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Brief Report

Simplifying Disinfectant Choices to Improve Safety in Contact Precaution Rooms

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Both quaternary ammonium and bleach-based cleaning products are effective in reducing the transmission of methicillin-resistant *Staphylococcus aureus* and vancomycin-resistant Enterococcus in hospitals, but bleach-based compounds demonstrate better control of *Clostridium difficile* infections. Our pilot study demonstrates the potential to reduce *C. difficile* transmission in an acute care hospital by eliminating the need for providers to choose the appropriate cleaning product from isolation precaution carts.

Health care–associated infections (HAIs), including central line–associated bloodstream infections, catheter-associated urinary tract infections, and ventilator-associated pneumonia, are major risks for patients in acute care hospital settings. In 2011, the most recently reported year, US acute care hospitals experienced 722,000 HAIs.[1] Prevention and reduction of HAIs are important patient safety concerns and Agency Priority Goals for the US Department of Health and Human Services. Effective means of prevention require knowledge of the risks, largely gained from education and training programs, and deliberate behavior at the facility, team, and individual levels.

Hand hygiene is considered the most important method for preventing HAIs.[2-4] Despite the importance of this low-cost and easily implemented intervention, it is challenged by a lack of sustainability and poor compliance, with less than 50% participation in some provider groups.[4] Health care equipment and environmental fixtures are also known sources for transmission, and reductions of HAIs have been demonstrated with improved cleaning strategies for health care equipment.[5,6]

Drawing upon the challenges presented by provider compliance with hand hygiene and understanding that improperly cleaned equipment can act as vehicles for the transmission of infections among patients, we developed a simple non-patient-specific quality improvement project for an inpatient rehabilitation unit within an acute care hospital. The quality improvement project was designed as a pilot to determine the efficacy of simplifying isolation cart disinfectant choice.

METHODS

The quality improvement project took place in a 24-bed, post-acute inpatient rehabilitation unit in an academic quaternary care hospital in Seattle, WA, from January to August 2017. The pre-intervention phase was comprised of 115 admissions and 2717 patient days, and the post-intervention phased was comprised of 128 admissions and 2419 patient days.

Prior to the intervention, the rehabilitation unit followed the hospital's current practice of placing both non-bleach (alkyl dimethyl ammonium chloride) and bleach (sodium hypochlorite) wipes in front of all contact (methicillin-resistant *Staphylococcus aureus* [MRSA] or vancomycin-resistant *Enterococcus* [VRE]) and contact enteric (*Clostridium difficile*) rooms. Although the isolation precaution signs designate the type of precaution, deciding which disinfectant wipe to use relies on the knowledge of the user. Our primary intervention was the placement of only bleach-based disinfectant wipes on the isolation carts of patients requiring contact precautions for either MRSA/VRE or *C. difficile*. With this intervention, the inpatient rehabilitation unit's cleaning protocol changed to using only bleach-based wipes for cleaning health care equipment utilized within contact precautions rooms.

Random samples of the unit's isolation precautions paired with the disinfectant wipes present on isolation carts were taken over the course of 4 months before the intervention and for 4 months after. The sampling monitored for critical errors, including (1) no wipes present, or (2) an isolation precaution being paired with an incorrect

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or inappropriate disinfectant (eg, non-bleach wipes paired with a contact enteric room).

RESULTS

During the pre-intervention phase, data were collected from a total of 65 isolation carts. Of these, 41 (63%) were designated as contact and 24 (37%) were designated as contact enteric precautions. Both wipes were present on 42 (65%) of these carts, but 3 carts (5%) did not have any wipes present and 2 carts (3%) had the incorrect disinfectant wipes, for a total of 5 carts (8%) without appropriate wipes present. The remainder (27%) correctly had either bleach- or non-bleach-based wipes present.

During the post-intervention phase, data were collected from a total of 67 isolation carts. Of these, 28 (42%) were designated as contact and 39 (58%) were designated as contact enteric precautions. Bleach wipes were present on 61 (91%) of these carts. Four (6%) of the remaining carts had only non-bleach-based wipes, and 1 cart (1.5%) had both types of disinfectant wipes. During this phase, 1 cart had neither wipes and 1 had the incorrect wipes, for a total of 2 carts (3%) without appropriate wipes present. The decrease from 5/65 (8%) to 2/67 (3%) of carts without appropriate wipes is a non-significant difference with a *P* value of .274 using Fisher's exact test. A non-significant decrease in new *Clostridium difficile* infections was also observed on the unit during our intervention.

DISCUSSION

This quality improvement project has demonstrated the feasibility of changing standard practices for isolation carts on a single inpatient rehabilitation unit. Prior to the intervention, both types of wipes were found on most carts, regardless of the contact precaution required. Additionally, prior to the intervention, 5 critical errors were found; however, after the intervention, only 2 critical errors were found.

No errors were noted post-intervention until the last month, which may have been related to staff turnover, as education was provided once just prior to the intervention. In future iterations, more frequent educational sessions with essential staff as well as periodic checks to ensure compliance may work to further decrease errors. Rates of injury due to bleach in health care are extremely low, and this project was no different, as there were no reported negative effects from bleach use.[6] Theoretical risks from exposure to bleach, including garment stains, skin irritation, and mucous membrane irritation, can be avoided with proper handling.

Ultimately, the best approach for infection reduction in any setting is likely to be multifactorial, combining active surveillance with easily implemented, generalizable interventions, as well as provider education and continuing quality improvement efforts. Our intervention is one part of a large, robust, hospital-wide infection control program that should achieve a reduction in HAIs through simplicity, better compliance, and less practitioner error.

References

1. Centers for Disease Control and Prevention. Healthcare-associated infections. Available from: https://www.cdc.gov/hai/surveillance/index.html. Accessed May 8, 2018.
2. Gould DJ, Moralejo D, Drey N, Chudleigh JH. Interventions to improve hand hygiene compliance in patient care. Cochrane Database Syst Rev 2010;9:CD005186.
3. Sickbert-Bennett EE, DiBiase LM, Willis TM, Wolak ES, Weber DJ, Rutala WA. Reduction of healthcare associated infections by exceeding high compliance with hand hygiene practices. Emerg Infect Dis 2016;22:1628-30.
4. Schabrun S, Chipchase L. Healthcare equipment as a source of nosocomial infection: a systematic review. J Hosp Infect 2006;63:239-45.
5. Donskey CJ. Does improving surface cleaning and disinfection reduce health care-associated infections? Am J Infect Control 2013;41(Suppl):S12-9.
6. Rutala WA, Weber DJ. Use of inorganic hypochlorite (bleach) in health-care facilities. Clin Microbiol Rev 1997;10:597-610.