

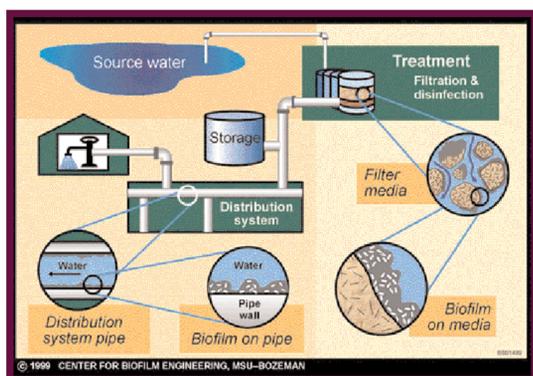
# Bugs Be Gone: Identify Potential Source of HAIs, the Basin

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## Overview

Healthcare associated infections (HAIs) in the U.S. are a growing problem. They affect an estimated 1.75 to 3.5 million U.S. patients (5-10%) annually, resulting in 90,000 annual deaths and a significant financial burden to our health care systems.<sup>1-4</sup> Researchers have identified hospital water supplies as likely sources for many HAIs, such as pneumonia, bacteremia, and urinary tract infections. One facility after going back to the basin from a pre-package disposable bathing product experienced a significant increase in the number of UTIs.<sup>5</sup> Biofilm-forming pathogens can create potent biofilms in hospital pipes, hot water tanks, sinks, and even touchless faucets, contaminating water upon contact.<sup>1,6-7</sup>

### Biofilm colonization in a water source.<sup>8</sup>



### Biofilm colonization on pipe.<sup>9</sup>



Hospital staff can also transmit pathogens both into and via water. Mechanical friction during bathing releases skin flora into water; therefore, basins can become a source for cross-contamination, and serve as a potential reservoir for the transmission of HAIs.<sup>1,10-12</sup> To date there has been only one published study on actual pathogen counts in the water in basins used by hospitalized patients. Shannon et al sampled patient bath water and found all samples (n=23) to be positive for bacterial growth.<sup>13</sup>

## Aim

Identify potential sources of bacterial colonization that may contribute to healthcare acquired infections through examining a routine nursing care activity, the basin bed bath.

## Measures

This project looked at microbial colonization of bath basins for patients in the hospital for > 48 hours. The sampling is part of a larger project that examined over 92 patient basins in 3 ICU's in different parts of the country. All basins were sampled by a registered nurse utilizing a culture sponge. The culture sponge was sent to an outside laboratory where qualitative and quantitative microbial tests were conducted. We also cultured medical-surgical floors but their samples are not included below.

### Typical examples of contaminated basins with used patient care items.



## Results

### Microorganisms within the Basin after at least 48 hours of use.

Table 1. Basin sampling qualitative and quantitative results: N=32\* (CCU & Telemetry)

Bacteria	Plate counts	% of sample	Enrichments	% of sample
Gram-negative rods	5	15.6%	12	37.5%
E. coli	2	6.3%	0	0
P. aeruginosa	0	0	0	0
S. aureus	1	3.1%	8	25%
MRSA	0	0	1	3.1%
Enterococcus	7	21.9%	22	68.8%
VRE	1	3.1%	4	12.5%
C. albicans	0	0	1	3.1%

Majority of samples yielded bacteria levels between 10 and 99,000 CFU/sponge (90.6%), with the most common count falling between 100 and 990 CFU/sponge (31.3%). Two of the thirty-two samples exceeded 1,000,000 CFU/sponge.

- A total of 68.8% (12) of samples grew Enterococcus during enrichment and 21.9% (7) of samples found Enterococcus on plate counts.
- Vancomycin-resistant Enterococcus was present in 12.5% (4) of samples during enrichment, and found on 3.1% (1) of samples on plate count. These were from patients with bath basins that were not previously diagnosis with VRE or MRSA.

Two positive samples came from patients in a semi-private room.

- One sample found MRSA on enrichment, and it should be noted the patient utilizing this basin contracted a sternal wound infection colonized with MRSA and subsequently died from complications.

Based on these findings, a larger study should be conducted targeted to examine the connection between bath basins as potential reservoirs for harmful bacteria and the spread of hospital-acquired infections.

## Changes

- **Presbyterian Hospital is evaluating alternative bathing methods** that do not require water/basin and continues to examine additional sources of bacterial colonization associated with traditional nursing care activities.
- **Presentations**, including data, made to the Education/Research council, Critical Care councils and Infectious Disease will be shared.
- **Policies and procedures** are being developed to complement the change in bathing practices.
- **Examining other potential environmental sources** that may contribute to the development of HAIs in at-risk populations.

## Lessons Learned

- **In light of new CMS regulations and National Patient Safety Campaigns**, all patient care activities and nursing care processes should be examined and studied to improve patient care.
- **Basins are contaminated**, become storage bins of used patient care items, are used for multiple activities like emesis and incontinence clean-up, and come in contact with the patient via water from head to toe.
- **Effective communication between team members**, getting the frontline staff involved and excited made it easier to conduct the study and evaluate a prepackaged bathing alternative.
- **Having a consultant to help guide the process** is most helpful if a mentor is not available in your institution.

## Team Contact

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