

**Standard Infection Control Precautions Literature Review:
Management of care equipment**

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2.0	May 2016	<p>Inclusion of 'What is the definition of decontamination?' as a question.</p> <p>When should non-invasive, reusable, communal care equipment be decontaminated? Recommendation updated to now read. Non-invasive, reusable, communal care equipment that requires disinfection should first be cleaned with a neutral detergent; alternatively a combined detergent/disinfectant may be used.</p> <p>What is the correct use of disinfectants in the decontamination of non-invasive, reusable, communal care equipment? Addition of 2 new recommendations</p> <p>Chlorine releasing agents should be used for the disinfection of non-invasive reusable, communal care equipment, as standard. If the item cannot withstand chlorine releasing agents consult the manufacturer's instructions for a suitable alternative e.g. alcohol. (GRADE D recommendation)</p> <p>Disinfectants may be used routinely to decontaminate specific items of non-invasive, reusable, communal care equipment if recommended by the manufacturer e.g. alcohol on stethoscopes. (GRADE D recommendation)</p>	

		<p>What are the recommended methods for decontaminating non-invasive, reusable, communal care equipment.</p> <p>New recommendation made Following decontamination equipment should be rinsed to remove residual detergent or disinfectant and dried (wiping or air drying)</p>	
1.0	January 2012	Final for publication	

Approvals – this document requires the following approvals (in cases where signatures are required add an additional ‘Signatures’ column to this table)::

Version	Date Approved	Name	Job Title	Division
2.0	May 2016	National Policies and Outbreaks Steering Group		
1.0	January 2012	Steering (Expert Advisory) Group for SICPs and TBPs		

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Purpose:	To inform the Standard Infection Control Precautions (SICP) section on the management of care equipment section of the National Infection Prevention and Control Manual in order to facilitate the prevention and control of healthcare associated infections in NHS Scotland.
Description:	This literature review examines the available professional literature on care equipment in the hospital setting.
Target audience:	All NHS staff involved in the prevention and control of infection in NHS Scotland.
Circulation list:	Infection Control Managers, Infection Prevention and Control Teams, Public Health Teams
Update/review schedule:	Updated as new evidence emerges with changes made to recommendations as required.
Cross reference:	National Infection Prevention and Control Manual http://www.nipcm.hps.scot.nhs.uk/ SICP Literature Review: Management of Blood and Body Fluid spillages in the hospital setting http://www.nipcm.hps.scot.nhs.uk/documents/sicp-management-of-blood-and-body-fluid-spillages-in-the-hospital-setting/
Update level:	Change to practice – No significant change to practice Research – No change to evidence. Changes to wording for clarity in the recommendations and addition of 3 new recommendations.

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1. Objectives

The aim of this review is to examine the extant professional literature regarding the management of care equipment in health and social care settings. The specific objectives of the review are to determine:

- What is the definition of decontamination?
- How should care equipment be categorised?
- What is the risk of healthcare associated infection from non-invasive reusable, communal care equipment?
- When should non-invasive, reusable, communal care equipment be decontaminated?
- What is the correct use of detergent in the decontamination of non-invasive, reusable, communal care equipment?
- What is the correct use of disinfectant in the decontamination of non-invasive, reusable, communal care equipment?
- What are the recommended methods for decontaminating non-invasive, reusable, communal care equipment?
- Where should non-invasive, reusable, communal care equipment be decontaminated?
- Where should decontaminated non-invasive, reusable, communal care equipment be stored?
- Who has responsibility for decontaminating non-invasive, reusable, communal care equipment?

Inclusion/exclusion criteria

This literature review considers medical devices and other equipment used in the care of persons in health and social care settings under the broad heading of 'care equipment'. Invasive, high-risk medical devices, single-use and single-patient use equipment are not within the remit of this review; however, they are discussed to inform the section on categorisation of care equipment.

The review concentrates on non-invasive, reusable, communal care equipment. Equipment which is not intended for single-use or single-patient use is defined as 'communal equipment'. Examples of items which come into this category are: beds and mattresses, blood pressure cuffs, commodes, drip stands, infusion pumps, lockers, sliding sheets, stethoscopes, trolleys, wheelchairs etc. This list is not definitive and is provided to illustrate examples of non-invasive, communal patient care equipment.

2. Methodology

This targeted literature review was produced using a defined methodology as described in the [National Infection Prevention and Control Manual: Development Process](#).

3. Recommendations

This review makes the following recommendations based on an assessment of the extant professional literature on the management of non-invasive, reusable, communal care equipment:

What is the definition of decontamination?

Decontamination is a process which reduces, removes or destroys contamination to ensure that infectious agents or other contaminants cannot reach a susceptible site in sufficient quantities to cause infection or any other harmful response. Decontamination can involve cleaning, disinfection and/or sterilisation as required and according to the infection risk.

How should care equipment be categorised?

Care equipment can be classified single-use, single-patient use and reusable. It can also be classified according to the infection risk (low, medium or high) and as invasive and non-invasive. This review is concerned with non-invasive, reusable, communal care equipment.

(Mandatory)

What is the risk of healthcare associated infection from non-invasive, reusable, communal care equipment?

The risk of equipment contamination is high but the risk of healthcare associated infection (HAI) to the patient depends on the exposure to non-intact skin or mucous membranes, or on whether the patient is immunocompromised. There is also a risk of secondary contact transmission through hand contamination via contaminated equipment.

(AGREE rating: recommend)

(Grade D recommendation)

When should non-invasive, reusable, communal care equipment be decontaminated?

Decontamination should take place:

- between each patient use;
- after blood/body fluid contamination;
- before inspection, servicing or repair;
- before disposal;
- at regular, pre-defined intervals as part of an equipment cleaning schedule.

(Mandatory)

Non-invasive, reusable, communal care equipment that requires disinfection should first be cleaned with a neutral detergent; alternatively a combined detergent/disinfectant may be used.

(GRADE D recommendation)**(AGREE rating: recommend)**

Disinfection of non-invasive, reusable, communal care equipment should be considered when the equipment has been in a contaminated area e.g. isolation room, or there is an increased risk of a healthcare associated infection.

An increased risk would occur when the item:

- has been in contact with mucous membranes;
- has been contaminated with blood or other body fluids;
- is contaminated with particularly virulent or readily transmissible organisms;
- is to be used on or by immunocompromised patients.

(GRADE D recommendation)**(AGREE rating: recommend)**

Regular equipment decontamination should follow local schedules which should be subject to audit and decontamination results being documented.

(Mandatory)

A condition record should be kept and equipment should be disposed of when effective decontamination can no longer be achieved.

(Mandatory)

What is the correct use of detergents in the decontamination of non-invasive, reusable, communal care equipment?

A neutral detergent in warm/tepid water should be used to decontaminate non-invasive, reusable, communal care equipment.

(AGREE rating: Recommend)

Only products recommended by the manufacturer and supplied by employers should be used. Products should be used in accordance with Control of Substances Hazardous to Health (COSHH) Regulations and manufacturers instructions.

(Mandatory)

What is the correct use of disinfectants in the decontamination of non-invasive, reusable, communal care equipment?

Chlorine releasing agents should be used for the disinfection of non-invasive reusable, communal care equipment, as standard. If the item cannot withstand chlorine releasing agents consult the manufacturer's instructions for a suitable alternative e.g. alcohol.

(GRADE D recommendation)

Disinfectants may be used routinely to decontaminate specific items of non-invasive, reusable, communal care equipment if recommended by the manufacturer e.g. alcohol on stethoscopes.

(GRADE D recommendation)

Only products recommended by the manufacturer and supplied by employers should be used. Products should be used in accordance with Control of Substances Hazardous to Health (COSHH) Regulations and manufacturers instructions.

(Mandatory)**Where should non-invasive, reusable, communal care equipment be decontaminated?**

Equipment that has been used on a non-infected patient should be decontaminated away from clean items.

(Good Practice Point (GPP))

Equipment that has been used in a contaminated area or by, or on, a patient with a suspected or confirmed infection should be decontaminated prior to its removal from that area.

(Good Practice Point (GPP))

Large dedicated sinks should be available for the disposal of contaminated waste water and for decontaminating materials (buckets etc.) used in the decontamination of equipment. Hand wash sinks must not be used for the decontamination of equipment.

(Mandatory)

What are the recommended methods for decontaminating non-invasive, reusable, communal care equipment?

Non-invasive reusable, communal care equipment should be decontaminated following manufacturer instructions. General guidance is that items should be decontaminated in a systematic manner from the top or furthest away point of the equipment. For items such as blood pressure testing equipment and breast pumps the first area to be decontaminated should be the area that connects with the patient.

(Good Practice Point (GPP))

Following decontamination equipment should be rinsed to remove residual detergent or disinfectant and dried (wiping or air drying).

(Good Practice Point (GPP))

All materials required (cloths, buckets etc.) should be assembled before commencing decontamination of equipment e.g. on a dedicated trolley. The cloth and cleaning solution should be changed when dirty, at least every 15 minutes and between items of equipment.

(Good Practice Point (GPP))

Personal Protective Equipment (PPE) must be worn when carrying out decontamination, e.g. disposable apron or gown and gloves, and eye/face protection if splashing is likely to occur; these must be disposed of after use.

(Mandatory)

Where should decontaminated non-invasive, reusable, communal care equipment be stored?

Decontaminated equipment that is not in use should be stored separately from used equipment and away from areas where decontamination is taking place.

(Good Practice Point (GPP))

Health Facilities Scotland advise that all healthcare premises should have a storage area for large items of equipment, such as beds, mattresses, hoists, wheelchairs and trolleys which are clean but not in use.³²

(Mandatory)**Who has responsibility for decontaminating non-invasive, reusable, communal care equipment?**

A named person or persons e.g. charge nurses should be responsible for all aspects of environmental cleanliness within their care area. This includes the cleanliness of non-invasive, reusable, communal healthcare equipment.

(Mandatory)

A local decontamination policy should be in place to determine which groups of staff are responsible for the regular decontamination of care equipment and all staff should be clear on their specific responsibilities for decontaminating equipment and trained accordingly.

(Good Practice Point (GPP))

4. Discussion

4.1 Implications for practice

What is the definition of decontamination?

Decontamination is a process which reduces, removes or destroys contamination to ensure that infectious agents or other contaminants cannot reach a susceptible site in sufficient quantities to cause infection or any other harmful response.¹ Decontamination can involve cleaning, disinfection and/or sterilisation as required and according to the infection risk.

- Cleaning is defined as ‘a process which physically removes infectious agents and the organic matter on which they thrive but does not necessarily destroy infectious agents’.¹
- Disinfection is defined as a process used to reduce the number of viable microorganisms but which may not necessarily inactivate some infectious agents.¹
- Sterilisation is defined as a process to make an object free from viable micro-organisms.¹ The processes for sterilisation are specified in BS EN ISO 14937:2009.

How should care equipment be categorised?

Care equipment can be categorised into 4 broad groups:

- Single-use
- Single-patient use
- Reusable invasive equipment
- Reusable non-invasive equipment

This literature review will concentrate on non-invasive, reusable, communal care equipment. To place this in context some information is given on the other categories before a fuller definition and discussion on non-invasive, reusable, communal care equipment.

Single-use

Equipment (including medical devices) intended for single-use should not be re-used. Anyone re-using equipment intended for single-use bears full responsibility for its safety and

effectiveness. Re-using equipment intended for single-use can compromise infection control and single-use equipment may be unsuitable for cleaning.

Equipment intended for single-use are marked with the symbol:



(Note that equipment should also have CE marking to indicate compatibility with European Union health and safety requirements.) This means the item is intended to be used on an individual patient for a single-use and then discarded. It is not intended to be reprocessed and used again. Equipment intended for single-use may require sterilisation before use and this will be indicated in the manufacturer's instructions. These items cannot be re-sterilised.

(Mandatory)

Single-patient use

Single-patient use means equipment may be used more than once on one patient only and the device may undergo some reprocessing and cleaning between each use following the manufacturer's instructions.

(Mandatory)

Reusable equipment – invasive/non-invasive

The Spaulding classification has been adapted by the Microbiology Advisory Committee (the MAC Manual) to indicate the infection risk associated with particular categories of equipment.

Table 1: Classification of infection risk associated with the decontamination of medical devices.

Risk	Application of item	Recommendation
High	<ul style="list-style-type: none"> in close contact with a break in the skin or mucous membrane introduced into sterile body areas 	Sterilisation
Intermediate	<ul style="list-style-type: none"> in contact with mucous membranes contaminated with particularly virulent or readily transmissible organisms prior to use on immunocompromised patients 	Sterilisation or disinfection required Cleaning may be acceptable in some agreed evidence based situations
Low	<ul style="list-style-type: none"> in contact with healthy skin not in contact with patient 	Cleaning

The Spaulding classification refers to medical devices. Medical devices are defined in EU legislation and summarised by MHRA as being any instrument, apparatus, appliance, material

or other article, whether used alone or in combination, intended by the manufacturer to be used on human beings for the purpose of:

- Control of conception.
- Diagnosis, prevention, monitoring, treatment or alleviation of disease.
- Diagnosis, monitoring, treatment, alleviation of or compensation for an injury or disability.
- Investigation, replacement or modification of the anatomy or physiological process.

The EU legislation further defines medical devices as not achieving the principal intended action in or on the human body by pharmacological, immunological or metabolic means.

What is the risk of healthcare associated infection (HAI) from non-invasive, reusable, communal care equipment?

The MAC Manual states that all medical devices and equipment may become contaminated with biological material, and therefore present a Healthcare Associated Infection (HAI) risk.² A number of observational studies have identified non-invasive, reusable care equipment as reservoirs of contamination, for example, commodes,³ blood pressure cuffs,^{4;5} tourniquets,⁶ breast pumps,⁷ basins,⁸ stethoscopes^{9;10} and bed handsets.¹¹ In addition, two systematic reviews have identified evidence of high levels of contamination on non-invasive, reusable care equipment; a substantial proportion of which were also found to be positive for pathogenic or multidrug resistant organisms^{12;13} One of the systematic reviews also identified evidence of transmission of microorganisms between equipment and patients.¹² For non-invasive reusable communal equipment the severity of this risk is defined in [Table 1](#) as low or medium depending on the exposure rather than the level of contamination.

The main risks for transmitting HAI via non-invasive, reusable, communal care equipment are through secondary transmission on contaminated hands; when equipment becomes intermediate risk through contact with non-intact skin or mucous membranes;¹⁴ or to immunocompromised patients.¹³

(AGREE rating: recommend)

(Grade D recommendation)

When should non-invasive, reusable, communal care equipment be decontaminated?

The Healthcare Associated Infection (HAI) Standards and the NPSA Revised Healthcare Cleaning Manual recommend that all non-invasive, reusable, communal care equipment should be decontaminated using an appropriate method for the infection risk;

- before being inspected,
- before being serviced,
- before being repaired,
- before disposal.^{2;15}
- between each patient use,
- after soiling,
- at regular intervals, whether in use or not,^{16;17}

Local schedules should be established that indicate the frequency of regular decontamination.^{16;17} Manufacturer's guidance on the frequency of decontamination should also be followed.¹⁸

Decontamination should be documented by the person who decontaminated the equipment and decontamination schedules should be audited.^{2;19} A condition monitor should be kept and equipment should be disposed of when effective decontamination can no longer be achieved.¹⁹

(Mandatory)**What is the correct use of detergent in the decontamination of non-invasive, reusable, communal care equipment?**

Organic material such as body fluids or skin cells present on used equipment can reduce the effectiveness of disinfectants; before disinfection or sterilisation equipment should first be cleaned with a neutral detergent to remove any material that may inhibit disinfection^{2;11;15}. The use of disinfectants is discussed in more detail below.

(Grade D recommendation)**(AGREE rating: recommend)**

Detergent in tepid/warm water should be used to decontaminate equipment. Detergents are effective against organic material but are not antimicrobial. The detergent should be a neutral or near-neutral pH solution.¹⁴ Neutral detergent is recommended as these solutions provide the best material compatibility and are efficient at removing soiling.¹⁴

(AGREE rating: recommend)

Only cleaning products supplied by employers should be used and the solution should be prepared according to the manufacturer's instructions and local policy.¹⁷ Cleaning products are covered by Control of Substances Hazardous to Health (COSHH) Regulations and will be subject to a risk assessment before use.¹

(Mandatory)

What is the correct use of disinfectants in the decontamination of non-invasive, reusable, communal healthcare equipment?

Disinfection should take place if the item becomes an intermediate risk. That is, it comes into contact with mucous membranes, is contaminated with particularly virulent or readily transmitted organisms or prior to use on immunocompromised patients.¹⁸ Disinfection may also take place if the item is visibly soiled with blood or other body fluids¹⁸ ([see HPS Management of Blood and Body Fluid Spillages literature review](#)) or if there has been an outbreak.²⁰ Items to be disinfected should be cleaned beforehand to remove organic material.^{1;7;21;22}

(AGREE rating: Recommend)

(Grade D recommendation)

There is on-going debate in the literature on the routine use of disinfectants in healthcare settings.^{23;23-25} The literature is inconclusive with the debate centring on the alleged toxicity of disinfectants, the potential for the growth of resistance amongst micro-organisms exposed to disinfectants.

The routine use of disinfectants for decontaminating care equipment is recommended in the CDC guidelines which state that the use of a disinfectant will 'provide anti-microbial activity that is likely to be achieved with minimal additional cost or work'.¹⁴ The CDC differentiates between low, intermediate, general (and high) level disinfectants. Low-level and intermediate level

disinfectants destroy all vegetative bacteria (except tubercle bacilli), lipid viruses, some non-lipid viruses, and fungi, but not bacterial spores (e.g. alcohol). General disinfectants are effective against both gram-negative and gram-positive bacteria. High-level disinfectants are capable of killing bacterial spores when used in sufficient concentration under suitable conditions.¹⁴ It is low or intermediate level disinfectants that are advocated in the guidelines for routine cleaning.

The National Patient Safety Agency (NPSA) advises using alcohol wipes after cleaning on the following equipment; audiometer headphones, baby changing mat, bath hoist, disposable bedpan carrier, blood pressure testing equipment, examination couch, infant incubator, mattress, pillow, toys, mechanical ventilators, walking aids, wheelchairs and bedside entertainment system.¹⁷ There are several observational and evaluation studies indicating the effectiveness of alcohol wipes to clean specific types of care equipment, particularly stethoscopes and blood pressure cuffs.^{4;5;9;13;21} Fraise and Bradley²⁰ state that after thorough cleaning with detergent and water, items may be immersed in alcohol or disinfected using a disposable alcohol impregnated wipe.

The CDC guidelines highlight that alcohols have 'generally underrated germicidal characteristics'; when used at an optimum concentration (60-90% (v/v) in water) ethyl- and isopropyl alcohol are tuberculocidal, virucidal, fungicidal and rapidly bactericidal against vegetative bacteria.¹⁴ However, alcohols are not sporicidal and can damage some equipment (shellac, rubber and plastics), particularly with prolonged use.¹⁴

The NPSA revised healthcare cleaning manual advocates using a sporicidal disinfectant wipe for the routine cleaning of commodes,¹⁷ although other generic cleaning guides^{18;20;26} only recommend disinfectant if the commode is visibly contaminated or used by a patient with an enteric infection. Contaminated commodes have been implicated in *C. difficile* outbreaks,²⁷ however there is little literature specifically discussing cleaning or disinfecting commodes as a preventative measure rather than in response to an outbreak. The SICPs literature review '[Routine Cleaning of the Environment](#)' recommends the use of chlorine releasing agents at 1000 parts per million (ppm) available chlorine (av.cl.) for the routine cleaning of sanitary fixtures such as toilets, commodes were not considered as part of that review, however, typically any reusable care equipment that becomes contaminated with blood or body fluids should be disinfected.

The CDC guidelines also highlight the important role of contact time in the application of disinfectant.¹⁴

(Grade D recommendation)

As with cleaning products, only disinfectants supplied by employers should be used and products should be prepared in accordance with manufacturer's instructions and local policy.^{17;28} Disinfectants are covered by Control of Substances Hazardous to Health (COSHH) Regulations and will be subject to a risk assessment before use.¹

(Mandatory)

What are the recommended methods for decontaminating non-invasive, reusable, communal healthcare equipment?

There is generally a lack of evidence to inform the method for decontaminating care equipment and most recommendations are based on expert opinion or have been extrapolated from evidence related to environmental decontamination. The NPSA revised healthcare cleaning manual¹⁷ outlines procedures for decontaminating particular pieces of equipment. Generic advice from this and other best practice statements^{18;29} is to clean systematically, from the top or furthest away point of the equipment and to follow any manufacturer instructions. For items such as blood pressure testing equipment and breast pumps the first area to be cleaned should be the area that connects with the patient.¹⁷

(Good Practice Point (GPP))

Price and Ayliffe stress that items need to be rinsed as residual detergent or disinfectant may be toxic or irritant.³⁰

The NPSA manual¹⁷ advocates that items are left to dry; Price and Ayliffe³⁰ recommend wiping or air drying and highlight that air drying is best achieved in areas with good ventilation. The importance of drying the item before storage or re-use is related to some microorganisms being able to thrive in moist conditions.³¹

(Good Practice Point (GPP))

The NPSA manual advocates the use of a cleaning trolley to hold the bucket and materials used for cleaning equipment, and that the cloth and cleaning solution should be changed when

soiled. The HPS SICPs literature review '[Routine cleaning of the environment](#)' states that cloths and cleaning solutions should be changed when dirty, every 15 minutes and prior to moving to a new location. These recommendations can be applied to the decontamination of patient care equipment but rather than changing cloths and solutions before moving to a new location these should be changed between items of equipment.

(Good Practice Point (GPP))

Personal Protective Equipment (PPE) should be worn when carrying out cleaning, e.g. disposable apron or gown and gloves, and eye/face protection if splashing is likely to occur, and this should be disposed of after use.¹

(Mandatory)

Where should non-invasive, reusable, communal healthcare equipment be decontaminated?

For non-invasive, reusable, communal healthcare equipment the NPSA manual advises identifying a "suitable location for cleaning".¹⁷ This is left undefined in the document. A best practice statement from the Department of Health states that equipment that has been used on a non-infected patient should be decontaminated in a designated area and away from clean items.²⁹ Again though, the designated area is left undefined.

(Good Practice Point (GPP))

For equipment that has been used in a contaminated area or by/on a patient with a suspected or confirmed HAI the equipment should be decontaminated prior to its removal from that area.²⁹ Decontamination will include cleaning and disinfection as required by the infection risk as discussed above.

(Good Practice Point (GPP))

Large dedicated sinks should be available for the disposal of contaminated waste water and for decontaminating materials (buckets etc.) used in the decontamination of equipment.³²

(Mandatory)

Where should decontaminated non-invasive, reusable, communal healthcare equipment be stored?

Decontaminated equipment should be stored separately from used equipment and away from areas where cleaning is taking place.²⁹

(Good Practice Point (GPP))

Health Facilities Scotland advise that all healthcare premises should have a storage area for large items of equipment, such as beds, mattresses, hoists, wheelchairs and trolleys which are clean but not in use.³²

(Mandatory)**Who has responsibility for decontaminating non-invasive, reusable, communal healthcare equipment?**

HDL(2005)07 establishes that senior charge nurses are responsible for all aspects of environmental cleanliness within their clinical area. This includes authority over cleaning services.³³

(Mandatory)

The NHSScotland Code of Practice for the Local Management of Hygiene and Healthcare Associated Infection refers to a lack of clarity about who is responsible for decontaminating particular items.¹⁹ In general, local policy should be in place to determine which groups of staff are responsible for the regular decontamination of care equipment and all staff should be clear on their specific responsibilities for decontaminating equipment.¹⁵

The NPSA Revised Healthcare Cleaning Manual for NHS England has generic advice on work schedules for cleaning and nursing staff.¹⁷ As a generalisation, cleaning staff are responsible for the built environment and fixtures and fittings and nursing staff are responsible for care equipment. The nursing staff responsibility includes regular cleaning, after patient use cleaning and cleaning after contamination. The NPSA manual emphasises that this is general advice and that local policies should be in place and are not bound by its recommendations. A Royal College of Nursing member survey highlights the need for adequate training and resourcing.³⁴

(Good Practice Point (GPP))

4.2 Implications for research

A review by Dancer in 2009²⁴ discusses the lack of research around cleaning in healthcare and in particular highlights that cleaning standards are generally not based on sufficient scientific evidence. The review concludes by recommending an evidence-based approach to the topic. This lack of research is particularly marked in the management of care equipment. Much of the evidence used in the review takes the form of best practice statements and is graded as level D expert opinion. There is a larger evidence base on the management of medical devices, control of the environment and management of outbreaks but this cannot always be extrapolated to the routine management of non-invasive, reusable, communal care equipment.

The routine use of disinfectants in cleaning is advocated by the CDC but argued against by other experts in the field.^{25;30} Dettenkofer²⁵ highlights the need for larger, crossover trials lasting a minimum of six months to provide more substantial evidence on the effectiveness of cleaning methods.

The use of detergent, alcohol and sporicidal wipes is advocated in different best practice statements and guidelines but there is little evidence specifically examining the use of wipes as opposed to disposable cloths and solution.^{35;36} The literature review found two small scale studies indicating that water or saline wipes are as effective as disinfectant wipes with one study indicating that if plastic items are only wiped once then a disinfectant wipe should be used but wiping 3 times or more with a saline moistened wipe produces the same results.³⁷ The other study was on computer keyboards and indicated water-containing wipes were effective at removing pathogens from the keyboards.²² Further research is needed on wipes as an application method, particularly on the role of mechanical action such as wiping. This could include lab-based studies but research is also needed in the hospital setting.

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