

Treasured CHESTS



Reducing VAP in the ICU

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By Christie L. Carter Everybody knows that an ounce of prevention is worth a pound of cure. Recent ventilator-associated pneumonia data, however, show that an ounce of prevention could be worth even more than that.

Research suggests a mortality rate of 25 percent to 30 percent with VAP patients — not the odds a hospital strives for when treating patients in the ICU, where as many as 25 percent of nosocomial infections occur. Clinicians know that prevention supercedes all methods of treatment, and many of them are using evidence-based medicine and systematic research to make VAP infections obsolete.

A study of 9,080 mechanically ventilated patients published in a 2002 issue of the journal *Chest* reported that patients with ventilator-associated pneumonia fared poorly compared to patients without VAP. On average, VAP patients required an additional 9.6 days of mechanical ventilation, 6.1 days in the intensive care unit and 11.5 additional days in the hospital, at a cost of more than \$40,000 per patient case.

More health care organizations now use precautionary measures to prevent VAP, such as keeping the head of the bed elevated at least 30 degrees and administering appropriate sedation. But implementing these and other measures is a challenge, primarily because threading such processes into daily routines takes time and often meets with resistance. But the rewards are worth it, says Dennis Clifford, M.D., director of critical care units at VHA Shareholder-controlled Exemplar Lutheran Medical Center, Wheat Ridge, Colo., whose organization saw a nine-month period in 2003 with no VAP cases in its 673 ICU admissions.

“We’re trying to discover what the best practices are, but we haven’t reached the pinnacle yet,” Clifford says. “We’re redefining what excellent care is by saying that what used to be acceptable is no longer, because we want zero complications from being on the ventilator. Having that goal — that strive for perfection — has given everyone in our hospital a vision of what we can be.”

VHA’s Transformation of the ICU program provides member organizations with a basis for measurement, as well as evidence-based protocols, to improve their VAP rates. Much of a hospital’s ability to prevent VAP lies in implementing the five aspects of TICU’s ventilator bundle: head of bed elevation, appropriate sedation, assessment for extubation, and appropriate deep-vein thrombosis prophylaxis and peptic ulcer prophylaxis. As some hospitals beginning the TICU program discovered, their VAP protocols were less than stellar.

“If you think you’re doing these things successfully, measure and see how many times you’re actually doing all five of these things 100 percent of the time for each ventilated patient, because that’s the key,” says Eric Shore, M.D., director of VHA Shareholder-controlled Hartford (Conn.) Hospital’s medical ICU. “Every patient has some of these elements, but how many have all five? That’s the challenge.”

Before beginning the TICU program, Patty Bumgarner, R.N., unit manager of VHA Partner-controlled Lynchburg (Va.) General Hospital’s medical ICU, thought they were doing a good job with ventilator guidelines. “But it turned out that we were only following all of the ventilator guidelines 20 percent to 25 percent of the time,” she says.

Three years later, that rate jumped to between 95 percent and 98 percent. Hartford Hospital also saw dramatic improvement; their VAP rate decreased from 9.8 cases per 1,000 ventilator days in 2002 to 5.5 cases per 1,000 ventilator days in 2003.

“The whole focus of these efforts is prevention, and if we do these things, we can prevent complications like nosocomial pneumonia,” says Shore. “And if you prevent just one case, you cut your lengths of stay and your ventilator days. It’s a simple win.”

Hospitals such as Exempla and Lynchburg also attribute their reduction in VAP rates to new oral care regimens for ventilated patients. An oral care system developed by Novation supplier Sage Products contains instruments to clean, debride, suction and moisturize intubated patients’ mouths. The kit includes a covered Yankauer and suction toothbrush that remove plaque, debris and oral secretions, mouth swabs and mouth moisturizer to hydrate lips and oral tissue.

The covered Yankauer, a suction device, allows nurses to lay the instrument down without threat of contamination. Previously, nurses struggled with handling the Yankauer when they needed both hands to provide oral care to patients. “Having all the supplies together in one package, plus the controlled one-hand approach, makes it more efficient for nurses to use,” says Annie James, R.N., nurse educator for VHA Shareholder-controlled Wake Medical Center, Raleigh, N.C.

In addition, having three units in one packet is a good reminder to implement the protocol, and the kit serves as a check-and-balance system, says Mary Ann Tate, R.N., a critical care clinical nurse specialist at Lynchburg General. “If the evening shift sees that the midday oral care packet hasn’t been used, they can question the nurses from the previous shift to ensure that oral care is being handled properly.” Individual packs of oral care supplies are in every patient room as well, to assist in the oral care that occurs in between major cleanings.

Lynchburg General’s medical ICU, which reported an eight-month period last year with no VAP cases, adopted a formal policy for oral care of ventilated patients in February 2003. The protocol requires that patients’ oral cavities be assessed every shift by a registered nurse. All

unconscious and intubated patients are provided with oral care every two hours, and as needed. Intubated patients are also assessed to determine the need for removal of oropharyngeal secretions every four hours, as well as prior to repositioning the tube or deflation of the cuff.

Most health care organizations say that, despite the fact that the kits cost slightly more than previous oral care products, the difference is negligible when compared to the costs of one VAP case. “If you balance the cost of the kits against increased lengths of stay and possible death from VAP, the cost is extremely minimal,” says Tate. “One VAP case can cost \$40,000 to treat, so how can you argue with a few additional dollars that will help reduce those cases?”

But fostering change around daily processes and procedures that staff members are used to is difficult. Keeping ventilated patients’ beds elevated at least 30 degrees was a year-long struggle, says Shore. After an engineer measured the bed angles with a protractor, staff members discovered that some beds were mislabeled, something Exempla Lutheran also encountered. “Sometimes what looks like 30 degrees, in fact, isn’t,” says Clifford.

Exempla Lutheran experienced some nurse resistance to elevating beds because it’s difficult to keep patients in that position. They often slide toward the foot of the bed, so repositioning them requires more effort from nurses and therapists. In addition, many medical tests require patients to be flat, and nurses must remember to re-elevate patients when tests are completed.

Appropriate sedation, however, appears the hardest of the ventilator bundle aspects to implement, in large part because nurses want their patients sedated and comfortable so they don’t try to pull out their lines or get out of bed, while physicians need patients to be responsive during assessment for weaning from the ventilator.

Appropriate sedation is determined by a patient’s ability to respond to simple commands, but finding that ideal point for each patient is a challenge in itself. Sedation in ICUs remains difficult, says Clifford, because there is not an ideal sedative agent that will work on every patient. “Some people can tolerate very little

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**— Eric Shore, M.D.,
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sedation while on the ventilator,” says Clifford, “while others must be extremely sedated — practically in a coma — to keep them from becoming agitated and fighting the machine to the point that you’ll never get the results you want.”

Real change, says Shore, requires patience. “It’s a slow but steady process, but change can be achieved with education and a dedicated team,” he says. But Hartford Hospital’s medical ICU is winning by maintaining a VAP rate of less than one percent and the unit’s length of stay at its lowest point ever.

Reducing VAP rates hinges on one thing — nurses and clinicians changing the way they practice medicine. But first they must be convinced that new measures will make a difference. Staff preparation before implementing these changes is vital to their success, and clinicians and nurses are most convinced when they see hard data that show a process or procedure will improve care.

Exempla Lutheran created a team approach to the changes, educating nursing staff, social services, dietitians, physical and occupational therapists, and speech and respiratory therapists. “Everybody has to be educated on the goal you’re trying to achieve,” Clifford says. “Once everyone understands that, pilot the project and see where the problems fall.”

For instance, while the day shift might understand the importance of weaning a patient from the ventilator early the next morning, the night shift must understand that they need to reduce the amount of sedation a few hours prior to that time. Even though everyone is looking toward the same goal, the timing of things still must be worked out, says Clifford.

“We educated our multidisciplinary team on our motivations for the changes — that we were making these changes not because someone said it was the right thing to do, but because there is good evidence to show that’s how we should be doing things,” says Shore.

Lynchburg General’s Tate goes over the oral care protocol at the bedside with new nurses and regularly verifies that the oral care kits are at every bedside on the unit, while the unit manager sends out reminder e-mails to use the kits. “It’s a matter

of reminding staff members constantly until it becomes part of their routine,” she says.

Culture change isn’t easy, but it can happen. “We’re very good at bed elevation now, but it took time,” says Shore. “Everybody believes in it, and it’s like seeing someone without a seat belt — we’re not comfortable seeing ventilated patients lying flat on their backs anymore. That’s the kind of culture we’re trying to create.” ☺

Transformation of the ICU

Today’s intensive care units have the highest mortality and complication rates among hospital services and represent approximately 30 percent of hospital costs.

VHA has spent the last several years working with innovative teams and nationally recognized experts to tackle the significant issues affecting ICUs. VHA’s Transformation of the ICU program allows member organizations to learn from others in implementing best practices, saving time and increasing the likelihood of success.

“I’ve been a member of this organization for almost 20 years, and of all the projects I’ve been a part of, TICU has absolutely, hands-down been the most successful,” says Eric Shore, M.D., director of Hartford Hospital’s medical ICU. “This program works, and it has been of tremendous value to our organization and our patients.”

A sampling of results achieved by VHA members participating in TICU:

- The percentage of ventilator days where patients followed commands at least once during the day increased from 40 percent in the benchmark month to 100 percent in three of four months measured
- The number of ventilator-associated pneumonia cases per 1,000 ventilator days decreased from nearly 10 in the benchmark month to zero in each of the four months measured
- The direct cost per ICU admission fell 37 percent in seven months
- ICU bed turnover rate increased from three times to approximately 5.5 times in six months
- Aggregate scores for patient and family satisfaction increased from less than 84 percent in the benchmark month to approximately 91 percent in 11 months

“The TICU program has taught participants that they don’t have to settle for being in the 50th percentile when it comes to reducing VAP cases,” says Peter Pronovost, associate professor at the Johns Hopkins University School of Medicine and TICU national chair. “But the evidence-based practices taught in TICU have shown us that we can in fact reduce the number of VAP cases to practically zero.

“What we recognized is that previous benchmarks are likely based on systems that don’t reliably ensure that patients receive evidence-based interventions,” Pronovost adds. “We created a system where they do receive those interventions and performance improved to unprecedented levels.”

To read VHA member organization TICU case studies, go to this story on Alliance online.



For more information about Transformation of the ICU, please contact VHA at (800) 842-5146 or vhacustomerservice@vha.com.