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Hospital hand hygiene compliance improves with increased monitoring and immediate feedback



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Background: Health care–associated infections are serious complications impacting 2 million patients and accounting for approximately 100,000 deaths per year. In the present study, we evaluated the effectiveness of a new hand hygiene monitoring program (HHMP) and measured the sustainability of this effectiveness over a 1-year period.

Methods: The HHMP consisted of 4 key components: extensive education, conspicuous and visible monitors, immediate feedback concerning compliance to health care workers, and real-time data dissemination to leadership. The HHMP was implemented in 2 hospital care units. Two different, but similar, departments served as controls, and hand hygiene compliance was monitored via the “secret shopper” technique. All 4 departments were followed for 12 months.

Results: Both experimental departments showed statistically significant increases in hand hygiene compliance. Experimental department 1 increased compliance from 49% to an average of 90%, and experimental department 2 increased compliance from 60% to an average of 96%. Both experimental departments were able to sustain these results for at least 6 months. Compliance rates were significantly higher in the experimental departments compared with the control departments. No significant changes were seen in the control departments.

Conclusions: These findings suggest that continuous monitoring by salient observers and immediate feedback are critical to the success of hand hygiene programs.

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This year, an estimated 2 million patients will acquire an infection during their hospital stay that might have been easily prevented. Health care–associated infections (HAIs) are serious complications, accounting for approximately 100,000 deaths annually.¹ Although seemingly puerile, hand hygiene is acknowledged by the World Health Organization, Joint Commission, and Centers for Disease Control and Prevention as a major factor in reducing HAI rates.²⁻⁵ Despite continued efforts from infection prevention teams, hospital systems across the United States continue to struggle with hand hygiene participation, with a reported national compliance rate of <50%.^{6,7}

Following hand hygiene recommendations put forth by national health organization, various hand hygiene initiatives have been developed in attempts to improve compliance among health care workers (HCWs). Previously published hand hygiene programs typically consist of some combination of the following: education, engaging coworker accountability, visual cues, reminders, convenience, availability and easy access of hygiene products, warning signs, electronic surveillance, alarm systems, and use of family and patients as monitors.⁸⁻¹¹ Although most intervention programs show improvement in hand hygiene compliance after implementation, valid standardized methodology and long-term sustainability remain unclear.¹²⁻¹⁴ Recently, Duke University Medical Center (DUMC) initiated a technology-based hand hygiene monitoring system and has reported a compliance rate of 90% for the last 3 years (50% above the national average).¹⁵

Over the last decade, Mercy Hospital's Infection Prevention Team (IPT) has trialed a number of different evidence-based compliance

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programs in a continuing effort to improve hand hygiene practices and provide a culture of patient safety. These programs seemed to have had little sustainable impact on overall hand hygiene compliance, with rates still hovering around national averages.

During these efforts, anecdotal evidence was gathered. A questionnaire concerning hand hygiene compliance revealed that HCWs perceived their own hand hygiene as 90% compliant while rating their fellow coworkers as only 50% compliant. Owing to the potential for self-reporting bias by HCWs, the IPT monitored hand hygiene compliance using “secret department observers” between 2009 and 2011. These observers were fellow HCWs from within the department tasked to secretly monitor hand hygiene compliance without other HCWs awareness. These observers submitted their data monthly to the IPT. Once again, the rates were apparently inflated, showing 95%–99% hand hygiene compliance. Given the national average compliance rate of approximately 40%, the inflated percentages were of concern to the IPT, again suggesting reporting biases. Thus, the IPT began conducting its own “secret” hand hygiene monitoring observations over a 6-month period in 2011. Their findings indicated an actual compliance rate of only 46%. Discrepancies between the IPT data and the secret department observer’s data were hypothesized to be related to potential reporting bias by an observer not wanting to get fellow coworkers and colleagues in trouble.

The IPT findings suggest that despite efforts at continued education and increasing awareness, hand hygiene compliance lacked sustainability and showed little improvement over time. Thus, based on these historical anecdotal observations, the IPT developed a hand hygiene monitoring program (HHMP) aimed at increasing compliance among HCWs. This HHMP incorporated concepts from the US Department of Health and Human Services guidelines and the DUMC monitoring program. The purpose of the present study was to test the efficacy and measure the sustainability of the new HHMP over a 12-month period.

METHODS

Following Institutional Review Board approval, data were collected at a level 1 tertiary care facility in southwest Missouri. Based on the similarity of patient care and high volume of staff allowing for more observations and data generation, 4 medical units (2 experimental and 2 controls) were chosen to serve as test departments for this study. All 4 departments were postoperative adult surgical units, each with approximately a 31-bed capacity. Baseline hand hygiene data were collected for 1 month across all 4 test departments before HHMP implementation. The data were managed and coded in a manner to ensure anonymity and confidentiality; however, a descriptive summary of each department’s data was provided to leadership, as described below.

HHMP

The HHMP incorporated concepts from the DUMC hand hygiene model and from the “National Action Plan to Prevent Healthcare-Associated Infections: Road Map to Elimination” published by the US Department of Health and Human Services. The HHMP included 4 key components identified as necessary for a successful comprehensive program: extensive education, salient hand hygiene monitors, immediate feedback, and provision of real-time data to leadership.

Extensive education

An extensive hand hygiene education campaign was implemented before the study to cover proper methods as well as risks of noncompliance. All HCWs were assigned an electronic learning module describing the hand hygiene program and their

accountability for hand hygiene compliance. Additional learning materials were distributed to each department leader to reinforce the initial mandatory education. This educational material consisted of PowerPoint presentations, posters, and hand hygiene tool kits to be distributed throughout the department.

Salient hand hygiene monitors

Regardless of extensive efforts, it has repeatedly been shown that HCW compliance decreases when HCWs believe that they are not being monitored.^{14,16} Thus, hand hygiene monitoring by observers salient to HCWs is necessary. The HHMP included hand hygiene monitors in the nursing departments observing and recording hand hygiene compliance. Each hand hygiene monitor wore an IPT lab coat with clear markings for ready identification by the HCWs. All of the hand hygiene monitors were trained in the same manner, with identical operational definitions of dependent measurements. Hand hygiene compliance was defined as using an alcohol product or soap/water (referred to as “foam-in, foam-out”) on entry and exit of designated patient care areas and rated as yes/no. Failure of an HCW to foam-in or foam-out was recorded as a noncompliant incident by the hand hygiene monitor. Successful foaming-in and foaming-out of the designated areas was recorded as a compliant incident.

Immediate feedback

It is important that HCWs receive immediate feedback for noncompliance. Initially, instead of punishment, noncompliant incidents were used as teaching opportunities, allowing the HCW to take responsibility and ownership. On observing a noncompliant incident, the hand hygiene monitor issued educational materials to the HCW, to ensure engagement and providing a reminder of the importance of hand hygiene. For example, feedback cards reading “Remember to foam-in and foam-out” were distributed to non-compliant HCWs, while the compliant HCWs received a feedback card reading “Thank you for using proper hand hygiene.” Non-compliant HCWs also received additional educational material.

Real-time data to leadership

Hand hygiene monitors collected compliance data with electronic hand-held devices. The data were then automatically disseminated in real time to hospital leadership. Provision of real-time compliance data allow leadership in each department to take immediate steps to either acknowledge compliant incidences or address noncompliance. Department leadership shared hand hygiene compliance data with front-line HCWs and key stakeholders to encourage compliance.

Program implementation

All 4 major components of the HHMP were implemented in the 2 experimental departments. Hand hygiene compliance data were collected by salient monitors on Monday through Friday, 7:00 AM to 5:00 PM. Although observations did not occur during the weekend, staff in these units maintained rotating weekend coverage with cross-coverage between weekday and weekend shifts. Not conducting observations during weekend shifts potentially limited data collection. Data were then disseminated to hospital leadership. Two equivalent departments served as controls, with secret observations by the IPT but with no HHMP interventions.

Statistical analysis

Data on the continuous response, y (monthly percent compliance), were available for each of the 4 departments for a period of

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