



## Major article

## Effectiveness of an audible reminder on hand hygiene adherence

Morkos Fakhry MBBS, PhD<sup>a</sup>, George B. Hanna PhD, FRCS<sup>a,\*</sup>, Oliver Anderson BSc, MRCS<sup>a</sup>, Alison Holmes MD, MPH, FRCP<sup>b</sup>, Dinesh Nathwani FRCS<sup>a</sup>

<sup>a</sup>Department of Surgery and Cancer, Imperial College London, London, UK

<sup>b</sup>Centre for Infection Prevention and Management, Imperial College London, London, UK

## Key Words:

Cross-infection  
Prevention  
Guideline  
Handwashing  
Health personnel  
Infection control

**Background:** Multimodal interventions aim to improve health care workers' adherence to hand hygiene guidelines. Visitors are not primarily targeted, but may spread epidemic infections. Effective interventions that improve the adherence of visitors to hand hygiene guidelines are needed to prevent the transmission of epidemic infections to or from health care environments.

**Methods:** An electronic motion sensor-triggered audible hand hygiene reminder was installed at hospital ward entrances. An 8-month preinterventional and postinterventional study was carried out to measure the adherence of hospital visitors and staff to hand hygiene guidelines.

**Results:** Overall hand hygiene adherence increased from 7.6% to 49.9% ( $P < .001$ ). The adherence of visitors and nonclinical staff increased immediately from 10.6% to 63.7% and from 5.3% to 34.8%, respectively ( $P < .001$ ). Adherence of doctors, nurses, and physiotherapists increased gradually from 4.5% to 38.3%, from 5.4% to 43.4%, and from 8.7% to 49.5%, respectively ( $P < .001$ ). Improved adherence was sustained among visitors and clinical staff ( $P < .001$ ), but not among nonclinical staff ( $P = .341$ ).

**Conclusions:** The electronic motion sensor-triggered audible reminder immediately and significantly improved and sustained greater adherence of hospital visitors and clinical staff to hand hygiene guidelines. This is an effective addition to multimodal hand hygiene interventions and may help control epidemic infections.

Copyright © 2012 by the Association for Professionals in Infection Control and Epidemiology, Inc.  
Published by Elsevier Inc. All rights reserved.

Multimodal interventions aim to improve the adherence of health care workers to hand hygiene guidelines, with the goal of reducing health care-associated infections. Multimodal interventions include adequate provision of alcohol-based hand rub and soap and water, training and education, evaluation and feedback of performance, provision of workplace reminders, and a culture of safety.<sup>1</sup> Visitors may transmit epidemic infections and are not primarily targeted by multimodal interventions. The present study was initiated in response to the H1N1 influenza pandemic of 2009. There is a need for an effective, rapidly deployable, yet inexpensive intervention aimed at improving the adherence of visitors to hand hygiene guidelines to prevent the transmission of epidemic infections to or from health care environments without the need for education or training.

The World Health Organization's (WHO) "Five Moments for Hand Hygiene" are recommended indications for hand hygiene,

which include before and after touching a patient and after touching a patient's surroundings.<sup>2</sup> The hand hygiene guidelines from the Centers for Disease Control and Prevention and the WHO mandate that alcohol-based hand rub sanitizers be made available at the entrance to patient rooms or other convenient locations.<sup>3,4</sup> If patients are not confined to single rooms, then the entrance to patient rooms is synonymous with the entrance to the ward. This represents the last doorway passed through before touching a patient and the first doorway passed through after touching a patient or a patient's surroundings. Even though this is not strictly one of the WHO's five moments, 28% of hospitals in the Republic of Ireland currently provide alcohol-based hand rub sanitizers at the entrance to every ward.<sup>5</sup> This convenient location for hand hygiene is used by visitors more often than sanitizer located at patient bedsides, and accounts for 21% of all alcohol-based hand rub consumption in National Health Service hospital wards.<sup>6</sup> Local guidelines promote hand hygiene before entering or leaving a ward.<sup>7</sup> Alcohol-based hand rub sanitizers were provided at the entrance to a New Zealand hospital during the H1N1 influenza pandemic; the use of sanitizer rose to 18% during the pandemic<sup>8</sup> and dropped to 8% four months later.<sup>9</sup>

\* Address correspondence to George B. Hanna, PhD, FRCS, 10th Floor QEOM Building, St Mary's Hospital, London W2 1NY, UK.

E-mail address: [g.hanna@imperial.ac.uk](mailto:g.hanna@imperial.ac.uk) (G.B. Hanna).

Conflict of interest: None to report.



Fig 1. Configuration of the audible hand hygiene reminder. The green symbols are alcohol-based hand rub dispensers.

One of the WHO's objectives for future research is the implementation and evaluation of individual multimodal hand hygiene intervention components.<sup>1</sup> A study investigating improved reminders at individual patient room entrances found a significant increase in alcohol-based hand rub use and reduced health care–associated infection rates, but did not establish the effect on visitors or at hospital ward entrances.<sup>10</sup>

In this article, we report the effectiveness of an electronic motion sensor–triggered audible hand hygiene reminder in increasing the use of alcohol-based hand rub by visitors and health care workers at the entrances to hospital wards.

## METHODS

We conducted a preinterventional and postinterventional study over an 8-month period in one hospital. Local infection prevention and control guidelines already promoted the use of alcohol-based hand rub by visitors and health care workers through the Intranet and posters. Two clinical researchers directly observed visitors and hospital staff entering and exiting wards via 4 separate doors to measure their adherence to hand hygiene guidelines using alcohol-based hand rub placed at each entrance. The researchers disguised their observations by pretending to be waiting for the elevator (Fig 1). Any hand hygiene attempt, regardless of technique, at the moment of entering or exiting the ward was rated as adherence. The designation of the subject (visitor, doctor, nurse, physiotherapist, or nonclinical staff) was recorded. Observations were completed over three 15-minute periods during the day. The preintervention phase took place over 2 months from November to December 2009, and the postintervention phase extended for 6 months from January to June 2010. No other hand hygiene interventions were implemented during the study period.

Implementation of the intervention involved the installation of electronic motion sensor–triggered audible hand hygiene reminders (Technical Initiatives UK, Essex, UK). The motion sensors and

speakers were located in the ceiling in the corridor outside the ward entrances. The audible alert sounded the following message: “Please clean your hands with hand rub dispensers when entering or exiting any clinical ward.” Alcohol-based hand rub dispensers had already been installed by the doors. After activation, the alert deactivated for 20 seconds. The entire system comprised 4 motion sensors and 3 speakers, cost \$500, and was installed in half a day.

The resulting data were first analyzed to compare hand hygiene adherence during the preintervention and postintervention phases. Then the preintervention phase and the second half of the postintervention phase were compared to detect sustained improvements in adherence. The percentage adherence values are calculated from the numerator, consisting of the number of hand hygiene opportunities used, and the denominator, consisting of the total number of hand hygiene opportunities. We used Pearson's  $\chi^2$  to test binomial data ( $\alpha = 0.05$ , 2-tailed). All analyses were carried out using SPSS version 18 (SPSS Inc, Chicago, IL).

This study was granted approval from the Imperial Healthcare National Health Service Trust's Audit Department.

## RESULTS

A total of 2,863 hand hygiene opportunities were observed during 54 periods over the entire 8-month study period, including 706 opportunities in the preintervention phase and 2,157 opportunities in the postintervention phase. Visitors were the most frequently observed subject group (Table 1).

Overall, hand hygiene adherence increased from 7.6% to 49.9% ( $P < .001$ ). Adherence increased from 10.6% to 63.7% in visitors ( $P < .001$ ), from 4.5% to 38.3% in doctors ( $P < .001$ ), from 5.4% to 43.4% in nurses ( $P < .001$ ); from 8.7% to 49.5% in physiologists ( $P < .001$ ), and from 5.3% to 34.8% in nonclinical staff ( $P < .001$ ). The effect was immediate in visitors and nonclinical staff and gradual in clinical staff, including doctors, nurses, and physiotherapists.

Download English Version:

<https://daneshyari.com/en/article/2637934>

Download Persian Version:

<https://daneshyari.com/article/2637934>

[Daneshyari.com](https://daneshyari.com)