Safety Checklist Yields 10 Percent Drop In Hospital Deaths

A Johns Hopkins-led safety checklist program that virtually eliminated bloodstream infections in hospital intensive care units throughout Michigan appears to have also reduced deaths by 10 percent, a new study suggests. Although prior research showed a major reduction in central-line related bloodstream infections at hospitals using the checklist, the new study is the first to show its use directly lowered mortality.

"We knew that when we applied safety science principles to the delivery of health care, we would dramatically reduce infections in intensive care units, and now we know we are also saving lives," says Peter J. Pronovost, M.D., Ph.D., a professor of anesthesiology and critical care medicine at the Johns Hopkins University School of Medicine and leader of the study published in the *British Medical Journal*. "Thousands of people are believed to have survived because of this effort to reduce bloodstream infections."

Pronovost's previous research has shown that coupling a cockpit-style infection-control checklist he developed with a work environment that encourages nurses to speak up if safety rules aren't followed can reduced ICU central-line bloodstream infections to nearly zero at Johns Hopkins and hospitals throughout Michigan and Rhode Island. Experts say an estimated 80,000 patients a year with central lines get infected, some 31,000 die and the cost of treating them may be as high as $3 billion nationally.

For the new study, Pronovost and his team, using Medicare claims data, studied hospital mortality of patients admitted to ICUs in Michigan before, during and after what is known as the Keystone ICU Project, which features the checklist. They compared the Michigan information to similar data from 11 surrounding states. While data from both Michigan and the other states showed a reduction in hospital deaths of elderly patients admitted to ICUs over a five-year period, the patients in Michigan were significantly more likely to survive a hospital stay during and after the Keystone project.

These findings cannot definitively attribute the mortality reduction to the Keystone project, Pronovost says, but no other known large-scale initiatives were uniquely introduced across Michigan during the study period. "This is perhaps the only large-scale study to suggest a significant reduction in mortality from a quality-improvement initiative," Pronovost says.

The Keystone ICU Project includes a much-heralded checklist for doctors and nurses to follow when placing a central-line catheter, highlighting five cautionary and basic

steps from hand-washing to avoiding placement in the groin area where infection rates are higher. Along with the checklist, the program promotes a "culture of safety" that comprises safety science education, training in ways to identify potential safety problems, development of evidence-based solutions, and measurement of improvements. The program also empowers all caregivers, no matter how senior or junior, to question each other and stop procedures if safety is compromised.

In 2009, U.S. Health and Human Services Secretary Kathleen Sebelius called for a 50 percent reduction in catheter-related infections nationwide by 2012. To that end, in partnership with a branch of the American Hospital Association and the Michigan Hospital Association, the Johns Hopkins model is being rolled out state-by-state across the country. Forty states have launched the program, and preliminary data from some of the early adopters is very encouraging, Pronovost says.

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