Opinionator

Exclusive Online Commentary From The Times

November 24, 2011, 6:45 PM

An Electronic Eye on Hospital Hand-Washing

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Fixes looks at solutions to social problems and why they work.

TAGS:

HOSPITALS, INFECTIONS, NORTH SHORE UNIVERSITY HOSPITAL, SURGERY AND SURGEONS, VIDEO

Richard Lee for The New York Times

A board in the surgical intensive care unit at North Shore University Hospital in Manhasset, N.Y., reminds people to sanitize their hands.

Beeps and blinking lights are the constant chatter of a hospital intensive care unit, but at the I.C.U.'s in North Shore University Hospital in Manhasset, N.Y., the conversation has some unusual contributors. Two L.E.D. displays adorn the wall across from each nurses' station. They show the hand hygiene rate achieved: last Friday in the surgical I.C.U., the weekly rate was 85 percent and the current shift had a rate of 91 percent. "Great Shift!!" the sign said. At the medical I.C.U. next door, the weekly rate was 81 percent, and the current shift 82 percent.

That's too low for a "Great Shift!!" message. But by most standards, both I.C.U.'s are doing well. Those L.E.D. displays are very demanding — health care workers must clean their hands within 10 seconds of entering and exiting a patient's room, or it doesn't count. Three years ago, using the same criteria, the medical I.C.U.'s hand hygiene rate was appalling — it averaged 6.5 percent. But a video monitoring system that provides instant feedback on success has raised rates of hand-washing or use of alcohol rubs to over 80 percent, and kept them there.

Hospitals do impossible things like heart surgery on a fetus, but they are apparently stymied by the task of getting health care workers to wash their hands. Most hospitals report compliance of around 40 percent — and that's using a far more lax measure than North Shore uses. I.C.U.'s, where health care workers are the most harried, usually have the lowest rates — between 30 and 40 percent. But these are the places where patients are the sickest and most endangered by infection.

How do hospitals even know their rates? Some hospitals track how much soap and alcohol gel gets used — a very rough measure. The current standard of care is to send around the hospital equivalent of secret shoppers — staff members who secretly observe their colleagues and record whether they wash their hands. This has serious drawbacks: it is expensive and the results are distorted if health care workers figure out they're being observed. One reason the North Shore staff was so shocked by the 6.5 percent hand-washing rate the video cameras found was that measured by the secret shoppers, the rate was 60 percent.

Richard Lee for The New York Times

In the past few years, several new technologies have emerged that can help hospitals to measure and improve hand hygiene rates. I've written in Fixes about some hospitals that have tried them and found good results. But medicine pays attention only when there are studies in a peer-reviewed journal, and there hasn't been one — until now. The North Shore study, published this week in the journal Clinical Infectious Diseases, is the first use of video in promoting hospital hand-washing, and the first controlled study in a peer-reviewed journal of a high-tech effort to increase hand hygiene rates.

Dr. Bruce Farber, the head of infectious diseases at North Shore, says that hospitals are now willing to take extraordinary and expensive measures to prevent infection — but this attitude is new. If he had proposed experimenting with video cameras a few years earlier, he said, he might have met with a lot of resistance. But he found none. "I don't think there's any pushback in terms of people thinking this is a real problem and we need to do things," he said. "The next crux is: what works and what doesn't work?"

There is an overwhelming need to find out. About 1 in 20 hospital patients becomes ill with an infection — many or most of them from the hands of health-care workers. Hospital-acquired infections are the fourth leading cause of death in America. Add up annual deaths in the United States from car accidents, AIDS, and breast cancer, and they are still lower than the 100,000 deaths each year from hospital-acquired infection.

Recently, hospitals have been given a financial incentive as well. In 2008, Medicare began to stop reimbursing hospitals (nor are hospitals allowed to bill patients) for the cost of treating some hospital-acquired infections, and the list is expanding every year. The health care reform bill does the same with Medicaid, and insurance companies are beginning to follow. Treating these infections is hugely expensive — the average cost is at least $15,000. These infections cost somewhere between $28 billion and $45 billion a year.

I wrote earlier about hospitals trying a sensor system: health care workers get a badge that sniffs alcohol — an ingredient in hand sanitizer and hospital soap. The sensor can tell when the worker last washed hands. If the worker crosses a perimeter around a patient and hasn't washed his hands, the system beeps to remind him.

Richard Lee for The New York Times

North Shore instead uses a video monitoring system made by a company called Arrowsight. Cameras on the ceiling are trained on the sinks and hand sanitizer dispensers just inside and outside patient rooms. (Patients are not photographed.) A monitor at each door tracks when someone enters or leaves the room — anyone passing through a door has 10 seconds to wash hands. Arrowsight employees in India monitor random snippets of tape and grade each event as pass or fail.

What makes the system function is not the videotaping alone — it's the feedback. The nurse manager gets an e-mail message three hours into the shift with detailed information about hand hygiene rates, and again at the end. The L.E.D. signs are a constant presence in both the surgical and medical I.C.U.s. "They look at the rates," said Isabel Law, nurse manager of the surgical I.C.U.. "It becomes a positive competition. Seeing "Great Shift!!" is important. It's human nature that we all want to do well. Now we have a picture to see how we're doing."

Data on infection rates was not in the journal article, but Dr. Farber said that rates of MRSA (resistant staph, one of the most deadly and expensive superbugs) have dropped.

The development of Arrowsight's technology shows the evolution in hospitals' thinking about hand hygiene. This is Arrowsight's first foray into health care. The company's main business is meat: half the beef processing plants in America use its video system to monitor workers' hygienic practices.

Adam Aronson, Arrowsight's chief executive, said that at one plant cameras focused on a hand sanitizer dispenser right outside the bathroom. With monitoring and feedback, hand hygiene rates went from about 4 percent to over 95 percent, and the achievement was sustained.

Aronson showed the results to his father, Mark David Aronson, a professor at Harvard Medical School. His father told him that 3,000 people die every year of the food-borne illnesses the cameras in meat plants were trying to prevent — but 100,000 die of hospital-acquired infections. "You have a civic duty to try to get this into hospitals," his father said.

Aronson met with 10 hospitals; no one was interested, and he gave up.

Then five years ago, Aronson's mother and sister both contracted serious infections in hospitals: his sister nearly died of infection after giving birth, and his mother contracted a bone infection that has left her with a permanent limp. He decided to try again. One of his employees had an uncle who ran a tiny surgery center in Macon, Ga. "It had very low rates of hand hygiene — and we got them over 90 percent within weeks," he said. Then he approached North Shore.

At first Farber feared he wouldn't be able to get approval; the conventional wisdom was that employees don't like being videotaped. But then he thought about a recent experience at the dry cleaner: he had picked up some of his daughter's clothes, but one of her suits was missing. He went back to the shop and told them the date and approximate time of his visit. They pulled up a video that indeed showed him leaving her suit behind. "If dry cleaners are doing that, we need to do that in the hospital," he thought.

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North Shore got a $50,000 grant from the New York State health department to install the system in the 18-bed medical I.C.U.; the hospital pays the $1000 monthly maintenance. Because it was an academic study, North Shore decided not to reward or punish individual workers, for fear it might contaminate the results. The "Great Shift!!" on the L.E.D. sign is the only reward. North Shore later put the system into the surgical I.C.U. as well. Now another hospital, the University of California San Francisco Medical Center, has installed the system.

Like the other high-tech hand hygiene systems, Arrowsight's is expensive. But if low-tech isn't working, it's a good investment — it will pay for itself if it prevents two or three infections.

It is now nearly four years since the cameras went in to North Shore, and hand hygiene rates remain high, although higher in the surgical I.C.U. than the medical I.C.U.. William Senicola, the nurse manager of the medical I.C.U., said one reason for the difference was that there had been an emergency with a patient that morning, which gave the staff other priorities. "It has to do with volume," he said. He said that three months into the program, one of the nurses on his staff called him on a Saturday morning at home. She told him that she had gotten up to go to the bathroom in the middle of the night and banged into the wall as she automatically reached for the alcohol gel dispenser she expected to find. "That's a real change in culture," he said. "That's when we knew we were there."

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Hospitals, Infections, North Shore University Hospital, Surgery and Surgeons, video