those with patients not on a ventilator, and a mortality rate ranging from 15-30 percent.

Sutter Health Brushes Up on Oral Care

Fortunately, one simple step has proven very effective in fighting this hard-to-target problem: improved oral care. "Pneumonia comes from germs in the mouth," explains Baker. "Although there are other contributing factors, such a lack of mobility, it's primarily the overgrowth of germs being microaspirated into the lungs that causes pneumonia. You have to get rid of those pathogens, which basically comes down to oral care."

Quinn and Baker rolled out a plan to fight NV-HAP at Sutter Hospital in Sacramento. From May 2012 to December 2014, their efforts at this 550-bed hospital resulted in 164 avoided cases of NV-HAP, 31 lives saved, \$5.9 million saved, and 656-1476 extra days in the hospital avoided. In 2018, the Sutter Health system renewed its commitment to track and reduce NV-HAP as a healthcare-associated infection (APSS Challenge #2) and pledged to include all of Sutter's 21 hospitals.

A summary of the plan Quinn and Baker implemented at that first Sutter Hospital in Sacramento includes:

Track data – This is an important step in recruiting support if NV-HAP isn't on the radar.

Look for gaps – Gap analysis is the process of recognizing and acknowledging what can be done to prevent pneumonia and what's actually happening in the hospital. List interventions to address the gaps.

Assemble an inter-professional team – IT is an important department to recruit early on to gather the initial data, and later for tracking processes. Supply chain is also important because the toothbrushes that most hospitals distribute are substandard and need to be upgraded. Other key departments include Respiratory and Nursing.

Build community partnerships – Quinn and Baker built relationships outside the hospital, for example with local dentists who have trained the staff on the proper way to brush patients' teeth. Baker has also been working with Aetna Health Insurance Company on a program called Rush to Brush. "They send out oral care kits to their pre-approved surgical patients, and they're having great success in their efforts to prevent pneumonia in their customers," explains Baker.

Quinn and Baker have been impressed with how hospital staff can rise to the challenge of preventing NV-HAP, especially the unlicensed staff, who handle the majority of the basic care. "The toothbrushes most hospitals distribute are pretty cheap and it's common for the bristles to fall out. The staff members were embarrassed to hand them to patients," says Quinn. "To go through this process and see the change in their demeanor is amazing," Baker adds. "They are also really the ones who taught us how important it is to add oral care in a way that fits into the normal work routine."

Carpe data!

For patient-safety advocates who want to address NV-HAP in their healthcare organizations, Quinn and Baker recommend starting with the data. "Just start. Get your data and take a look. Do you have this problem or not? If you have it, give us a call," says Baker.

Quinn encourages hospitals to specifically find out how many patients are affected by NV-HAP, their outcomes, lengths of stay, the mortality rate associated with NV-HAP, the cost, and the percentages of these patients who are re-admitted within 30 days. "Once hospitals see that data, that's usually the turning point," says Quinn.

Hospitals should also consider how pneumonia layers into issues of other healthcare-associated infections, as well as antibiotic stewardship. "Most antibiotics for hospital-acquired infections are prescribed for pneumonia – it has a definite role in antibiotic stewardship," explains Baker. "It also plays a role in MRSA because staph is an important cause of pneumonia. And, the majority of sepsis initiates as pneumonia. So, if you can tamp back pneumonia, you're getting at antibiotic stewardship problems, MRSA, and sepsis. You're going to save lives, and you're addressing costs."

Next Steps

In addition to working diligently to publicize the problem of NV-HAP, Quinn and Baker formed a larger group, which has created a toolkit to help hospitals get started (see the sidebar on Spreading the Word). NV-HAP prevention is now included as a sub-challenge of [PSMF's APSS Challenge #2](#).

Spreading the Word

Barbara Quinn and Dian Baker formed the Hospital Acquired Pneumonia Prevention Initiative (HAPPI) Group at the first Sutter Hospital in Sacramento where they started their process improvement and research work. From there, the team grew into a small but mighty group of researchers who have dedicated time and energy to learning more about NV-HAP, and disseminating that information. Its members include:

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In addition to taking NV-HAP prevention from Sutter's Sacramento Hospital to the entire Sutter Health network and worked with individual hospitals on grants to fund individual site efforts. Baker also routinely engages with the CDC and other decision-makers in the hopes of getting requirements put in place to track and prevent NV-HAP at all U.S. hospitals.

Although immensely proud of their efforts, Baker describes the changes thus far as a drop in the bucket of the more than 6,000 adult-bed hospitals in the U.S. "Our running joke is that none of us are going to retire – or even sleep – until we get this on the national radar," says Baker. With their help NV-HAP prevention could be coming to a hospital near you.

Published on : Thu, 23 Apr 2020