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Mucosal Barrier Injury Laboratory-Confirmed Bloodstream Infection or Contaminant?

To the Editor—Dr. See and colleagues[1] published the results of field testing of mucosal barrier injury laboratory-confirmed bloodstream infection (MBI-LCBI), a newly defined subset of bloodstream infection (BSI) designed to capture bacteremia or fungemia due to translocation of gut organisms in a subgroup of patients who have undergone an allogenic stem cell transplantation within the previous year plus graft versus host disease or significant diarrhea or neutropenia. Only a single positive blood culture for a "recognized pathogen" (eg, *Staphylococcus aureus*, *Escherichia coli*, and *Candida albicans*) is required for a BSI to be considered laboratory confirmed (according to the current National Healthcare Safety Network [NHSN] definition).[2] It is hoped that, by incorporating this new definition, infections attributable to translocation will be distinguished from those due to central line–associated BSI.

In a retrospective study of blood cultures obtained at our institution in 2007,[3] it was reported that blood specimens obtained through a central venous catheter were 2.5 times more likely to have growth and 5.6 times more likely to be contaminated than blood specimens obtained by venipuncture. Importantly, it was found that contaminants were diverse and included Enterobacteraciae, *Pseudomonas* species, *Acinteobacter* species, and *Candida* species. It was postulated that contamination was the result of inadequate sterilization of the central catheter hub and reflected the skin flora of hospitalized patients and/or transmission via the hands of healthcare workers.

Thus, I am concerned that a single positive blood culture of a specimen obtained via central venous catheter and positive for a recognized pathogen could be categorized as evidence of MBI-LCBI when, in fact, the positive culture result is due to contamination. Furthermore, although Centers for Disease Control and Prevention and NHSN guidelines also note that catheter-drawn blood specimens have a higher rate of contamination, it is my experience that many oncology units often obtain blood specimens via central catheter (typically, 1 venipuncture and 1 via central catheter). Given the population addressed by the new guideline (stem cell transplant recipients or patients with neutropenia), a patient with a single positive blood culture of a specimen obtained from a central venous catheter would be defined as having BNI-LCBI. Our study would suggest that many of those isolates are attributable to contaminants. In this population, I believe that MBI-LCBI would be more accurately defined by at least 2 positive culture specimens obtained via venipuncture.

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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.