

# HANDWASH SINKS AND HOSPITAL ACQUIRED INFECTIONS (HAIs) SOLUTION OR A CONTRIBUTOR?

What is growing in your hospitals plumbing fixtures and waste water system could be contributing to Hospital Acquired Infections (HAIs). Pseudomonas, Klebsiella, superbugs, and other bacteria that can lead to pneumonia and other HAIs.

Until now the design of sinks and other plumbing fixtures have not changed for over a century. Handwashing has long been recognized as a leading means to reduce the transmission of disease and therefore we have installed them in the patient care environment. Regardless, sink drains have been found by researchers at the University of Virginia and elsewhere, to be a contributor to HAI's. Sinks can act as an ideal environment for antibiotic

resistant bacteria, as they thrive below the drain.

In 2016, Safe Health Solutions, LLC (SHS) set out to design and build a device to mitigate this risk and separate the contaminants in the sewer from the patient and staff. In 2017, the device was tested at the University of Nebraska Medical Center (UNMC) by Dr. James E. Talmadge in a lab environment. The device was tested to extremes that were well beyond anything that should be encountered in an actual install. Results exceeded expectations and those results were recently published in the Journal of Hospital Infection, which can be found on the following page along with an expanded view of the summary.

## SUMMARY

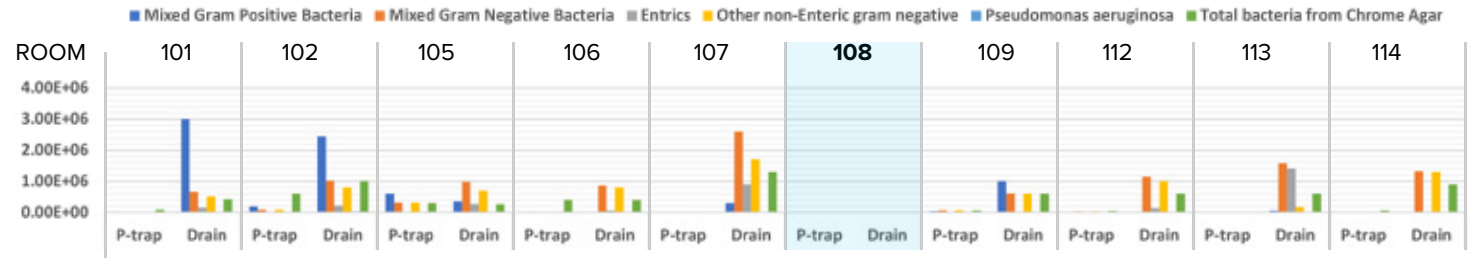


- Background** Healthcare-associated infections (HAIs) are a significant cause of increased medical costs, morbidity, mortality, and have been partly associated with sinks, their waste water outlets and associated pipework
- Aim** To determine whether an engineered sink could limit microbial aerosol contaminants in the air and sink basin.
- Methods** Multiple comparisons were undertaken between an experimental sink, designed to limit aerosolization and p-trap contamination to a control hospital sink, both connected to a common drain system. The experimental sink was equipped with ultraviolet light (UV), an aerosol containment hood, ozonated water generator and a flush system to limit bacterial growth/aerosolization and limit microbial growth in the p-trap. Nutrient material was added daily to simulate typical material discarded into a hospital sink. Surface collection swabs, settle plates and p-trap contamination levels were assessed for bacteria and fungi.
- Findings** The experimental sink had significantly decreased levels of bacterial and fungal p-trap contamination (99.9% for Tryptic Soy (TSA) and Sabouraud agar (SAB) plates) relative to the initial levels. Aerosol-induced contaminant from the p-traps was significantly lower for the experimental vs the control sink for TSA (76%) and SAB (86%) agar settle plates.
- Conclusions** Limiting microbial contamination is critical for the control of nosocomial infections of in-room sinks, which provide a major source of contamination. Our experimental sink studies document that regular ozonated water rinsing of the sink surface, decontamination of p-trap water, and UV decontamination of surfaces limits microbial aerosolization and surface contamination, with potential to decrease patient exposure and reduce hospital acquired infections.



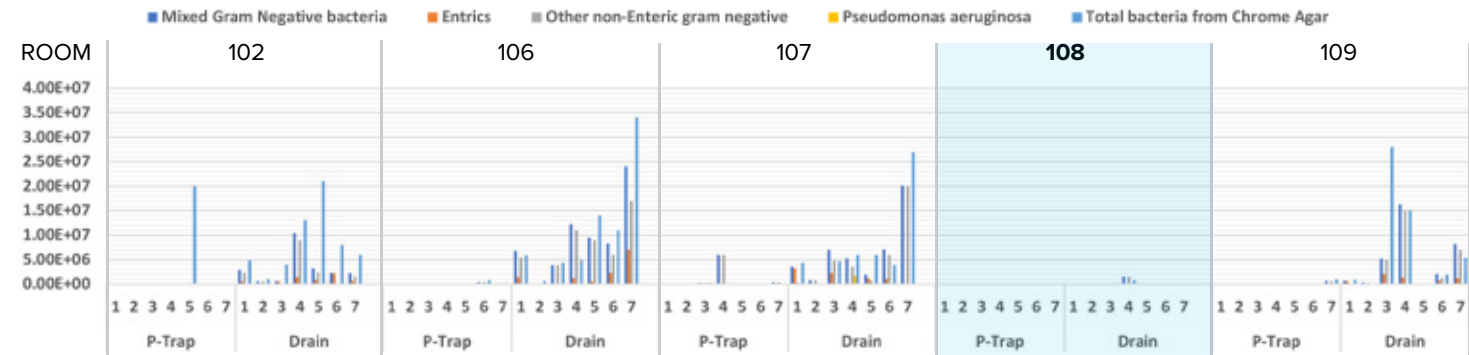
On September 1, 2018 at Children’s Hospital and Medical Center in Omaha, Nebraska, the Short Stay Unit (SSU) opened with a Safe Health Solutions (SHS) device installed in Patient Room 108. After four months of normal operation and infection control protocol, test samples were taken at the drain and the P-trap water. Results and analysis below were provided by the University of Virginia.

**SSU INITIAL TESTING 01/15/2019 - SHS DEVICE LOCATED IN ROOM 108**



A fourteen week follow up study was completed on four control rooms and patient room 108.

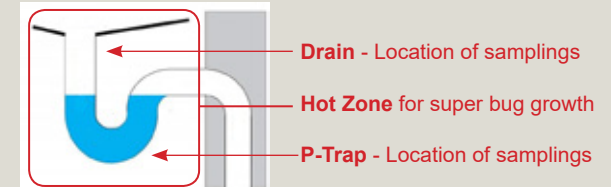
**SSU BI-WEEKLY TESTING RESULTS 03/20/2019 - 06/12/2019 SHS DEVICE LOCATED IN ROOM 108**



The only nonzero readings occurred in rounds 3 and 4 in the drain when the aqueous ozone flush time was dialed back to see what would happen. Once the first negligible readings to date were noted, the measures were returned to their original settings and the technology self-cleaned back to zeros. The original design goal of keeping contaminants from getting into the sink basin and therefore eliminating the basin as a contributor to Hospital Acquired Infections has been proven. Not only has this goal been achieved, the drain and P-traps sample tests are showing readings of **ZERO**.

**SINK BASIN AND STUDY AREA**

**Sink Basin** - Research testing found contaminants as far as 30 inches away onto surrounding surfaces and objects.



**Waste Water System** - Research has shown the connected system to be a pathway for contaminants to move from room-to-room at growth rates of one inch per day.

US Patent No: 10,151,084 B2  
Granted December 11, 2018

We believe this device will make sinks in clinical areas safe to wash hands and help combat HAIs.