

## Johns Hopkins Awarded \$7.3 Million to Prevent Ventilator-Associated Pneumonia

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The Johns Hopkins Armstrong Institute for Patient Safety and Quality has been awarded a three-year, \$7.3 million contract from the Agency for Healthcare Research & Quality to bring its proven checklist for reducing ventilator-associated pneumonia — the most lethal of all hospital-acquired infections — to hospitals nationwide.

Following on the heels of reducing these infections by 70 percent throughout Michigan and a similar program underway in 60 hospitals in Maryland and Pennsylvania, the researchers hope to reach hospitals in all 50 states, the District of Columbia and Puerto Rico with a system that couples a relatively simple series of steps with an education program and a culture that promote patient safety. If successful, the checklist program could save thousands of lives and millions of dollars in health care costs.

“We know that many hospital-acquired infections are completely preventable,” says Sean Berenholtz, M.D., M.H.S., physician director of inpatient quality and safety at the Armstrong Institute and an associate professor of anesthesiology and critical care medicine at the Johns Hopkins University School of Medicine. “We have found a way to prevent ventilator-associated pneumonias on a smaller scale. Now we are excited to be able to bring this approach to the entire country.”

Severely ill or injured intensive-care patients who can't breathe on their own need ventilators, but they are at serious risk for complications including infections such as ventilator-associated pneumonia (VAP), which afflicts an estimated 250,000 patients each year. The risk of VAP increases about 1 to 3 percent for every day on a ventilator.

The national rollout mirrors another successful Johns Hopkins project, which, by a similar method, reduced deadly central line-associated bloodstream infections nationwide by 41 percent in more than 1,000 hospitals in 44 states, D.C. and Puerto Rico.

For VAP, the Johns Hopkins group looked at the evidence-based recommendations for prevention and distilled them into a checklist of five suggested therapies, known as the ventilator bundle, for caregivers to follow when assisting patients on breathing machines.

The five therapies include elevating the head of the bed more than 30 degrees to keep bacteria from migrating into the lungs; lessening sedation to allow patients to follow commands and allow staff to evaluate readiness to remove the breathing tube daily; regular oral care to remove bacteria-containing plaques that can lead to VAP; using special endotracheal tubes to facilitate suctioning of secretions; and making patients mobile as quickly as possible, even while still hooked up to the breathing machines. All are designed to shorten the length of time on the ventilator — a key to reducing complications including the risk of infection, the researchers say.

But checklists do not work in isolation. As part of the program, staff members also will be trained to use teamwork and better communication to ensure that the bundle is being properly administered. Caregivers will engage in a program to allow them to learn from their mistakes. Another strategy in developing a “culture of safety” involves educating patients’ families about the therapies and

encouraging them to ask questions to ensure that their loved ones are getting the appropriate care, a measure that can help keep caregivers on their toes, Berenholtz says.

Another element helps staff members to understand — and overcome barriers — to providing the best care for ventilated patients.

“Our staff members care a lot about patients and are working hard to do the right thing,” Berenholtz says. “We hope this program will give them the tools to be successful.”

Partners in the contract include the Michigan Health & Hospital Association, Harvard Pilgrim Health Care and CECity, Inc.