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Editorial

The healthcare environment and infection

Currently two subject areas dominate the pages of the *Journal of Hospital Infection*, multidrug-resistant Gram-negative bacteria (MDRGNB) and the role of the environment in the spread of healthcare associated infections. These two subject areas are inextricably linked as more evidence emerges of the role of the environment in the spread of MDRGNB in healthcare facilities. It has become increasingly clear that investment in control measures such as rapid molecular laboratory technology, and even increased capacity to isolate patients, is futile unless environmental reservoirs of MDRGNB are also dealt with.

Antifungal resistance too has been described as a global emergency, with recent outbreaks of multi-resistant *Candida auris* reported globally [1]. In England this year anti-fungal stewardship has been added to the Commissioning for Quality and Innovation (CQUIN) scheme [2]. This scheme makes a proportion of healthcare providers' income conditional on demonstrating improvements in quality and innovation in specified areas of care. However, whilst anti-fungal stewardship is important, again it is important to recognise that *C. auris* can successfully persist in the hospital environment. Moreover, this species can selectively tolerate clinically relevant concentrations of commonly used hospital disinfectants such as sodium hypochlorite [1].

Effective cleaning of the healthcare environment is therefore an essential component of our fight against antimicrobial resistance. National standards of cleanliness were first published in England in 2001, and have since been updated on several occasions. However, the general tenet of the various iterations of this guidance has remained largely unchanged. Standards of cleanliness for different items are described, but not the methods required to achieve those standards. For information on methods, healthcare staff must refer to the Revised Healthcare Cleaning Manual, published ten years ago, which contains 83 technical methods statements for tasks performed by cleaning staff alone. However, despite the comprehensiveness of this document, individual methods statements do not necessarily help cleaning staff plan how to clean clinical areas that present varying challenges for effective cleaning from day to day. In this regard, the article in this issue by Dancer and Kramer that advocates a four-step (LOOK, PLAN, CLEAN and DRY) guide for daily cleaning would seem to offer promise as a practical overall guide to cleaning [3].

The national standards of cleanliness are currently under review, and it is anticipated that the next version will incorporate method statements to support the standards. However, it is intriguing as to whether the revised standards will address some of the key issues around environmental cleanliness that have been the focus of recent publications in the *Journal of Hospital Infection*.

The first of these is the growing role of technology in healthcare. In an Editorial last year Professor Wilson noted that relatively little attention has been paid to the cleaning of technology equipment, such as hand held devices and computer keyboards [4]. There remains no generally accepted guidance on how to reduce contamination of such devices in the healthcare setting; use of standard hospital cleaning agents or disinfectants is at best likely to void manufacturers' warranties, and at worst irreparably damage equipment. Alternative approaches to decontamination, such as UV-based technology, are rapid and efficient, albeit disinfection must be maintained at regular frequency to minimize recontamination of surfaces [5]. There is still a lot to learn about the infection risks associated with such equipment. Even when potential pathogens are found on such devices it is not necessarily the case that they are the same strains as isolated from patients [6]. However, it is striking how carriage and use of personal mobile devices has become so commonplace amongst patients, visitors and staff over a very short time period; it seems like only yesterday that hospitals did not allow mobile telephones in clinical areas because of concern that their use would interfere with electronic medical devices. The sheer ubiquity of personal mobile devices would seem reason enough to believe that they must sometimes be implicated in the transmission of healthcare associated infections.

A second key issue is the role of water outlets in the transmission of infection, and in particular the risks associated with poor drainage exemplified in laboratory and clinical studies recently published in the JHI [7,8]. One of the problems with strict isolation of patients carrying carbapenemase-producing Enterobacteriaceae is the likelihood that patients and visitors will use handwash basins in isolation rooms for purposes other than hand hygiene, increasing the risk of MDRGNB being able to flourish in the drainage systems. Whilst the long-term solution to poor drainage may be an engineering one, in the shorter term recognition of the risks posed by drainage systems can only be mitigated against by cleaning and disinfection not just of sinks and drains, but also surrounding surfaces.

With cleanliness of the healthcare environment receiving both the scientific and government attention that it deserves, it is not at all surprising that we have been able to collate a collection of articles on this subject that are published online at the end of

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this issue. These are high quality articles that are not only informative, but be hope will also prompt readers to review practices in their own institutions and stimulate further research.

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