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An international survey of cleaning and disinfection practices in the healthcare environment

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SUMMARY

Background: Antimicrobial resistance has become an urgent global health priority. Basic hygiene practices and cleaning and disinfection of the hospital environment are key in preventing pathogen cross-transmission.

Aim: To our knowledge no studies have assessed the worldwide differences in cleaning and disinfection practices in healthcare facilities. The electronic survey described here was developed in order to evaluate differences in healthcare facility cleaning practices around the world.

Methods: The International Society of Antimicrobial Chemotherapy (ISAC, formerly ISC), Infection Prevention and Control work group developed a survey with 30 multiple-choice questions. The questions were designed to assess the current cleaning practices in healthcare settings around the world.

Findings: A total of 110 healthcare professionals, representing 23 countries, participated in the online survey. In 96% of the facilities a written cleaning policy was present. Training of cleaning staff occurred in 70% of the facilities at the start of employment. Cleaning practices and monitoring of these practices varied.

Conclusions: The survey enabled assessment and recognition of widely differing global practices in approaches to environmental cleaning and disinfection. Development of guideline recommendations for cleaning and disinfection could improve practices and set minimum standards worldwide.

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Introduction

Antimicrobial resistance has become an urgent global health priority. Basic hygiene practices and cleaning and disinfection of the hospital environment are key in preventing pathogen cross-transmission.

Recently the cleaning and disinfection of the hospital environment has received more attention as an important measure to avoid the spread of pathogens. Surface-level cleanliness has been shown to be pivotal in healthcare settings to control the transmission of healthcare-acquired infections [1]. The World Health Organization developed a Global Action Plan, which endorses that cleaning and disinfection is pivotal to reduce antimicrobial resistance [2]. Peer-reviewed literature also shows that cleaning and disinfection is a key component to control outbreak situations in healthcare settings [3]. New, advanced technologies have become available for the cleaning and disinfection of the hospital environment [4–6]. However, their efficacy is not always known.

The available cleaning and disinfection guidelines have been in place for more than five years and a revision is therefore needed, considering the continuous changes in cleaning and disinfection in healthcare facilities [6,7]. To date, no specific international guidelines solely on the cleaning and disinfection of the operating theatre have been available. New technologies such as hydrogen peroxide vapour (HPV), UV-c light devices and antimicrobial coatings are frequently brought to the market. Different methods of delivery for cleaning and disinfection are evolving, for example ready-to-use cleaning plus disinfection cloths and sprays. To our knowledge, no studies have assessed the worldwide differences in cleaning and disinfection practices in healthcare facilities. The electronic survey described here was developed in order to evaluate differences in healthcare facility cleaning practices around the world.

Methods

The International Society of Antimicrobial Chemotherapy (ISAC, formerly ISC), Infection Prevention and Control (IPC) work group developed a survey with 30 multiple-choice questions. The ISAC IPC working group represents professionals from 50 different countries. The questions were designed to assess the current cleaning practices in healthcare settings worldwide. Two hospital settings were included in the survey; clinical ward areas and the operating theatres. Dissemination of the survey was through known infection control blogs, infection control societies, and through the professional networks of ISAC members. Data were collected from July 2016 to December 2016. If participants had identical IP addresses, the responses were excluded from the data. The survey is attached in [Appendix A](#).

Results

Participants

A total of 110 healthcare professionals, representing 23 countries (33% Europe, 17% Australia, 28% Asia, 18% North America, 3% South America, 1% Africa) participated in the online survey. The survey was completed by infection control

professionals (68%), ID physicians (13%), clinical microbiologists (6%), facility managers (2%), and other healthcare professionals (11%).

Cleaning policy and training

Of the 110 respondents, 96% had a written cleaning policy for clinical areas and 82% had a policy for shared clinical equipment. Ninety percent of the facilities had a cleaning policy in place for the operating theatre; 6% of respondents were not sure. When surveyed as to which healthcare workers (HCWs) were responsible for cleaning of clinical areas, it was found that this was mostly carried out by employees of the healthcare setting (57%), followed by employees of an external contractor (34%); in 9% of institutions responsibilities were shared between internal staff and contractors. Among the facilities reporting that HCWs were responsible for cleaning the areas outside of patients' rooms on the ward, 82% stated that the institution's dedicated cleaners were responsible, 14% that nursing staff were responsible, and in 4% the role was shared by nursing staff and dedicated cleaners. The HCWs responsible for the cleaning and disinfection of shared equipment were nurses (89%), cleaning staff (41%), physicians (20%), and other HCWs (23%), i.e. 'staff that used the equipment'.

Training of cleaning staff related to cleaning practices occurred in 70% of the facilities at employment; 46% received yearly training, 15% twice yearly, and 20% sporadic training.

Cleaning and disinfection methods

Worldwide, microfibre cloths and mops were the most frequently used method of delivery for routine cleaning (60%), followed by cotton cloths and mops (27%) ([Figure 1](#)).

In general, most patient rooms were routinely cleaned with either a disinfectant alone (25%) or with a combination of a detergent and disinfectant (27%) when either multidrug-resistant organisms (MDROs), carbapenemase-producing Enterobacteriaceae (CPE), or *Clostridium difficile* were present ([Figure 2](#)). When no MDRO, CPE or *C. difficile* were present, 38% of participating institutes used detergent only.

For terminal cleaning the most frequently used methods of delivery were microfibre cloths and mops (44%), followed by cotton cloths and mops (18%).

Terminal cleaning after discharge of a patient with MDRO, CPE, or *C. difficile* present was most frequently performed with a detergent and disinfectants (37%), followed by only disinfectants (30%). When no MDRO, CPE, or *C. difficile* were present, 33% used only a detergent for terminal cleaning, followed by 23% who used detergent and a disinfectant (23%).

Disinfectants

Halogens (82%) were the most frequently used disinfectants. In 33% of facilities surveyed, alcohols were used and in 32% of facilities surveyed quaternary ammonium cations (QATs) were used.

The disinfectants most often used for terminal room cleaning after a *C. difficile* carrier vacates a room were sodium hypochlorite (halogens) (82%), followed by hydrogen peroxides (24%), alcohols and QATs (6%), chlorhexidine (3%), and aldehydes (3%). In 10% of surveyed facilities, either no disinfectants or another type of disinfectant was used.

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