Safe Management of the Care Environment (Environmental Decontamination and Management of Blood and Body Fluid Spillages) Literature Review

Evidence Tables

Version 1.0

25 March 2026

Antimicrobial Resistance & Healthcare Associated Infection (ARHAI) Scotland
An NHS Scotland Assure Service

Version history

This literature review will be updated in real time if any significant changes are found in the professional literature or from national guidance or policy.

Version	Date	Summary of changes
V1.0	March 2026	New document.

Contents

Introduction

All studies which are critically appraised as part of the literature review are assigned a grade of evidence based on the SIGN 50 methodology grading system (SIGN, 2019), which allows scientific studies to be assessed for quality using a number of reviewing forms (available from the SIGN website). Guidelines are appraised and graded using the AGREE II grading system (details available from the AGREE website).

Main conclusions from evidence sources (studies and guidance) are summarised along with a brief description of the methods and limitations within evidence table entries. Evidence sources with sufficient quality, which specifically answer a defined research question, are grouped together to enable the formation of an overall assessment regarding the evidence base.

Evidence grading

The following grades were given to the papers included in this evidence table:

SIGN 50 evidence levels

Grade	Description
1++	High quality meta analyses, systematic reviews of RCTs, or RCTs with a very low risk of bias
1+	Well conducted meta analyses, systematic reviews of RCTs, or RCTs with a low risk of bias
1-	Meta analyses, systematic reviews of RCTs, or RCTs with a high risk of bias
2++	High quality systematic reviews of case-control or cohort studies. High quality case-control or cohort studies with a very low risk of confounding, bias, or chance and a high probability that the relationship is causal
2+	Well conducted case control or cohort studies with a low risk of confounding, bias, or chance and a moderate probability that the relationship is causal

Grade	Description
2-	Case control or cohort studies with a high risk of confounding, bias, or chance and a significant risk that the relationship is not causal
3	Non-analytic studies, for example case reports, case series
4	Expert opinion

AGREE II evidence levels

Grade	Description
AGREE 'Recommend'	This indicates that the guideline is of high overall quality and can be considered for use in practice without modifications.
AGREE 'Recommend with modifications'	This indicates that the guideline is of moderate overall quality. This could be due to insufficient or lacking information in the guideline for some items. If modifications are made, the guideline could still be considered for use in practice when no other guidelines on the same topic are available.
AGREE 'Do not Recommend'	This indicates that the guideline is of low overall quality and has serious shortcomings. Therefore, it should not be recommended for use in practice.

Research questions for evidence tables

Question 1: What is the risk of Healthcare Associated Infection (HAI) from the care environment?

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Chen LF, Knelson LP, Gergen MF, et al. A prospective study of transmission of Multidrug-Resistant Organisms (MDROs) between environmental sites and hospitalized patients-the TransFER study. Infect Control Hosp Epidemiol. 2019;40(1):47-52.	Prospective cohort study	Level 2+	Terminal cleaning using bleach and/or ultraviolet light (UV-C).	Terminal cleaning with quaternary ammonium disinfectant (QA).	1. “The baseline and subsequent patterns of patient colonisation and hospital surface contamination.” 2. “The number of microbiological and molecularly proven bacterial transfer events between hospital surfaces and patients.”

Assessment of evidence
Country: US (North Carolina) Setting: general medicine services and oncology wards Cohort: 80 participants split into four groups (20 per group) based on terminal cleaning product (bleach, QA, bleach + UV-C, QA + UV-C). To investigate transmission of multi-drug-resistant organisms (MDROs) between the environment and patients, by utilising microbiological and molecular methods. Specimens were taken from patients and the environment at day 0, three and seven of the study, and each week thereafter. Patients were excluded if they had been placed into the room prior to screening and baseline sampling, and testing of molecular similarity between patient colonisation and environmental room sample, and testing at day 0 was done to mitigate outcome at enrolment. **Limitations:** • Only tested for certain pathogens so other transmission events could have occurred. • Study did not provide information on what environmental surfaces were swabbed for MDRO's. • Confounding variables may have impacted results regarding the direction of transmission results, including infection prevention and control (IPC) measures such as hand hygiene, healthcare worker transfer, visitor transfer, external vectors fomites from contaminated equipment, antibiotic treatment). • Lack of terminal cleaning protocol or noted frequency for evaluation. • Lack of pathogen viability testing. **Conclusions:** Detection of four environment to patient events; one patient colonised with vancomycin resistant *enterobacteria* and three with *Clostridioides difficile* infection (CDI) (one asymptomatic case). For the three CDI events, the rooms were terminal cleaned with either bleach (1) or QA (2), suggesting that terminal room disinfection was inadequate for these specific pathogens. Only two of

Assessment of evidence
the four environment to patient cases had the presence of molecularly related isolates (both CDI). Along with the four reported events of bacterial transfer from patient to environment, the findings of MDRO surface contamination after terminal disinfection in 44 of 80 (55%) patient rooms indicate presence of risk for ongoing transfer to future room occupants, staff & visitors. However, it is unclear if the identified MDRO's were viable pathogen with the ability to transmit to hosts. Moreover, IPC practices and patients in US hospital settings may not be applicable to UK settings and patients.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Cheng VCC, Wong SC, Cao H, et al. Whole-genome sequencing data-based modeling for the investigation of an outbreak of community-associated methicillin-resistant Staphylococcus aureus in a neonatal intensive care unit in Hong Kong.	Outbreak study	**Level 3**	N/A	N/A	N/A

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Eur J Clin Microbiol Infect Dis. 2019;38(3):563-573.					

Assessment of evidence

Country: Hong Kong

Setting: 16-bed neonatal intensive care unit (NICU) from 04 September 2017 to February 2018

Cohort: 15 patient cases, one healthcare worker case and three environmental isolates

IPC measures in place included: contact tracing and screening to detect asymptomatic patients (nasal swabs), contact precautions and isolation, terminal cleaning of cubicle or room with chlorine dioxide solution (125ppm) when a patient tested positive, “enforced” hand hygiene and environmental cleaning and decolonisation (intranasal mupirocin twice daily, 4% chlorhexidine bathing daily for five days). In a second phase, admission screening, weekly patient screening and environmental samples (from incubators, resuscitaires, ventilators, infusion pumps, designated stethoscopes, phototherapy lamps, touchscreen monitors, computer keyboards and bedside tables), and hand hygiene observations were also implemented. Equipment was also sampled (filing cabinets, milk fridges, milk preparation areas, trolleys, sinks, scales, ultrasound equipment and telephones). In a third phase of IPC precautions, cohort nursing, equipment segregation and HCW testing were implemented.

Case (n=13) control (n=131) analysis was carried out which indicated that cephalosporins, 49.84 [95% CI: 3.10 to 801.46], and length of hospital stay, 1.02 [95% confidence intervals (CIs): 1.00 to 1.04], were statistically significant in multivariate modelling (p=.006 and .013 respectively).

Assessment of evidence

Limitations:

- Outbreak response was bundled in phases.
- Length of hospital stay and cephalosporins were confounding factors for acquisition of methicillin-resistant Staphylococcus (MRSA) in this study, but CIs for length of hospital stay were close to 0 indicating minimal effect.
- Although HCW testing was in place, this was voluntary so may not have captured all HCW carriers.
- Epidemiological link between the window bench and cases not described.
- Patient demographics not provided out-with that described in case-control analysis.
- Report incomplete cultures but do not report rate of compliance.

Conclusions:

Whole genome sequence modelling was carried out which did not indicate the source of the outbreak, but did indicate that contamination of the window bench was linked in a cluster indicating transmission to three additional patients. Analysis suggested transmission also occurred between patients and from patients to the environment and the HCW. In this study suggest , even in the presence of terminal cleaning for positive patient cases, the environment in the NICU (in this case the window bench) was a potential source of infection for this strain of MRSA (community-associated methicillin-resistant *Staphylococcus aureus* (MRSA, strain ST59-SCC*mec* type V) in this specific NICU setting.

Question 2: What is environmental decontamination?

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Centers for Disease Prevention and Control (CDC). Guideline for Disinfection and Sterilization in Healthcare Facilities. 2008. Updated June 2024. Accessed 13 August 2024	Guidance	**Level 4**	N/A	N/A	N/A

Assessment of evidence

Country: US

This guidance describes the different levels of environmental decontamination used in healthcare facilities, particularly disinfection and sterilisation. The guidance describes sterilisation as a process that "destroys or eliminates all forms of microbial life and is carried out in health-care facilities by physical or chemical methods". This process is more commonly used for medical devices and surgical instruments and less so for the decontamination of the environment. The guidance describes disinfection as "a process that eliminates many or all pathogenic microorganisms, except bacterial spores, on inanimate objects. In health-care settings, objects usually are disinfected by liquid chemicals or wet pasteurisation." It is also noted that disinfectants are not always sporicidal, and prolonged exposure time may be needed for this. The guidance describes cleaning as the "removal of

Assessment of evidence
visible soil (e.g., organic and inorganic material) from objects and surfaces and normally is accomplished manually or mechanically using water with detergents or enzymatic products." It is also noted that cleaning is essential before disinfection and sterilisation. The guidance broadly describes decontamination as "removes pathogenic microorganisms from objects so they are safe to handle, use, or discard". **Limitations:** This guidance provides evidence on different types of environmental decontamination used in heath and care settings, and aligns the definitions provide in other grey literature/guidance sources. The guidance lacks a systematic methodology and states that the included literature is not used to support recommendations and is therefore deemed as expert opinion. Furthermore, IPC practices may differ in the US, limiting applicability of this guidance to Scottish health and care settings.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
CDC and the Healthcare Infection Control Practices Advisory Committee (HICPAC). Guidelines for Environmental Infection Control in Health-Care Facilities.	Guidance	**Level 4**	N/A	N/A	N/A

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
2003. Updated July 2019. Accessed 16 August 2024.					

Assessment of evidence

Country: US

This guidance describes different principles for the decontamination of environmental surfaces, particularly cleaning and disinfection. The guidance describes cleaning as a necessary first step before disinfection or sterilisation, concluding that cleaning is a form of decontamination particularly "removing organic matter, salts, and visible soils, all of which interfere with microbial inactivation" via physical action of "scrubbing with detergents and surfactants". The guidance defines disinfection as "a generally less lethal process of microbial inactivation (compared to sterilization) that eliminates virtually all recognized pathogenic microorganisms but not necessarily all microbial forms (e.g. bacterial spores)" and classifies surface disinfection levels based on the "Spaulding system" of disinfection – high, intermediate or low level.

Limitations:

This guidance is deemed as expert opinion as it does not follow a rigorous systematic review methodology, although recommendations "are evidence-based" wherever possible. The guidance has cited evidence sources from pre-2000, which may be out of date with current scientific practices. Furthermore, IPC practices may differ in the US, limiting applicability of this guidance to Scottish health and care settings.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Royal College of Nursing. Essential Practice for Infection Prevention and Control Guidance for nursing staff. November 2017. Accessed 18 August 2024	Guidance	**Level 4**	N/A	N/A	N/A

Assessment of evidence

Country: UK

This guidance provides practice recommendations for staff working in health and social care settings. The guidance is high level and provides minimal detail on environmental decontamination. The guidance describes cleaning:

“Cleaning removes contaminants, including dust and soil, large numbers of micro-organisms, and the organic matter that may shield them – for example, biofilms, faeces, blood and other bodily fluids. Cleanliness applies to the inanimate environment as well as equipment and fixtures and fittings. A number of different methods are available for cleaning, which include traditional cleaning with cloths and detergent or microfiber technology.” The guidance fails to describe other types of environmental decontamination.

Assessment of evidence
Limitations: This guidance states that the practice recommendations are evidence based, however there is no evidence of a systematic methodology, or references provided therefore the guidance is deemed as expert opinion.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Health and Safety Executive (HSE). Decontamination against bloodborne viruses: Methods of decontamination. Accessed 11 June 2025.	Guidance	**Level 4**	N/A	N/A	N/A

Assessment of evidence
The guidance defines decontamination at a higher level and categorises the different methods within that: Physical cleaning – “Successful disinfection and sterilisation are dependent on the number of microorganisms initially present. Therefore, it can be important to physically clean before effective disinfection and sterilisation. Various powder or liquid detergents are available which may need to be diluted in hot water.” Disinfection – “This is a process of reducing the numbers of microorganisms to an acceptable level.”

Assessment of evidence
Chemical disinfection – “Disinfection of contaminated surfaces with bleach solution (minimum 1000 parts per million (ppm) active chlorine) is known to be effective for the inactivation of BBVs, but bleach is also susceptible to inactivation by organic soiling. This underlines the need for prior cleaning when disinfecting any solid items, to reduce the organic load.” Sterilisation – “In contrast to disinfection, this is an absolute term denoting destruction of all microorganisms, including bacterial spores.” **Limitations:** No systematic methodology or references are provided for this guidance, however the HSE is a UK national regulatory body for health and safety in the workplace. This guidance is expert opinion.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Infection Prevention and Control Canada Environmental Cleaning and Disinfection for Emergency Medical Vehicles and Equipment. September 2014. Updated July 2022.	Guidance	**Level 4**	N/A	N/A	N/A

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Accessed 24 August 2024					

Assessment of evidence

This short document by the Infection Prevention and Control Canada was developed for the Environmental Cleaning and Disinfection for Emergency Medical Vehicles and Equipment. The guidance defines the following levels of environmental decontamination:

Routine clean – “The physical removal of foreign material (e.g., dust, soil) and organic material (e.g., blood, secretions, excretions, microorganisms). Cleaning physically removes rather than kills microorganisms. It is accomplished with water, detergents, and mechanical action. It is necessary to maintain a specific measure of cleanliness and must be effective and consistent to reduce the transmission of microorganisms.”

Disinfection – “The inactivation of disease-producing microorganisms. Disinfection does not destroy bacterial spores. Medical equipment/devices must be cleaned thoroughly before effective disinfection can take place… Cleaning, followed by disinfection, will kill the majority of pathogenic microorganisms on a surface, however only sterilization will kill all microorganisms on an object. Sterilization is used for critical re-usable medical and some semi-critical reusable devices.” The guidance also categorises disinfection based on high, medium or low level. Low level disinfection is relevant to cleaning environmental surfaces. Other levels are relevant to equipment decontamination.”

Sterilisation “The level of reprocessing required for critical medical equipment/devices and preferred for semi-critical items. Sterilization results in the destruction of all forms of microbial life including bacteria, viruses, spores and fungi. Equipment/devices shall be cleaned thoroughly before effective sterilization can take place.” Again, this is relevant to equipment decontamination.

Limitations:

This guidance provides recommendations that are ‘based on the best available evidence’ however, there is no evidence of a systematic methodology for the guidance development. The guidance only refers to 14 references and it is unclear which evidence contributed to recommendations. Although much of the evidence aligns with other guidance documents, these

Assessment of evidence
recommendations should be interpretated with caution. The recommendations are also specifically for emergency vehicles, so may not be relevant to all NHS Scotland health and care settings. Furthermore, IPC practices may differ in Canada, further limiting applicability of this guidance to Scottish health and care settings.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
National Health and Medical Research Council. Australian Guidelines for the Prevention and Control of Infection in Healthcare. May 2019. Accessed 24 August 2024.	Guidance	**Level 4**	N/A	N/A	N/A
Assessment of evidence					
Country: Australia This guidance has been developed for infection prevention and control in healthcare settings in Australia. The guidance refers to environmental decontamination as “use of physical or chemical means to remove, inactivate, or destroy pathogens on a surface					

Assessment of evidence
or item so that they are no longer capable of transmitting infectious particles and the surface or item is rendered safe for handling, use, or disposal." The guidance also defines the following other levels of environmental decontamination: Cleaning – "Removing dirt and germs from surfaces. The most effective way to do this is by rubbing or scrubbing the surface with warm water and detergent, followed by rinsing and drying. When MROs are suspected or known to be present, the cleaning process should include the use of a detergent solution followed by the use of a disinfectant so that surfaces are cleaned and disinfected." Clean technique – "refers to practices that reduce the number of infectious agents, and should be considered the minimum level of infection control for non-invasive patient-care activities. Practices include:… environmental cleaning; and reprocessing of equipment between patient uses." Manual/mechanical/physical cleaning – "Physical (mechanical or manual) cleaning is the most important step in cleaning. It is a cleaning process which applies friction (rubbing/scrubbing) and fluids (detergent). It intends to remove foreign material (e.g. blood, body substances, micro-organisms and dust) from a surface or an object." Disinfection – "Reduction of the number of viable microorganisms (by physical or chemical means) on a product to a level previously specified as appropriate for its intended further handling or use." Sterilisation – "Use of a physical or chemical procedure to destroy all microorganisms including substantial numbers of resistant bacterial spores." **Limitations:** The guidance has been developed using GRADE methodology, however there is no reference to a systematic literature review for the recommendations related to this question. It is also unclear what references have been used to support the recommendations; therefore, this guidance is deemed as expert opinion. Differences in health and care systems out-with Scotland and legalities surrounding decontamination product choice may vary.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Public Health Agency of Canada Routine Practices and Additional Precautions for Preventing the Transmission of Infection in Healthcare Settings. September 2017. Accessed 01 September 2024	Guidance	**Level 4**	N/A	N/A	N/A

Assessment of evidence

Country: Canada

This guidance was developed for health and care settings in Canada. The guidance defines the following:

Decontamination – “The removal of microorganisms to leave an item safe for further handling.”

Cleaning – “The physical removal of foreign material (e.g., dust, soil, organic material such as blood, secretions, excretions and microorganisms). Cleaning physically removes rather than kills microorganisms. It is accomplished using water and detergents in conjunction with mechanical action.”

Disinfection – “The inactivation of disease-producing microorganisms with the exception of bacterial spores. […] Low-level disinfection is the level of disinfection needed when processing non-critical items or some environmental surfaces. Low-level

Assessment of evidence
disinfectants kill most vegetative bacteria and some fungi, as well as enveloped (lipid) viruses (e.g., influenza, hepatitis B and C and HIV). Low-level disinfectants do not kill mycobacteria or bacterial spores." Disinfection (high-level) is also discussed in relation to decontaminating equipment which is out-with the scope of this review. Sterilisation – "The destruction of all forms of microbial life, including bacteria, viruses, spores and fungi." **Limitations:** The guidance has been developed using a system for grading recommendations by an expert group, however there is no reference to a systematic literature review being undertaken to support recommendations, therefore this guidance is deemed as expert opinion. Furthermore, IPC practices may differ in Canada, limiting applicability of this guidance to Scottish health and care settings.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Ling ML, Apisarnthanarak A, Thu le TA, Villanueva V, Pandjaitan C, Yusof MY. APSIC Guidelines for environmental cleaning and decontamination. Antimicrob Resist	Guidance	**Level 4**	N/A	N/A	N/A

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Infect Control. 2015;4:58. Published 2015 Dec 29. doi:10.1186/s13756-015-0099-7					

Assessment of evidence

Country: Asian Pacific countries.

This guidance was developed by the Asia Pacific Society of Infection Control (APSIC) for use in all health and care settings. The guidance defines the following:

Cleaning - ” the removal of foreign material (e.g., dust, soil, organic material such as blood, secretions, excretions and microorganisms) from a surface or object. Cleaning physically with water, detergents and mechanical action removes rather than kills microorganisms, reducing the organism load on a surface. The key to cleaning is the use of friction to remove microorganisms and debris. Thorough cleaning is required for any equipment/device to be disinfected, as organic material may inactivate a disinfectant.”

Disinfection – “is a process used on inanimate objects and surfaces to kill microorganisms. Disinfection will kill most disease-causing microorganisms but may not kill all bacterial spores”.

Limitations

The guidance is high level and lacks detailed systematic methodology or information on how recommendations were created. Some references have been provided however it is unclear which references informed recommendations; therefore, the guidance is expert opinion. Furthermore, IPC practices may differ in Asian Pacific countries, limiting applicability of this guidance to Scottish health and care settings.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Loveday H, Wilson J, Pratt R, et al. Epic3: national evidence-based guidelines for preventing healthcare-associated infections in NHS hospitals in England. Journal of Hospital Infection 2014; 86: S1-S70.	Guideline	**AGREE II 'with modifications'**	N/A	N/A	N/A

Assessment of evidence

Country: UK (NHS England)

This guidance was developed using a systematic methodology for use in NHS England hospitals and other acute care settings to prevent healthcare-associated infections. The guidance provides some in text information on environmental decontamination (non-recommendations) including:

Cleaning – "the physical removal of soil, dirt or dust from surfaces".

Disinfection – "the use of chemical or physical methods to reduce the number of pathogenic microorganisms on surfaces. These methods need to be used in combination with cleaning as they have limited ability to penetrate organic material."

Assessment of evidence
Decontamination – “the process that results in the removal of hazardous substances (e.g. microorganisms, chemicals) and therefore may apply to cleaning or disinfection”. **Limitations:** This guidance was assessed using the AGREE II tool and was graded as ‘agree with modifications’. The guidance lacks some important elements such as rigour of development and adherence to a search strategy. The guidance is also outdated as it should have been updated in 2018. The guidance is high level and lacks detail in certain areas of environmental decontamination, including references.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Siegel JD, Rhinehart E, Jackson M et al. Management of Multidrug-Resistant Organisms in Healthcare Settings. 2006. Updated February 2017. Accessed 13 August 2024	Guidance	**Level 4**	N/A	N/A	N/A

Assessment of evidence
Country: US This guidance is for application in health and care settings in situations with multi-drug resistant organisms (MDROs) for example MRSA and VRE. The guidance recommends the following high-level use of products: “Clean and disinfect surfaces and equipment that may be contaminated with pathogens, including those that are in close proximity to the patient (e.g., bed rails, over bed tables) and frequently-touched surfaces in the patient care environment (e.g., door knobs, surfaces in and surrounding toilets in patients' rooms) on a more frequent schedule compared to that for minimal touch surfaces (e.g., horizontal surfaces in waiting rooms). Although cleaning is referenced, product selection is not addressed. **Limitations:** The guidance does not provide a full systematic methodology so is deemed as expert opinion. The references provided within the recommendations are older (many before 2000) and practices may have changed since then. The guidance lacks any specific extra details for environmental decontamination in situations for MDROs compared to infected patients or outbreaks with any pathogens – when extra cleaning and disinfection would be taking place. The guidance does also not define what cleaning and disinfection are, or detail specific products. Furthermore, IPC practices may differ in the US, limiting applicability of this guidance to Scottish health and care settings.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Siegel JD, Rhinehart, E, Jackson, M et al. 2007 Guideline for Isolation Precautions: Preventing Transmission of Infectious Agents in Healthcare Settings. December 2007. Updated September 2024. Accessed 13 August 2024.	Guidance	**Level 4**	N/A	N/A	N/A

Assessment of evidence

Country: US

Guidance gives high some high-level recommendations on environmental decontamination in cases of isolation precautions, however the guidance links to specific environmental decontamination guidance from the CDC with further detail.

“Clean and disinfect surfaces that are likely to be contaminated with pathogens, including those that are in close proximity to the patient (e.g., bed rails, over bed tables) and frequently-touched surfaces in the patient care environment (e.g., door knobs,

Assessment of evidence
surfaces in and surrounding toilets in patients' rooms) on a more frequent schedule compared to that for other surfaces (e.g., horizontal surfaces in waiting rooms)." Although cleaning is referenced, product selection is not addressed. **Limitations:** This guidance does not have a systematic methodology and is expert opinion. IPC practices may differ in the US, limiting applicability of this guidance to Scottish health and care settings.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Munoz-Price LS, Bowdle A, Johnston BL, et al. Society for Healthcare Epidemiology of America (SHEA) Expert Guidance Infection Prevention in the Operating Room Anesthesia Work Area. October 2018.	Guidance	**Level 4**	N/A	N/A	N/A

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Accessed 11 August 2024					

Assessment of evidence

Country: US

This expert opinion guidance is for use in the operating room anaesthesia work area. The guidance was created for “topics of relatively narrow scope that lack the level of evidence required for a formal guideline development.”

Recommendation:

To reduce the bioburden of organisms and the risk of transmitting these organisms to patients, the facility should clean and disinfect high-touch surfaces on the anaesthesia machine and anaesthesia work area between OR uses with an EPA-approved hospital disinfectant that is compatible with the equipment and surfaces based on the manufacturers’ instruction for use.” Although the authors refer to disinfectant, product that should be used for cleaning is not specified.

Limitations:

This guidance is high level, specific to operating room anaesthesia work area, and IPC practices may differ in the US, limiting applicability of this guidance to Scottish health and care settings.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
World Health Organization (WHO). Global guidelines for the prevention of surgical site infection, second edition. December 2018. Accessed 01 September 2024.	Guidance	**Level 4**	N/A	N/A	N/A

Assessment of evidence

Country: international

This guidance had been created for surgical settings with a global context to reduce the risk of surgical site and healthcare associated infections. The guidance defines environmental decontamination and different levels within this, including:

Decontamination – “The use of physical or chemical means to remove, inactivate or destroy pathogenic microorganisms from a surface or item to the point where they are no longer capable of transmitting infectious particles and the surface or item is rendered safe for handling, use or disposal. This term is used to cover cleaning, disinfection and sterilization. A risk assessment [based on the sections below] must be conducted to decide the appropriate level of decontamination required.”

Cleaning – “The removal, usually with detergent and water, of adherent visible soil, blood, protein substances, microorganisms and other debris from the surfaces, crevices, serrations, joints and lumens of instruments, devices and equipment by a manual or

Assessment of evidence
mechanical process that prepares the items for safe handling and/or further decontamination. Cleaning is essential prior to the use of heat or chemicals." Disinfection – "Either thermal or chemical destruction of pathogenic and other types of microorganisms. Disinfection is less lethal than sterilization because it destroys most recognized pathogenic microorganisms, but not necessarily all microbial forms (for example, bacterial spores). It reduces the number of microorganisms to a level that is not harmful to health or safe to handle." Sterilisation – "The complete destruction of all microorganisms including bacterial spores." **Limitations:** The recommendations in this guidance appear to be evidence-based with systematic reviews undertaken for certain topics, however there is no reference to a systematic review for environmental decontamination, so this is deemed as expert opinion. The guidelines are only applicable to surgical settings and lack detail due to the global context where heath and care settings vary, therefore limiting applicability of this guidance to Scottish health and care settings.

Question 3: For the purpose of environmental decontamination what is the care environment, including patient zones?

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Health Facilities Scotland. NHSScotland national cleaning services specification (SHFN 01-02). July 2025. Accessed 30 September 2025	Guidance	**Level 4**	N/A	N/A	N/A

Assessment of evidence

Country: UK (NHSScotland)

The NHSScotland national cleaning services specification categorises all rooms and areas under an alphanumeric-coding system, and these are split into clinical and non-clinical areas. This guidance on clinical and non-clinical areas in relation to the care environment is important to understand the risk rating for each specific care environment in relation to healthcare associated infection and environmental decontamination.

Assessment of evidence
Limitations: This document has been developed by an expert working group intended for specific used in NHS Scotland health and care settings, therefore it is highly applicable. However, limitations include no systematic methodology, minimal reference to the evidence base and no graded recommendations for assessment.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
National Health and Medical Research Council. Australian Guidelines for the Prevention and Control of Infection in Healthcare. May 2019. Accessed 24 August 2024	Guidance	**Level 4**	N/A	N/A	N/A

Assessment of evidence
Country: Australia This guidance has been developed for infection prevention and control in healthcare settings. A good practice statement is made regarding routine cleaning of frequently touched surfaces.

Assessment of evidence
The following two terms are considered under the 'patient zone': "Patient surroundings - All inanimate surfaces that are touched by or in physical contact with the patient (such as bed rails, bedside table, bed linen, invasive devices, dressings, personal belongings and food) and surfaces frequently touched by healthcare workers while caring for the patient (such as monitors, knobs and buttons)." "Patient-care area - The room or area in which patient care takes place." **Limitations:** The guidance has been developed using the GRADE methodology, however there is no reference to a systematic literature review for the recommendations for environmental decontamination. It is also unclear which references have supported the recommendations; therefore, this guidance is deemed as expert opinion. Applicability to NHS Scotland health and care settings may be limited due to differences in IPC practices in Australia.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
World Health Organization (WHO) Global guidelines for the prevention of surgical site infection, second edition. 2018.	Guidance	**Level 4**	N/A	N/A	N/A

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Accessed 01 September 2024.					

Assessment of evidence

Country: international

This guidance had been created for surgical settings with a global context to reduce the risk of surgical site and healthcare associated infections.

The guidance does not define the care environment, but it refers to surgical areas depending on surface type and levels of contamination – high hand touch-surface, minimal touch surface, toilet areas and administrative and office areas.

Limitations:

The recommendations in this guidance appear to be evidence-based with systematic reviews undertaken for certain topics, however there is no reference to a systematic review for environmental decontamination, so this is deemed as expert opinion. The guidelines are only applicable to surgical settings and lack detail due to the global context where heath and care settings vary, therefore limiting applicability of this guidance to Scottish health and care settings.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Ling ML, Apisarnthanarak A, Thu le TA, et al. APSIC Guidelines for environmental cleaning and decontamination. Antimicrob Resist Infect Control. 2015;4:58. Published 2015 Dec 29. doi:10.1186/s13756-015-0099-7	Guidance	**Level 4**	N/A	N/A	N/A
Assessment of evidence					
Country: Asia Pacific region This guidance was developed by the Asia Pacific Society of Infection Control (APSIC) for use in all health and care settings. The guidance discusses the care environment and splits this into low and high touch areas for the purposes of environmental decontamination. Examples of high touch surfaces include “doorknobs, elevator buttons, telephones, call bells, bedrails, light switches, computer keyboards, monitoring equipment, haemodialysis machines, wall areas around the toilet and edges of privacy curtains”. Examples of low touch surfaces include “floors, walls, ceilings, mirrors and windowsills”. The guidance also discusses					

Assessment of evidence
the probability of contamination of items and surfaces to determine risk and cleaning frequency (heavy, moderate and light contamination). **Limitations:** The guidance is high level and lacks detailed systematic methodology or information on how recommendations were created. Some references have been provided however it is unclear which references informed recommendations; therefore, the guidance is deemed as expert opinion. Applicability of this guidance to NHS Scotland health and care settings should be considered low due to lack of detail and differences in health and care systems and policies related to environmental decontamination.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
World Health Organization (WHO) Guidelines on hand hygiene in health care: first global patient safety challenge clean care is safer care. January 2009. Accessed 03 September 2024	Guidance	**Level 4**	N/A	N/A	N/A

Assessment of evidence
Country: international This guidance describes the patient zone model for environmental decontamination and hand hygiene in health and care settings. Namely, the patient zone is considered the area containing the patient and their immediate surroundings, including inanimate surfaces which the patient touches or is in direct contact with. Examples include “bed rails, bedside table, bed linen, infusion tubing and other medical equipment”. Surfaces touched by HCWs are also included in this area, such as “monitors, knobs and buttons” as well as high touch surfaces. **Limitations:** The guidance has been graded as expert opinion due to limitations in the systematic review methodology and lack of guidance update which was intended every two to three years as stated. Moreover, heath and care settings may vary globally, limiting applicability of this guidance to Scottish health and care settings.

Question 4: What different types of environmental decontamination are undertaken in health and care settings and why are they required?

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Health Facilities Scotland. NHSScotland national cleaning services specification (SHFN 01-02). July 2025. Accessed 30 September 2025	Guidance	**Level 4**	N/A	N/A	N/A

Assessment of evidence

Country: UK (NHS Scotland)

This guidance refers to, and defines, different types of environmental decontamination undertaken in NHS Scotland health and care settings. Including:

Check cleaning- “This is a visual check of cleanliness, for spots, spillages, general debris, and so on, at a specified frequency throughout the day. Sufficient cleaning should be carried out to restore the area or item to acceptable standard using the agreed cleaning procedures”.

Assessment of evidence
Discharge clean – “A discharge clean should take place after each patient discharge. Local flexibility is required in order that daily programmed clean can be reprogrammed/reallocated thus avoiding requirement for additional cleaning input.” “To reduce risk of cross infection emphasis requires to be placed on the cleaning of contact surfaces”. Terminal clean – “The procedure required to ensure that an area has been cleaned/decontaminated after a patient with an alert organism or communicable disease has been nursed in the area, in order to render it safe for the next patient”. High-level cleaning - “Particular attention should be given to the cleaning of high level surfaces to prevent the build up of dust”. Low-level cleaning - “Low level cleaning applies to any surface which might attract dust and spillages”. Source isolation cleaning – “the cleaning of a room where patients with known or suspected alert organisms or communicable diseases are cared for with minimal contact with other patients”. This guidance also refers to routine cleaning (including of soft and hard flooring), but does not define this term. The document emphasises the need for cleaning to reduce the risk of cross contamination, and to remove any dust, soil, stains and residue. The document provides standard operating procedures (SOPs) which detail the level of decontamination (detergent or disinfection) based on patient infection status. It should be noted that the term ‘cleaning’ if often used in this document to describe disinfection and both are different methods of decontamination. **Limitations:** This document has been developed by an expert working group intended for specific used in NHS Scotland health and care settings, therefore it is highly applicable. However, limitations include no systematic methodology, minimal reference to the evidence base and no graded recommendations for assessment.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
CDC and the Healthcare Infection Control Practices Advisory Committee (HICPAC). Guidelines for Environmental Infection Control in Health-Care Facilities. 2003. Updated July 2019. Accessed 16 August 2024.	Guidance	**Level 4**	N/A	N/A	N/A
Assessment of evidence					
Country: US This guidance defines cleaning and disinfection for environmental decontamination and separates these by certain 'special pathogens' which includes Antibiotic-Resistant Gram-Positive Cocci, *Clostridium difficile*, Respiratory and Enteric Viruses in Pediatric-Care Settings, Severe Acute Respiratory Syndrome (SARS) Virus and Creutzfeldt-Jakob Disease (CJD) in Patient-Care Areas.					

Assessment of evidence
This guidance does not explicitly define types of environmental decontamination but discusses different situations in the health and care setting where cleaning or disinfection is appropriate. The guidance mentions terminal disinfection and routine cleaning but does not define these terms. The guidance lacks mention of types of decontamination in outbreak settings or patient infectivity status. **Limitations:** The guidance lacks a systematic methodology and includes literature from year 1977, which may not be relevant to current practices. Furthermore, IPC practices may differ in the US, limiting applicability of this guidance to Scottish health and care settings.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
National Health and Medical Research Council. Australian Guidelines for the Prevention and Control of Infection in Healthcare. May 2019. Accessed 24 August 2024	Guidance	**Level 4**	N/A	N/A	N/A

Assessment of evidence
Country: Australia This guidance has been developed for infection prevention and control in healthcare settings. The guidance refers to different types of environmental decontamination in the health and care setting: “Discharge/terminal clean – Cleaning process required after patient(s) has vacated the room, either through room transfer or discharge. Routine - Performed as part of usual practice (as opposed to the use of additional measures in specific circumstances for example where invasive procedures are conducted or in the event of an outbreak).” **Limitations:** The guidance has been developed using the GRADE methodology, however there is no reference to a systematic literature review for the recommendations for environmental decontamination. It is also unclear which references have supported the recommendations; therefore, this guidance is deemed as expert opinion. Furthermore, IPC practices may differ in Australia, limiting applicability of this guidance to Scottish health and care settings.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Infection Prevention and Control Canada Environmental Cleaning and Disinfection for Emergency Medical Vehicles and Equipment. September 2014. Updated July 2022. Accessed 24 August 2024	Guidance	**Level 4**	N/A	N/A	N/A

Assessment of evidence

Country: Canada

This short document by the Infection Prevention and Control Canada was developed for the Environmental Cleaning and Disinfection for Emergency Medical Vehicles and Equipment.

“Routine Clean: The physical removal of foreign material (e.g., dust, soil) and organic material (e.g., blood, secretions, excretions, microorganisms). Cleaning physically removes rather than kills microorganisms. It is accomplished with water, detergents, and mechanical action. It is necessary to maintain a specific measure of cleanliness and must be effective and consistent to reduce the transmission of microorganisms.”

Assessment of evidence
Limitations: This guidance provides recommendations that are 'based on the best available evidence' however, there is no evidence of a systematic methodology for the guidance development. The guidance refers to 14 references and it is unclear which evidence contributed to recommendations. The recommendations are specifically for emergency vehicles, so this is not relevant to all NHSScotland health and care settings. Furthermore, IPC practices may differ in Canada, further limiting applicability of this guidance to Scottish health and care settings.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Public Health Agency of Canada Routine Practices and Additional Precautions for Preventing the Transmission of Infection in Healthcare Settings. September 2017. Accessed 01 September 2024	Guidance	**Level 4**	N/A	N/A	N/A

Assessment of evidence
Country: Canada This guidance was developed for health and care settings in Canada. The guidance discusses different types of environmental decontamination undertaken in health and care settings and defines environmental decontamination under routine practices or additional practices depending on infectious agents (including antibiotic resistant pathogens), outbreaks and transmission-based precautions being undertaken. The guidance defines the following: “Routine practices − A comprehensive set of IPC measures that have been developed for use in the routine care of all patients at all times in all healthcare settings. Routine practices aim to minimize or prevent HAIs in all individuals in the healthcare setting, including patients, HCWs, other staff, visitors and contractors. Terminal cleaning − Terminal cleaning refers to the process for cleaning and disinfecting patient accommodation that is undertaken upon discharge of any patient or on discontinuation of contact precautions. The patient room, cubicle, or bedspace, bed, bedside equipment, environmental surfaces, sinks and bathroom should be thoroughly cleaned before another patient is allowed to occupy the space. The bed linens should be removed before cleaning begins.” **Limitations:** The guidance has been developed using a system for grading recommendations by an expert group, however there is no reference to a systematic literature review being undertaken to support recommendations, therefore this guidance is deemed as expert opinion. Furthermore, IPC practices may differ in the US, limiting applicability of this guidance to Scottish health and care settings.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Ling ML, Apisarnthanarak A, Thu le TA, et al. APSIC Guidelines for environmental cleaning and decontamination. Antimicrob Resist Infect Control. 2015;4:58. Published 2015 Dec 29. doi:10.1186/s13756-015-0099-7	Guidance	**Level 4**	N/A	N/A	N/A

Assessment of evidence

Country: Asia Pacific region

This guidance was developed by the Asia Pacific Society of Infection Control (APSIC) for use in all health and care settings. The guidelines are high level and discuss different types of environmental decontamination in health and care settings:

“Hotel Clean is a measure of cleanliness based on visual appearance that includes dust and dirt removal, waste disposal and cleaning of windows and surfaces. Hotel Clean is the basic cleaning that takes place in all areas of a health care setting.

Assessment of evidence
Hospital Clean is a measure of cleanliness routinely maintained in care areas of the health care setting. Hospital Clean is 'Hotel Clean' with the addition of disinfection, increased frequency of cleaning, auditing and other infection control measures in client/patient/resident care areas." The guidance also discusses discharge/terminal cleaning but does not define this. **Limitations:** The guidance is high level and lacks detailed systematic methodology or information on how recommendations were created. Some references have been provided however it is unclear which references informed recommendations, therefore the guidance is graded as expert opinion. Furthermore, IPC practices may differ in the Asia Pacific region, limiting applicability of this guidance to Scottish health and care settings.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Loveday H, Wilson J, Pratt R, et al. Epic3: national evidence-based guidelines for preventing healthcare-associated infections in NHS hospitals in England.	Guideline	**AGREE II 'with modifications'**	N/A	N/A	N/A

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Journal of Hospital Infection 2014; 86: S1-S70.					

Assessment of evidence

Country: UK (NHS England)

This guidance was developed using a systematic methodology for use in NHS England hospitals and other acute care settings to prevent healthcare-associated infections.

The guidance provides some in text information (non-recommendations) on enhanced cleaning but does not discuss other types – “Enhanced cleaning describes the use of methods in addition to standard cleaning specific cations. These may include increased cleaning frequency for all or some surfaces, or the use of additional cleaning equipment. Enhanced cleaning may be applied to all areas of the healthcare environment or in specific circumstances, such as cleaning of rooms or bed spaces following the transfer or discharge of patients who are colonised or infected with a pathogenic microorganism. This is sometimes referred to as ‘terminal cleaning’.”

Limitations:

This guidance was assessed using the AGREE II tool and was graded as ‘agree with modifications’. The guidance lacks some important elements such as rigour of development and adherence to a search strategy. The guidance is also outdated as it should have been updated in 2018. The guidance is high level and lacks detail in certain areas of environmental decontamination, including references.

Question 5: Are there any legislative requirements or standards that should be adhered to when undertaking environmental decontamination?

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Public Health etc. (Scotland) Act 2008. July 2008. Accessed 05 August 2024	Legislation	**Mandatory**	N/A	N/A	N/A

Assessment of evidence

Country: Scotland

This legislation states the duties of health boards to protect public health, including the prevent and control of infectious diseases. Adhering to environmental decontamination policies and best practice in NHS Scotland health and care settings fulfils this mandatory duty.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
The Control of Substances Hazardous to Health Regulations 2002.	Legislation	**Mandatory**	N/A	N/A	N/A

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
November 2002. Accessed 05 August 2024.					

Assessment of evidence

Country: UK

This legislation outlines duties for employers to protect employees and others likely to be affected by working with substances hazardous to health, for example, patients in a hospital. The substances include biological agents (microorganisms) and “which have the potential to cause harm to health if they are ingested, inhaled, or are absorbed by, or come into contact with, the skin, or other body membranes.” The legislation states the importance of assessing the risk to health when working with substances hazardous to health and applying adequate controls and protective measures when exposure will occur (for example personal protective equipment). Although this legislation is not specific for health and care settings, the use of chemical detergents and disinfectants in environmental decontamination in NHSScotland health and care settings is relevant under the regulations listed in the COSHH.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Health and Safety Executive. The Control of Substances Hazardous to Health Regulations	Guidance	**Level 4**	N/A	N/A	N/A

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
2002. Approved Code of Practice and guidance. 2013. Accessed 15 August 2024.					

Assessment of evidence

Country: UK

This guidance provides an approved code of practice in relation to mandatory 'The Control of Substances Hazardous to Health Regulations 2002'. This guidance outlines approved methods to ensure duty holders (including health and safety professionals) comply with the regulations/law. Specifically, recommendations on "Schedule 2A Principles of good practice for the control of exposure to substances hazardous to health", including risk assessment on preventing harm to health, are relevant for environmental decontamination processes and products in NHS Scotland health and care settings.

Limitations:

The methodology for this guidance is unclear and is therefore deemed as expert opinion. This guidance is not compulsory however, the legislation that it is linked to is.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Health and Safety at Work act. Act 1974. July 1974. Accessed 05 August 2024	Legislation	**Mandatory**	N/A	N/A	N/A
Assessment of evidence					
Country: UK Chapter 37 of this legislation sets out the legal framework for managing workplace health and safety and is applicable to NHSScotland health and care settings employees. This states that it is the duty of every employee to “take reasonable care for the health and safety of himself and of other persons who may be affected by his acts or omissions at work”. This could be applied to undertaking the correct policies and procedures related to environmental decontamination.					

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
The Detergents (Amendment) (EU Exit) Regulations 2020. December 2020.	Legislation	**Mandatory**	N/A	N/A	N/A

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Accessed 05 August 2024					
Assessment of evidence					
Country: UK This legislation is relevant for the requirements of detergents and surfactants on the market in Great Britian and is applicable to the use of detergents for environmental decontamination in NHS Scotland health and care settings.					

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
The Personal Protective Equipment at Work Regulations 1992. November 1992. Accessed 30 September 2025.	Legislation	**Mandatory**	N/A	N/A	N/A
Assessment of evidence					
Country: UK According to the Explanatory Note, this legislation “impose(s) health and safety requirements with respect to the provision for, and use by, persons at work of personal protective equipment”, and “require employers to ensure suitable personal protective equipment is provided for their employees”, as per minimum suitable conditions detailed in regulation 4.					

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Health and Safety Executive. Detergents regulation in Great Britain (GB) and Northern Ireland (NI) Purpose and scope of the regulation. Accessed 05 August 2024.	Guidance	**Level 4**	N/A	N/A	N/A

Assessment of evidence

Country: UK

The guidance provides information on the background and scope of the The Detergents (Amendment) (EU Exit) Regulations 2020 for health and safety in relevant workplaces. The regulation is related to a testing regime to assess the biodegradability of the active ingredients in detergents. This legislation is relevant to NHSScotland health and care settings where detergents are procured and used to ensure appropriate environmental decontamination.

Limitations:

The methodology for this guidance is unclear and is therefore graded as expert opinion. This guidance is not compulsory however, the legislation that it is linked to is.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
British Standards Institution. BS EN 14885:2022 Chemical disinfectants and antiseptics. Application of European Standards for chemical disinfectants and antiseptics. July 2022. Accessed 05 August 2024.	British Standard	**Level 4**	N/A	N/A	N/A

Assessment of evidence

Country: UK

This standard can be described as a master document (including medical, veterinary and food, industrial, domestic and institutional areas) referring to the “standard test methods for substantiating product claims” in the medical area which includes surface disinfection, relevant to environmental decontamination in NHS Scotland health and care settings.

The document suggests obligatory and additional BS EN standards to be passed for disinfectants in the medical area, listed in the following evidence table entries.

Assessment of evidence
This standard outlines the obligatory and additional standards for a disinfectant product used in a medical area to support claims of specific properties, for example, bactericidal. Standards include two phases – in vitro testing and simulation of practical conditions with and without mechanical action Each standard provides minimum laboratory methods that a product must meet or pass to claim the intended microbiological outcome. “The CEN standards relate to only a limited range of microbial species. These have been chosen as representative species taking into account their relative resistance and their relevance to practical use […] handling properties and the microbiological safety.” “It is recognized that at the present time there is only limited knowledge regarding the relationship between the activity of products as determined by suspension as compared with surface tests, and the relevance of the results of both tests to conditions of use.” **Limitations:** Although the standards have some limitations regarding applicability of specific laboratory methods to real-world clinical settings, it is important that disinfectant products used in NHS Scotland health and care settings provide evidence of antimicrobial activity against a range of pathogens to ensure correct disinfection which reduced the risk of healthcare associated infections, and this can be evidenced through passing the obligatory and additional standards (with and without mechanical action depending on the intended purpose of the disinfectant). It must be noted that these standards do not apply to detergent products as they do not claim microbiological properties.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
British Standards Institution. BS EN 13727:2012+A2:2015. Chemical disinfectants and antiseptics. Quantitative suspension test for the evaluation of bactericidal activity in the medical area - Test method and requirements (phase 2, step 1). October 2012. Accessed 23 June 2025.	British standard	**Level 4**	N/A	N/A	N/A

Assessment of evidence
Country: UK According to the British Standards Institute website, this standard applies to chemical disinfectant and antiseptic products used in the medical area for disinfection of surfaces by wiping, spraying, flooding or other means. Test pathogens listed in BS EN 14885:2022 include *Pseudomonas Aeruginosa, Staphylococcus Aureus* and *Enterococcus hirae.* **Limitations:** British Standards have limited detail on the methods for developing these standards. Furthermore, laboratory methods may not replicate contamination patterns (such as biofilms) in real-world clinical settings.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
British Standards Institution. BS EN 17387:2021 Chemical disinfectants and antiseptics. Quantitative test for the evaluation of bactericidal and yeasticidal and/or fungicidal activity of chemical disinfectants in the	British standard	**Level 4**	N/A	N/A	N/A

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
medical area on non-porous surfaces without mechanical action. Test method and requirements (phase 2, step 2). August 2021. Not accessed in full.					

Assessment of evidence

Country: UK

According to the British Standards Institute website, this standard applies to chemical disinfectant products used in the medical area for disinfection of non-porous surfaces without mechanical action. Test pathogens listed in BS EN 14885:2022 include *S. aureus, Enterococcus hirae, Pseudomonas aeruginosa, Candida albicans* and *Aspergillus niger/Aspergillus brasiliensis*

Limitations:

British Standards have limited detail on the methods for developing these standards. Furthermore, laboratory methods may not replicate contamination patterns (such as biofilms) in real-world clinical settings.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
British Standards Institution. BS EN 13624:2021. Chemical disinfectants and antiseptics. Quantitative suspension test for the evaluation of fungicidal or yeasticidal activity in the medical area. Test method and requirements (phase 2, step 1). March 2022. Accessed 23 June 2025.	British standard	**Level 4**	N/A	N/A	N/A

Assessment of evidence
Country: UK According to the British Standards Institute website, this standard applies to chemical disinfectant and antiseptic products used in the medical area for disinfection of surfaces by wiping, spraying, flooding or other means. Test pathogens listed in BS EN 14885:2022 include *Candida albicans* or *Candida albicans* and *Aspergillus brasiliensis.* **Limitations:** British Standards have limited detail on methods for developing these standards. Furthermore, laboratory methods may not replicate contamination patterns (such as biofilms) in real-world clinical settings.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
British Standards Institution. BS EN 14348:2005. Chemical disinfectants and antiseptics. Quantitative suspension test for the evaluation of mycobactericidal activity of chemical disinfectants in the	British Standard	**Level 4**	N/A	N/A	N/A

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
medical area including instrument disinfectants. Test methods and requirements (phase 2, step 1). February 2005. Accessed 23 June 2025.					
Assessment of evidence					
Country: UK According to the British Standards Institute website, this standard applies to chemical disinfectant products used in the medical area. Test pathogens listed in BS EN 14885:2022 include *Mycobacterium terrae* or *Mycobacterium avium* and *Mycobacterium terrae* **Limitations:** British Standards have limited detail on methods for developing these standards. Furthermore, laboratory methods may not replicate contamination patterns (such as biofilms) in real-world clinical settings.					

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
British Standards Institution. BS EN 14476:2013+A2-2019 Chemical disinfectants and antiseptics. Quantitative suspension test for the evaluation of virucidal activity in the medical area. Test method and requirements (Phase 2/Step 1). August 2019. Not accessed in full.	British standard	**Level 4**	N/A	N/A	N/A

Assessment of evidence
Country: UK According to the British Standards Institute website, this standard applies to chemical disinfectant and antiseptic products used in the medical area for disinfection of surfaces (by wiping, spraying, flooding or other means) and textiles. Test pathogens listed in BS EN 14885:2022 include Poliovirus, Adenovirus, Vacciniavirus, Murine norovirus and Murine parvovirus. **Limitations:** British Standards have limited detail on methods for developing these standards. Furthermore, laboratory methods may not replicate contamination patterns (such as biofilms) in real-world clinical settings.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
British Standards Institution. BS EN 16777:2018 Chemical disinfectants and antiseptics. Quantitative non-porous surface test without mechanical action for the evaluation of virucidal activity of chemical	British standard	**Level 4**	N/A	N/A	N/A

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
disinfectants used in the medical area. Test method and requirements (phase 2/step 2). December 2018. Not accessed in full.					

Assessment of evidence

Country: UK

According to the British Standards Institute website, this standard applies to chemical disinfectant and antiseptic products used in the medical area for disinfection of non-porous surfaces. Test pathogens listed in BS EN 14885:2022 include Adenovirus, Murine norovirus and Vacciniavirus.

Limitations:

British Standards have limited detail on methods for developing these standards. Furthermore, laboratory methods may not replicate contamination patterns (such as biofilms) in real-world clinical settings.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
British Standards Institution. BS EN 16615:2015 Chemical disinfectants and antiseptics. Quantitative test method for the evaluation of bactericidal and yeasticidal activity on non-porous surfaces with mechanical action employing wipes in the medical area (4- field test). Test method and requirements (phase 2, step 2). April 2015. Accessed 23 June 2025.	British standard	**Level 4**	N/A	N/A	N/A

Assessment of evidence
Country: UK According to the British Standards Institute website, this standard applies to chemical disinfectant products used in the medical area for disinfection of non-porous surfaces by wiping. Test pathogens listed in BS EN 14885:2022 include *Enterococcus hirae, Pseudomonas aeruginosa, Staphylococcus Aureus* and *Candida albicans.* **Limitations:** British Standards have limited detail on methods for developing these standards. Furthermore, laboratory methods may not replicate contamination patterns (such as biofilms) in real-world clinical settings.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
British Standards Institution. BS EN 17126:2018. Chemical disinfectants and antiseptics. Quantitative suspension test for the evaluation of sporicidal activity of chemical disinfectants in the	British standard	**Level 4**	N/A	N/A	N/A

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
medical area. Test method and requirements (phase 2, step 1). December 2018. Accessed 23 June 2025.					

Assessment of evidence

Country: UK

According to the British Standards Institute website, this standard applies to chemical disinfectant products used in the medical area for disinfection of surfaces by wiping, spraying, flooding or other means. Test pathogens listed in BS EN 14885:2022 include *Bacillus subtilis, Bacillus cereus* and *Clostridium difficile*

Limitations:

British Standards have limited detail on methods for developing these standards. Furthermore, laboratory methods may not replicate contamination patterns (such as biofilms) in real-world clinical settings.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Health Facilities Scotland. NHSScotland national cleaning services specification (SHFN 01-02). July 2025. Accessed 30 September 2025	Guidance	**Level 4**	N/A	N/A	N/A

Assessment of evidence

Country: UK (NHS Scotland)

The NHS Scotland National Cleaning Services Specification (NCSS) is to be followed wherever care is delivered in NHS Scotland. The guidance refers to COSHH legislation but does not go into detail regarding its' applicability to environmental decontamination.

Limitations:

This document has been developed by an expert working group intended for specific use in NHS Scotland health and care settings, therefore it is highly applicable. However, limitations include no systematic methodology, minimal reference to the evidence base and no graded recommendations for assessment.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Royal College of Nursing. Essential Practice for Infection Prevention and Control Guidance for nursing staff. November 2017. Accessed 18 August 2024	Guidance	**Level 4**	N/A	N/A	N/A

Assessment of evidence

Country: UK

This guidance provides practice recommendations for staff working in health and social care settings. The guidance is high level and provides minimal detail on environmental decontamination but does provide reference to COSHH when undertaking 'cleaning of the environment':

"Ensure up to date COSHH assessments are completed by a competent person and shared with and followed by staff."

Limitations:

This guidance states that the practice recommendations are evidence based, however there is no evidence of a systematic methodology, or references provided therefore the guidance is deemed as expert opinion.

Question 6: What methods (techniques) are recommended for decontamination of the health and care environment?

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Ungurs M, W and M, Vassey M, et al. The effectiveness of sodium dichloroisocyanurate treatments against Clostridium difficile spores contaminating stainless steel. American Journal of Infection Control 2011; 39: 199-205.	Laboratory	**Level 3**	Efficacy of active chlorine products sodium dichloroisocyanurate (NaDCC) and NaDCC combined with detergent (NaDCC+), detergent (1:1,500 Brillo) and mechanical action (wiping) on reducing C. diff contamination on a stainless-steel surface.	Cleaning method using chlorine-based product: • Chlorine-based cleaning product alone • Pre-clean with detergent then chlorine-based cleaning product	Log_{10} reduction of viable C. diff spores (CFU).
Assessment of evidence					
Country: UK Setting: laboratory-based Cohort: NA					

Assessment of evidence

This study investigated efficacy of various cleaning products and methods on a C diff. contaminated stainless steel surface, using methodology adapted from BS EN 13697:2001.

Limitations:

- Limited to one strain of C. diff (NCTC 11209)
- Not all data is included in write up e.g. data from all concentrations of NaDCC tested not reported
- Do not report ANOVA or t-test statistics beyond p values
- Limited to specific chemical makeup of NaDCC brand used in this experiment (but the study is UK based so may be applicable to Scotland)
- Viability of isolated organisms not investigated

Conclusions:

When comparing mechanical wiping with NaDCC with hard water control following pre-clean with detergent, there was a significantly higher reduction for 1,000ppm NaDCC (4.00+/-0.33$\log_{10}$) than the control (3.25+/-0.26$\log_{10}$), p=.03. ANOVA was used to compare all methods tested, and wiping with detergent and then NaDCC was the most effective when compared with just 1,000ppm NaDCC without wiping (p<.0001) and wiping with NaDCC only (p=.0004). Wiping with NaDCC or detergent was significantly more effective than just 1,000ppm NaDCC (p=.0008). Pre-clean with detergent was more effective on the test strain of C. diff than wiping with NaDCC with no pre-clean. These findings suggest that mechanical wiping is more effective than product alone at removing C. diff contamination, and efficacy varies depending on product used.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Health Facilities Scotland. NHSScotland national cleaning services specification (SHFN 01-02). July 2025. Accessed 30 September 2025	Guidance	**Level 4**	N/A	N/A	N/A

Assessment of evidence

Country: UK (NHSScotland)

The NHSScotland NCSS arranges routine environmental cleaning (including soft and hard flooring, high- and low-level cleaning, paintwork, walls & doors, changing/hanging curtains and bed screens, sanitary fixtures and fittings, furniture), discharge cleaning, terminal cleaning and isolation room cleaning operations into a series of tasks to be carried out in particular patient accommodation categories; specific methods and minimum required frequencies are detailed for each task group. Particular attention must be given to surfaces and areas that are frequently touched by patients and healthcare workers, for example taps, dispensers, toilets, urinals, bidets, sinks, wash hand basins, baths and showers. Working from clean to dirty areas is described in the standard operating procedures contained within this guidance. This document also provides methods for cleaning ambulances.

Assessment of evidence
Limitations: This document provides detailed methods/techniques for the different types of environmental decontamination undertaken in NHS Scotland health and care settings. This document has specifically been developed for these settings by an expert working group so is highly applicable. However, the cleaning specification has minimal reference to any evidence used to create the recommendations.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
CDC and the Healthcare Infection Control Practices Advisory Committee (HICPAC). Guidelines for Environmental Infection Control in Health-Care Facilities. 2003. Updated July 2019. Accessed 16 August 2024.	Guidance	**Level 4**	N/A	N/A	N/A

Assessment of evidence
Country: US This guidance was developed for health and care settings and provides high level recommendations on methods (techniques) for environmental decontamination including surfaces, dusting ("Use appropriate dusting methods for patient-care areas designated for immunocompromised patients (e.g., HSCT patients)" such as wet-dusting horizontal surfaces with a moist cloth and to avoid dust dispersal methods of dusting) and flooring. The guidance also provides specific recommendations for 'special pathogens' which includes Antibiotic-Resistant Gram-Positive Cocci, *Clostridium difficile*, Respiratory and Enteric Viruses in Pediatric-Care Settings, Severe Acute Respiratory Syndrome (SARS) Virus and Creutzfeldt-Jakob Disease (CJD). **Limitations:** The guidance lacks a systematic methodology and includes literature from year 1977, which may not be relevant to current practices. Furthermore, IPC practices may differ in the US, limiting applicability of this guidance to Scottish health and care settings.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
World Health Organization (WHO) Global guidelines for the prevention of surgical site	Guidance	**Level 4**	N/A	N/A	N/A

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
infection, second edition. 2018. Accessed 01 September 2024.					

Assessment of evidence

Country: international

This guidance had been created for surgical settings with a global context to reduce the risk of surgical site and healthcare associated infections. The guidance discusses methods (techniques) for decontamination based on surface type and touch frequency:

The following cleaning principles are described:

- "Avoid cleaning methods that produce mists or aerosols or disperse dust, for example dry sweeping (brooms, etc.), dry mopping, spraying or dusting."

Limitations:

The recommendations in this guidance appear to be evidence-based with systematic reviews undertaken for certain topics, however there is no reference to a systematic review for environmental decontamination, so this is deemed as level 4 expert opinion. Lack of referencing throughout the document provides difficulty when assessing where the evidence has been sourced from. The guidelines are only applicable to surgical settings and lack detail due to the global context where heath and care settings vary.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
National Health and Medical Research Council. Australian Guidelines for the Prevention and Control of Infection in Healthcare. May 2019. Accessed 24 August 2024.	Guidance	**Level 4**	N/A	N/A	N/A

Assessment of evidence

Country: Australia

This guidance has been developed for infection prevention and control in healthcare settings in Australia. The guidance emphasises the need for risk assessment which would determine the methods, thoroughness, frequency and products used for different surfaces. This should form the basis of a “cleaning strategy and schedule with the housekeeping staff”.

Limitations:

The guidance has been developed using the GRADE methodology, however there is no reference to a systematic literature review for the recommendations for ‘Managing the physical environment across healthcare settings’. It is also unclear what reference have been used to support the recommendations; therefore this guidance is graded as expert opinion. IPC practices may differ in Australia, limiting applicability of this guidance to Scottish health and care settings.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Royal College of Nursing. Essential Practice for Infection Prevention and Control Guidance for nursing staff. November 2017. Accessed 18 August 2024	Guidance	**Level 4**	N/A	N/A	N/A

Assessment of evidence

Country: UK

This guidance provides practice recommendations for staff working in health and social care settings, developed in the UK. The guidance is high level and provides minimal detail on methods (techniques) for decontamination. The guidance states that:

“Ensure an appropriate cleaning specification is in place to meet the needs of the environment where patients are cared for or use; this applies to inpatient and outpatient environments. For acute and community facilities a risk assessment should be performed to identify the cleaning needs and frequency” and “a local cleaning policy should be in place clearly defining which areas are cleaned and by whom”.

Limitations:

This guidance states that the practice recommendations are evidence based, however there is no evidence of a systematic methodology, or references provided therefore the guidance is graded as expert opinion.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Infection Prevention and Control Canada Environmental Cleaning and Disinfection for Emergency Medical Vehicles and Equipment. September 2014. Updated July 2022. Accessed 24 August 2024.	Guidance	**Level 4**	N/A	N/A	N/A

Assessment of evidence

Country: Canada

This short guidance document by the Infection Prevention and Control Canada was developed for the Environmental Cleaning and Disinfection for Emergency Medical Vehicles and Equipment. The guidance describes some methods (techniques) for routine cleaning including from cleanest to dirtiest areas and a standard method for the emergency vehicle.

Limitations:

This guidance provides recommendations that are 'based on the best available evidence' however, there is no evidence of a systematic methodology for the guidance development. The guidance only refers to 14 references and it is unclear which

Assessment of evidence
evidence contributed to recommendations. IPC practices may differ in Canada, limiting applicability of this guidance to Scottish health and care settings.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Public Health Agency of Canada Routine Practices and Additional Precautions for Preventing the Transmission of Infection in Healthcare Settings. September 2017. Accessed 01 September 2024	Guidance	**Level 4**	N/A	N/A	N/A

Assessment of evidence
Country: Canada This guidance was developed for health and care settings. The guidance describes some high-level methods (techniques) for environmental decontamination. The guidance emphasises the need for local policies and procedures to be in place for environmental decontamination. Specific steps for deep cleaning are provided, including removing all items to allow thorough clean, disinfection and dry. **Limitations:** The guidance has been developed using a system for grading recommendations by an expert group, however there is no reference to a systematic literature review being undertaken to support recommendations, therefore this guidance is graded as expert opinion. Furthermore, IPC practices may differ in the US, limiting applicability of this guidance to Scottish health and care settings.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Health Facilities Scotland. Scottish Health Facilities Note (SHFN) 01-05 Safe Management of the Care Environment Cleaning Specification for Care Homes.	Guidance	**Level 4**	N/A	N/A	N/A

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
May 2021. Updated May 2023. Accessed 05 August 2024.					

Assessment of evidence

Country: UK (NHS Scotland)

This guidance was produced as a cleaning specification for care homes in NHS Scotland. The guidance is not mandatory and does not have a systematic methodology, however it is expert opinion and deemed as best practice.

The guidance provides tools, templates and methods (techniques) for different daily cleaning tasks in the care home setting. Templates provide a list of possible areas in each room needing cleaned. Detailed methods for the following areas are provided, including type of equipment and product – sanitary fixtures and fittings, toilets/urinals, sinks/wash hand basins/baths, showers, cleaning of high level areas, furniture/fixtures/fitting, soft furnishings, cleaning of low levels, paintwork/walls/doors and cleaning of floors. Standard operating procedures reference working from clean to dirty areas.

Limitations:

This guidance is not applicable to acute care settings and is relevant for care homes in NHS Scotland. It should be noted that variation in job titles and staffing exist in this area, so application or roles and responsibilities may vary. .

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Ling ML, Apisarnthanarak A, Thu le TA, et al. APSIC Guidelines for environmental cleaning and decontamination. Antimicrob Resist Infect Control. 2015;4:58. Published 2015 Dec 29. doi:10.1186/s13756-015-0099-7	Guidance	**Level 4**	N/A	N/A	N/A
Assessment of evidence					
Country: Asia Pacific region This guidance was developed by the Asia Pacific Society of Infection Control (APSIC) for use in all health and care settings. The guidance discusses general cleaning practices/methods (techniques) for before during and after cleaning. It is advised during cleaning to work from least soiled to most soiled areas. The guidance also describes methods for discharge/terminal cleaning in cases of certain pathogens or when contact and airborne precautions are in place, including removing “clutter” before starting cleaning.					

Assessment of evidence
Limitations: The guidance is high level and lacks detailed systematic methodology or information on how recommendations were created. Some references have been provided however it is unclear which references informed recommendations, therefore the guidance is graded as expert opinion. Furthermore, IPC practices may differ in the Asia Pacific region, limiting applicability of this guidance to Scottish health and care settings.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Siegel JD, Rhinehart, E, Jackson, M et al. 2007 Guideline for Isolation Precautions: Preventing Transmission of Infectious Agents in Healthcare Settings. December 2007. Updated September 2024.	Guidance	**Level 4**	N/A	N/A	N/A

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Accessed 13 August 2024.					

Assessment of evidence

Country: US

Guidance gives high some high-level recommendations on environmental decontamination in cases of isolation precautions, however the guidance links to specific environmental decontamination guidance from the CDC with further detail.

“Establish policies and procedures for routine and targeted cleaning of environmental surfaces as indicated by the level of patient contact and degree of soiling.”

Limitations:

This guidance does not have a systematic methodology and is graded as expert opinion. Furthermore, IPC practices may differ in the US, limiting applicability of this guidance to Scottish health and care settings.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Centers for Disease Prevention and Control (CDC). Guideline for Disinfection and Sterilization in Healthcare Facilities. 2008. Updated June 2024. Accessed 13 August 2024	Guidance	**Level 4**	N/A	N/A	N/A
Assessment of evidence					
Country: US This guidance has been created for application to health and care settings. For healthcare facilities, the following recommendations are made which are “suggested for implementation” and either supported by theory or clinical or epidemiological study: “Wet-dust horizontal surfaces regularly (e.g., daily, three times per week) using clean cloths moistened with an EPA-registered hospital disinfectant (or detergent).” “Frequently changing disinfectant solution with no ‘double-dipping’ of cloths into disinfectant”.					

Assessment of evidence
This guidance provide evidence for when and how different products should be used for environmental decontamination, with emphasis on following manufacturers guidance when applying a product. Although the guidance does discuss situations ‘when’ to use a product, the guidance lacks acknowledgement of applying different products (detergent or disinfectant) in the presence of an infected patient/outbreak status. **Limitations:** The guidance lacks a systematic methodology and states that the included literature is not used to support recommendations and is therefore graded as expert opinion. Furthermore, this guidance lacks applicability to NHS Scotland health and care settings due to reference to EPA-registered products, as different legalities apply in UK law, and IPC practices may differ in the US.

Question 7: When and how are different products used for decontamination of the health and care environment?

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Centers for Disease Prevention and Control (CDC). Guideline for Disinfection and Sterilization in Healthcare Facilities. 2008. Updated June 2024. Accessed 13 August 2024	Guidance	**Level 4**	N/A	N/A	N/A
Assessment of evidence					
Country: US This guidance has been created for application to health and care settings. A detergent is defined as a “cleaning agent that makes no antimicrobial claims on the label”. The following recommendation is made for dentistry settings, which is a strong recommendation based on experimental, clinical or epidemiological studies and on a theoretical basis: “Noncritical clinical contact surfaces, such as uncovered operatory surfaces (e.g., countertops, switches, light handles), should be barrier-protected or disinfected between patients with an intermediate-					

Assessment of evidence

disinfectant (i.e., EPA-registered hospital disinfectant with a tuberculocidal claim) or low-level disinfectant (i.e., EPA-registered hospital disinfectant with HIV and HBV claim)."

For healthcare facilities, the following recommendations are made which are "suggested for implementation" and either supported by theory or clinical or epidemiological study:

"Clean housekeeping surfaces (e.g., floors, tabletops) on a regular basis, when spills occur, and when these surfaces are visibly soiled.

Disinfect (or clean) environmental surfaces on a regular basis (e.g., daily, three times per week) and when surfaces are visibly soiled.

Follow manufacturers' instructions for proper use of disinfecting (or detergent) products --- such as recommended use-dilution, material compatibility, storage, shelf-life, and safe use and disposal.

Clean walls, blinds, and window curtains in patient-care areas when these surfaces are visibly contaminated or soiled.

Prepare disinfecting (or detergent) solutions as needed and replace these with fresh solution frequently (e.g., replace floor mopping solution every three patient rooms, change no less often than at 60-minute intervals), according to the facility's policy.

Use a one-step process and an EPA-registered hospital disinfectant designed for housekeeping purposes in patient care areas where 1. uncertainty exists about the nature of the soil on the surfaces (e.g., blood or body fluid contamination versus routine dust or dirt); or 2. uncertainty exists about the presence of multidrug resistant organisms on such surfaces.

[…]Wet-dust horizontal surfaces regularly (e.g., daily, three times per week) using clean cloths moistened with an EPA-registered hospital disinfectant (or detergent). Prepare the disinfectant (or detergent) as recommended by the manufacturer.

Disinfect noncritical surfaces with an EPA-registered hospital disinfectant according to the label's safety precautions and use directions."

"Frequently changing disinfectant solution with no 'double-dipping' of cloths into disinfectant", although the term 'double-dipping' is not defined.

Assessment of evidence
This guidance provide evidence for when and how different products should be used for environmental decontamination, with emphasis on following manufacturers guidance when applying a product. Although the guidance does discuss situations 'when' to use a product, the guidance lacks acknowledgement of applying different products (detergent or disinfectant) in the presence of an infected patient/outbreak status. **Limitations:** The guidance lacks a systematic methodology and states that the included literature is not used to support recommendations and is therefore deemed as expert opinion. Furthermore, this guidance lacks applicability to NHS Scotland health and care settings due to reference to EPA-registered products, as different legalities apply in UK law, and IPC practices may differ in the US.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
European Centre for Disease Control (ECDC) Considerations for infection prevention and control practices in relation to respiratory viral infections in healthcare settings. February 2023	Guidance	**Level 4**	N/A	N/A	N/A

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Accessed: 15 August 2024.					

Assessment of evidence

Country: EU/EAA

This guidance refers to some high-level recommendations for the cleaning in health in care settings during high levels of circulating respiratory viruses, such as during the winter season. The guidance recommends the following in ‘patients with respiratory viral tract infections’:

“In hospital rooms, it is recommended that the floor is cleaned regularly and that frequently-touched surfaces are disinfected using hospital disinfectants active against viruses.” Alternative options for when disinfectants aren’t available are provided.

Limitations:

This guidance provides minimal evidence for when and how different products are used for environmental decontamination, this is high level and lacks detail. This guidance does not define ‘regular cleaning and disinfection’ making interpretation and implementation difficult and does not clearly state if cleaning with a detergent is needed before disinfection, or if the term ‘disinfection’ is referring to a combined detergent/disinfectant product. This guidance is graded as expert opinion as it lacks any systematic methodology, and no references are provided for the ‘cleaning’ recommendations. Minimal detail is provided on environmental decontamination, and IPC practices may differ in the EU/EEA, limiting applicability to NHS Scotland health and care settings.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
National Health and Medical Research Council. Australian Guidelines for the Prevention and Control of Infection in Healthcare. May 2019. Accessed 24 August 2024.	Guidance	**Level 4**	N/A	N/A	N/A
Assessment of evidence					
Country: Australia This guidance was developed for use in Australian healthcare facilities and outlines general principles and recommendations for the use of different environmental decontamination products. Recommendations: “It is good practice to routinely clean surfaces as follows: Clean frequently touched surfaces with detergent solution at least daily, when visibly soiled and after every known contamination. Clean general surfaces and fittings when visibly soiled and immediately after spillage.”					

Assessment of evidence
“It is good practice to use a chlorine-based product such as sodium hypochlorite or a Therapeutic Goods Administration-listed hospital-grade disinfectant with specific claims in addition to standard cleaning practices to effectively manage norovirus specific outbreaks.” “It is suggested that site decontamination should occur after spills of blood or other potentially infectious materials. Spills of blood or other potentially infectious materials should be promptly cleaned […] with a cloth or paper towels using detergent solution. Use of Therapeutic Goods Administration-listed hospital-grade disinfectants with specific claims or a chlorine-based product such as sodium hypochlorite should be based on assessment of risk of transmission of infectious agents from that spill. The decision to use disinfectants should be dependent upon the compatibility of the disinfectant with the materials where the spill occurred.” The guidance consistently recommends detergent products for cleaning and the use of disinfectants in circumstances with uncertainty about the nature of soiling on the surface (e.g. blood or body substance contamination versus routine dust or dirt) or the presence of MROs (including C. difficile), norovirus, or other infectious agents requiring transmission-based precautions (e.g. pulmonary tuberculosis) is known or suspected. This can be done via a two-step process using a detergent followed by a disinfectant or using a combined detergent/disinfectant. **Limitations:** The guidance has been developed using the GRADE methodology, however there is no reference to a systematic literature review for the recommendations for ‘Managing the physical environment across healthcare settings’. It is also unclear what references have been used to support the recommendations, therefore this guidance is deemed as expert opinion. Furthermore, IPC practices and decontamination products may differ in Australia, limiting applicability to Scottish health and care settings.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Health and Safety Executive (HSE). Decontamination against bloodborne viruses: Methods of decontamination. Accessed 11 June 2025.	Guidance	**Level 4**	N/A	N/A	N/A

Assessment of evidence

Country: UK

The guidance discussed different types of chemical disinfectants available for work surfaces - powder or liquid detergent, bleach (must contain minimum 1000ppm available chlorine), 60-80% alcohol and Halogenated Tertiary Amines or Quaternary Ammonium Compounds. The guidance also discusses glutaraldehyde and phenolic based products but these are not recommended for use.

Guidance discusses in high level when and when not to use these products should be used on work surfaces. The guidance also emphasises the need for prior cleaning before disinfection, to remove any organic matter, and briefly describes how to use disinfectants:

“evidence of the product's effectiveness against BBVs according to the disinfectant manufacturer use in accordance with manufacturer’s instructions including concentrations, contact times and expiry times

[…] levels of contamination may vary, and this will influence the degree of cleaning and disinfectant required for different applications. In particular, visible blood or body fluid may require use of a higher concentration of any chosen product compatibility of disinfectants with different types of surfaces of equipment or materials to be cleaned or disinfected”.

Assessment of evidence
Limitations: No systematic methodology or references are provided for this guidance, however the HSE is a UK national regulatory body for health and safety in the workplace. This is graded as expert opinion.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Infection Prevention and Control Canada Environmental Cleaning and Disinfection for Emergency Medical Vehicles and Equipment. September 2014. Updated July 2022. Accessed 24 August 2024	Guidance	**Level 4**	N/A	N/A	N/A

Assessment of evidence
Country: Canada This short document by the Infection Prevention and Control Canada was developed for the Environmental Cleaning and Disinfection for Emergency Medical Vehicles and Equipment. For different products it is suggested that: “Routine cleaning and surface disinfection with, at minimum, a healthcare/hospital grade disinfectant with a Drug Identification Number (DIN), shall occur following the use of vehicles and equipment, paying particular attention to frequently touched surfaces and horizontal surfaces, while adhering to the manufacturer’s instructions for use.” Detergent is described in the glossary as a product that “increases the ability of water to penetrate organic material and breakdown greases and dirt”, supporting effective cleaning. This guidance is high level and doesn’t provide in detail evidence of the when and how to use different products for environmental decontamination, such as when it is appropriate to use a detergent or disinfectant. The guidance relies on local policy to detail this information. **Limitations:** The guidance provides recommendations that are ‘based on the best available evidence’ however, there is no evidence of a systematic methodology for the guidance development. The guidance refers to 14 references and it is unclear what evidence was used per recommendation. The recommendations are specifically for emergency vehicles which may not be relevant to all NHS Scotland health and care settings. Furthermore, IPC practices may differ in Canada, further limiting applicability of this guidance to Scottish health and care settings.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Public Health Agency of Canada. Guidance: Infection Prevention and Control Measures for Healthcare Workers in All Healthcare Settings. Carbapenem-resistant Gram-negative Bacilli. 2010. Updated April 2012.	Guidance	**Level 4**	N/A	N/A	N/A

Assessment of evidence

Country: Canada

This guidance is specifically for patient colonised or infected with Carbapenem-resistant Gram-negative Bacilli:

“Hospital-grade cleaning and disinfecting agents are sufficient for environmental cleaning in the context of CRGNB colonization or infection.”

Limitations:

There is no evidence of a systematic methodology for the development of this guidance, and it has been developed by infection control experts and is deemed as expert opinion. The guidance refers to eight references and it is unclear what evidence was

Assessment of evidence
used per recommendation. IPC practices and patient screening may differ in Canada, limiting applicability of this guidance to Scottish health and care settings.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Public Health Agency of Canada Routine Practices and Additional Precautions for Preventing the Transmission of Infection in Healthcare Settings. September 2017. Accessed 01 September 2024	Guidance	**Level 4**	N/A	N/A	N/A

Assessment of evidence
Country: Canada This guidance was developed for health and care settings. The guidance describes when/how certain products should be used: “In situations of continued transmission of certain microorganisms (e.g., norovirus, rotavirus, C. difficile) use of specific disinfectant products may need to be considered. In outbreak situations or when there is continued transmission, rooms of C. difficile infection patients should be decontaminated and cleaned with chlorine-containing cleaning agents (at least 1,000 ppm) or other sporicidal agents. Detergent disinfectants with a Drug Identification Number that have microbiocidal (i.e., killing) activity against the pathogens most likely to contaminate the patient care environment should be used. The infection prevention and control program should approve the products purchased. The product should be used in accordance with manufacturer’s instructions.” **Limitations:** The guidance fails to detail the use of detergents and primarily focusses on disinfectants. The guidance has been developed using a system for grading recommendations by an expert group, however there is no reference to a systematic literature review being undertaken to support recommendations, therefore this guidance is deemed as expert opinion. IPC practices and products available for environmental decontamination may differ in Canada, limiting applicability of this guidance to Scottish health and care settings.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Health Facilities Scotland. Scottish Health Facilities Note (SHFN) 01-05 Safe Management of the Care Environment Cleaning Specification for Care Homes. May 2021. Updated May 2023. Accessed 05 August 2024	Guidance	**Level 4**	N/A	N/A	N/A

Assessment of evidence

Country: UK (NHS Scotland)

This guidance was produced as a cleaning specification for care homes in NHS Scotland. The guidance is not mandatory and does not have a systematic methodology, however it is expert opinion and deemed as best practice.

The guidance provides tools, templates and methods (techniques) for different daily cleaning tasks in the care home setting. This includes when to use different products (detergent or disinfectant) for environmental decontamination. Neutral detergent in warm water is recommended for routine cleaning (changed at 15 minute intervals, when changing tasks or when the solution dirty).

Assessment of evidence
Although routine disinfection of the environment is not recommended, routine disinfection of sanitary fittings with 1,000ppm chlorine is. This guidance lacks information on when to use detergents (uses term cleaning solution). Guidance states that manufacturers instructions must be followed when using decontamination products. The guidance also recommends the use of washable or reusable cloths for detergents/disinfectants depending on the surface being cleaned. Further detailed methods included in the guidance specific to the area. **Limitations:** This guidance is not applicable to acute care settings and is relevant for care homes in NHS Scotland. It should be noted that variation in job titles and staffing exist in this area, so application or roles and responsibilities may vary.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Ling ML, Apisarnthanarak A, Thu le TA, et al. APSIC Guidelines for environmental cleaning and decontamination. *Antimicrob Resist Infect Control*. 2015;4:58. Published 2015 Dec	Guidance	**Level 4**	N/A	N/A	N/A

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
29. doi:10.1186/s13756-015-0099-7					

Assessment of evidence

Country: Asia Pacific region

This guidance was developed by the Asia Pacific Society of Infection Control (APSIC) for use in all health and care settings. The guidance discusses different products used for cleaning and disinfection:

“Routine cleaning with soap and water or detergents is the most useful method for removing organic material and suspended grease or oil. Equipment and surfaces in the health care setting must be cleaned with approved hospital-grade cleaners. The physical action of scrubbing with detergents and surfactants and rinsing with water removes large numbers of microorganisms from surfaces.”

“Disinfectants rapidly kill or inactivate most infectious agents. Disinfectants are only to be used to disinfect and must not be used as general cleaning agents, unless combined with a cleaning agent as a detergent-disinfectant. Disinfecting products used in the health care setting.”

“Recommended disinfectants for environmental use in all health care settings include: - Chlorine: Sodium hypochlorite (bleach), - Phenolics - Quaternary Ammonium Compounds (QUATs’) - Iodophors - Hydrogen Peroxide (AHP) - Ethyl alcohol or isopropyl alcohol in concentrations of 60%–90% (used to disinfect small surfaces).”

The following recommendations are made:

“Cleaning and disinfection should be done as soon as possible after items have been used”

“Liquid disinfectants chosen for use in environmental health care should: […] Be active against the usual microorganisms encountered in the health care setting”

Assessment of evidence
"Effective use of a disinfectant for environment includes: a. Application of disinfectant only after visible soil and other impediments to disinfection have been removed b. Following the manufacturer's written instructions for dilution and contact time" For adequate removal of *C. difficile*, the use of a sporicidal agent for disinfection after the room has been cleaned is needed. **Limitations:** The guidance is high level and lacks detailed systematic methodology or information on how recommendations were created. Some references have been provided however it is unclear which references informed recommendations, therefore the guidance is graded as expert opinion. Applicability of this guidance to NHS Scotland health and care settings should be considered as low due to differences in health and care systems and policies related to environmental decontamination.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Siegel JD, Rhinehart, E, Jackson, M et al. 2007 Guideline for Isolation Precautions: Preventing Transmission of Infectious Agents in Healthcare Settings.	Guidance	**Level 4**	N/A	N/A	N/A

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
December 2007. Updated September 2024. Accessed 13 August 2024.					

Assessment of evidence

Country: US

Guidance gives high some high level recommendations on environmental decontamination in cases of isolation precautions, however the guidance points to specific environmental decontamination guidance with further detail. This guidance does not have a systematic methodology and is deemed as expert opinion. The guidance recommends:

“Clean and disinfect surfaces that are likely to be contaminated with pathogens, including those that are in close proximity to the patient (e.g., bed rails, over bed tables) and frequently-touched surfaces in the patient care environment (e.g., door knobs, surfaces in and surrounding toilets in patients’ rooms) on a more frequent schedule compared to that for other surfaces (e.g., horizontal surfaces in waiting rooms).”

“Use EPA-registered disinfectants that have microbiocidal (i.e., killing) activity against the pathogens most likely to contaminate the patient-care environment. Use in accordance with manufacturer’s instructions.”

Limitations:

This guidance does not have a systematic methodology and is graded as expert opinion. IPC practices and products available for environmental decontamination may differ in the US, limiting applicability of this guidance to Scottish health and care settings.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Centers for Disease Control and Prevention. Core Infection Prevention and Control Practices for Safe Healthcare Delivery in All Settings. April 2024. Accessed 13 August 2024	Guidance	**Level 4**	N/A	N/A	N/A

Assessment of evidence

Country: US

This is a high-level document that summarises infection prevention and control principles that should be applied to all health and care settings, regardless of healthcare provided. The document summarises core recommendations from more than one of the CDC guideline documents. This document was formulated by a working group and is deemed as expert opinion. The document recommends the following high-level principle:

“Follow manufacturers’ instructions for proper use of cleaning and disinfecting products (e.g., dilution, contact time, material compatibility, storage, shelf-life, safe use and disposal).”

Assessment of evidence
Limitations: Differences in registered disinfectants used in the US differs from those in the UK limiting applicability to Scottish health and care settings.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
World Health Organization (WHO) Global guidelines for the prevention of surgical site infection, second edition. 2018. Accessed 01 September 2024.	Guidance	**Level 4**	N/A	N/A	N/A

Assessment of evidence
Country: international This guidance had been created for surgical settings with a global context to reduce the risk of surgical site and healthcare associated infections. The guidance discusses methods (techniques) for decontamination based on surface type and touch frequency:

Assessment of evidence

"At the beginning of each day, all flat surfaces should be wiped with a clean, lint-free moist cloth to remove dust and lint. Between cases, hand-touch surfaces and surfaces that may have come in contact with patients' blood or body fluids, should be wiped clean first by using a detergent solution and then disinfected according to hospital policy and allowed to dry."

"The operating table should be cleaned and wiped with a detergent solution, including the mattress and the surface. All surfaces that have come in contact with a patient or a patient's body fluids must be cleaned and disinfected using an appropriate disinfectant solution according to local protocols."

"At the end of every day, it is necessary to perform a total cleaning procedure. All areas of the surgical suite, scrub sinks, scrub or utility areas, hallways and equipment should be thoroughly cleaned, regardless of whether they were used or not during the last 24 hours…All surfaces should be cleaned from top to bottom using a detergent, followed by a disinfectant if necessary, and then allowed to dry. To reduce the microbial contamination of environmental surfaces, such as walls, ceilings and floors, they should be thoroughly cleaned from top to bottom with a detergent and allowed to dry. The routine use of a disinfectant or fumigation of the OR is not necessary even after contaminated surgery."

The following cleaning principles are described:

- "Cleaning is an essential first step prior to any disinfection process to remove dirt, debris and other materials.
- The use of a neutral detergent solution is essential for effective cleaning. It removes dirt while improving the quality of cleaning by preventing the build-up of biofilms and thus increasing the effectiveness of chemical disinfectants.
- If disinfectants are used, they must be prepared and diluted according to the manufacturer's instructions. Too high and/or too low concentrations reduce the effectiveness of disinfectants. In addition, high concentrations of disinfectant may damage surfaces.
- Avoid cleaning methods that produce mists or aerosols or disperse dust, for example dry sweeping (brooms, etc.), dry mopping, spraying or dusting."

Assessment of evidence
Limitations: The recommendations in this guidance appear to be evidence-based with systematic reviews undertaken for certain topics, however there is no reference to a systematic review for environmental decontamination, so this is deemed as level 4 expert opinion. Lack of referencing throughout the document provides difficulty when assessing where the evidence has been sourced from. The guidelines are only applicable to surgical settings and lack detail due to the global context where heath and care settings vary.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Siegel JD, Rhinehart E, Jackson M et al. Management of Multidrug-Resistant Organisms in Healthcare Settings. 2006. Updated February 2017. Accessed 13 August 2024	Guidance	**Level 4**	N/A	N/A	N/A

Assessment of evidence
Country: US This guidance is for application in health and care settings in situations with multi-drug resistant organisms (MDROs) for example MRSA and VRE. The guidance recommends the following high level use of products: “Clean and disinfect surfaces and equipment that may be contaminated with pathogens, including those that are in close proximity to the patient (e.g., bed rails, over bed tables) and frequently-touched surfaces in the patient care environment (e.g., door knobs, surfaces in and surrounding toilets in patients' rooms) on a more frequent schedule compared to that for minimal touch surfaces (e.g., horizontal surfaces in waiting rooms). Prioritize room cleaning of patients on Contact Precautions. Focus on cleaning and disinfecting frequently touched surfaces (e.g., bedrails, bedside commodes, bathroom fixtures in the patient's room, doorknobs) and equipment in the immediate vicinity of the patient.” **Limitations:** The guidance does not provide a full systematic methodology so is deemed as expert opinion. The references provided within the recommendations are older (many before 2000) and practices may have changed since then. The guidance lacks any specific extra details for environmental decontamination in situations for MDROs compared to infected patients or outbreaks with any pathogens – when extra cleaning and disinfection would be taking place. The guidance does also not define what cleaning and disinfection are, or detail specific products, and IPC practices may differ in the US, limiting applicability of this guidance to Scottish health and care settings.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Munoz-Price LS, Bowdle A, Johnston BL, et al. Society for Healthcare Epidemiology of America (SHEA) Expert Guidance Infection Prevention in the Operating Room Anesthesia Work Area. October 2018. Accessed 11 August 2024	Guidance	**Level 4**	N/A	N/A	N/A
Assessment of evidence					
Country: US This expert opinion guidance is for use in the operating room anaesthesia work area. The guidance was created for “topics of relatively narrow scope that lack the level of evidence required for a formal guideline development.” The following recommendation is made:					

Assessment of evidence
"To reduce the bioburden of organisms and the risk of transmitting these organisms to patients, the facility should clean and disinfect high-touch surfaces on the anaesthesia machine and anaesthesia work area between OR uses with an EPA-approved hospital disinfectant that is compatible with the equipment and surfaces based on the manufacturers' instruction for use. […] the authors suggest prioritizing high-touch surfaces." **Limitations:** This guidance is high level and specific to operating room anaesthesia work area and there are differences in legal requirements of disinfectants, limiting applicability to all NHS Scotland health and care settings.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Loveday H, Wilson J, Pratt R, et al. Epic3: national evidence-based guidelines for preventing healthcare-associated infections in NHS hospitals in England.	Guideline	**AGREE II 'with modifications'**	N/A	N/A	N/A

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Journal of Hospital Infection 2014; 86: S1-S70.					

Assessment of evidence

Country: UK (NHS England)

This guidance was developed using a systematic methodology for use in NHS England hospitals and other acute care settings to prevent healthcare-associated infections. The guidance provides some high-level recommendations for environmental decontamination methods (techniques):

“The use of disinfectants should be considered for cases of infection and/ or colonisation when a suspected or known pathogen can survive in the environment, and environmental contamination may contribute to the spread of infection.”

Limitations:

This guidance was assessed using the AGREE II tool and the outcome was ‘agree with modifications’. The guidance lacks some important elements such as rigour of development and adherence to a search strategy. The guidance is also outdated and should have been updated in 2018. The guidance is also high level and lacks detail in certain areas of environmental decontamination, including in the correct application of detergent or disinfectants.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Health Facilities Scotland. NHSScotland national cleaning services specification (SHFN 01-02). July 2025. Accessed 30 September 2025	Guidance	**Level 4**	N/A	N/A	N/A

Assessment of evidence

Country: UK (NHS Scotland)

The NHS Scotland national cleaning services specification categorises all rooms and areas under an alphanumeric-coding system, and these are split into clinical and non-clinical areas. This guidance on clinical and non- clinical areas in relation to the care environment is important to understand the risk rating for each specific care environment in relation to healthcare associated infection and environmental decontamination.

Specific products and methods are not described. Instead, SOPs refer to preparing “cleaning/disinfectant solution according to manufacturer’s instructions”. Note 4 advises that “when using cleaning/ disinfectant solution change solution every 15 minutes or when moving to a new location, in line with manufacturer's instructions”.

Assessment of evidence
Limitations: This document has been developed by an expert working group intended for specific used in NHS Scotland health and care settings, therefore it is highly applicable. However, limitations include no systematic methodology, minimal reference to the evidence base and no graded recommendations for assessment.

Question 8: How should blood and body fluid spillages be managed?

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Centers for Disease Prevention and Control (CDC). Guideline for Disinfection and Sterilization in Healthcare Facilities. 2008. Updated June 2024. Accessed 13 August 2024	Guidance	**Level 4**	N/A	N/A	N/A

Assessment of evidence

Country: US

This guidance has been created for application to health and care settings. This guidance provides information on the management of blood and body fluid spillages:

“Promptly clean and decontaminate spills of blood and other potentially infectious materials. Discard blood-contaminated items in compliance with federal regulations.

Disinfect areas contaminated with blood spills using an EPA-registered tuberculocidal agent, a registered germicide on the EPA Lists D and E (i.e., products with specific label claims for HIV or HBV or freshly diluted hypochlorite solution.

Assessment of evidence
If sodium hypochlorite solutions are selected use a 1:100 dilution (e.g., 1:100 dilution of a 5.25-6.15% sodium hypochlorite provides 525-615 ppm available chlorine) to decontaminate nonporous surfaces after a small spill (e.g., 10 mL) of blood or other potentially infectious materials, or involves a culture spill in the laboratory, use a 1:10 dilution for the first application of hypochlorite solution before cleaning in order to reduce the risk of infection during the cleaning process in the event of a sharp injury. Follow this decontamination process with a terminal disinfection, using a 1:100 dilution of sodium hypochlorite. If the spill contains large amounts of blood or body fluids, clean the visible matter with disposable absorbent material, and discard the contaminated materials in appropriate, labelled containment. Use protective gloves and other PPE appropriate for this task [cleaning spills].” **Limitations:** This guidance suggests the use of sodium hypochlorite for managing blood and body fluid spillages, categorising methods based on the size of spillage. Reference to EPA-approved products and differences in IPC practices in the US limits applicability of this guidance to Scottish health and care settings. Furthermore, this guidance lacks a systematic methodology and states that the included literature is not used to support recommendations and is therefore graded as expert opinion.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
CDC and the Healthcare Infection Control Practices Advisory Committee (HICPAC).	Guidance	**Level 4**	N/A	N/A	N/A

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Guidelines for Environmental Infection Control in Health-Care Facilities. 2003. Updated July 2019. Accessed 16 August 2024.					

Assessment of evidence

Country: US

This guidance is for health and care settings and provides detail on cleaning and decontaminating spills of blood, body fluids and potentially infectious materials:

“Promptly clean and decontaminate spills of blood or other potentially infectious materials.

Follow proper procedures for site decontamination of spills of blood or blood-containing body fluids.

Use protective gloves and other PPE appropriate for this task.

If the spill contains large amounts of blood or body fluids, clean the visible matter with disposable absorbent material, and discard the contaminated materials in appropriate, labelled containment.

Swab the area with a cloth or paper towels moderately wetted with disinfectant, and allow the surface to dry.

Assessment of evidence
Use EPA-registered hospital disinfectants labelled tuberculocidal or registered germicides on the EPA Lists D and E (products with specific label claims for HIV or hepatitis B virus [HBV]) in accordance with label instructions to decontaminate spills of blood and other body fluids An EPA-registered sodium hypochlorite product is preferred, but if such products are not available, generic versions of sodium hypochlorite solutions (e.g., household chlorine bleach) may be used Use a 1:100 dilution (500–615 ppm available chlorine) to decontaminate nonporous surfaces after cleaning a spill of either blood or body fluids in patient-care settings. If a spill involves large amounts of blood or body fluids, or if a blood or culture spill occurs in the laboratory, use a 1:10 dilution (5,000–6,150 ppm available chlorine) for the first application of germicide before cleaning." **Limitations:** This guidance suggests the use of sodium hypochlorite for managing blood and body fluid spillages, categorising methods based on the size of spillage. This guidance provides some evidence for different techniques used for managing blood and body fluid spillages; however, this is high level and lacks detail. The guidance lacks a systematic methodology and includes literature from year 1977, which may not be relevant to current practices. Furthermore, reference to EPA-approved products and differences in IPC practices in the US limits applicability of this guidance to Scottish health and care settings

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
National Health and Medical Research Council. Australian Guidelines for the Prevention and Control of Infection in Healthcare. May 2019. Accessed 24 August 2024.	Guidance	**Level 4**	N/A	N/A	N/A

Assessment of evidence

Country: Australia

This guidance was developed for use in healthcare facilities and outlines general principles and recommendations for the management of blood and body fluid spillages.

The following 'weak' recommendation is made:

"It is suggested that site decontamination should occur after spills of blood or other potentially infectious materials. Spills of blood or other potentially infectious materials should be promptly cleaned as follows: wear gloves and other personal protective equipment appropriate to the task, confine and contain spill, clean visible matter with disposable absorbent material and discard the used cleaning materials in the appropriate waste container, clean the spill area with a cloth or paper towels using detergent solution. Use of Therapeutic Goods Administration-listed hospital-grade disinfectants with specific claims or a chlorine-based product such as sodium hypochlorite should be based on assessment of risk of transmission of infectious agents from that spill.

Assessment of evidence
The decision to use disinfectants should be dependent upon the compatibility of the disinfectant with the materials where the spill occurred." The guidance suggests appropriate processed for managing spills based on the volume of the spill (spot cleaning, small spills up to 10cm diameter or large spills over 10cm in diameter). The recommendations is to clean with a detergent followed by sodium hypochlorite solutions. For small spills an absorbent material can be used first and for larger spills an absorbent clumping agent followed by detergent then sodium hypochlorite. "Strategies for decontaminating spills of blood and other body substances (e.g. vomit, urine) differ based on the setting in which they occur and the volume of the spill: • healthcare workers can manage small spills by cleaning with detergent solution • for spills containing large amounts of blood or other body substances, workers should contain and confine the spill by: ◦ removing visible organic matter with absorbent material (e.g. disposable paper towels) ◦ removing any broken glass or sharp material with forceps ◦ soaking up excess liquid using an absorbent clumping agent (e.g. absorbent granules)." **Limitations:** The guidance has been developed using the GRADE methodology, however there is no reference to a systematic literature review for the recommendations for 'Managing the physical environment across healthcare settings'. It is also unclear what references have been used to support the recommendations, therefore this guidance is deemed as expert opinion. Furthermore, IPC practices and products available for environmental decontamination may differ in Australia, limiting applicability of this guidance to Scottish health and care settings.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Health and Safety Executive (HSE). Decontamination against bloodborne viruses: Methods of decontamination. Accessed 11 June 2025.	Guidance	**Level 4**	N/A	N/A	N/A

Assessment of evidence

Country: UK

The guidance discusses management of blood and body fluid spillages. The guidance suggests that “The supplier should be asked to provide evidence of the product's efficacy against BBV (blood borne viruses) and the user must be satisfied with its efficacy under the proposed conditions of use”. The guidance also states that:

“Levels of contamination may vary, and this will influence the degree of cleaning and disinfectant required for different applications. In particular, visible blood or body fluid will require use of a higher concentration of any chosen product, and the end user should be aware that higher concentrations of some disinfectants might produce bleaching or staining effects on treated materials. A wide choice of virucidal products is, however, now available, and material damage should be avoidable without compromising treatment efficacy.”

The following high-level methods are suggested:

“Because clearing blood or body fluid spillages may expose an individual to infectious microorganisms, every care must be taken to ensure the member of staff is protected by the appropriate use of protective clothing. Local codes of practice should specify procedures (eg spill kits) and the disinfectants to be used for dealing with spillage and other forms of contamination.

Assessment of evidence
The following points apply, regardless of the scale of the spill: Gloves should be worn throughout and should be discarded safely after use; and […] Procedure for small spots of blood or small spills: Gloves should be worn and lesions on exposed skin covered with waterproof dressings. Contamination should be wiped up with a paper towel soaked in freshly prepared hypochlorite solution containing 10,000ppm available chlorine. Towels and gloves should be placed in a clinical waste bag for incineration and hands washed. Procedure for larger spills other than urine (unless bloodstained): Gloves should be worn and lesions on exposed skin covered with waterproof dressings. If the spillage is extensive, disposable plastic overshoes or rubber boots may be necessary; If splashing is likely to occur while cleaning up, other protective clothing should be worn, eg to protect the eyes, clothing. Liquid spills should be covered with dichloroisocyanurate granules and left for at least two minutes before clearing up with paper towels and/or a plastic dustpan. Alternatively, the spill may be covered with paper towels and the contaminated area gently flooded with hypochlorite solution containing 10,000ppm available chlorine (again this should be left for at least two minutes before attempting to clear up). Note that urine may promote the release of free chlorine from the treated area when hypochlorite or other chlorine-containing compounds are applied. Ventilation of the area will be necessary. Towels, gloves, disposable overshoes and contaminated clothing should be placed in a waste bag for incineration and hands washed; (rubber boots may be decontaminated with dilute disinfectant).

Assessment of evidence
Finally, the area should be washed with water and detergent and allowed to dry." The guidance aligns with other evidence in this area on the management of blood and body fluid spillages, particularly suggesting a chlorine based agent and adapting the methods to the size of the spillage. **Limitations:** No systematic methodology or references are provided for this guidance, however the HSE is a UK national regulatory body for health and safety in the workplace. This is deemed as expert opinion.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Royal College of Nursing. Essential Practice for Infection Prevention and Control Guidance for nursing staff. November 2017. Accessed 18 August 2024	Guidance	**Level 4**	N/A	N/A	N/A

Assessment of evidence
Country: UK This guidance provides practice recommendations for staff working in health and social care settings. The guidance lacks detail on management of blood and body fluid spills but states that: “Spillages of blood and bodily fluids should be dealt with quickly, following your workplace’s written policy for dealing with spillages. The policy should include details of the chemicals staff should use to ensure that any spillage is disinfected properly, taking into account the surface where the incident happened – for example, a carpet in a patient’s home, or a hard surface in a hospital.” **Limitations:** This guidance states that the practice recommendations are evidence based, however there is no evidence of a systematic methodology or references provided.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Ling ML, Apisarnthanarak A, Thu le TA, et al. APSIC Guidelines for environmental cleaning and decontamination. Antimicrob Resist Infect Control.	Guidance	**Level 4**	N/A	N/A	N/A

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
2015;4:58. Published 2015 Dec 29. doi:10.1186/s13756-015-0099-7					

Assessment of evidence

Country: Asia Pacific region

This guidance was developed by the Asia Pacific Society of Infection Control (APSIC) for use in all health and care settings. The guidance discusses “cleaning spills of blood and body substances” and divides this into small and larger spills.

For small spots of blood or small spills:

“Contamination should be wiped up with paper towels soaked in freshly prepared chlorine-based compound containing 10,000 ppm (1% available chlorine). […]. Towels and gloves used should be disposed of in biohazard waste bag for appropriate disposal. Hands must be washed following clearing up.”

For larger spills other than urine (unless bloodstained):

“Liquid spills should be covered with chlorine releasing granules and left for appropriate contact time according to manufacturer’s written instruction, before clearing up with paper towels. Alternatively, the spill may be covered with paper towels and gently flooded with chlorine-based solution containing 10,000 ppm (1% available chlorine). […] Paper towels, gloves and any contaminated clothing should be placed in the biohazard waste bag for appropriate disposal. Finally, the area should be washed with water and detergent and allowed to dry . A normal mop and bucket should not be used for cleaning blood spillages.”

The following recommendations are made:

“Spills of blood and other bodily substances must be contained, cleaned and the area disinfected immediately.”

Assessment of evidence
"Absorbent disinfectant spillage granules may be more convenient to use instead of liquid disinfectant." **Limitations:** The guidance is high level and lacks detailed systematic methodology or information on how recommendations were created. Some references have been provided however it is unclear which references informed recommendations, therefore the guidance is deemed as expert opinion. Differences in health and care systems and policies related to environmental decontamination may limit applicability of this guidance to Scottish health and care settings.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Centers for Disease Control and Prevention. Core Infection Prevention and Control Practices for Safe Healthcare Delivery in All Settings. April 2024. Accessed 13 August 2024	Guidance	**Level 4**	N/A	N/A	N/A

Assessment of evidence
Country: US This is a high-level document that summarises infection prevention and control principles that should be applied to all health and care settings, regardless of healthcare provided. The document summarises core recommendations from more than one of the CDC guideline documents. This document was formulated by a working group and is deemed as expert opinion. The document recommends the following high-level principles: “Promptly clean and decontaminate spills of blood or other potentially infectious materials.” The guidance aligns with the wider evidence base when promptly decontaminating blood and bodily fluid spillages. **Limitations:** Differences in registered disinfectants used in the US differs from those in the UK, and IPC practices may differ which limits applicability of this guidance to Scottish health and care settings.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
World Health Organization (WHO) Global guidelines for the prevention of surgical site infection, second edition. 2018.	Guidance	**Level 4**	N/A	N/A	N/A

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Accessed 01 September 2024.					

Assessment of evidence

Country: international

This guidance had been created for surgical settings with a global context to reduce the risk of surgical site and healthcare associated infections. The guidance mentioned prompt cleaning and disinfection of blood and body fluid spillages and does not detail methods (techniques).

Limitations:

The recommendations in this guidance appear to be evidence-based with systematic reviews undertaken for certain topics, however there is no reference to a systematic review for environmental decontamination, so this is deemed as level 4 expert opinion. Lack of referencing throughout the document provides difficulty when assessing where the evidence has been sourced from. The guidelines are only applicable to surgical settings and lack detail due to the global context where heath and care settings vary.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Siegel JD, Rhinehart, E, Jackson, M et al. 2007 Guideline for Isolation Precautions: Preventing Transmission of Infectious Agents in Healthcare Settings. December 2007. Updated September 2024. Accessed 13 August 2024.	Guidance	**Level 4**	N/A	N/A	N/A

Assessment of evidence

Country: US

Guidance gives high some high-level recommendations on environmental decontamination in cases of isolation precautions, however the guidance links to specific environmental decontamination guidance from the CDC with further detail. This guidance does not have a systematic methodology and is deemed as expert opinion. The guidance recommends:

Assessment of evidence
"Clean and disinfect surfaces that are likely to be contaminated with pathogens, including those that are in close proximity to the patient (e.g., bed rails, over bed tables) and frequently-touched surfaces in the patient care environment (e.g., door knobs, surfaces in and surrounding toilets in patients' rooms) on a more frequent schedule compared to that for other surfaces (e.g., horizontal surfaces in waiting rooms)." **Limitations:** This guidance does not have a systematic methodology and is graded as expert opinion. Furthermore, IPC practices may differ in the US, limiting applicability of this guidance to Scottish health and care settings.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
NHS National Services Scotland. SAN(SC)19/03 Risk of death and severe harm from ingesting superabsorbent polymer gel granules. December 2019. Accessed 30 July 2025.	Safety Action Notice (SAN)	**Level 4**	N/A	N/A	N/A

Assessment of evidence
Country: UK (Scotland) This SAN describes a Restricted Alert Placeholder in place of the alert containing “information which could undermine the safety of patients, staff and others if misused”.

Question 9: What is the recommended frequency for environmental decontamination?

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Centers for Disease Prevention and Control (CDC). Guideline for Disinfection and Sterilization in Healthcare Facilities. 2008. Updated June 2024. Accessed 13 August 2024	Guidance	**Level 4**	N/A	N/A	N/A

Assessment of evidence

Country: US

This guidance has been created for application to health and care settings. This guidance provides some high level recommendations for frequency for environmental decontamination:

- “Clean housekeeping surfaces (e.g., floors, tabletops) on a regular basis, when spills occur, and when these surfaces are visibly soiled.

Assessment of evidence

- Clean walls, blinds, and window curtains in patient-care areas when these surfaces are visibly contaminated or soiled.
- Disinfect (or clean) environmental surfaces on a regular basis (e.g., daily, three times per week) and when surfaces are visibly soiled."

The above recommendations provides some recommendations on frequency of routine cleaning or disinfection, although frequency remains vague for certain situations (suggesting daily or three times per week).

Limitations:

The guidance lacks acknowledgement of the need for cleaning and disinfection in the case of an outbreak or infected patient. Some limitations of this guidance include a lack a systematic methodology and the included literature is not used to support recommendations and is therefore graded as expert opinion. IPC practices may differ in the US, limiting applicability of this guidance to Scottish health and care settings.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
CDC and the Healthcare Infection Control Practices Advisory Committee (HICPAC). Guidelines for Environmental Infection Control in	Guidance	**Level 4**	N/A	N/A	N/A

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Health-Care Facilities. 2003. Updated July 2019. Accessed 16 August 2024.					

Assessment of evidence

Country: US

This guidance provides some high-level recommendations for frequency for environmental decontamination.

“Keep housekeeping surfaces (e.g., floors, walls, and tabletops) visibly clean on a regular basis and clean up spills promptly

Clean and disinfect high-touch surfaces (e.g., doorknobs, bed rails, light switches, and surfaces in and around toilets in patients’ rooms) on a more frequent schedule than minimal touch housekeeping surfaces.

Clean walls, blinds, and window curtains in patient-care areas when they are visibly dusty or soiled.

After the last surgical procedure of the day or night, wet vacuum or mop operating room floors with a single-use mop and an EPA-registered hospital disinfectant.

Use a one-step process and an EPA-registered hospital disinfectant/detergent designed for general housekeeping purposes in patient-care areas when • * uncertainty exists as to the nature of the soil on these surfaces [e.g., blood or body fluid contamination versus routine dust or dirt]; or * uncertainty exists regarding the presence or absence of multi-drug resistant organisms on such surfaces.”

Assessment of evidence
Limitations: This guidance provides high level evidence for frequency of environmental decontamination, however recommendations are very vague. The guidance lacks acknowledgement of the need for cleaning and disinfection in the case of an outbreak or infected patient. This guidance provides some evidence for frequency of environmental decontamination; however, this is high level. The guidance lacks a systematic methodology and included literature from year 1977, which may not be relevant to current practices and is graded as expert opinion. Furthermore, IPC practices and products available for environmental decontamination may differ in the US, limiting applicability of this guidance to Scottish health and care settings.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
National Health and Medical Research Council. Australian Guidelines for the Prevention and Control of Infection in Healthcare. May 2019. Accessed 24 August 2024.	Guidance	**Level 4**	N/A	N/A	N/A

Assessment of evidence
Country: Australia This guidance was developed for use in healthcare facilities and outlines general principles and recommendations for the frequency of environmental decontamination. The guidance recommends that frequency of cleaning is undertaken via risk assessment and 'reflected in the healthcare facility policy'. Recommendations of cleaning frequency are presented in a table. This details all different elements of the health and care setting and categorises this based on high, medium and low risk. Cleaning of frequently touched surfaces should be "at least daily, when visibly soiled and after every known contamination" and "general surfaces and fittings" should be cleaned "when visibly soiled and immediately after spillage". Frequency is also dependent on contamination levels for example in outbreak situations: "Frequency and efficiency of environmental cleaning should be increased above the standard for the area to ensure any contaminants are removed. A targeted cleaning regime may be introduced and continued for the duration of the outbreak dependent on the mode of transmission of the infectious agent', spillages, noticeable contamination and the presences of MDRO's or norovirus." **Limitations:** The guidance has been developed using the GRADE methodology, however there is no reference to a systematic literature review for the recommendations for 'Managing the physical environment across healthcare settings'. It is also unclear what references have been used to support the recommendations, therefore this guidance is deemed as expert opinion. IPC practices and products available for environmental decontamination may differ in the US, limiting applicability of this guidance to Scottish health and care settings.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Royal College of Nursing. Essential Practice for Infection Prevention and Control Guidance for nursing staff. November 2017. Accessed 18 August 2024	Guidance	**Level 4**	N/A	N/A	N/A

Assessment of evidence

Country: UK

This guidance provides practice recommendations for staff working in health and social care settings, developed in the UK. The guidance is high level and provides minimal detail on methods (techniques) for decontamination. The guidance states that:

“Ensure an appropriate cleaning specification is in place to meet the needs of the environment where patients are cared for or use; this applies to inpatient and outpatient environments. For acute and community facilities a risk assessment should be performed to identify the cleaning needs and frequency” and “a local cleaning policy should be in place clearly defining which areas are cleaned and by whom”.

Limitations:

This guidance states that the practice recommendations are evidence based, however there is no evidence of a systematic methodology, or references provided therefore the guidance is graded as expert opinion.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
European Centre for Disease Control (ECDC) Considerations for infection prevention and control practices in relation to respiratory viral infections in healthcare settings. February 2023 Accessed: 15 August 2024.	Guidance	**Level 4**	N/A	N/A	N/A
Assessment of evidence					
Country: EU/EAA The above guidance refers to some high-level recommendations for the cleaning in health in care settings during high levels of circulating respiratory viruses, such as during the winter season. This guidance is intended for use in EU/EEA countries. The guidance recommends the following in 'patients with respiratory viral tract infections': "In hospital rooms, it is recommended that the floor is cleaned regularly and that frequently-touched surfaces are disinfected using hospital disinfectants active against viruses with disinfectant"					

Assessment of evidence
Limitations: This guidance is high level and provides minimal evidence for frequency of environmental decontamination. The guidance does not define 'regular cleaning and disinfection' making interpretation and applicability difficult. Furthermore, IPC practices may differ in the EU/EEA, limiting applicability of this guidance to Scottish health and care settings. This guidance is graded as expert opinion as it lacks any systematic methodology, and no references are provided for the 'cleaning' recommendations.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Public Health Agency of Canada Routine Practices and Additional Precautions for Preventing the Transmission of Infection in Healthcare Settings. September 2017. Accessed 01 September 2024	Guidance	**Level 4**	N/A	N/A	N/A

Assessment of evidence

Country: Canada

This guidance was developed for health and care settings in Canada. The guidance describes frequency based on different situations in the health and care setting:

“Surfaces that are likely to be touched and/or used frequently should be cleaned and disinfected on a more frequent schedule.”

“In outbreaks, consideration should be given to more frequent cleaning and/or cleaning with disinfectants.”

“Additional cleaning measures or frequency may be warranted in situations where continued transmission of specific infectious agents is noted (e.g., Clostridium difficile, norovirus and rotavirus)”

“Terminal cleaning refers to the process for cleaning and disinfecting patient accommodation, which is undertaken upon discharge of any patient or on discontinuation of contact precautions.”

Limitations:

The guidance is high level and states that local policy and procedures are created for environmental decontamination and detailed frequency for routine environmental decontamination is not documented. The guidance has been developed using a system for grading recommendations by an expert group, however there is no reference to a systematic literature review being undertaken to support recommendations, therefore this guidance is deemed as expert opinion. Furthermore, IPC practices may differ in Canada, limiting applicability of this guidance to Scottish health and care settings.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Health Facilities Scotland. Scottish Health Facilities Note (SHFN) 01-05 Safe Management of the Care Environment Cleaning Specification for Care Homes. May 2021. Updated May 2023. Accessed 05 August 2024	Guidance	**Level 4**	N/A	N/A	N/A

Assessment of evidence

Country: UK (NHS Scotland)

This guidance was produced as a cleaning specification for care homes in NHS Scotland. The guidance is not mandatory and does not have a systematic methodology, however it is expert opinion and deemed as best practice.

The guidance provides tools, templates and methods (techniques) for different daily cleaning tasks in the care home setting. Routine disinfection of the environment is not recommended. Guidance states that “It remains the responsibility, locally, to

Assessment of evidence
monitor each area on an on-going basis and amend the frequency of tasks accordingly to achieve an acceptable quality output." Guidance suggests daily and weekly cleaning schedules for each areas/room type. **Limitations:** This guidance is not applicable to acute care settings and is relevant for care homes in NHS Scotland. It should be noted that variation in job titles and staffing exist in this area, so application or roles and responsibilities may vary.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Ling ML, Apisarnthanarak A, Thu le TA, et al. APSIC Guidelines for environmental cleaning and decontamination. Antimicrob Resist Infect Control. 2015;4:58. Published 2015 Dec 29. doi:10.1186/s13756-015-0099-7	Guidance	**Level 4**	N/A	N/A	N/A

Assessment of evidence
Country: Asia Pacific region This guidance was developed by the Asia Pacific Society of Infection Control (APSIC) for use in all health and care settings. The guidance discusses frequency: Specific recommendations made include: “Housekeeping in the health care setting should be performed on a routine and consistent basis to provide for a safe and sanitary environment.” “Cleaning schedules should be developed, with frequency of cleaning reflecting whether surfaces are high-touch or low-touch, the type of activity taking place in the area and the infection risk associated with it; the vulnerability of the patients housed in the area; and the probability of contamination.” Further detail regarding factors to consider when determining risk score are provided, including consideration of probability of contamination. It is stated that this should inform frequency cleaning and disinfection, rather than disinfection being performed on a routine basis. The guidance describes the differences in frequency of decontamination based on high and low touch surfaces, along with risk assessment. Vulnerability of patient population, heavy, moderate or light contamination re also considered in risk assessment for cleaning frequency. **Limitations:** The guidance is high level and lacks detailed systematic methodology or information on how recommendations were created. Some references have been provided however it is unclear which references informed recommendations, therefore the guidance is deemed as expert opinion. Applicability of this guidance to NHS Scotland health and care settings should be considered as low due to differences in health and care systems and policies related to environmental decontamination.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Siegel JD, Rhinehart, E, Jackson, M et al. 2007 Guideline for Isolation Precautions: Preventing Transmission of Infectious Agents in Healthcare Settings. December 2007. Updated September 2024. Accessed 13 August 2024.	Guidance	**Level 4**	N/A	N/A	N/A
Assessment of evidence					
Country: US Guidance gives high some high level recommendations on environmental decontamination in cases of isolation precautions, however the guidance points to specific environmental decontamination guidance with further detail. This guidance does not have a systematic methodology and is deemed as expert opinion. The guidance recommends:					

Assessment of evidence
“Clean and disinfect surfaces that are likely to be contaminated with pathogens, including those that are in close proximity to the patient (e.g., bed rails, over bed tables) and frequently-touched surfaces in the patient care environment (e.g., door knobs, surfaces in and surrounding toilets in patients’ rooms) on a more frequent schedule compared to that for other surfaces (e.g., horizontal surfaces in waiting rooms).” “Establish policies and procedures for routine and targeted cleaning of environmental surfaces as indicated by the level of patient contact and degree of soiling.” ““Ensure that rooms of patients on Contact Precautions are prioritized for frequent cleaning and disinfection (e.g., at least daily) with a focus on frequently-touched surfaced (e.g., bed rails, overbed table, bedside commode, lavatory surfaces in patient bathrooms, doorknobs) and equipment in the immediate vicinity of the patient”. **Limitations:** This guidance does not have a systematic methodology and is deemed as expert opinion. Furthermore, IPC practices may differ in the US, limiting applicability of this guidance to Scottish health and care settings.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Centers for Disease Control and Prevention. Core Infection Prevention and Control Practices for Safe Healthcare	Guidance	**Level 4**	N/A	N/A	N/A

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Delivery in All Settings. April 2024. Accessed 13 August 2024					

Assessment of evidence

Country: US

This is a high-level document that summarises infection prevention and control principles that should be applied to all health and care settings, regardless of healthcare provided. The document summarises core recommendations from more than one of the CDC guideline documents. This document was formulated by a working group and is deemed as expert opinion. The document recommends the following high-level principle related to frequency:

“Require routine and targeted cleaning of environmental surfaces as indicated by the level of patient contact and degree of soiling.”

No further detail is provided on frequency.

Limitations:

Differences in registered disinfectants used in the US differs from those in the UK, and IPC practices may differ, limiting applicability of this guidance to Scottish health and care settings.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
World Health Organization (WHO) Global guidelines for the prevention of surgical site infection, second edition. 2018. Accessed 01 September 2024.	Guidance	**Level 4**	N/A	N/A	N/A

Assessment of evidence

Country: international

This guidance had been created for surgical settings with a global context to reduce the risk of surgical site and healthcare associated infections. The guidance discusses methods (techniques) for decontamination based on surface type and touch frequency:

“High hand touch surfaces - Requires special attention and more frequent cleaning. After thorough cleaning, consider the use of appropriate disinfectants to decontaminate these surfaces”

“Minimal touch surface (floors, walls, ceilings, window sills, etc.) -Requires cleaning on a regular basis with detergent only or when soiling or spills occur. Also required following patient discharge from the health care setting.”

“Administrative and office areas - Require normal domestic cleaning with detergent only.”

Assessment of evidence
"Toilet area - Clean toilet areas at least twice daily and as needed." "Surface contaminated with blood and body fluids - Requires prompt cleaning and disinfection." **Limitations:** The recommendations in this guidance appear to be evidence-based with systematic reviews undertaken for certain topics, however there is no reference to a systematic review for environmental decontamination, so this is deemed as level 4 expert opinion. Lack of referencing throughout the document provides difficulty when assessing where the evidence has been sourced from. The guidelines are only applicable to surgical settings and lack detail due to the global context where heath and care settings vary.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Siegel JD, Rhinehart E, Jackson M et al. Management of Multidrug-Resistant Organisms in Healthcare Settings. 2006. Updated February 2017.	Guidance	**Level 4**	N/A	N/A	N/A

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Accessed 13 August 2024					

Assessment of evidence

Country: US

This guidance is for application in health and care settings in situations with multi-drug resistant organisms (MDROs) for example MRSA and VRE. The guidance recommends the following high level information on frequency of environmental decontamination:

“Clean and disinfect surfaces and equipment that may be contaminated with pathogens, including those that are in close proximity to the patient (e.g., bed rails, over bed tables) and frequently-touched surfaces in the patient care environment (e.g., door knobs, surfaces in and surrounding toilets in patients' rooms) on a more frequent schedule compared to that for minimal touch surfaces (e.g., horizontal surfaces in waiting rooms).

Prioritize room cleaning of patients on Contact Precautions. Focus on cleaning and disinfecting frequently touched surfaces (e.g., bedrails, bedside commodes, bathroom fixtures in the patient's room, doorknobs) and equipment in the immediate vicinity of the patient.”

Limitations:

The guidance does not provide a full systematic methodology so is deemed as expert opinion. The references provided within the recommendations are older (many before 2000) and practices may have changed since then. The guidance lacks any specific extra details for environmental decontamination in situations for MDROs compared to infected patients or outbreaks with any pathogens – when extra cleaning and disinfection would be taking place. The guidance does also not define what cleaning and disinfection are, or detail specific products. Due to these limitations, this guidance may be less applicable to NHS Scotland health and care settings.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Loveday H, Wilson J, Pratt R, et al. Epic3: national evidence-based guidelines for preventing healthcare-associated infections in NHS hospitals in England. Journal of Hospital Infection 2014; 86: S1-S70.	Guideline	**AGREE II 'with modifications'**	N/A	N/A	N/A

Assessment of evidence

Country: UK (NHS England)

This guidance was developed using a systematic methodology for use in NHS England hospitals and other acute care settings to prevent healthcare-associated infections. The guidance provides some in text information on environmental decontamination frequency (not a recommendation with a grading):

Within the definition for enhanced/terminal cleaning - "Enhanced cleaning may be applied to all areas of the healthcare environment or in specific circumstances, such as cleaning of rooms or bed spaces following the transfer or discharge of patients who are colonised or infected with a pathogenic microorganism."

Assessment of evidence
This guidance was assessed using the AGREE II tool and the outcome was 'agree with modifications'. The guidance lacks some important elements such as rigour of development and adherence to a search strategy. The guidance is also outdated and should have been updated in 2018. The guidance is also high level and lacks detail in certain areas of environmental decontamination.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Health Facilities Scotland. NHSScotland national cleaning services specification (SHFN 01-02). July 2025. Accessed 30 September 2025	Guidance	**Level 4**	N/A	N/A	N/A

Assessment of evidence
Country: UK (NHS Scotland) The guidance describes cleaning frequency as a local risk assessment approach to determine the frequency of cleaning: "It remains the responsibility, locally, to monitor each area on an on-going basis and amend frequency of tasks accordingly to achieve an acceptable quality output." Moreover, it's stated that "Particular attention must be given to surfaces and areas that are frequently touched."

Assessment of evidence
Regarding discharge cleans: “A discharge clean should take place after each patient discharge. Local flexibility is required in order that daily programmed clean can be reprogrammed/reallocated thus avoiding requirement for additional cleaning input.” Regarding source isolation rooms: “Isolation rooms or bays should be cleaned at least daily”. Regarding cleaning of ambulance interior: “requirement for daily and weekly recording of vehicle cleaning”. **Limitations:** This document has been developed by an expert working group intended for specific used in NHS Scotland health and care settings, therefore it is highly applicable to the types of environmental decontamination undertaken specifically in NHS Scotland health and care settings.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Munoz-Price LS, Bowdle A, Johnston BL, et al. Society for Healthcare Epidemiology of America (SHEA) Expert Guidance Infection Prevention in the Operating Room	Guidance	**Level 4**	N/A	N/A	N/A

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Anesthesia Work Area. October 2018. Accessed 11 August 2024					

Assessment of evidence

Country: US

This expert opinion guidance is for use in the operating room anaesthesia work area. The guidance was created for “topics of relatively narrow scope that lack the level of evidence required for a formal guideline development.”

The following recommendation is made:

“To reduce the bioburden of organisms and the risk of transmitting these organisms to patients, the facility should clean and disinfect high-touch surfaces on the anaesthesia machine and anaesthesia work area between OR uses with an EPA-approved hospital disinfectant that is compatible with the equipment and surfaces based on the manufacturers’ instruction for use. […] the authors suggest prioritizing high-touch surfaces.”

Limitations:

This guidance is high level and specific to operating room anaesthesia work area and there may be differences in IPC practices and legal requirements for disinfectants in the US, therefore may not be applicable to all NHS Scotland health and care settings.

Question 10: Are there specific requirements for the decontamination of soft furnishings?

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
CDC and the Healthcare Infection Control Practices Advisory Committee (HICPAC). Guidelines for Environmental Infection Control in Health-Care Facilities. 2003. Updated July 2019. Accessed 16 August 2024.	Guidance	**Level 4**	N/A	N/A	N/A

Assessment of evidence

Country: US

Guidance from the CDC contains specific recommendations for ‘carpet and cloth furnishings’ made based on varying quantity and quality of evidence and expert opinion:

“Vacuum carpeting in public areas of health-care facilities and in general patient-care areas regularly with well-maintained equipment designed to minimize dust dispersion.

Avoid use of carpeting in high-traffic zones in patient-care areas or where spills are likely (e.g., burn therapy units, operating rooms, laboratories, and intensive care units).

Follow proper procedures for managing spills on carpeting. Spot-clean blood or body substance spills promptly. If a spill occurs on carpet tiles, replace any tiles contaminated by blood and body fluids or body substances.

Do not use carpeting in hallways and patient rooms in areas housing immunosuppressed patients (e.g., PE areas).

Avoid the use of upholstered furniture and furnishings in high-risk patient-care areas and in areas with increased potential for body substance contamination (e.g., pediatrics units).

If upholstered furniture in a patient’s room requires cleaning to remove visible soil or body substance contamination, move that item to a maintenance area where it can be adequately cleaned with a process appropriate for the type of upholstery and the nature of the soil.”

Limitations:

This guidance suggests some specific requirements for the decontamination of carpets and soft furnishings. This is relevant to NHS Scotland health and care settings, however this is high level and lacks detail with reference to ‘local policy and procedure’. The guidance lacks a systematic methodology and includes literature from year 1977, which may not be relevant to current practices. Furthermore, IPC practices may differ in the US, limiting applicability of this guidance to Scottish health and care settings.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
National Health and Medical Research Council. Australian Guidelines for the Prevention and Control of Infection in Healthcare. May 2019. Accessed 24 August 2024.	Guidance	**Level 4**	N/A	N/A	N/A

Assessment of evidence

Country: Australia

This guidance was developed for use in healthcare facilities and outlines general principles for soft furnishing decontamination. The guidance discusses the following (non-recommendations):

“If spillage has occurred on soft furnishings, a detergent solution can be used to clean the area thoroughly. Do not clean soft furnishings with a disinfectant such as sodium hypochlorite. Soft furnishings can also be wet vacuumed. Following cleaning of soft furnishings, they must be allowed to dry before reuse.”

Limitations:

The guidance has been developed using the GRADE methodology, however there is no reference to a systematic literature review for the recommendations for ‘Managing the physical environment across healthcare settings’. It is also unclear what references have been used to support the recommendations, therefore this guidance is deemed as expert opinion. Furthermore,

Assessment of evidence
IPC practices and products available for environmental decontamination may differ in the US, limiting applicability of this guidance to Scottish health and care settings.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Health and Safety Executive (HSE). Decontamination against bloodborne viruses: Methods of decontamination. Accessed 11 June 2025.	Guidance	**Level 4**	N/A	N/A	N/A

Assessment of evidence
Country: UK The guidance discussed the decontamination of carpet and upholstery cleaning and spills from blood or body fluid. It is suggested that in environments where they are likely to be blood and body fluid spillages, carpets and soft furnishings should be avoided. Where blood and body fluid spills do occur on carpets or fixed cover textiles, “detergent cleaning should be followed by steam cleaning, so long as the materials will tolerate this. For curtains and other loose cover items, laundering or dry-cleaning followed by hot pressing is effective. Again, textiles should be checked to ensure their tolerance of such treatments. It should, however, be

Assessment of evidence
noted that the efficacy of such procedures is likely to be variable, and dependent on choice of (steaming) equipment, disinfectants and nature of the textile being treated. If unable to disinfect as suggested, it will be necessary to incinerate soft furnishings if the contamination level is heavy and if there are grounds for believing that the contaminating material is infectious." Specific conditions are described wherein use of liquid vacuum methods and use of disinfectant would be acceptable. **Limitations:** No systematic methodology or references are provided for this guidance, however the HSE is a UK national regulatory body for health and safety in the workplace. This guidance is graded as expert opinion.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Health Facilities Scotland. Scottish Health Facilities Note (SHFN) 01-05 Safe Management of the Care Environment Cleaning Specification for Care Homes.	Guidance	**Level 4**	N/A	N/A	N/A

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
May 2021. Updated May 2023. Accessed 05 August 2024					

Assessment of evidence

Country: UK (NHS Scotland)

This guidance was produced as a cleaning specification for care homes in NHS Scotland. The guidance is not mandatory and does not have a systematic methodology, however it is expert opinion and deemed as best practice. The guidance details cleaning for soft furnishing to reduce the risk of cross infection: “Soft furnishings can include chairs, foot stools, couches, cushions and carpets, Service Users personal belongings included in this.” Detailed methods can be found in the guidance, including vacuuming/suction cleaning, and reference to manufacturers instructions when undertaking cleaning of specific furnishings is required. Reference is made to specific carpet cleaning kits for spot or deep cleaning.

Limitations:

This guidance is not applicable to acute care settings and is relevant for care homes in NHS Scotland. It should be noted that variation in job titles and staffing exist in this area, so application or roles and responsibilities may vary.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Health Facilities Scotland. NHSScotland national cleaning services specification (SHFN 01-02). July 2025. Accessed 30 September 2025	Guidance	**Level 4**	N/A	N/A	N/A

Assessment of evidence

Country: UK (NHS Scotland)

The guidance describes methods (techniques) of cleaning of soft flooring and carpeted flooring. Further detail is in the guidance.

The SOPs refer to suction cleaning carpeted floors as part of routine cleaning.

Limitations:

This document has been developed by an expert working group intended for specific used in NHS Scotland health and care settings, therefore it is highly applicable to the types of environmental decontamination undertaken specifically in NHS Scotland health and care settings.

Question 11: Who has responsibility for ensuring the care environment is decontaminated appropriately?

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Scottish Executive Health Department. NHS HDL (2005) 7 Infection control and cleaning: nursing issues. March 2005.	Guidance	**Level 4**	N/A	N/A	N/A

Assessment of evidence

Country: UK (NHS Scotland)

HDL(2005)07 establishes that Charge Nurses/Sisters are responsible for ensuring safe working conditions within their clinical area, including all aspects of environmental cleanliness. This includes authority to require local cleaning services to act on any problems identified. It is also noted that Charge Nurses/Sisters are responsible for ensuring the implementation of any local or national IPC guidance provided by the ICT in their area. The HDL also reinstates the importance of infection control and that maintaining a clean environment and reducing infection risks is “everyone’s responsibility – management, frontline staff, patients and the public.”

This HDL is directly applicable to NHS Scotland health and care settings.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Royal College of Nursing. Essential Practice for Infection Prevention and Control Guidance for nursing staff. November 2017. Accessed 18 August 2024	Guidance	**Level 4**	N/A	N/A	N/A

Assessment of evidence

Country: UK

This guidance provides practice recommendations for staff working in health and social care settings. The guidance is high level and provides some detail on responsibility for ensuring the care environment is decontaminated appropriately. The guidance states that:

“All nurses, midwives and health care assistants have a responsibility to be aware of their local cleaning specification to ensure that any issues are highlighted immediately should they occur; while overall responsibility usually lies with the ward/department manager, all staff have a responsibility to support them and ensure that patients are cared for in a clean safe environment.”

Assessment of evidence
Limitations: This guidance states that the practice recommendations are evidence based, however there is no evidence of a systematic methodology, or references provided. IPC practices may differ in the US, limiting applicability of this guidance to Scottish health and care settings.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Health Facilities Scotland. Scottish Health Facilities Note (SHFN) 01-05 Safe Management of the Care Environment Cleaning Specification for Care Homes. May 2021. Updated May 2023. Accessed 05 August 2024	Guidance	**Level 4**	N/A	N/A	N/A

Assessment of evidence
Country: UK (NHSScotland) This guidance was produced as a cleaning specification for care homes in NHS Scotland. The guidance is not mandatory and does not have a systematic methodology, however it is expert opinion. The guidance details responsibility for ensuring the care environment is appropriately decontaminated in care homes: “Governance is an essential part of any system or process and must be clear, concise and structured. Across Scottish care homes the structure of domestic services, varies as do roles, titles and even responsibilities. Locally, within each care home, the responsible person will be the care home manager. It is important for all users of this document to be aware of the responsibilities and roles of each staff member with domestic services involvement.” Further detail of specific roles and responsibilities for decontamination for care home manager and domestic staff is listed in table 2.2. **Limitations:** This guidance is not applicable to acute care settings and is relevant for care homes in NHS Scotland. It should be noted that variation in job titles and staffing exist in this area, so application or roles and responsibilities may vary.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
UK Department of Health and Social Care. Infection prevention and control: resource for adult social care	Guidance	**Level 4**	N/A	N/A	N/A

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
2024. Accessed 05 August 2024.					

Assessment of evidence

Country: UK

This guidance is intended for adult health and social care settings out with the NHS provided services. The guidance briefly describes worker responsibility for cleaning of the environment:

“Where cleaning is the responsibility of the worker it is important all understand their responsibilities” including methods, training, roles and responsibilities, with specific examples provided.

As this guidance is intended to cover a wide variety of setting, it does not provide staff roles for direct responsibility of ensuring safety of the care environment however it does provide some information on workers responsibility if cleaning falls under this. This guidance could be applied to care home settings out with NHS Scotland.

Limitations:

The guidance does not follow a systematic methodology and is graded as expert opinion. Differences in setting structure should be considered when applying this guidance to Scottish health and care settings.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Health Facilities Scotland. NHSScotland national cleaning services specification (SHFN 01-02). July 2025. Accessed 30 September 2025	Guidance	**Leve l 4**	N/A	N/A	N/A

Assessment of evidence

Country: UK (NHS Scotland)

The guidance describes different responsibilities based on job title within the domestic services:

“Domestic Assistant Responsible for ensuring the environment is clean by: • carrying out the scheduled cleaning duties within their allocated areas and completion of relevant paperwork for example work checklist • escalate gaps in the work schedule completion and the reasons for that for example, equipment not available/ malfunction or access denial or delay • reporting by exception and recording the reason why areas could not be cleaned for example, access issues or staffing levels • reporting of equipment faults, these will be determined by local maintenance arrangements”.

Domestic Supervisor Responsible for: “day to day supervision of the Domestic Assistants within an area or site; regularly auditing the clinical and non-clinical environment ensuring that the Domestic Assistant is fulfilling their duties; general supervision of cleaning services daily; regular review of their areas of responsibility using the risk assessments within the NCSS and supporting in the development of the work schedules; reviewing exception reports and identifying any trends to allow review of service

Assessment of evidence
provision, e.g. change of timing for cleaning; • completion of any paperwork relevant to their teams for example, reviewing and signing domestic work checklists • equipment fault reporting and adverse event reporting” Domestic Manager Responsible for overseeing the implementation and effective use of the NCSS including: “provision of advice and support relating to cleaning issues; developing and reviewing the work schedules with the Domestic Supervisors and agreeing review processes; allocation of resources to ensure that the requirements of the output specification can be achieved; • equipment fault reporting and adverse event reporting. Work schedules require to be signed off every two years by the Domestic Manager, Infection Prevention and Control Team and the Charge Nurse/Head of Department for each clinical area.” The guidance also discusses the escalation process in the event of an outbreak from the nursing/IPC staff to domestic manager. **Limitations:** This document has been developed by an expert working group intended for specific used in NHS Scotland health and care settings, therefore it is highly applicable to the types of environmental decontamination undertaken specifically in NHS Scotland health and care settings.

Question 12: How should environmental decontamination equipment be managed and stored?

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Tembo GM, Chaggar GK, Li X, Teska PJ, Oliver HF. Evaluation of automated floor cleaning, disinfection, and application methods against Staphylococcus aureus. Am J Infect Control. 2023;51(4):380-387. doi:10.1016/j.ajic.2022.07.011	Experimental	**Level 3**	Automated floor cleaner (Taski455B)	Cleaning product (chemical compositions in Table 1 in the paper): • Hydrogen peroxide 1 (1:128) • Hydrogen peroxide 2 (1:64) • Hydrogen peroxide 3 (1:64) • Quaternary ammonium chloride (QAC) 1 (1:256	Mean $\log_{10}$ reduction of S. aureus (CFU/ml)

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
				• QAC 2 (1:256) • Neutral cleaner (1:256) Application method: • red pad (non-woven polyester fiber) • twister pad (non-woven polyethylene terephthalate (PET) impregnated with microscopic diamonds bound in resin) • wipeout pad (open cell	

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
				malamine grey foam and non-woven PET fiber backing)	

Assessment of evidence

Country: US

Setting: experimental set up (vinyl floor)

Cohort: NA

This study investigated the efficacy of an automated floor cleaner with three different application methods and using five different disinfectants.

A Taski 455B cleaner was used to clean a vinyl floor contaminated with ATCC-6538 *S. aureus* (prepared using EPA SOP). Potential cross-contamination to the floor cleaner was also assessed. The floor cleaner was passed through the 'lead-in' area to wet the cleaner with the disinfectant being investigated, then through the ‘inoculation zone' (which was contaminated with *S. aureus*), then to the sampling boxes. The floor cleaner was disinfected between uses. The test surface floor, sample areas, machine squeegee and wastewater bucket were sampled and neutralised. The test pads were cut for sampling and wastewater from the floor cleaner was sampled. There were three replicates for each product and two technical replicates for each biological replicate.

Limitations:

- Simulated contamination of the floor may not represent actual contamination in real-life setting e.g. due to spread of pathogen via footwear or wheeled equipment

Assessment of evidence

- Authors received funding from Diversey (company that makes these specific floor cleaners)
- Technique of wetting the floor cleaner with disinfectant does not guarantee uniform volume of disinfectant across trials
- CFU/ml does not equate to actual risk of HAI
- limited to one strain of *S. aureus*

Summary:

The QAC and hydrogen peroxide products resulted in higher reduction of CFU/ml than the neutral cleaner ($p<.0001$). There was not a significant difference in performance between products of the same type. Bactericidal efficacy of these products remained significantly higher regardless of application method or surface area investigated. Mean log_{10} densities of S. aureus were significantly higher in the wastewater compared to the basket and squeegee ($p<.001$), and contamination following using neutral cleaner was significantly higher when compared with the disinfectant products ($p<.05$). However, this study is limited to *S. aureus* contamination only and is a simulation so may not accurately represent actual floor contamination in a clinical setting.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Benbow A, Clarke M, Yates C, et al. Hospital-wide healthcare-associated carbapenemase-producing Enterobacterales	Outbreak study	**Level 3**	N/A	N/A	N/A

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
outbreak: risks of electric floor scrubbers in catering facilities and kitchens. J Hosp Infect. 2024;146:59-65. doi:10.1016/j.jhin.2024.01.016					

Assessment of evidence

Country: UK

Setting: two hospitals forming “part of a large acute hospital organization with over 1600 hospital beds”, “tertiary referral centres, located 8km apart”; Hospital A included A&E department

Cohort: 12 patients identified over a three-year period

Description of outbreaks of New Delhi metallo-beta-lactamase (NDM) Carbapenemase-producing Enterobacterales (CPE) in wards 1, 2 and 3, with sporadic cases in between. Immediate control measures described in supplementary material include isolation of cases, CPE precautions (gowns and gloves), dedicated CPE patient equipment, cleaning and decontamination (1% sodium hypochlorite, 1,000ppm chlorine), deep clean of side rooms following patient discharge (10,000ppm chlorine) and hydrogen peroxide vapour. Confounding factors investigated which did not indicate commonalities include healthcare workers, equipment, patient pathways, patient feeding (tubes, thickeners, supplements) and food intake. Patient screening and environmental sampling was carried out. PFGE typing indicated indistinguishable environmental (sluice, Patient E’s toilet and shower drain, sluice, ward kitchen, bay toilet and toilet floor, mop and floor scrubber in hospital central food production unit) and patient strains. The authors hypothesised faecal-oral transmission from aerosolised bacteria from a floor scrubber used in the

Assessment of evidence

hospital central food production unit. The supplementary materials describe an experimental study demonstrating contamination of the environment when the floor scrubber was used. Ward outbreaks were declared over "when no further cases were detected in four weeks", and the discussion states that no patients were identified after ward outbreak 3, following implementation of multiple measures including decommissioning floor scrubber used in hospital kitchen. Re-contamination of the new floor scrubber was investigated by carrying out sampling weekly.

Limitations:

- Unclear temporal link between environmental samples (including floor scrubber) and patient samples
- Many confounding factors mean that an epidemiological link between floor cleaner and patient cases was unclear – however the floor scrubber was demonstrated as a reservoir of the outbreak strain
- Limited detail in supplementary materials regarding experiment with floor scrubber, including cleaning products used (if any).

Conclusions:

This study demonstrates contamination of a floor scrubber with an outbreak strain in a real-world context. Although the authors' hypothesis of faeco-oral transmission of CPE could not be proven, following decommissioning and replacement of this equipment (amongst other control measures), no further cases were detected.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
National Health and Medical Research Council. Australian Guidelines for the Prevention and Control of Infection in Healthcare. May 2019. Accessed 24 August 2024.	Guidance	**Level 4**	N/A	N/A	N/A
Assessment of evidence					
Country: Australia This guidance was developed for use in healthcare facilities and outlines general principles for decontamination equipment management and storage. The guidance discusses the following (non-recommendations): Cleaning equipment should be cleaned after use using detergent or detergent & disinfectant in the presence of MDROs. It is stated that "It is important that staff who perform housekeeping duties in healthcare facilities have access to dedicated housekeeping rooms or closets. All housekeeping rooms/closets should be maintained in accordance with good hygiene practices, and should not be used for the storage of personal clothing or grooming supplies." "In long-term care homes, cleaning carts should be equipped with a locked compartment for storage of hazardous substances and each cart should be locked at all times when not attended."					

Assessment of evidence
Limitations: The guidance has been developed using the GRADE methodology, however there is no reference to a systematic literature review for the recommendations for 'Managing the physical environment across healthcare settings'. It is also unclear what references have been used to support the recommendations, therefore this guidance is deemed as expert opinion. Furthermore, IPC practices may differ in Canada, limiting applicability of this guidance to Scottish health and care settings.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Royal College of Nursing. Essential Practice for Infection Prevention and Control Guidance for nursing staff. November 2017. Accessed 18 August 2024	Guidance	**Level 4**	N/A	N/A	N/A

Assessment of evidence
Country: UK This guidance provides practice recommendations for staff working in health and social care settings. The guidance is high level and provides minimal detail on management and storage of decontamination equipment. The guidance states that:

Assessment of evidence
"Cleaning equipment such as vacuums, floor scrubbing machines and polishers should be cleaned regularly and properly maintained…appropriate dedicated facilities for storage of cleaning equipment should be in place and these should be maintained in a clean and tidy condition." **Limitations:** This guidance states that the practice recommendations are evidence based, however there is no evidence of a systematic methodology or references provided.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Health Facilities Scotland. Scottish Health Facilities Note (SHFN) 01-05 Safe Management of the Care Environment Cleaning Specification for Care Homes. May 2021. Updated May 2023.	Guidance	**Level 4**	N/A	N/A	N/A

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Accessed 05 August 2024					

Assessment of evidence

Country: UK (NHS Scotland)

This guidance was produced as a cleaning specification for care homes in NHS Scotland. The guidance is not mandatory and does not have a systematic methodology, however it is expert opinion and deemed as best practice. “All equipment should be properly maintained according to the manufacturer’s instructions. Storage areas should be kept in a clean and tidy condition and locked when unattended.” Guidance also provides cleaning schedules for store rooms for decontamination equipment. Colour coded equipment is discussed, in line with the NCSS.

Limitations:

This guidance is not applicable to acute care settings and is relevant for care homes in NHS Scotland. It should be noted that variation in job titles and staffing exist in this area, so application or roles and responsibilities may vary.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Health Facilities Scotland. NHSScotland national cleaning services specification (SHFN 01-02). July 2025. Accessed 30 September 2025	Guidance	**Level 4**	N/A	N/A	N/A

Assessment of evidence

Country: UK (NHSScotland)

The guidance describes an equipment colour coding programme to ensure correct storage:

“Red: Bathrooms, washrooms, showers, toilets, basins and bathroom floors

Blue: General areas including wards, departments, offices and basins in public areas

Green: Catering departments, ward kitchen areas and patient food service at ward level

Yellow: Isolation areas.”

The guidance has a general risk assessment for cleaning equipment and further detail can be found in the guidance. The guidance also suggests storage of equipment in assigned domestic services room and Note 4 advises to “always enquire equipment is clean prior to use”. Several SOPs advise ensuring equipment is clean and dry before storing following use.

Assessment of evidence
Limitations: This document has been developed by an expert working group intended for specific used in NHS Scotland health and care settings, therefore it is highly applicable to the types of environmental decontamination undertaken specifically in NHS Scotland health and care settings.