

How a team of doctors at one hospital boosted hand washing, cut infections and created a culture of safety

Dr. Gerald Hickson launched the innovative program at Vanderbilt University Hospital after seeing wife's post-operation care

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Dr. Gerald Hickson (L) and Dr. Tom Talbot of Vanderbilt University Medical Center. (Photo by Hollis Bennett/Getty

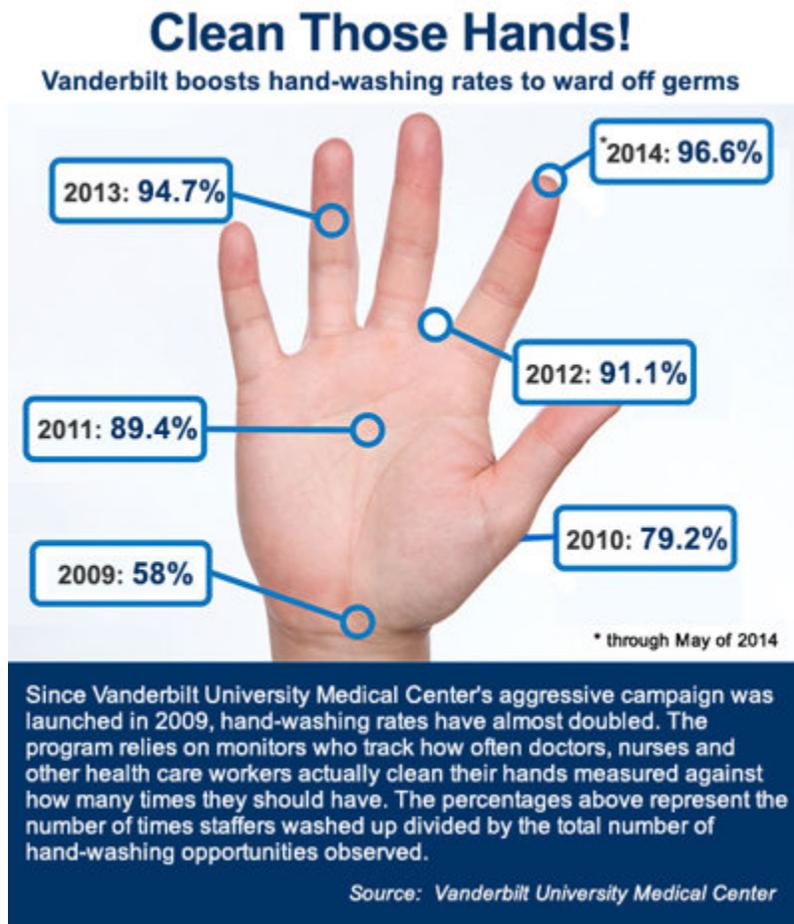
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Dr. Gerald Hickson had two primary concerns after his wife's double-knee replacement operation at Vanderbilt University Hospital in July 2008: making sure she received appropriate pain control and getting her moving as quickly as possible to avoid blood clots. But as he sat with her during her recovery, Hickson made a disturbing discovery. Most of the nurses, doctors and other hospital workers filing in and out of the room to care for his wife, who was at risk of contracting an infection after surgery, were not washing their hands.

A compulsive person by nature, Hickson started counting. He found 92 instances when staff members should have soaped up or used antiseptic foam. The total number of times they actually did? 32. Hickson did not want to humiliate anyone, but he was also fiercely committed to protecting his wife. With polite Southern collegiality, he calmly pointed out the 60 opportunities when staffers could have provided safer care but didn't. Some staffers were immediately embarrassed. Several wondered if he was kidding, got defensive and offered explanations for their lapses. A few — including one who needed prompting three times — said, "Thank you." Hickson sent them all out to clean up. "I was stunned by what I was seeing," he says.

Washing hands is one of the single most effective ways to prevent the spread of dangerous infections — ranging from pneumonia to MRSA, a life-threatening staph infection — in U.S. hospitals. One in 25 patients will battle at least one infection picked up in the hospital, according to new data from the Centers for Disease Control and Prevention. In

2011, there were approximately 722,000 of these health care-associated infections nationwide and about 75,000 patients died. Still, hospital workers wash their hands only about 40 to 50 percent of the time, often because it's inconvenient or they are overwhelmed by other tasks. "It's well-known that hand hygiene must be practiced far more frequently and effectively, yet many health care providers are in the habit of doing it sporadically or inadequately," says Dr. Don Goldmann, chief medical and scientific officer at the Institute for Healthcare Improvement in Cambridge, Massachusetts. "There should not be any more excuses."



Clean Those Hands - Graphic for Operation Clean Hands story

Hickson agrees. The day he sat with his wife after her surgery, he was dressed in shorts and a T-shirt, trying to be incognito. But he is far from your typical health care consumer. In addition to being a physician, Hickson is the senior vice president for Quality, Safety and Risk Prevention at Vanderbilt University Medical Center, which includes the main hospital where his wife was treated, as well as other specialty hospitals and clinics. There was no way he was going to let his own medical team put its patients at risk. Hickson reported his findings to Dr. Tom Talbot, VUMC's chief epidemiologist, and Talbot ran with it, spearheading an ambitious clean hands initiative that was launched in July 2009. Since then, hand-washing rates at Vanderbilt have jumped from 58 percent to 97 percent; at the same time, the number of several stubborn infections has dropped, one of them by as much as 80 percent. "We get into bad habits, all of us do, and sometimes we need somebody to remind us to get back on the right pathway," says Hickson. "That's the key to transforming health care."

Anybody trained in medicine — any school kid, for that matter — knows that washing hands helps stop the spread of germs. But knowing doesn't always translate into doing. Convenience is a big barrier: If sinks or antiseptic foam and gel dispensers aren't readily accessible to medical staff, hand washing is easy to overlook in the midst of other responsibilities. Preparing a patient for anesthesia, for example, requires hundreds of small steps, from applying oxygen sensors to measuring potent medications, says Dr. Warren Sandberg, Vanderbilt's chair of anesthesiology. Even with

the best of intentions, hand hygiene can fall by the wayside. “Physicians are subject to the frailties of having merely human minds,” says Sandberg, “instead of a never-forget supercomputer.”

Talbot orchestrated a number of practical changes right away, including installing additional hand sanitizer dispensers at the entrance and exit of every patient’s room or bay and within easy reach inside. Staffers were instructed to clean their hands before and after every encounter with patients, even if all they planned to do was have a conversation. Even the smallest details were addressed. Clinicians who complained that their skin had become irritated by excess antiseptic gel were told to cut back to a dime-size portion, and moisturizing lotion dispensers were added throughout the hospital.

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That was the easy part. Talbot knew that it would take an all-out culture shift to see dramatic improvement. A prior hand-washing program, which focused largely on education and random surveillance, had done little to boost rates. This time, Talbot drilled down on what he believed would be the keys to success: training, communication and shared accountability up and down the staff hierarchy.

Everybody, from receptionist and medical student to cardiologist and surgeon, would be educated on the direct link between hand washing and preventable infections. Each department or unit would commit at least one staff member as an “observer,” who would monitor and document hand washing 20 times per month. Performance would be carefully monitored to see how individual units and departments fared against each other and against a target goal set for VUMC, which was steadily bumped up year to year.

Respect and professionalism would be the heart of the program. A nurse, or even a receptionist, needed to feel comfortable reminding the chief of neurosurgery to clean his hands, and the chief would be expected to respond with a polite “thank you.” Annoyance or condescension would trigger an initial informal conversation between the observer and the clinician. A pattern of poor behavior would lead up an “accountability pyramid” to a formal discussion with the hospital’s vice chancellor.

If a particular unit or department underperformed, its medical and nursing leaders would receive an intervention letter from Hickson, Talbot and a nursing director documenting their division’s lower compliance rate — the percentage of times staff members washed their hands out of the total number of times they were expected to — compared to the goal. The tone would be positive and encouraging (“Thank you for continuing to emphasize the importance of hand hygiene to faculty, staff and students”), but if staff members didn’t start washing their hands more often, the higher-ups would be called in to develop a plan of action.



Vanderbilt's hand hygiene app has replaced pen and paper, making it easier for monitors to track how often healthcare

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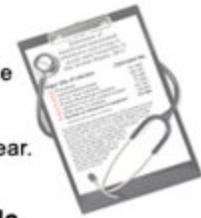
Because the hospital's top leadership would be the ultimate enforcers, Hickson and Talbot knew they needed buy-in before the program was officially launched. The old days of giving high-performing doctors a pass on unprofessional conduct — “Oh, that's just Dr. So and So, that's how he is” — would be over. Every hospital worker, no matter his or her rank, would be held to the same high standards. “We had to have support from leadership, so if we had pushback, we would elevate that up and they wouldn't blink,” says Talbot. “Instead, they would say, ‘That's not the kind of behavior we expect here.’”

It turned out to be a prime time to act. Over the past decade, hospitals have been under intense pressure to improve everything from infection rates to how well doctors and nurses communicate with patients. “Report cards” on individual hospital performance are now publicly posted, and Medicare won't pay for many preventable errors, including infections. Every hospital exec knows that if patient care doesn't improve, dollars could be lost and the hospital's reputation could suffer. VUMC had already been working on nurturing a culture of safety and improving performance in other areas. Hand washing would be a natural next step. “Our highest leadership got it,” Talbot says. “It was intuitive.”

More effort was required to convince some of the leadership one tier down, including several department chairs who felt the initiative was unnecessary and would waste valuable time and resources. Sandberg, an early champion of the program, was not surprised. It wasn't malicious, he says, but doctors like having control over their lives and don't always react well when told to do something new. “This was a big change,” he says. Talbot listened to their concerns and then invited skeptics to go on rounds with program leaders and observe for themselves. “Within 20 minutes, one vocal critic said, ‘We don't wash our hands,’” Talbot says. “He became as strong a supporter as he'd been an opponent.”

Patient safety at risk

Hospitals are doing better at battling infections, but a wide range of wily bugs continues to plague patients across the country. Some are resistant to antibiotics, making them especially difficult to treat. Hand washing and other safety practices, like removing catheters promptly, help stop the spread of these dangerous and deadly infections, which kill as many as 75,000 patients every year. Here's how they stack up:



Major Site of Infection	Estimated No.
Pneumonia	157,500
Surgical site infections from any inpatient surgery	157,500
Gastrointestinal illness	123,100
Other types of infections	118,500
Urinary tract infections	93,300
Primary bloodstream infections	71,900
Estimated total number of infections in hospitals	721,800

Source: Centers for Disease Control and Prevention

It took several months to resolve logistical questions about how observations would work. If a nurse was in a room with two beds divided by a curtain, did she need to clean her hands twice? Yes. Did it count if a doctor washed her hands but the observer didn't see her do it? Not necessarily. The observer would need to query the clinician to be sure. Territory was a concern, too. Should a nurse in the obstetrics unit worry about the hand hygiene of a consulting cardiologist, who made only occasional visits? Yes, Talbot told them, using speed limits as an analogy. "If I'm driving through a county I don't live in, I still need to drive 35 miles an hour," he says. "That's a safe culture."

The program would succeed only if every staff member believed it was the right thing to do, but Hickson also offered a financial incentive to boost enthusiasm. A national expert in medical malpractice, Hickson had already established a novel program at Vanderbilt that tied good safety practices to malpractice rebates. He and Talbot looped hand hygiene in and told department leaders that if hand-washing rates reached the hospital's target goal, their divisions would get back 2.5 percent of the cost of malpractice insurance premiums. Departments could use those dollars at their discretion. Most department chairs would eventually invest the money in education and safety programs; one would use it to boost staff bonuses. In keeping with the safety culture across the board, however, there was a catch: Everybody, from the burn unit to the cardiac suite, had to perform well to receive the payoff. "The concept was we're in this together," says Talbot.

The CDC and the World Health Organization provide guidelines for good hand hygiene, but there is no one-size-fits-all approach to changing bad habits. Some hospitals rely on training sessions and educational posters. Others are turning to high-tech solutions, including electronic badges or bracelets worn by hospital workers, which automatically track compliance. One badge turns green when it detects hand sanitizer on a provider's hands. Another communicates with sensors on foam dispensers and vibrates to remind staffers that they need to wash up.



A hospital employee using hand sanitizer. (Getty Images)

Technology frees up human resources, works faster and reduces the likelihood that a practitioner will wash his hands only when he's being watched. From the start, however, Vanderbilt focused on a communal approach: peer-to-peer communication. A mobile app designed in-house, which allows observers to record their findings on an iPhone or iPad, has made data collection quicker and less obtrusive than pen and paper. But that's as high-tech as Vanderbilt has taken it. Talbot believes anything more would start to feel like Big Brother. Not only that, badges and bracelets would not promote the personal interactions that build camaraderie and make it easier for people to speak up about other issues that arise, like whether a patient is receiving the right dose of medicine.

Sandberg relies on those conversations to increase awareness and generate commitment. He asks the anesthesiologists in his department to imagine how they would feel as patients. Wouldn't they want clean hands? He encourages patients to ask questions about anything that bothers them, including a technician who doesn't wash his hands. And he teaches by example. When he is called out — it happens — his first thought is a Homer Simpson "D'oh!" Then he says, "thank you," and heads for the sink or dispenser.

Diane Johnson, a director of nursing in Vanderbilt's adult pre-op and recovery rooms and a designated hand-washing observer, appreciates the peer-to-peer approach. It allows staff members to ask questions that arise along the way ("What do I do if I'm carrying a bag of dirty linen out of the room?" or "What if I've got gloves on?") and builds motivation. She thinks hospital workers would disregard buzzers and sensors after a while. "It would become white noise in the background," she says. "There's nothing better than face-to-face communication."

That includes positive reinforcement. Johnson makes a point of thanking people when they wash their hands, especially if a staff member missed an opportunity previously. When units do well, she writes "Congratulations on Hand Hygiene!" and "Keep up the good work!" on their white boards and gives them Hershey's kisses to stuff into their pockets for later. "Everybody loves it when they do a good job and somebody notices," she says.

Competition is a big motivator at Vanderbilt, too. Hand-washing scores for individual units and departments are tallied up from highest to lowest, and results are posted every month in break rooms and other staff areas so that everyone can see how his or her team compares with the one down the hall. "You want to look better than other services when that scorecard comes out," says Johnson. "You don't want to be at the bottom. That's just human nature."



(Yahoo News/Getty Images)

Today, after more than 200,000 hand-washing observations, Vanderbilt's overall hand-washing compliance rate has almost doubled. At the same time, three major types of infections linked to the insertion of tubes and catheters have been reduced considerably, according to Talbot. Urinary tract infections related to catheters in intensive care units have dropped by 33 percent; pneumonia linked to ventilators by 61 percent; and bloodstream infections associated with central lines — the tubing that delivers fluids and medications to patients — by 80 percent in ICUs.

The government assesses how infection numbers at individual hospitals compare with other institutions nationwide. In several categories, including urinary tract infections, Vanderbilt's caseload is on par with the national benchmark. In one case, infections related to colon surgery, it ranks worse; in another, a potentially fatal intestinal infection, it scores better. Since its hand-washing initiative was launched, Vanderbilt's tally of bloodstream infections linked to central lines shows a dramatic shift from markedly worse than predicted to significantly better than predicted. Data recorded by the Tennessee Department of Health shows that in 2009 Vanderbilt had 123 central-line-associated bloodstream infections in its adult and pediatric intensive care units — one and a half times the national benchmark of 83. By 2012, however, Vanderbilt had just 26 of these infections, far fewer than the statistical prediction of 86 cases. In the past, the thinking was that there was little that could be done to prevent these kinds of infections in very sick patients. Now, says Talbot, the question is: "Can we push the envelope further?"

There's no way to prove absolute cause and effect between increased hand washing and decreased infection rates. That's because the kind of gold standard comparison study required as evidence — treating one group of patients with clean hands and another group without — would be unethical. In addition, hand hygiene is just one variable among many. Over the past several years, Vanderbilt has launched a series of other safety practices to cut back on infection rates. In the case of central lines, for example, these measures include covering the patient in a sterile drape, cleaning the patient's skin with an appropriate antiseptic agent and removing the tube as soon as it is no longer needed.

Still, numerous studies have shown “convincing evidence” that improved hand hygiene leads to fewer health care-associated infections, according to the WHO. At Vanderbilt, Talbot was able to document an inverse correlation. “In the months when our hand hygiene compliance is higher, our infections related to devices are significantly lower. There’s a strong association there,” he says. “If we can’t get hand washing right, then we’re not maximizing the impact of all our other efforts. We’ve got to nail this one.”

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- Dr. Gerald Hickson, VUMC

Sandberg says he sees the difference. When he joined Vanderbilt in 2010, he noticed numerous “contact precaution” notices on doors where patients were fighting drug-resistant infections contracted in the hospital. Anybody entering the room had to put on arm-length gloves and yellow gowns over their clothing. Today, he rarely sees the yellow gowns. “We wiped that problem out by doing good hand hygiene,” says Sandberg.

Nina Gross, a nurse and manager of patient care services, says she can feel the difference, too. She admits that she was initially skeptical about the usefulness of having observers monitor hand washing, but she has seen it pay off. “It’s the right thing to do, and people are truly doing it out of habit now,” she says. Above all, Gross says the program has helped instill a sense of community, while chipping away at the chain of command. “There’s not a hierarchy anymore when you’re talking about patient safety,” she says. “It truly is a culture shift.”

Vanderbilt has no plans to dial back on its hand-washing push. Observations will continue without an end date, as will conversations and monthly performance reports. Internally, the program is being used as a model for other safety initiatives that need further improvement, including the reduction of falls. As part of an effort to share their experiences more broadly, Hickson, Talbot and other members of the hand hygiene team published a study in a medical journal specializing in infection control last fall, detailing the elements of Vanderbilt’s program and its positive results. Approximately 10 other institutions have consulted with Vanderbilt, seeking guidance for their own efforts to increase hand washing and stop the spread of germs.

Above all, Hickson and Talbot will keep talking about the importance of clean hands. “We are constantly reminding our leaders that their willingness to stand behind this project is paying off,” says Hickson. Their dedication has not gone unnoticed. Sandberg credits Hickson’s passion and persuasiveness and Talbot’s patience and persistence as fundamental ingredients for success. “Take away Tom Talbot and Jerry Hickson and you’ve got a very different equation,” says Sandberg. “Health care is still a very human enterprise.” And only humans can make it better.

- Health
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