Journal of Hospital Infection 101 (2019) 422–425

Available online at www.sciencedirect.com

Journal of Hospital Infection

journal homepage: www.elsevier.com/locate/jhin

Letters to the Editor

A quality improvement initiative for improving hospital visitor hand hygiene

Sir,

Hand hygiene is crucial for the prevention of hospital-acquired infections. Hand hygiene promotions generally target healthcare workers, with variable success, but hospital visitors have poor hand hygiene and are infrequently encouraged to improve it [1–5]. Improving the hand hygiene of visitors thus offers an opportunity to reduce the transmission of pathogens between healthcare settings and the community. However, there are few data on effective strategies to promote visitor hand hygiene. Here we present a low-cost quality improvement initiative that improved visitor hand hygiene in our facility.

We designed and measured the efficacy of an initiative incorporating three instances of hand hygiene promotion specifically targeting visitors to a combination long-term acute care (LTAC) and rehabilitation unit at the Johns Hopkins Bayview Medical Center. This study unit and corresponding convenience sample of visitors was selected based on LTAC patients' particular susceptibility to infection and tendency to harbour multidrug-resistant organisms [6]. During the intervention period, security staff provided all visitors with a promotional sticker designed by the CDC (Figure 1) and a verbal reminder to wash their hands; matching signs were applied over all publicly available alcohol-based hand sanitizer (AHS) dispensers on the unit [7]. Individuals were intended, but not specifically instructed, to wear the sticker to increase awareness and create social pressure to perform the behaviour corresponding to the displayed sticker. The posters indicated that AHS dispensers were intended for use by both visitors and healthcare workers.

To assess the effectiveness of our promotion, three observers directly observed visitors during high-traffic hours on weekdays and weekends before and after initiative implementation, and then determined the proportion who used AHS between their arrival to the unit and entering patient rooms. The observers also recorded gender, unit wing, and the presence of a visible sticker. The control and intervention groups consisted of visitors observed for eight weeks prior to, and nine weeks after, implementation of the initiative, respectively. Visitors were unaware that their behaviour was being observed. Children and repeat visitors were offered stickers but excluded from observation; hospital employees and vendors were not given stickers. No personal identifying information was collected. The Johns Hopkins University Institutional Review Board approved this work. Pearson's χ^2-test with Yates' continuity correction was used to assess the change in handwashing post-intervention; significance level for all analyses was $P < 0.05$. RStudio 1.0.143 (RStudio, Boston, MA, USA) was used for all analyses.

Prior to implementation, we observed 225 visitors, and 4.4% ($N = 10$) of these used AHS, compared to 19.5% ($N = 43$) of the 220 visitors observed after the intervention. This improvement was statistically significant ($\chi^2 = 26.67$, $P < 0.001$) and consistent between genders and rehabilitation and LTAC wings. Twenty-five visitors in the intervention group were seen wearing a sticker; of these, 17 (68%) washed their hands; and 39.5% of visitors in the post-intervention group who washed their hands were wearing a sticker.

Our promotional initiative incorporating verbal and visual cues improved hospital visitor hand hygiene. The sticker seemed to be particularly effective; among those who took the sticker from staff and wore it as intended, hand hygiene compliance was 68%. However, overall participation in the sticker campaign was low at 12.5%. We cannot evaluate the relative efficacy of the posters and stickers separately, but previous studies have shown that posters alone do not improve hand hygiene among healthcare workers [8]. The significant increase in overall hand hygiene despite poor sticker participation suggests that the act of being offered a promotional sticker alone makes visitors more likely to clean their hands. Low sticker participation was likely due to mixed adherence to the study protocol by security staff and visitor unwillingness to wear a sticker.

A weakness of our study is its short time-period; we do not know whether the demonstrated effects would be sustained over time. Additionally, the lack of a simultaneously observed control group means that confounding variables such as weather conditions or news events may have influenced visitor hand hygiene more than our promotion. Visitors who took stickers may also have been more likely to clean their hands at baseline. Finally, despite the relative success of our intervention, 80.5% of visitors in the post-intervention group failed to clean their hands despite multiple cues to do so, indicating that further study of effective interventions to improve visitor hand hygiene is needed. However, a significant increase in visitor hand hygiene was achieved at no cost besides that of the sticker paper. Fine-tuning of our methods, perhaps by recruiting a volunteer to hand out stickers, could result in even higher participation, ultimately helping to protect both patients and the community from hospital-acquired infections.

Figure 1. 'Clean Hands Count' campaign logo designed by the US Centers for Disease Control and Prevention (CDC), available for no cost on the CDC's 'Hand hygiene in healthcare settings', 'Promotional materials' page. Stickers and posters in the campaign featured this image.

Acknowledgements

C.C. D'Orleans and P.V. Selvam conducted observations and helped develop study methods. J.J. Lee reviewed initial drafts and contributed to the discussion. C. Caulfield-Noll, MLIS, AHIP, assisted in the literature review process.

Conflict of interest statement
None declared.

Funding sources
None.

References

[1] McGuckin M, Waterman R, Govednik J. Hand hygiene compliance rates in the United States — a one-year multicenter collaboration using product/volume usage measurement and feedback. Am J Med Qual 2009;24:205–13.
[2] Randle J, Arthur A, Vaughan N. Twenty-four-hour observational study of hospital hand hygiene compliance. J Hosp Infect 2010;76:252–5.
[3] Birnbach DJ, Nevo I, Barnes S, Fitzpatrick M, Rosen LF, Everett-Thomas R, et al. Do hospital visitors wash their hands? Assessing the use of alcohol-based hand sanitizer in a hospital lobby. Am J Infect Control 2012;40:340–3.
[4] Birnbach DJ, Rosen LF, Fitzpatrick M, Arheart KL, Munoz-Price LS. An evaluation of hand hygiene in an intensive care unit: are visitors a potential vector for pathogens? J Infect Public Health 2015;8:570–4.
[5] Hobbs MA, Robinson S, Neyens DM, Steed C. Visitor characteristics and alcohol-based hand sanitizer dispenser locations at the hospital entrance: effect on visitor use rates. Am J Infect Control 2016;44:258–62.
[6] Mody L, Foxman B, Bradley S, McNamara S, Lansing B, Gibson K, et al. Longitudinal assessment of multidrug-resistant organisms in newly admitted nursing facility patients: implications for an evolving population. Clin Infect Dis 2018;67:837–44.
[7] Centers for Disease Control and Prevention. Clean Hands Count Campaign, promotional materials. Available at: https://www.cdc.gov/handhygiene/campaign/promotional.html. [Accessed December 2018].
[8] Birnbach DJ, Rosen LF, Fitzpatrick M, Everett-Thomas R, Arheart KL. A ubiquitous but ineffective intervention: signs do not increase hand hygiene compliance. J Infect Public Health 2017;10:295–8.

A.T. Hummel*
K. Vleck
W.B. Greenough III
Johns Hopkins Bayview Medical Center, Division of Geriatric Medicine and Gerontology, Baltimore, MD, USA

* Corresponding author. Address: 2911 Euclid Ave., Apt. 1, Cincinnati, OH 45219, USA. Tel.: +1 (630) 877 7505.
E-mail address: hummelay@mail.uc.edu (A.T. Hummel)

Available online 4 January 2019

https://doi.org/10.1016/j.jhin.2018.12.019

Why volume matters — implications of applied volume of alcohol-based disinfectants for infection prevention

Sir,

The recently published study by Pidot *et al.* investigated the hypothesis as to whether increased use of alcohol-based disinfectants for hand disinfection purposes can induce tolerance of *Enterococcus faecium* to alcohols [1].

Enterococci are known for their intrinsic resistance to antimicrobial substances, and Wassilew *et al.* reported a large outbreak of vancomycin-resistant enterococci in Switzerland, which demonstrated that effective hygiene measures to prevent outbreaks and spread of nosocomial pathogens are of great relevance [2,3].

The study by Pidot *et al.* is an important contribution toward demonstrating that decontamination of surfaces (animate or inanimate) with a volatile active substance such as 70% (v/v) propan-2-ol can be substantially impaired if the quantities used for disinfection are too small [1]. In their animal model, Pidot *et al.* demonstrated that impaired disinfection of inanimate surfaces poses a great risk of transmission of pathogens. For disinfection of an area measuring 15 × 30 cm, a 4 × 4 cm piece of filter paper soaked with 0.85 mL of 70% (v/v) propan-2-ol was used [1]. Due to the minute amount of disinfectant applied, proper disinfection was substantially impaired, and evidence is provided that residual contamination of the animal housing resulted in a statistically significant increase in ingestion of the *E. faecium* strains by the mice that were kept in these cages afterwards. The hypothesis that the tested *E. faecium* isolates developed alcohol tolerance is, however, difficult to verify with the published experimental design.