CONCISE COMMUNICATION

Sustained High Level of Healthcare Worker Adherence With Hand Hygiene Practice Recommendations Using the Patient-as-Observer Approach in the Ambulatory Setting

Rachael A. Lee, MD;[1] Gary R. Cutter, PhD;[2] Janet L. Pate, JD, MHA, BSN, RN;[3] Emily Boohaker, MD;[4] Bernard C. Camins, MD, MSc[1]

We report on a quality improvement initiative for hand hygiene adherence using the patient-as-observer method in the ambulatory setting. There were 604,661 observations recorded with improvement of adherence from 88% to 95% or greater; alcohol-based hand sanitizer purchasing correlated with this increase. This sustainable method effectively ensures hand hygiene adherence.

Infect Control Hosp Epidemiol 2016;37:1496–1498

Hand hygiene is one of the most important and inexpensive methods for prevention of hospital-acquired infections; achieving sustained adherence remains a challenge, particularly in the ambulatory care setting.[1–3] Direct observation by trained personnel captures only a small fraction of opportunities and may even inflate the results, given the Hawthorne effect.[4] Patients are present during every healthcare worker (HCW) interaction and thus are a valuable resource for monitoring adherence. We instituted a patient-as-observer program in the ambulatory setting and report our findings in this article.

METHODS

This intervention was implemented in ambulatory clinics within the University of Alabama at Birmingham Health System. It was rolled out in 88 primary care and subspecialty clinics in a stepwise fashion from October 2012 to December 2014. Before 2012, adherence was monitored via direct observation, with an average rate noted to be 89% (range, 41%–100%; average number of observations monthly, 23). In October 2012, leadership instituted the patient-as-observer program as a quality improvement initiative with a rate of adherence goal of 95% or greater.

Before initiation, all clinic personnel, including physicians, were educated on the program. A survey was created asking patients to record their observations of the hand hygiene practices among providers, nurses, and technicians during clinic visits and to mark the form accordingly (see Online Supplemental Figure 1). Patients anonymously returned the surveys at the end of their clinic visit and appointment numbers were printed on the survey to allow tracking back to individual clinics. Any clinic that was below the set goal or that failed to achieve an 80% response rate received education on the importance of hand hygiene adherence, and leadership in that clinic was required to submit an action plan to improve adherence and response rates.

Adherence was calculated as the number of adherent observations divided by the total number of observations. Differences in adherence rates were analyzed using χ^2 and χ^2 for trend. $P \leq .05$ was considered statistically significant. Additionally, alcohol-based hand sanitizer purchasing data were correlated to hand hygiene adherence rates using the Pearson correlation coefficient.

RESULTS

A total of 604,661 observations were included in this analysis (Figure 1). There were 397,771 evaluable interactions for providers during the study period, with an initial hand hygiene adherence of 90.9%. The goal of 95% or greater was met by quarter 2, 2013, and this high rate has been sustained as shown by χ^2 for trend ($P < .001$). There were 391,344 evaluable interactions for nurses with an initial adherence rate of 91.25%. The goal of 95% or greater was reached by quarter 2, 2013, and has been sustained ($P < .001$). For technicians, 429,057 interactions were evaluable during the study period. Initial adherence rate was noted to be 88.8% and the goal of 95% or greater was reached by quarter 3, 2013. This rate was overall sustained for most subsequent quarters ($P < .001$).

The volume of hand hygiene product procured was also assessed before and during the intervention (Figure 2). Before the first quarter of 2014, the primary hand hygiene products available were an alcohol-based gel hand sanitizer and an alcohol-based foam hand sanitizer. In February 2014, the purchasing departments for the inpatient and outpatient settings were merged and hand hygiene products were changed primarily to alcohol-based gel hand sanitizer and hand wipes. Figure 2 shows that even though a change in the type of product used for hand hygiene occurred, there was an increase in the number of units of products procured during the intervention, correlating with increase in hand hygiene adherence rates ($r = 0.92$, $P < .001$).

DISCUSSION

Our experience shows that in the ambulatory setting, the patient-as-observer method for improving hand hygiene adherence is both effective and sustainable at high levels (≥95%). The key to successful implementation of this program was buy-in and active participation by individual clinics and hospital administration. Multifaceted interventions

https://doi.org/10.1017/ice.2016.211 Published online by Cambridge University Press

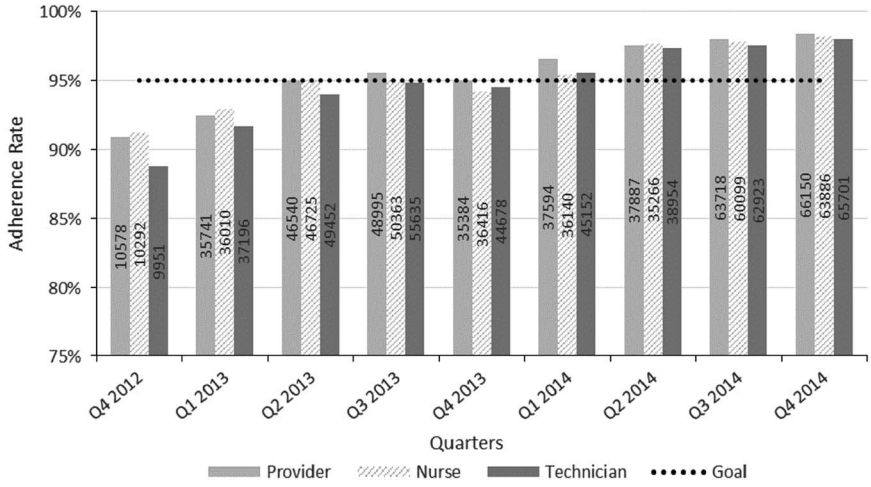

FIGURE 1. Percent hand hygiene adherence by quarter.

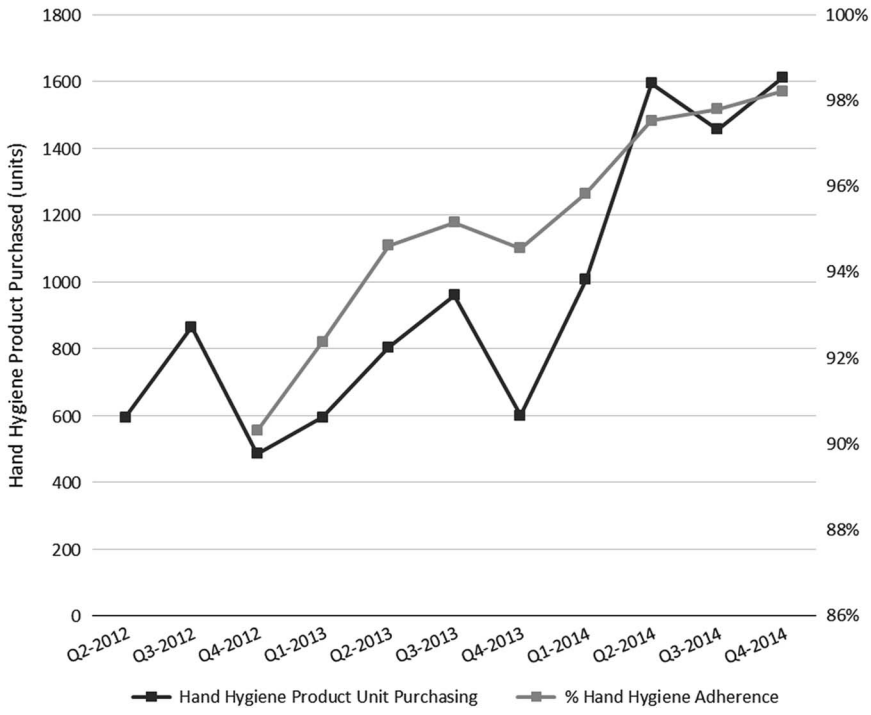

FIGURE 2. Ambulatory quarterly hand hygiene adherence rate and quarterly product purchase data.

that include a systems change, training, and education are associated with improved adherence to hand hygiene.[5] The data generated from our hand hygiene program are reviewed by leadership at the monthly Patient Safety Committee meeting; reinforcement and recognition of clinics at goal have also been helpful in maintaining the sustained high level of adherence.

Enlisting patients as observers not only is cost-effective but also engages them to be part of their care. Direct observation of HCWs by coworkers is very difficult to achieve because hand hygiene typically occurs behind closed doors. Both direct observation and patient-as-observer methods are likely to bias results through the Hawthorne effect.[3,6] However, the latter method is more likely to produce better results since a tremendous number of observations can be easily collected—HCWs are more likely to perform hand hygiene always because they know that they are being observed. Previous reports on patient-as-observer programs have either been small in scope or included a lower survey completion rate (22% and 75%).[7,8] Our experience shows that this method can be successfully implemented on a large scale, which has been

https://doi.org/10.1017/ice.2016.211 Published online by Cambridge University Press

sustained at 95% or greater for more than 2 years with 89% of distributed surveys returned. Although this rate cannot be validated by independent observers, the results are validated given the large number of surveys and both positive and negative comments submitted by patients when they observe instances of adherence and nonadherence.

We were able to show a correlation between the volume of hand hygiene products procured and the increase in hand hygiene adherence. Hand hygiene product purchasing data have been used to predict trends in adherence to hand hygiene by previous investigators.[9] The increase in the volume of product procured, however, was notably larger than the increase in hand hygiene adherence rate. We speculate that the true baseline adherence rate prior to implementation of this intervention may have been much lower than the observed rate of 91%.

The patient-as-observer program empowers patients to participate in their own care, which has been shown to improve quality of care and prevent medical errors. Our program has allowed patients to provide feedback anonymously, without fear of receiving suboptimal care.[6] Comments from patients were relayed to individual clinics, which allowed for reinforcement of the hand hygiene policy and illustration of organizational transparency to patients.

There are limitations to our study. Since HCWs were informed about the program before its implementation, they were aware that they were being monitored by patients. This potential for Hawthorne effect is the most likely explanation for our higher than expected initial adherence rates, which are similar to those reported by other investigators.[10] Recall bias is possible when patients are filling out the surveys, but HCWs have been scripted to alert patients as they are performing hand hygiene to decrease this bias. Finally, recent comments from patients may indicate "survey fatigue"; surveys are now distributed to patients once every 60 days unless they are new to a clinic.

In conclusion, in a large multispecialty ambulatory clinic setting, the patient-as-observer method to monitor adherence to hand hygiene was found to be feasible, cost-effective, and well accepted by patients and HCWs. This approach not only engages patients in their own care but also improves patient safety by providing monthly feedback to HCWs. As with any other successful hand hygiene program, unwavering support and emphasis of the program by hospital administration are essential.

ACKNOWLEDGMENTS

We thank Kendra Metcalf, RN, and Angela Medici, RN, who were both instrumental in the implementation of this quality improvement initiative.

Financial support. None reported.

Potential conflicts of interest. G.C. reports that he is employed by the University of Alabama at Birmingham and is president of Pythagoras; is currently on the following data and safety monitoring boards: Apotek, Biogen-Idec, Cleveland Clinic (Vivus), Glaxo Smith Klein, Gilead, Modigenetech/Prolor, Merck/Ono, Merck, Merck/Pfizer, Neuren, Sanofi-Aventis, Teva, Washington University, National Heart, Lung, and Blood Institute (Protocol Review Committee), National Institute of Neurological Disorders and Stroke, National Institute of Child Health and Human Development (Obstetric Pharmacology Research Units oversight committee); and is currently on the following consulting or advisory boards: Consortium of MS Centers (grant), D3 (Drug Discovery and Development), Genzyme, Genentech, Jannsen, Klein-Buendel, Medimmune, Novartis, Opexa Therapeutics, Receptos, Roche, EMD Serono, Somalution, Teva, and Transparency Life Sciences. None of these entities financially supported the data presented in this publication. All other authors report no conflicts of interest relevant to this article.

Affiliations: 1. Division of Infectious Diseases, Department of Medicine, University of Alabama at Birmingham, Birmingham, Alabama; 2. Department of Biostatistics, University of Alabama at Birmingham, Birmingham, Alabama; 3. University of Alabama Health Services Foundation, Birmingham, Alabama; 4. Department of Medicine, University of Alabama at Birmingham, Birmingham, Alabama.

Address correspondence to Rachael A. Lee, MD, 1900 University Blvd, THT 229, Birmingham, AL 35294 (ralee@uabmc.edu).

Presented in part: IDWeek 2015; San Diego, California; October 7–11, 2015 (Abstract 1099).

Received May 5, 2016; accepted August 8, 2016; electronically published October 4, 2016.

 0899-823X/2016/3712-0017. DOI: 10.1017/ice.2016.211

SUPPLEMENTARY MATERIAL

To view supplementary material for this article, please visit http://dx.doi.org/10.1017/ice.2016.211

REFERENCES

1. Ellingson K, Haas JP, Aiello AE, et al. Strategies to prevent healthcare-associated infections through hand hygiene. *Infect Control Hosp Epidemiol* 2014;35:S155–S178.
2. Camins BC, Fraser VJ. Reducing the risk of health care-associated infections by complying with CDC hand hygiene guidelines. *Jt Comm J Qual Patient Saf* 2005;31:173–179.
3. Magnus TP, Marra AR, Camargo TZ, et al. Measuring hand hygiene compliance rates in different special care settings: a comparative study of methodologies. *Int J Infect Dis* 2015;33:205–208.
4. Jeanes A, Coen PG, Wilson AP, Drey NS, Gould DJ. Collecting the data but missing the point: validity of hand hygiene audit data. *J Hosp Infect* 2015;90:156–162.
5. Luangasanatip N, Hongsuwan M, Limmathurotsakul D, et al. Comparative efficacy of interventions to promote hand hygiene in hospital: systematic review and network meta-analysis. *BMJ* 2015;351:h3728.
6. Davis R, Parand A, Pinto A, Buetow S. Systematic review of the effectiveness of strategies to encourage patients to remind healthcare professionals about their hand hygiene. *J Hosp Infect* 2015;89:141–162.
7. Bittle MJ, LaMarche S. Engaging the patient as observer to promote hand hygiene compliance in ambulatory care. *Jt Comm J Qual Patient Saf* 2009;35:519–525.
8. Le-Abuyen S, Ng J, Kim S, et al. Patient-as-observer approach: an alternative method for hand hygiene auditing in an ambulatory care setting. *Am J Infect Control* 2014;42:439–442.
9. Haubitz S, Atkinson A, Kaspar T, et al. Handrub consumption mirrors hand hygiene compliance. *Infect Control Hosp Epidemiol* 2016;37:707–710.
10. Eckmanns T, Bessert J, Behnke M, Gastmeier P, Ruden H. Compliance with antiseptic hand rub use in intensive care units: the Hawthorne effect. *Infect Control Hosp Epidemiol* 2006;27:931–934.