Hospital Bath Basins are Frequently Contaminated with Multi-Drug Resistant Human Pathogens

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BACKGROUND
Hospital-acquired infections are the primary complication of hospital stay, accounting for an estimated 1.7 million infections and 95,000 associated deaths annually in the United States.1 Environmental contamination of hospitals with nosocomial pathogens contributes to the transmission and spread of pathogens within the hospital setting.2 Environmental surfaces are increasingly recognized as a potential source of nosocomial infection, yet the role of bath basins as reservoirs for hospital-acquired pathogens has not been studied thoroughly.

Bath basins may be a reservoir for pathogens. Improper use of bath basins may contribute to the transmission of hospital-acquired infections (Figure 1).

STUDY AIM
To investigate the role of bath basins as potential reservoirs of common multidrug-resistant organisms associated with nosocomial outbreaks.

Common hospital-acquired pathogens include:
- Staphylococcus aureus including methicillin-resistant S. aureus (MRSA)
- Enterococcus species including vancomycin-resistant Enterococcus (VRE)
- Gram-negative bacilli including Acinetobacter baumannii, Pseudomonas aeruginosa, Klebsiella pneumoniae, Legionella pneumophila, Escherichia coli, and other enteric pathogens

METHODS
A prospective, multicenter trial involving 88 hospitals from 25 states within the United States and 4 Canadian provinces was conducted from July 2007 to February 2011. Local infection preventionists randomly collected cultures from inpatient and critical care units and patient floors with the use of a standardized, uniform collection method. An external central laboratory, blinded to the origin of the samples, conducted all microbiologic processing in accordance with Clinical Laboratory Standards Institute criteria (Figure 2).

RESULTS
Overall, 1103 basins were sampled during the study period, and 62.2% were contaminated with 1 or more of the following: Enterococcus species, Staphylococcus aureus, or Gram-negative bacilli. A total of 385 (34.9%) basins from 80 (90.9%) hospitals were colonized with VRE, 36 (3.3%) basins from 28 (31.8%) hospitals were colonized with MRSA, and 495 (44.9%) basins from 86 (97.7%) hospitals were colonized with Gram-negative bacilli (Table 1).

CONCLUSIONS
Bath basins frequently harbor pathogens associated with nosocomial infection. Multidrug-resistant organisms such as VRE and MRSA show a high rate of contamination of hospital bath basins. Hospital bath basins could be a potential source for the transmission of multidrug-resistant organisms.

PREVENTION STRATEGIES
The identification of bath basins as a reservoir of multidrug-resistant organisms warrants heightened safety precautions:
- Handle basins with gloves only.
- Avoid temporary storage of other medical equipment in basins.
- Store basins properly, in a uniform place in patient room.

Stringent methods to curb the incidence of hospital-acquired infections should also include:
- Basins should be perceived as carriers of multidrug-resistant organisms.
- Replacement of basin with disposable alternatives should be studied.