

Volume 33, Issue 5, Pages e38-e39 (June 2005)

Efficacy of disinfectants and detergents for cleaning hospital environmental surfaces as part of documented cleaning protocols

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BACKGROUND: Concern over increasing nosocomial methicillin-resistant *Staphylococcus aureus* (MRSA) infection rates in the United Kingdom has led to discussion of routine environmental surface cleaning in hospitals. Documented cleaning protocols ensure better compliance and describe in detail the steps needed to clean specific surfaces and may specify the use of a detergent or disinfectant. Although disinfectants have antimicrobial activity, concerns have been expressed about antibiotic resistance, risks to human health from prolonged exposure, and wider environmental issues. Detergents are better at detaching soil from surfaces. However, if the detached soil is not removed, reattachment and recolonization can occur. The aim of the investigation was to assess the ability of cleaning protocols, with and without disinfectants, to reduce microbial counts on hospital environmental surfaces.

METHODS: A general surgical ward of a 500-bed hospital was selected. After existing cleaning practices had been completed, surface counts were taken from eight designated environmental surfaces, using direct contact methods. This was repeated every day for 14 days to obtain baseline contamination levels. Existing cleaning protocols were evaluated and modified in accordance with best practice. The 14-day sampling cycle was repeated using modified protocols with existing non-ionic detergent. This was followed by another 14-day cycle, using a quaternary ammonium compound (QAC) disinfectant in place of the existing detergent. Surface counts for each site were compared using ANOVA with Tukey comparisons ($p = 0.05$).

RESULTS: Compared to the existing protocol, the modified cleaning significantly reduced contamination on 7/8 surfaces using the existing detergent and 8/8 using QAC. No significant difference was seen between modified protocols using detergent and QAC disinfectant on any surface. The most contaminated site was the patient's toilet sink handle (mean 9.3 cfu/cm², range 1.8–25 cfu/cm² using existing protocols), but both modified protocols reduced this figure to >0.5 cfu/cm². The least contaminated site with existing cleaning protocols was the ward sink handles (0.9 cfu/cm², range 0.1–6.5 cfu/cm²). Both modified protocols reduced this figure to >0.5 cfu/cm².

CONCLUSIONS: Optimizing cleaning methods can significantly reduce surface counts and may be more important in microbial removal than the requirement to use a disinfectant.

Abstract ID 52436

Tuesday, June 21

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LWMC, Cardiff, Great Britain

PII: S0196-6553(05)00218-X

doi:10.1016/j.ajic.2005.04.036

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