

In this article...

- Role of the nurse in environmental decontamination
- Escalating cleaning issues
- Examples of decontamination in practice

Environmental decontamination 2: the role of the nurse

Key points

Nurses are responsible for cleaning and disinfection of equipment such as blood pressure cuffs and electronic monitoring equipment

Approaches to the decontamination of items will be influenced by their intended use, the risk of soiling, and associated infection risk

Poor decontamination practices can result in outbreaks of healthcare-associated infection

Equipment should be decontaminated using a 'clean-to-dirty' approach – the sites at most risk of contamination are decontaminated last

Nurses have an important role in escalating issues related to decontamination

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Abstract This is the second article in our three-part series exploring environmental decontamination in healthcare settings. It discusses the role of nurses in the environmental decontamination process, and how they interact with other professional groups to deliver a clean and safe environment for healthcare.

Citation Otter J, Galletly T (2018) Environmental decontamination 2: the role of the nurse. *Nursing Times*; 114: 8, 30-32.

Effective environmental decontamination facilitates the prevention and control of infection. It is a requirement of the Health and Social Care Act 2008 code of practice ([Bit.ly/HSCA2008Code](http://bit.ly/HSCA2008Code)) and national standards in the devolved administrations. Nurses play a key role in environmental decontamination in a number of areas including:

- Direct responsibility for decontaminating items such as commodes and blood pressure monitors;
- Collaborating with cleaning and housekeeping staff;
- Developing decontamination policies and training schedules;
- Delivering training and education;
- Auditing the cleaning process, informing purchasing decisions and escalating cleaning issues;
- Supporting and driving innovation (Jeanes, 2005).

Decontamination

Nurses have direct responsibility for the cleaning and disinfection of items including shared and mobile patient care equipment, such as blood pressure cuffs and electronic

monitoring equipment. Inadequate decontamination between patients can lead to undetected transmission of pathogens or a point-source outbreak of healthcare-associated infection (HCAI) (Otter et al, 2011; Layton et al, 1993). As these items are usually decontaminated immediately after use rather than according to a fixed schedule, it is important that the appropriate cleaning and disinfection equipment is available.

The availability of combined cleaning and disinfection wipes is an important innovation that has brought effective decontamination to the point of care. However, one emerging challenge is the potential for contamination of mobile 'high-touch' electronic devices such as mobile phones and tablets (Manning et al, 2013; Brady et al, 2009). Nurses play an important role in ensuring hospital policies and procedures are adhered to when using these devices, as well as specifying decontamination strategies for them.

Escalating cleaning issues

Nurses working in all healthcare settings have an important role in escalating issues related to decontamination. This requires

forging strong relationships with all stakeholders in the decontamination process, from ward-based cleaners to senior managers. For example, if a cleaner is not available to perform their duties on a given day, this may need to be highlighted to senior management. Similarly, if cleaning is not being performed to required standards, this may need to be escalated.

Developing policies and training

Perhaps the single most important role for nurses in supporting decontamination in healthcare settings is in the development of policies, procedures and training schedules; these should take into account the various decontamination challenges. The approach to the decontamination of items will be influenced by their intended use, the risk of soiling and the associated infection risk (Fig 1).

Typically, policies for the decontamination of medical devices (critical and semi-critical items such as endoscopes and probes) are separate from the cleaning and disinfection of non-critical devices (those that come into contact with intact skin, such as beds and blood pressure cuffs). The cleaning and disinfection policy for non-critical items should:

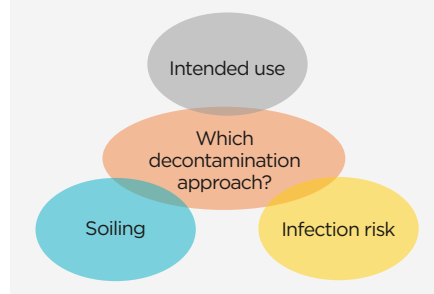
- Outline the approach for daily cleaning and cleaning at time of patient discharge;
- Specify when enhanced cleaning and disinfection is required (for example, when a patient is known to be infected or colonised with a pathogen associated with HCAI);
- Communicate the various levels of cleaning and disinfection, and when they should be used;
- Specify the appropriate cleaning materials and chemicals to be used;
- Delineate responsibilities for managing the decontamination of specific devices (who cleans what).

In addition to decontamination policies, specific training for all staff involved in decontamination is needed.

Delivering training and education

Nurses often have a role in the delivery of training related to environmental decontamination but the extent of their involvement depends on how cleaning is delivered in the organisation. For example, if a cleaning contract is outsourced, the management structures around the role of nurses are likely to be different than if cleaning is an in-house service. Regardless of where the cleaning contract sits, a close working relationship between nursing and cleaning staff is essential.

Fig 1. Factors influencing a decontamination approach



One particularly important area for training and education is the appropriate use of personal protective equipment (PPE) and hand hygiene for all involved in cleaning and disinfection. There is a tendency to over-use gloves: they are only required when dealing with blood and body fluids, or when handling certain chemicals. There is no need to use gloves for most cleaning and disinfection tasks (Loveday et al, 2014); when they are used, hand hygiene should be performed when they are removed to eliminate any contamination being transferred to hands during glove removal.

Auditing the cleaning process

The cleaning process can be audited in a number of ways. The most commonly used method is observational cleaning audits specified in the *National Specifications for Cleanliness in the NHS* (National Patient Safety Agency, 2007), which provides a framework for a monthly audit to be performed by cleaning and nursing staff.

Increasingly tools to provide a quantitative, objective assessment of cleaning performance – such as fluorescent markers or adenosine triphosphate bioluminescence – are being used (Boyce et al, 2011; Carling et al, 2008). These methods provide a quantitative measurement as to whether an item has been decontaminated adequately, and can be used to support training and audit (see Part 3).

Microbiological sampling of the healthcare environment is sometimes undertaken to measure the performance of cleaning, but this is generally only used in outbreak investigations (Otter et al, 2011). The advantages and disadvantages of methods used to evaluate cleaning will be explored in more detail in Part 3 of this series.

Informing purchasing decisions

Nurses have a unique skillset that is vital when undertaking purchasing decisions related to environmental decontamination.

For example, when specifying the key performance indicators for a cleaning service, nursing expertise is required to ensure that indicators are appropriate and objective.

Once a cleaning service is established, ongoing purchasing decisions require input from nursing staff; for example, specifying the most appropriate disinfectants requires a focused understanding of the key issues including whether the efficacy claims of a given disinfectant are plausible (Siani et al, 2011).

Supporting and driving innovation

Embedding a culture of continuous innovation is a vital part of assuring a successful and sustainable decontamination programme. Potentially useful innovations will need to be reviewed systematically by a multidisciplinary group to ensure that cost-effective innovations to improve the standards of decontamination are implemented. Some examples of emerging innovations in decontamination include:

- Improved hospital design;
- New liquid disinfectant formulations;
- Combined cleaning and disinfection wipes;
- Automated room decontamination technology.

Decontamination in practice

While responsibilities for cleaning specific items is often divided between different professional groups, this must not lead to an 'us and them' culture – there must be an ongoing focus of creating a multiprofessional cleaning and disinfection team culture. To provide a practical overview of how environmental decontamination works in practice, a number of examples have been outlined in Box 1 (page 32); these include effective decontamination for a mobile blood pressure monitor, a commode, an intravenous infusion stand, a bedside locker and an endoscope.

Conclusion

Nurses play a crucial role in environmental decontamination in healthcare settings. They should be provided with education and training to give them a detailed understanding of their role and the importance of collaborative working, and should be empowered to escalate cleaning issues when necessary. The approach to decontamination of items is influenced by their intended usage, the risk of soiling, and the associated infection risk. **NT**

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Box 1. Decontamination of care devices

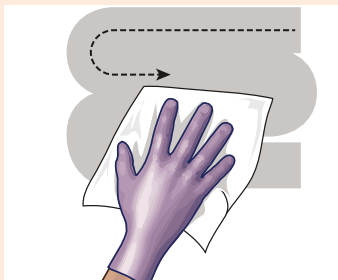
Blood pressure monitor

Mobile blood pressure monitors come into contact with unbroken skin and are classified as non-critical devices (see Part 1). However, they have been implicated in outbreaks of healthcare-associated infections (HCAs) (Layton et al, 1993) and responsibility for cleaning – especially the parts that come into contact with patients – usually falls to nurses.

Combined cleaning and disinfection wipes are often used to decontaminate blood pressure monitors between patients. Blood pressure cuffs, which come into contact with patient skin and are touched frequently by nursing staff, can be difficult to decontaminate. Their material and design should be chosen with input from infection control experts to facilitate effective decontamination. Disposable single-patient-use cuffs are used in some settings.

Commodes

Commodes can become heavily soiled with faecal material and have been linked with outbreaks of *Clostridium difficile* and



norovirus (Jia et al, 2016; Otter et al, 2011). They are usually cleaned, disinfected and stored in sluice rooms on wards, and responsibility is often shared between nursing and ward-based cleaning staff. Because of the risk of heavy soiling with faecal material, commodes

require thorough cleaning and disinfection using a sporicide between each patient. This can be achieved either through a two-step process, using a detergent followed by a chlorine-based disinfectant, or using one-step sporicidal cleaning and disinfection wipes (Siani et al, 2018). Care should be taken in selecting sporicidal wipes, because some wipes with sporicidal claims have minimal sporicidal activity when tested independently (Siani et al, 2011).

All removable parts should be taken off and cleaned separately, with the side touching the patient cleaned first. The

frame should be decontaminated following a clean-to-dirty, top-to-bottom approach using an S-shaped motion.

Infusion stands

Infusion stands can come into contact with staff hands, patient hands and intact skin, so are classified as non-critical devices. The responsibility for cleaning them will vary: in some settings they are decontaminated by nursing staff – usually using cleaning and disinfection wipes; in others, they are decontaminated in a central facility by non-clinical cleaning staff. Infusion stands should be decontaminated with a clean-to-dirty approach, where the sites at most risk of soiling and microbial contamination are decontaminated last; this will result in a top-to-bottom order of decontamination, with the wheels decontaminated last.

Bedside locker

Lockers are classified as non-critical devices. It is worth remembering that patients store items for consumption, such as snacks and drinks, in lockers. Since bedside lockers are high-touch sites in the near-patient environment, they frequently become contaminated with pathogens that can cause HCAs (French et al, 2004). The responsibility for cleaning bedside lockers usually falls to ward-based cleaning staff. In line with local policy, they should be cleaned using a detergent – and in some scenarios then disinfected, or decontaminated with a wipe that combines a detergent and disinfectant. Bedside lockers should be cleaned with a clean-to-dirty approach, beginning with the inside and working towards the outside, moving from the top to the bottom of the locker.

Endoscope

Endoscopes have contact with mucous membranes and are classified as semi-critical devices, which require high-level disinfection. Inadequately disinfected endoscopes have been implicated in the transmission of HCAs (Epstein et al, 2014). They are usually decontaminated in purpose-built facilities using validated procedures and the specific method chosen will depend on several factors including the design of the endoscope, the required turnaround time, and cost implications.

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CLINICAL
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decontamination series**

Part 1: The importance of environmental decontamination
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Part 2: Key role of nurses in environmental decontamination

Part 3: Performing effective auditing of environmental decontamination