

**PROFESSION**



The HyGreen hand-hygiene sensing device detects the alcohol in the gel that James L. Cook, MD, uses to wash his hands and sends an infrared signal to his badge to record the washing event. If he enters a 7-foot zone near a patient's monitor without washing his hands, the badge will vibrate as a reminder. [Photo by Ted Grudzinski / AMA]

## Hospitals' high-tech tools track who's washing their hands

The systems promise more accurate hygiene measurement -- and remind doctors and nurses who forget to wash up.

By **KEVIN B. O'REILLY**, amednews staff. *Posted Apr 25, 2011.*

More hospitals are exploring new technological alternatives to the traditional "secret shopper" method of monitoring whether physicians, nurses and other health professionals clean their hands when they are supposed to.

Systems using wireless, infrared, radio frequency identification and alcohol-sensing technology offer the promise of more accurate data on hand-hygiene compliance while gently reminding forgetful health professionals to wash up before interacting with patients. So far, hospitals are using the technology to gauge their hand-hygiene performance and encourage compliance while steering clear of using the data in punitive ways.

Health professionals' rate of compliance with hand-hygiene guidelines put forth by the Centers for Disease Control and Prevention and the World Health Organization has hovered between 40% and 50% nationally, depending on the study and measurement approach. The CDC says poor hand hygiene contributes to the country's 1.7 million annual health care-associated infections. About 99,000 patients die of these infections each year, the agency says.

The Joint Commission, which accredits hospitals and other health care organizations, requires hospitals to follow CDC or WHO guidelines and measure their compliance rates. The measurement method that has long prevailed relies on secret shoppers to roam hallways and track whether health professionals clean their hands before entering a patient room and wash up after leaving. The approach is problematic, infectious disease specialists say.

### Secret shoppers' limits

"You might not see behind closed doors where people are washing their hands," said Steven M. Gordon, MD, president of the Society for Healthcare Epidemiology of America. "And it's probably not a great thing to have to spend \$25 an hour plus benefits to have people watch people."

There is another downside that affects the accuracy of the secret-shopper method.

"Sometimes people know they're being watched," said Susan Pacheco, MD, director of infection control at the University of Illinois Medical Center in Chicago. Under surveillance, health professionals may behave differently than they would routinely, she said.



Dr. Cook, chief of the Section of Infectious Diseases, Immunology and International Medicine at the University of Illinois Medical Center in Chicago, says having a monitoring system will enable researchers to understand the effect hand-hygiene compliance has on health care-associated infections.

[Photo by Ted Grudzinski / AMA]

It is especially easy to spot secret shoppers when they are walking around the hospital with clipboards. An application called iScrub, developed at the University of Iowa, allows secret shoppers to enter data furtively using an iPhone or an iPod Touch. Even so, such data have their limits, Dr. Pacheco said.

"It's a small subset that might not be representative," she said. "It's a single day, capturing specific people."

In February, Dr. Pacheco's hospital opted for a high-tech approach, installing the HyGreen system, made by Gainesville, Fla.-based Xhale Inc., in 22 single-bed intensive care unit rooms. The system uses technology originally developed to detect alcohol on the breath to sense the alcohol in gels and soaps on health professionals' hands.

If the substance is detected, an infrared signal sent to the professional's badge turns on a green light. A monitor at the head of the bed senses the badge, and if a professional has not washed up and enters a seven-foot zone near the monitor, the badge will vibrate as a reminder. The badge will vibrate after an additional six to 10 seconds if the professional has not stepped outside the zone to clean up. After a third buzz, the instance is recorded as a noncompliant event and sent to the system's database. Email reports on each professional's compliance go to the hospital's infection control department.

"All the data we have so far are very good," said James L. Cook, MD, chief of the Section of Infectious Diseases, Immunology and International Medicine at the University of Illinois Medical Center. "There are very few people below 90% [compliance]. They know they are being watched, and they get reminded if they forget. When this thing buzzes, they get conditioned to know, 'Oh, I didn't wash my hands.' They don't have to think about it anymore."

Before installing the system, the hand-hygiene compliance rate at the medical center was about 67% overall, said Dr. Cook, who pushed for his hospital to purchase the HyGreen system. Complying with the system adds about five seconds to the hand-washing routine, he said.

The system also is in place at the Jesse Brown Veterans Affairs Medical Center in Chicago and Miami Children's Hospital, which in April presented results of its experience with HyGreen at SHEA's annual scientific meeting in Dallas.

Miami Children's achieved hand-hygiene compliance rates above 90% from September 2010 to March 2011 and saw an 89% drop in health care-associated infections after the HyGreen system was installed.

"Ninety-nine point nine percent of health care workers are not devious. They're just incredibly busy," said Richard J. Melker, MD, PhD, chief technology officer at Xhale. "We're taking the guesswork out of hand hygiene for the health care worker."

### Other hand-hygiene systems

HyGreen is far from the only option for hospitals. Mount Kisco, N.Y.-based Arrowsight Inc. has offered a video-monitoring service to help hospitals track hand hygiene and reported positive results. A spokesman said the company is retooling the product and should have a new system available within six months.

Birmingham, Ala.-based Proventix Systems has its nGage product installed in 12 hospitals, according to CEO Harvey Nix. Mechanical switches are placed on gel dispensers to track when they are used and RFID sensors in health professionals' badges detect their proximity to the sink.

Versus Technology has supplied RFID technology to hospitals that account for about 150,000 beds nationwide, a company official said. That functionality traditionally has been used to locate supplies and measure nurse workflow, but Versus is expanding into the hand-hygiene field. Several hospitals are experimenting with the firm's product, which works in a fashion similar to the Proventix system and costs \$500 to \$1,700 per bed, depending on what RFID technology the hospital has installed.

Using technology to better measure hand-hygiene compliance is a positive development, but should be used to prod hand-washing, not to punish occasional forgetfulness, said Dr. Gordon, chair of infectious diseases at the Cleveland Clinic.

"You don't want an 'I gotcha moment,' " he said. "You want a reminder so you can clean your hands before the patient touch. You don't want to give tickets; you want to enforce the behavior."

#### ADDITIONAL INFORMATION:

#### WEBLINK

Centers for Disease Control on hand hygiene in health care settings ([www.cdc.gov/handhygiene](http://www.cdc.gov/handhygiene))

Five Moments for Hand Hygiene, World Health Organization ([www.who.int/gpsc/tools/Five\\_moments](http://www.who.int/gpsc/tools/Five_moments))

Joint Commission Center for Transforming Healthcare Hand Hygiene Project ([www.centerfortransforminghealthcare.org/projects/display.aspx?projectid=5](http://www.centerfortransforminghealthcare.org/projects/display.aspx?projectid=5))

Xhale Inc.'s HyGreen hand hygiene recording and reminding system ([www.hygreeninc.com](http://www.hygreeninc.com))

Arrowsight Medical on hand hygiene ([www.arrowsight.com/public/as/html/medical/overview.asp](http://www.arrowsight.com/public/as/html/medical/overview.asp))

Proventix Systems' nGage system ([proventix.com/ngage.html](http://proventix.com/ngage.html))

Versus Technology Inc. on hand hygiene and infection control ([www.versustech.com/hand\\_hygiene.html](http://www.versustech.com/hand_hygiene.html))

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