

Construction and Children: The Perfect Pair for Bacterial Contamination in Clinics

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Background

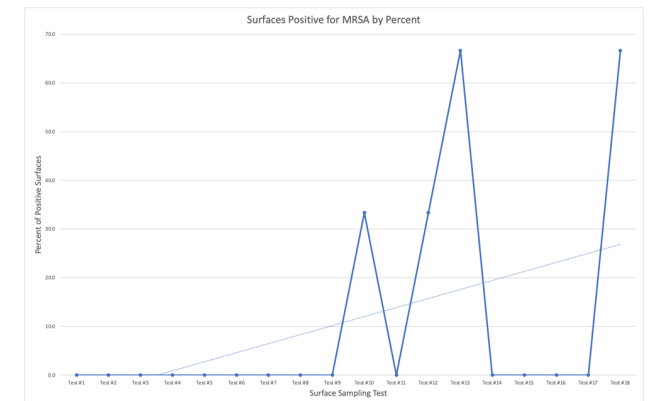
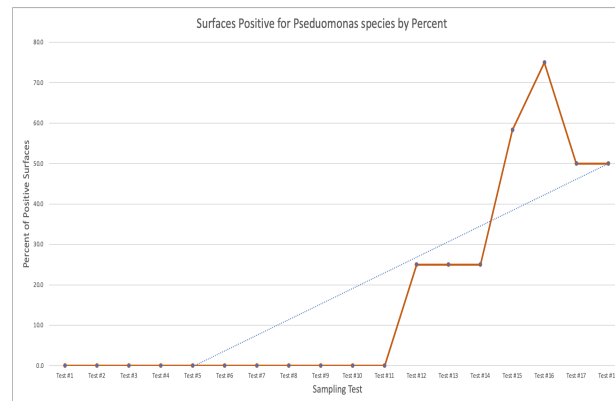
Pathogens that cause healthcare-associated infections (HAIs) can be transmitted from environmental surfaces in clinics, usually through direct contact on the hands of patients and visitors. A gap in the literature exists on the contamination of environmental surfaces with pathogens in newly constructed outpatient clinics. The objective of this study was to observe environmental contamination of Methicillin Resistant *Staphylococcus aureus* (MRSA) and *Pseudomonas* species (PASP) on surfaces in a newly constructed children's outpatient pulmonary clinic during construction and after patients began to use the facility.

Methods

The study was conducted at a hospital-based pediatric pulmonary outpatient clinic under the direction of UTC's Clinical Infectious Disease Control research group. The initial sampling was conducted while the clinic was undergoing construction and then continued for six months after patient visits began. Approximately 200cm² of surface area was thoroughly cultured at six sites (e.g., floors, counters, return air ducts) in each patient room on five separate collection dates, both during construction and after patient visits commenced. A total of 184 swabs from the clinic were assessed. Viable bacterial cultures isolated from surfaces in the outpatient clinics were identified using CHROM_MRSA agar for MRSA and Pseudomonas Isolation agar (PSI) for *Pseudomonas* species. Fisher's exact tests were run to compare the differences in bacterial burden. Nonparametric t-tests were used to identify factors significantly affecting the diversity of bacterial communities.

Results

MRSA presence increased from 3.2% of surfaces during construction to 37.3% of surfaces three months after patients were introduced ($p < 0.001$). *Pseudomonas* species presence increased from 0% during construction to 37% of surfaces after patient introduction ($p < 0.001$).



Conclusion

This large increase in contamination by these two pathogens reflects the fact that they are some of the most common pathogens of respiratory tract infections seen in pulmonary patients. These findings also support prior research that patients can inoculate spaces with their own flora, which can in turn, become part of the resident flora in the space. Further research is needed to determine if this increase in bacterial contamination is seen in other species in other types of newly constructed healthcare facilities.