

Principles of environmental cleaning: product selection

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Background

Environmental cleaning is an important strategy for reducing the transmission of pathogenic organisms and preventing healthcare-associated infections in healthcare settings.¹ The role of environmental cleaning is to reduce the number of infectious agents that may be present on surfaces and minimise the risk of transfer of microorganisms from one person/object to another, thereby reducing the risk of infection.²

Environmental cleaning is a key component of standard precautions; the first-line in infection prevention and control in the healthcare environment.³ These work practices are recommended for the treatment and care of all patients. The importance of environmental cleaning and decontamination is enhanced when these processes are used as part of transmission-based precautions and outbreak management.

Environmental cleaning should be considered as a key part of a comprehensive infection prevention program in hospitals, with programs put in place to support good cleaning performance and should include strategies to optimise product use, technique, audit and feedback, education of cleaners and communication¹. The National Safety and Quality Health Service Standards⁴ require health service organisations to have processes in place to maintain a clean and hygienic environment, in line with the current edition of the Australian Guidelines for the Prevention and Control of the Infection in Healthcare, and jurisdictional requirements, that:

- a. Respond to environmental risks, such as local outbreaks and pandemics
- b. Require cleaning and disinfection at recommended cleaning frequencies
- c. Include workforce training in the appropriate use of specialised personal protective equipment.

This document outlines the principles of product selection for environmental cleaning in acute care settings. Adoption of these principles in other healthcare settings should be assessed by those organisations.

The principles outlined in this document have been adapted from current literature and existing resources produced by NSW Health^{5,6}, the Tasmanian Department of Health⁷ and Human Services, and SA Health.²

Key Principles

1. Using detergent

- A detergent is a surfactant that facilitates the removal of dirt and organic matter
- Most hard surfaces can be adequately cleaned with warm water and a neutral detergent as per the manufacturer's instructions
- Physical/mechanical cleaning with a detergent and water is recommended for routine cleaning³
- Routine cleaning of floors with detergent and water is recommended.² Newly cleaned floors may become rapidly re-contaminated from shoes, equipment wheels, dust etc and microorganisms on floors, but pose minimal risk to patients.

2. Using disinfectant

- A disinfectant is a chemical agent that rapidly kills or inactivates most infectious agents. Disinfectants are not to be used as general cleaning agents, unless combined with a detergent as a combination cleaning agent (detergent-disinfectant)²
- Disinfection should always be undertaken following, and in addition to, detergent cleaning⁷
- Use of a disinfectant is necessary (Figure 1):
 - for cleaning surfaces (including floors) suspected or known to have been contaminated by a multi-resistant organism; an organism with outbreak potential; and/or, other potentially infectious material including blood and other bodily fluids³
 - in high or extreme risk settings (according to local risk assessment)
 - for discharge cleaning after caring for a patient with multi-resistant organisms or other infectious diseases.^{3,5,8}

- The routine use of a disinfectant in other areas of a healthcare facility, or for all discharge cleaning, should be determined locally by infection prevention and control team, after undertaking a risk assessment that considers local disease epidemiology, the implementation of local screening policies and jurisdictional guidelines and policies.

3. Choosing a disinfectant

- When assessing and selecting a disinfectant in the healthcare setting, factors such as kill claims, wet contact time, compatibility, safety, ease of use and value for money should be considered. Table 1 lists the factors to consider when choosing a disinfectant
- Only hospital-grade disinfectants with specific claims listed on the Australian Register of Therapeutic Goods (ARTG) or a chlorine-based product, such as sodium hypochlorite, should be used. For more information on the active agents in disinfectants and their mode of action, refer to Table A2.6 of the Australian Guidelines for the Prevention and Control of the Infection in Healthcare
- The assertions regarding the efficacy of a chemical should be carefully assessed by the local Infection prevention and control team and include a determination as to whether the disinfectant will be effective for its intended use²

- A disinfectant solution, when used according to the manufacturer's directions should contain a minimum of 1000 ppm available chlorine. Disinfectant solution can be either a single disinfectant product that is used after a detergent clean, or a combined detergent-disinfectant (2-in-1) product.⁷

4. Disinfectant use

- Care should be taken to ensure the correct chemical is used appropriately and in accordance with the manufacturer's instructions for use
- When using a disinfectant, ensure the correct contact time (i.e. the amount of time necessary for the disinfectant to be in contact with the surface to inactivate micro-organisms). Wet contact time should be at least 10 minutes³ but always refer to the manufacturer's instructions for use
- Once sufficient wet contact time has been achieved, the surface should be allowed to air-dry completely
- Ensure regular replacement of solutions, especially when cleaning heavily contaminated areas; when solutions appear visibly dirty; and, immediately after cleaning blood and body fluid spills
- Ensure that hand hygiene, appropriate personal protective equipment use and correct waste disposal processes are used when handling a disinfectant.

Figure 1. When to use a disinfectant in routine cleaning³

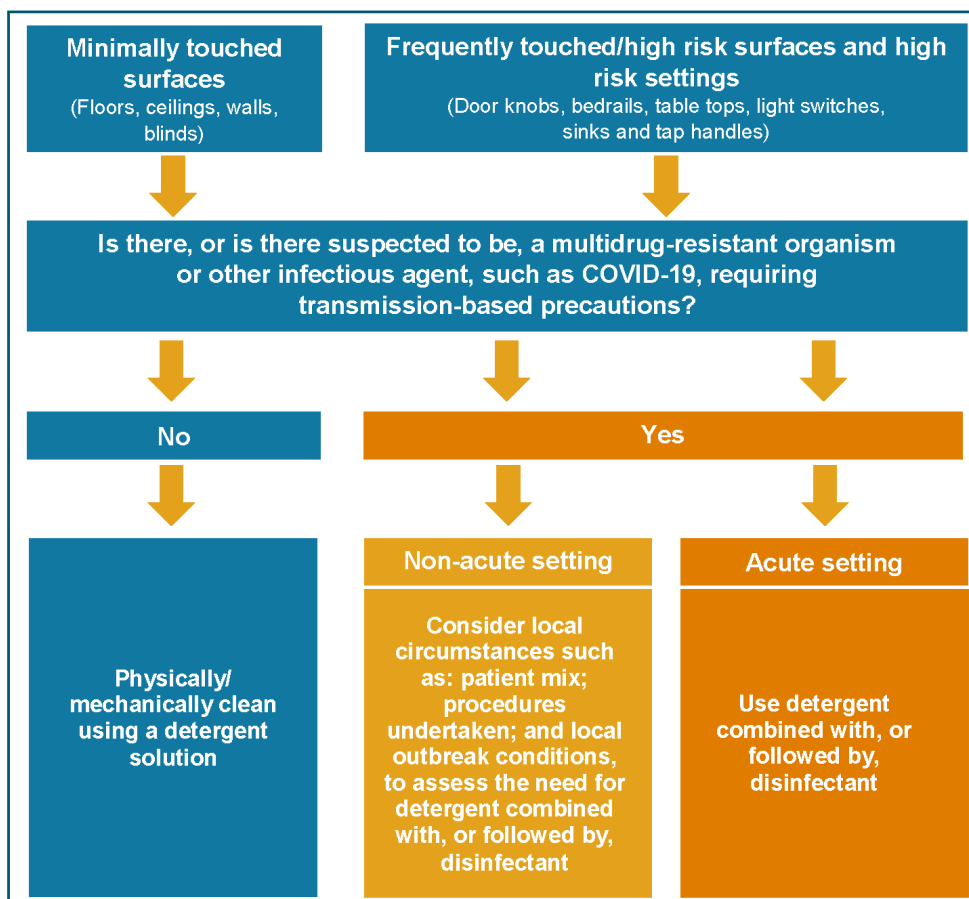


Table 1: Questions to ask when selecting disinfectants for healthcare facilities¹

Factors to consider	Questions to ask ^{3,8,10}
Kill claims	<p>Does the product:</p> <ul style="list-style-type: none"> • Kill pathogens that cause most HAIs, outbreaks, and are a major issue in our facility (see Table 1)? • Have sustained activity once used on a surface? • Work in the presence of organic matter (blood, sputum, faeces)? • Testing match real life scenarios? • Kill pathogens quickly?
Wet-contact times	<ul style="list-style-type: none"> • Is it "fast-acting"? • Does it keep surfaces wet for enough time to kill pathogens? • How long before the disinfectant evaporates? • Is the product inactivated by organic material?
Compatibility	<ul style="list-style-type: none"> • Is it compatible with the surfaces in our facility? • Is it compatible with other products in use? • Is it compatible with medical equipment?
Safety	<ul style="list-style-type: none"> • What is the toxicity rating? (Consider exposure of staff, visitors and patients) • Is it approved by a relevant regulatory body? • What personal protective equipment will be required?
Ease of use	<ul style="list-style-type: none"> • Does it come in the forms that our facility needs (wipes, sprays, liquids)? • Are the instructions clear? • Does it need dilution or is it a ready made solution? • Is it a two step or one step product? • How much training will be required and who will provide this training? • Can the product help you to standardise practices in your facility?
Value for money	<ul style="list-style-type: none"> • Is it the most cost effective option? (Consider product capabilities, efficiencies through improvements in cleaning compliance/standardisation and potential transmission avoided)

References

- Hall, L., Mitchell BG. Cleaning and decontamination of the healthcare environment. In: Walker J, editor. Decontamination in Hospitals and Healthcare. 2nd ed. London: Woodhead Publishing; 2019. p. 227-39.
- SA Health. Cleaning Standard for South Australian Healthcare Facilities. [Online] Adelaide: SA Health; 2014 [cited 14 October, 2014]; Available from: <https://www.sahealth.sa.gov.au/wps/wcm/connect/public+content/sa+health+internet/clinical+resources/clinical+topics/healthcare+associated+infections/prevention+and+management+of+infections+in+healthcare+settings/environmental+hygiene+in+healthcare#Cleaningstandard>.
- National Health and Medical Research Council, Australian Commission on Safety and Quality in Health Care. Australian Guidelines for the Prevention and Control of Infection in Healthcare. Canberra: National Health and Medical Research Council; 2019.
- Australian Commission on Safety and Quality in Health Care. National Safety and Quality Health Service Standards (second edition). [Online] 2017 [cited 16 October 2019]; Available from: <https://www.safetyandquality.gov.au/publications/national-safety-and-quality-health-service-standards-second-edition/>.
- Clinical Excellence Commission. Environmental Cleaning Standard Operating Procedures. [Online] Sydney Clinical Excellence Commission; 2012 [cited 14 October 2019]; Available from: <http://www.cec.health.nsw.gov.au/patient-safety-programs/infection-prevention-and-control/cleaning-and-reprocessing>.
- NSW Health. Cleaning of the Healthcare Environment. [Online] Sydney: NSW Health; 2020 [cited 25 August 2020]; Available from: https://www1.health.nsw.gov.au/pds/ActivePDSDocuments/PD2020_022.pdf.
- Tasmanian Government. Issue brief: Selection of disinfectant for environmental surface disinfection across the Tasmanian Health Service. Hobart: Department of Health and Human Services; 2017 [cited 16 October 2019].
- Centers for Disease Control and Prevention. Guidelines for environmental infection control in health-care facilities. Recommendations of CDC and the Healthcare Infection Control Practices Advisory Committee (HICPAC). [Online]: U.S. Department of Health and Human Services; 2003 [cited 16 October, 2019 RR-10]; 1-42.]. Available from: <https://www.cdc.gov/infectioncontrol/guidelines/environmental/>.
- Rutala WA, Weber DJ. Selection of the ideal disinfectant. Infection Control and Hospital Epidemiology. 2014;35(7):855-65.
- Rutala WA, Weber DJ. Monitoring and improving the effectiveness of surface cleaning and disinfection. American Journal of Infection Control. 2016; 44(Supplement 5):e69-e76.