Sustained Hand Hygiene Initiative Reduces MRSA Transmission

Robert J. Ancona, MD, Richard Boehler, MD, MBA, and Leigh A. Chapman, RN, BSN

Abstract
• **Objective:** To describe a sustained hand hygiene initiative in the hospital setting and its impact on rates of hand hygiene compliance and methicillin-resistant *Staphylococcus aureus* (MRSA) transmission.
• **Methods:** An institution-wide hand hygiene program was developed that included monitoring, recording observations, and providing personnel with regular feedback.
• **Results:** Hand hygiene compliance improved and was sustained at over 90% during a 3-year time frame with a concomitant reduction in health care–associated MRSA.
• **Conclusion:** Hand hygiene compliance over time is achievable in the hospital setting across all disciplines and prevents the spread of nosocomial pathogens.

It is generally accepted that strict adherence to handwashing guidelines is one of the most effective means of reducing transmission of infection in the hospital setting. Multiple studies have demonstrated a reduction in infection transmission rates with enhanced compliance, even in the short term [1–4]. Despite overwhelming evidence and the widespread acceptance on the part of health care workers that hand hygiene reduces the spread of infection, hospitals are rarely able to achieve and sustain greater than 50% observed compliance [5]. This is certainly much less than what we as health care leaders find acceptable and far less than what the lay public would expect as routine. Unfortunately, despite the well-established relationship between improved hand hygiene and reduced infection rates, compliance with handwashing among all types of health care workers remains poor [5].

Although we have struggled with the issue of hospital-associated infection and transmission of resistant organisms for decades, the recent focus on the rapid rise of community-associated methicillin-resistant *Staphylococcus aureus* (MRSA) by the media, as well as intense governmental, regulatory, and payor attention to hospital-associated infections, has forced us to pay strict attention to hand hygiene compliance amongst many other efforts to reduce the spread of infection. Consumer groups have more recently called for hospitals to report their rates of handwashing compliance as part of a growing demand for increased transparency [6]. Clearly, hospitals have a renewed and compelling interest to adopt strategies designed to overcome historical barriers to compliance to protect their patients—and their bottom lines.

Most successful programs employ a variety of strategies, including broad-based education, widespread deployment of handwashing stations, and regular feedback from direct observation [5,7]. Sustaining these efforts over time is particularly difficult. Variation in compliance by caregiver role, particularly with respect to physicians, is characteristic. We believed that a successful and sustained program in hand hygiene compliance, embraced by all caregivers, was achievable. We further hypothesized that it could, at a minimum “hold the line,” if not reduce, the number of patients colonized or infected with MRSA.

**Methods**

**Setting**

St. Joseph Medical Center is a 365-bed tertiary acute care medical center in suburban Baltimore, MD. St. Joseph has more than 25,000 admissions annually with 1200 physicians on staff and 2200 employees.

**Hand Hygiene Program**

The Infection Control department in conjunction with the Patient Safety Committee initiated the Hand Hygiene Program in 2005. A goal was set to achieve greater than 90% compliance with hand hygiene.

Managers from every department were asked to nominate a staff member to serve on a hand hygiene team led by the assistant vice president of Nursing and the Infection Control Department coordinator. Team members, designated “hand hygiene champions,” were charged with monitoring for hand hygiene compliance according to Centers for Disease Control and Prevention (CDC) guidelines [2,8]. Hand hygiene was defined as visualizing the use of either
hospital-approved alcohol-based sanitizer or traditional soap and water before and after each patient encounter. Soap and water hand hygiene was required when caring for patients on precautions for *Clostridium difficile* infection, prior to eating, after using the rest room, or any time hands were visibly soiled.

Initially, each team member was asked to observe for three 20-minute periods per week. All units and all shifts were observed. The team members recorded their observations on forms, which were forwarded to the Infection Control Department for compiling. Forms included the name and position of the individual who was observed. Champions were assigned to monitor units other than their own to reduce the possibility of bias.

To support the hand hygiene goal, the Infection Control Department worked with the facilities department to ensure strategic placement of waterless alcohol-based hand sanitizers, following CDC recommendations. In addition, we made sure that compatible hand lotion was available to alleviate skin dryness and irritation. The Infection Control Department and nursing management met with unit staff to provide feedback on performance and to discuss perceived barriers to compliance. One identified barrier was a lack of available sinks for soap and water hand hygiene. The hospital decided to convert 2 rooms per unit to private and installed sinks in those rooms, thereby creating a possible isolation room.

Hospital staff were encouraged to provide “in the moment” prompting or feedback to others when hand hygiene was not performed on their unit. However, staff indicated that they felt uncomfortable speaking up to a noncompliant provider, especially if the offender was seen as an authority figure. To address this issue, we developed scripts to assist staff in enforcing hand hygiene. For example:

To approach someone who has not performed hand hygiene:

“*Excuse me. I noticed that you didn’t wash your hands or use the sanitizer just now. It’s really important for patient safety. Could you please use hand hygiene now?*”

After the person sanitizes or washes:

“*Thank you. Hand hygiene does prevent infection.*”

If the person says “I didn’t touch anything:”

“*Performing hand hygiene every time you leave the room helps reinforce the habit. That’s why it is our policy.*”

If the person says “I just washed and I haven’t touched anything:”

“*I’m sorry. I didn’t observe you until just now. That is acceptable, as long as you didn’t touch anything at all after performing hand hygiene.*”

If the person says “I was wearing gloves:”

“You still need to perform hand hygiene. It’s our policy because you could possibly contaminate your hands when removing gloves and gloves may have pin-point holes.”

If you are the person who did not perform hand hygiene, and you are approached by a staff member or a patient:

“Oh, I am so sorry that I forgot. I know how important hand hygiene is. I’ll go do it right now. Thank you for reminding me.”

If you are approached and you *did* perform hand hygiene out of sight of the staff member or patient:

“I did perform hand hygiene just now because I know how important it is. But I will perform hand hygiene again so that you can be assured that I did it.”

Feedback on hand hygiene compliance was also provided in the form of graphs posted online and on hospital units showing house-wide data and data stratified by unit and job category. Copies of observation forms were provided to the respective unit managers. Successful units were celebrated in the hospital’s management council and invited to share their success story. The executive committee of the medical staff had blood agar plates of their hands prepared pre- and post–hand hygiene to demonstrate the effectiveness of hand sanitation.

**Results**

*Figure 1* shows our hand hygiene compliance rates based on our observations. Since program inception in 2005, we saw a slow, steady improvement, achieving our goal of 90% compliance in April 2006. Since that time, for the most part we have maintained the 90% rate.

Prior to the start of the hand hygiene campaign, infection control was monitoring house-wide rates of community- and health care–associated cases of MRSA infection. As has been the case nationally, there had been an increase in community-associated cases (mostly colonization) presenting to the hospital. *Figure 2* shows our hospital-associated MRSA infection rates over time and plotted against our hand hygiene results. We have been able to sustain low hospital-associated rates despite the increasing bioburden from the community.

Between 2005 and 2008, we observed a 49% reduction in transmission of MRSA housewide. This occurred despite a steady increase in the number of patients admitted with community-associated MRSA. We believe our success is largely tied to adherence to hand hygiene compliance—for all patients, and by all disciplines. We further believe that continued success with other intensive care unit infections, particularly central line–associated bloodstream infections and ventilator-associated pneumonia, while driven by bundle compliance, is also influenced by hand hygiene. We have
been successful at reducing these infections to 1 occurrence each in the last fiscal year.

**Success Factors**

Ongoing communication about the program’s progress and continuous feedback on staff performance was essential to our success. The Infection Control Department routinely attended staff meetings to communicate data, address challenges the staff were having, and create opportunities to remove barriers encountered. After every hand hygiene meeting the team divided into groups and visited each floor to “huddle” with the staff and share the hospital’s overall rate as well as unit- and practitioner-specific rates. Contests were held to involve staff at all levels. Instant hand sanitizer bottles with the hospital logo were given to staff as rewards. These “tokens” were well received, but it was clear that recognition in front of one’s peers was a major driver.

In addition to continuous feedback and recognition for success, a firm approach with just accountability on the part of leadership helped to foster the cultural transformation necessary to sustain the change. This is particularly important when it comes to the medical staff, where occasional resistance is likely to be encountered and confrontation over observed noncompliance can occur. One needs to continually reinforce that the playing field is level. When a physician was suspended for a repeat violation, this sent a message that hand hygiene compliance was serious and applied to all. When the inevitable friction occurred, staff were supported and commended for their efforts on behalf of patient safety.
**Current Status**

We continue to track our hand hygiene compliance, although on a more infrequent basis (fewer observations on fewer units per month) and our MRSA infection rates. We have been generally able to sustain compliance rates above 90%. We have had occasional decreases in compliance, but these have been improved with immediate feedback and increased efforts. We feel the employees have ingrained this into our culture, and new employees are oriented to it, making enhanced interventions less necessary.

Routine reporting by unit and discipline needs to continue. Our former experience with observed compliance was that we abandoned continued observation shortly after achieving our goal, assuming that we had achieved a new level of performance within the organization. When we re-assessed, in the face of a rising infection rate, we found that we had not created a sustainable change.

Recently, we have begun an educational campaign and systematic feedback from a series of direct observations on compliance with isolation precautions, an offshoot of our experience with hand hygiene. Although hand hygiene is an important element of isolation precaution, we see it as part of the “bundle” required for a perfect outcome. Preliminary data here suggest that adherence to all elements is good but can be increased by education and direct feedback. This work needs to continue.

**Conclusion**

Sustained observed compliance with hand hygiene is achievable with a careful, deliberate, and ongoing campaign supported at all levels of the organization. Hospitals can actively engage physicians and staff and create meaningful behavioral change with respect to hand hygiene compliance and thereby favorably influence transmission of nosocomial pathogens. While we have not attempted to quantify the costs associated with our efforts to create a benefit to cost ratio, we feel strongly that hand hygiene is one of the basics required to protect our patients and “part of the cost of doing business.”

*Corresponding author: Leigh Chapman, RN, BSN, 7601 Osler Dr., Towson, MD 21204, leighchapman@catholichealth.net.*

**References**