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Monitoring of Cleaning Practices for Portable, Multiuse Medical Equipment

To the Editor—Hospitalized patients are in contact with many types of multiuse medical equipment each day, ranging from stethoscopes to radiology machines. Healthcare providers often use medical equipment sequentially, with little time between contact with multiple patients.[1] Because numerous nosocomial pathogens can survive on inanimate surfaces for many hours to days, multiuse equipment could serve as vehicles for inadvertent transmission of organisms.[2] For example, stethoscopes are known to harbor pathogenic bacteria, including *Staphylococcus aureus*, coliforms, *Pseudomonas*, and *Clostridium difficile*.[3-5] Viable multidrug-resistant organisms (eg, vancomycin-resistant *Enterococci* [VRE]) have been found on portable medical equipment (eg, blood pressure cuffs and computer keyboards) used in the room of a patient infected or colonized with the same multidrug-resistant organism.[6] VRE was isolated from physicians' stethoscopes in 31% of cases after being in contact with patients colonized with VRE.[7] Transmission of hepatitis B virus was associated with monitoring of blood glucose by shared lancet endcaps and shared glucometers at an assisted living facility.[8]

Approaches to decrease the spread of pathogens in hospital settings include hand hygiene, environmental cleaning, and cleaning of equipment after each use.[9] However, while many hospitals have monitored hand hygiene and promoted campaigns to improve hand cleansing practices, only limited data are available on routine monitoring of and the performance of cleaning of multiuse equipment in clinical settings.

A cross-sectional study was performed at our 500-bed tertiary care center to evaluate cleaning practices of multiuse portable equipment. Portable electronic blood pressure devices, stethoscopes, glucometers, thermometers, and portable X-ray machines were selected for observation because these devices are commonly in direct contact with multiple patients on a daily basis.

We designed a survey tool to standardize data collection. A physician/public health student and two infection preventionists performed observations over the course of 4 weeks during spring 2012 in 3 medical-surgical units on different work shifts. Because the observations were performed in the context of a hand hygiene campaign, healthcare providers may have been aware that their hand hygiene practices were being observed but would not have known equipment cleaning was also being monitored. Any attempt to clean the equipment (before or after contact with the patient) with disinfectant wipes by the healthcare provider was recorded as successful cleaning. Disinfectant wipes are mounted on the wall by each patient room door and are usually in baskets attached to electronic blood pressure devices. Dedicated equipment for contact precautions was not included in the study.

Healthcare providers observed during the 110 patient encounters were 59 patient care assistants (53.6%), 28 physicians (25.5%), 22 nurses (20.0%), and 1 radiology technician (0.9%). Types of equipment under observation were 40 stethoscopes (36.4%), 28 portable electronic blood pressure cuffs (25.5%), 23 thermometers (20.9%), 18 point-of-care glucometers (16.4%), and 1 mobile X-ray machine (0.9%).

Equipment cleaning practices were poor among all categories of healthcare providers and for all types of equipment. Equipment was wiped in only 15 of 110 encounters (13.6%) before or after patient use (Figure 1). Equipment was cleaned in 23.9% of encounters for patients in contact precautions and 7.3% ($P < .0001$) of encounters for patients not in contact precautions. Performance of wash-out (81.8%) was higher than wash-in (33.6%) for all types of healthcare providers ($P < .0001$). A limitation of this study was that adequacy of equipment cleaning could not be assessed; any attempt to use disinfectant cloths to clean equipment was considered acceptable.

Utilizing a standardized survey tool that combined observations of equipment cleaning with hand hygiene monitoring, we noted that common multiuse medical equipment often was not cleaned between use on different patients. Cleaning practices were better—but still poor—for equipment used in contact precautions rooms compared with other rooms. In addition to inadequate hand hygiene, the failure to clean equipment between patient encounters may contribute to the transmission of pathogens in hospitals. Observations of equipment cleaning can be incorporated into ongoing hand hygiene monitoring programs to provide feedback and guide improvement of practices in hospital settings.

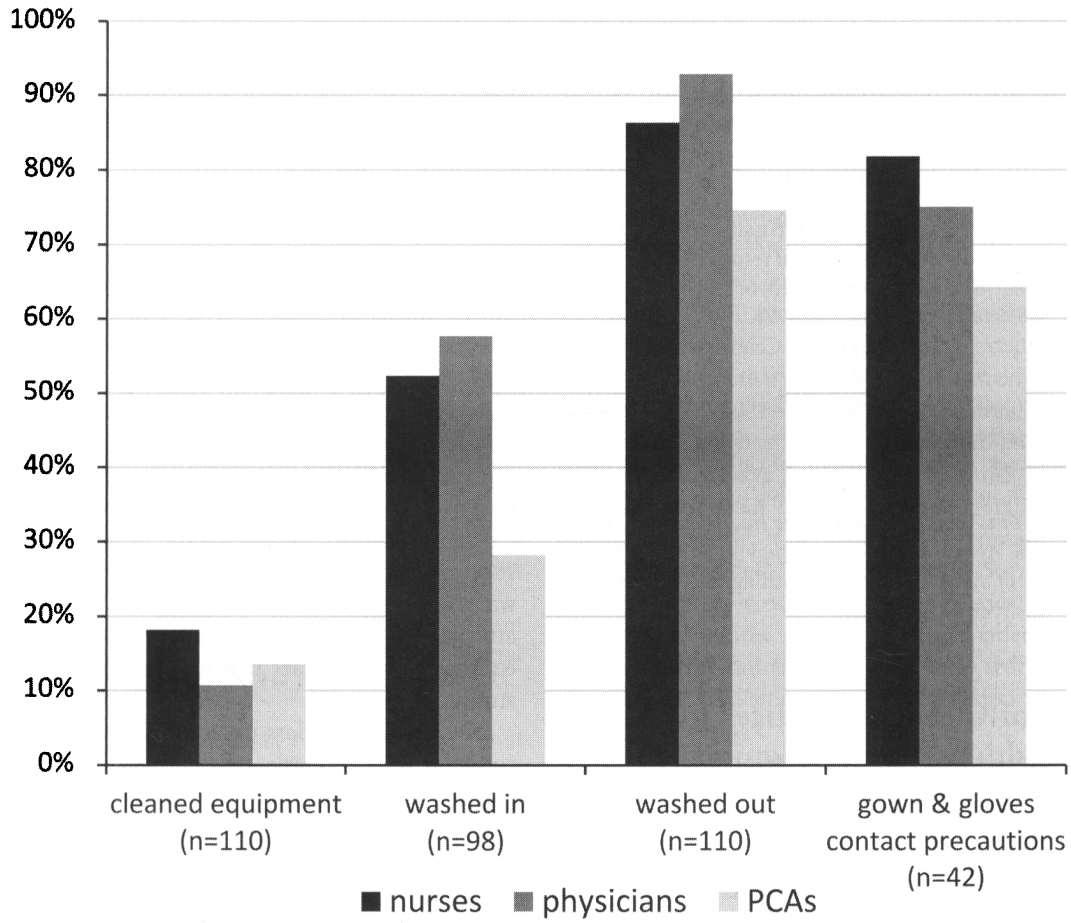

FIGURE 1. Equipment cleaning, wash-in, wash-out, and contact precautions compliance by healthcare provider (%). *n*, number of observations for each activity. PCA, patient care assistant.

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Sharing Eyedrops between Patients: When Will It End?

To the Editor—The Centers for Disease Control and Prevention recently released a Morbidity and Mortality Weekly Report on 6 outbreaks of adenovirus-associated keratoconjunctivitis in 4 US states occurring between 2008 and 2010.[1] These epidemics occurred in outpatient ophthalmologic clinics and a neonatal intensive care unit, and a total of 411 cases were identified. A goal of the American Academy of Ophthalmology Infection Prevention Statement (2012) is zero tolerance for healthcare-associated infections. The academy acknowledges that adenovirus is the main cause of nosocomial outbreaks of conjunctivitis occurring in eye clinics, nursing homes, and child care centers and that transmission can occur from ophthalmic solutions and instruments. The academy condones the practice of sharing eyedrop containers between patients on the condition that they are discarded if the patient has an obvious eye infection or the container tip has direct contact with the patient's tears or conjunctiva.[2] However, it may not always be apparent to the healthcare worker that a patient has an infectious eye disease. Adenovirus can be transmitted a few days before symptoms develop and can be shed long after symptoms have resolved. Some patients are asymptomatic, and others may have mild symptoms.[1-3] Clearly, if there is any physical contact between the eyedrop bottle and the conjunctiva, eyelashes, or tears, there is the potential to transmit disease to other patients.

Prior studies have shown that adenovirus is a virulently growing organism that can survive in the eyedrops of patients with confirmed adenovirus for up to 9 weeks after contamination.[4,5] In several studies, many organisms have been grown from ophthalmology solutions that were used on multiple patients in a variety of settings, including a primary care setting, ophthalmology clinics, and long-term care facilities. These include normal skin contaminants, such as coagulase-negative *Staphylococcus*, *Propionbacterium acnes*, and *Streptococcus viridans*, as well as pathogens such as *Pseudomonas putida*, *Burkholderia cepacia*, and *Serratia marcescans*.[6,7]

Currently, most healthcare facilities consider larger-volume eyedrop medications for multipatient use to be more economically viable than single-patient-use eyedrop vials. However, this ignores the cost of outbreaks of nosocomial infections related to the use of multipatient eyedrop bottles. As we strive to reduce all healthcare-associated infections, we should encourage the manufacture of inexpensive single-patient eyedrops for use in healthcare facilities. While there is any opportunity for the transmission of bacteria or viruses to occur, it is surprising that the sharing of any kind of medication between patients in healthcare settings is still considered acceptable practice.

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