



KEY POINT SUMMARY

OBJECTIVES

To investigate if and how i) if organisms are dispersed by hand dryers ii) if hand dryers provide a reservoir of bacteria iii) if bacterial spores are deposited on surfaces via hand dryer use.

Deposition of Bacteria and Bacterial Spores by Bathroom Hot Air Hand Dryers

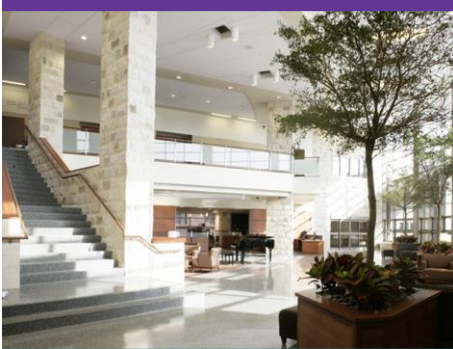
del Carmen Huesca-Espitia, L., Aslanzadeh, J., Feinn, R., Joseph, G., Murray, T. S., Setlow, P., 2018 | *Applied and Environmental Microbiology*. Volume 84, Issue 8, Page 1-11

Key Concepts/Context

Human skin is covered in both pathogenic and non-pathogenic flora, which can be transmitted from surface to surface in a way that may or may not be associated with nosocomial infection. The transmission of microorganisms within healthcare environments presents the possibility of nosocomial infection, especially in the cases of *Staphylococcus aureus*, enterococci, *Pseudomonas* spp, *Klebsiella* spp, and *Acinetobacter* spp. The efficacy of hand washing in reducing the transmission of these pathogens has been thoroughly investigated, but the use of hot air or jet dryers during this process has not been explored in depth. Although previous studies have shown that hand dryers can play a role in dispersing bacteria from hands and onto surrounding surfaces, researchers are still investigating the kinds of bacteria that are often dispersed and how exactly they are spread in the context of hand dryers.

Methods

Samples were taken from 36 hot air hand dryers installed in 18 women's and 18 men's bathrooms, as well as in adjacent science research areas in the same facility (all of which were connected by hallways that avoid clinical areas). Sample exposure ranged from 30 seconds at 12 inches from the air outlets to a full minute of exposure at the same distance. HEPA filters were then affixed to the dryers, with the aforementioned samples being gathered two days before and nine days after filter application. Fans in all rooms were sanitized and general bacterial levels in the surrounding spaces were measured. Bacterial presence on the inner nozzles of the dryers was also measured.



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Findings

Results indicate that many forms of bacteria, including potential spores and pathogens that may lead to nosocomial infection, can be deposited onto hands via hand dryers used in bathroom settings. Furthermore, these spores may be transmitted throughout building hallways and spread beyond the immediate radius of hand dryer dispersion.

Limitations

This study took place in a single healthcare facility with samples gathered over a relatively small window of time. The flow of patients, staff, and other personnel were not accounted for in the general assessment of bacterial levels. Only one model of hand dryer was tested.

Design Implications

Should a facility choose to install hand dryers in restrooms, this study suggests that they should be located far from clinical areas and/or other spaces that might increase the chances of patient exposure to infectious bacteria. HEPA filters may be affixed to hand dryers to reduce bacteria deposition.

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