Bloodstream infections cut by 44 percent in sickest hospital patients, study concludes

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A sweeping study on the issue of antibiotic-resistant bacteria in hospitals shows that using antimicrobial soap and ointment on all intensive-care patients significantly decreases bloodstream infection. The results, which are being presented for the first time at IDWeek 2012TM, may suggest a major change in health care practice that could help save lives.

The study involved nearly 75,000 patients in 43 mostly community hospitals in 16 states and involved each hospital's own quality improvement team. Working with these teams enabled important questions to be answered during routine medical care. As such, the study's findings about "universal decolonization" for methicillin-resistant Staphylococcus aureus (MRSA) may have widespread applicability to hospitals across the country.

Of the strategies tested, the one that proved to be most effective, was arguably the simplest and most straightforward: Rather than screening intensive care unit (ICU) patients for the bacteria and then focusing on those identified as carriers, all patients were bathed daily with chlorhexidine antiseptic soap for the duration of their ICU stay, and all received mupirocin antibiotic ointment applied in the nose for five days.

Investigators found that the number of patients harboring MRSA—not sick because of it, but at risk for later illness and for spreading it to others—dropped by more than a third. Bloodstream infections caused by MRSA and other pathogens decreased by nearly half.

"This trial provides strong evidence that removing bacteria from the skin and nose is highly effective at preventing serious infection in high-risk ICU patients," said lead researcher Susan Huang, MD, MPH, an associate professor at the University of California, Irvine School of Medicine and medical director of epidemiology and infection prevention at University of California, Irvine Healthcare.

"A 44 percent reduction in infection is very promising for improving medical care and protecting highly vulnerable patients," Huang said. "It suggests that treating all ICU patients with this strategy is beneficial. This approach may make screening for drug-resistant organisms unnecessary."

The study is among the significant work being discussed at the inaugural IDWeek meeting, taking place through Sunday in San Diego. With the theme Advancing Science, Improving Care, IDWeek features the latest science and bench-to-bedside approaches in prevention, diagnosis, treatment, and epidemiology of infectious diseases, including HIV, across the lifespan. More than 1,500 abstracts from scientists in this country and internationally will be highlighted over the conference's five days.

The trial, which was conducted in 2010-2011, was a collaborative effort involving several academic institutions, the Hospital Corporation of America (HCA), and research programs at two U.S. Department of Health and Human Services' agencies, the Agency for Healthcare Research and Quality (AHRQ) and the Centers for Disease Control and Prevention (CDC). The study concept and design was created by investigators in the CDC's Prevention Epicenter Program at the University of California, Irvine, Harvard Pilgrim Health Care Institute and Harvard Medical School, Rush University and Washington University in St. Louis. A total of 74 adult ICUs in the 43 HCA-affiliated hospitals took part. AHRQ's Healthcare Associated Infections

program provided funding to conduct the research as part of the agency's Developing Evidence to Inform Decisions about Effectiveness program.

Scott Fridkin, MD, vice-chair of IDWeek and a CDC senior medical epidemiologist, said the partners planned the study to impact clinical practice at the bedside. "We know that easy-to-use solutions help clinicians protect patients from MRSA and other drug-resistant infections that are known to be deadly for patients in healthcare settings," he said. "The ultimate goal of this effort is to prevent infections and save patients' lives."

In ICUs, many infections are caused by increasingly antibiotic-resistant bacteria that for most people live harmlessly on the skin or, particularly in the case of MRSA, in the nose. These often preventable infections can cause serious complications for patients, prolonging hospital stays, driving up costs and increasing the risk of death. More and more states have mandated MRSA screening by hospitals, but some experts question whether other measures, either targeted or universal, would have greater impact.

Huang and her colleagues looked at the potential benefit in covering all ICU patients. The 43 participating hospitals were randomized and assigned one of three approaches. One group was to continue routine care, screen ICU patients for MRSA and isolate those found to be carrying the bacteria. The second group similarly screened and isolated carriers but also provided bathing with chlorhexidine soap and then nasal mupirocin ointment to help remove (decolonize) MRSA from the body. The third group of hospital ICUs eliminated all screening and instead treated every patient who was admitted with the daily chlorhexidine bath and five days of mupirocin ointment in the nose.

The number of ICU patients carrying MRSA fell by approximately 35 percent in the universal decolonization group, compared to no change

among patients who were screened and isolated. Bloodstream infection due to all causes in the universal decolonization intervention group decreased to 3.6 cases per 1,000 patient days in the hospital, down from the previous rate of 6.1.

Huang cautioned that the results apply only to ICUs and that widespread use of antimicrobial soap and ointment in patient populations at low risk for infection might increase resistance to these products without providing benefit. In addition, there is concern whether broad adoption within critical-care settings could speed emerging antibiotic resistance. These issues will require further research, Huang said. Formal cost analyses also will be needed. CDC is in the process of evaluating how the findings should inform its infection prevention guidelines.

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