



KEY POINT SUMMARY

OBJECTIVES

To conduct epidemiological and microbiological studies comparing hospital rooms with carpet to rooms without carpet.

DESIGN IMPLICATIONS

This study shows that carpets can be easily contaminated, additionally authors argue it can be costly to clean and difficult to disinfect, and because they do not dry as quickly after spills the authors suggest avoiding carpet in intensive care units (except those used for cardiac care), nurseries, pediatric patient care rooms, isolation rooms, operating and delivery rooms, kitchens, laboratories, autopsy rooms, bathrooms, and utility rooms.

Carpeting in Hospitals: An Epidemiological Evaluation

Anderson, RL, Mackel, DC, Stoler, BS, Mallison, GF
 1982 | *Journal of Clinical Microbiology*
 Volume 15, Issue 3, Pages 408-15

Key Concepts/Context

Choice of flooring in a healthcare environment has tremendous cost implications. The impact of flooring on health related issues are only just beginning to be considered. A common issue of contention in healthcare design environments is the use of carpets and the implications for patient satisfaction and safety issues. While research shows that carpets may act as microbial reservoirs (especially in areas that are busy and associated with patient care) the relevance to disease, i.e. the epidemiological relevance, is not clear. As carpet grows in popularity in healthcare environments this 1982 paper is one of the earlier research projects that investigate the microbiology associated with carpets in hospitals and the implication that has on infection control.

Methods

Over a period of approximately 11 months patients randomly admitted to pediatric patient rooms with carpet (CR) and without carpet (NCR) were medically and microbiologically studied. Data was collected on a) specific microorganism contaminating the carpet and the bare floor, and organisms isolated from the patients during hospitalization, and b) patients' case histories to look for the type of microbial infection or colonization and the potential link to the inanimate environment (or carpet). The carpet was a densely packed, loop-pile, wool carpet placed on a vinyl tile floor. Sampling of carpet and bare floors was comparable using carpet plugs samples for carpet, and a swab-template sampling method for the tile floors. Patient specimens included rectal, nasal, and throat swabs as well as samples from other parts of the body, collected 12 h after admission and again before discharge. Series of cultures were obtained to create a basis for the microbial profile for each patient. Additionally, air samples were evaluated to look at the level of air contamination. Finally, data were abstracted from individual patient records to look for specific information that could be related to the contamination profiles of the



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two rooms. These included LOS, presence of infection on admission or HAI, site, severity and type of infection, and other pertinent factors.

Findings

Recovery rates for specific microbial organisms (*Enterobacter* spp., *Klebsiella*, pneumoniae, and *Escherichia coli*) were higher from carpet samples than from bare floor samples.

Typable organisms (such as *E. coli*, *Pseudomonas aeruginosa*, *K. pneumoniae*, and *Staphylococcus aureus*) obtained from patients were more frequently recovered from the carpet than from the bare flooring.

Patients who stayed in the CR were shown to be colonized with the same types of organisms as those initially recovered from the carpet. However, no statistically significant differences were found in patients in the CR versus NCR in colonization with all typable and nontypable organisms first found on the floor.

Disease in patients was found not to be associated with organisms found as contaminants of the carpet or the bare floor.

Air above carpeting contained more consistent concentrations of organisms than air above the bare flooring.

With the methods used in this study, the carpet tested was found to contain much higher levels of microbial contamination per square inch of the entire carpet thickness than those measured for each square inch of a hard surfaced floor. However, authors did not find that any frank (clinically evident) disease in patients was caused by potentially pathogenic organisms found in the floor samples.

In summary, authors found no association between contamination of the carpet and HA infection; however, they did demonstrate that patients in the CR (but not in the NCR) were colonized with the same types of organisms that contaminated the carpet.

Limitations

This study is from 1982- more recent studies on the same should be referred to before making any design decisions. Developments have occurred since this study both in the methods of analyzing surface and air contamination, as well as the properties of the flooring materials, and associated cleaning protocols, which must be considered. However the study provides valuable insights in terms of a well triangulated methodology and potential risks associated with carpet.