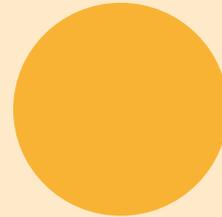




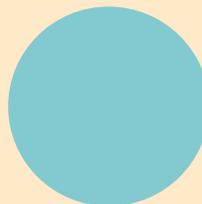
# wipe it out

One chance to get it right



## The selection and use of disinfectant wipes

RCN guidance



# Acknowledgements

The RCN would like to acknowledge the support of the following personnel in the development of this publication:

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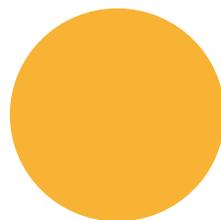
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# Executive summary and recommendations

Wipes are increasingly being used to decontaminate low risk patient equipment or environmental surfaces. Currently there is no guidance available to support users or purchasers of wipes and little evidence to support wipes as an effective infection prevention intervention. Dirt removal should be considered the main purpose of a wipe, but antimicrobial activity as a result of the inclusion of a disinfectant may be a bonus in some circumstances.

The selection of disinfectant wipes is important as infection prevention efforts may be compromised if a product is not fit for its intended purpose. The selection of an appropriate product can be a complex process that includes the consideration of scientific information and the interpretation of laboratory test data. The need for rigor in purchasing any item for use in a health care setting is also important to ensure financial resources are used appropriately.

This technical guidance provides advice on issues for those involved with the selection, use and implementation of environmental decontamination methods that may include the use of wipes. It can also be used by those wishing to influence the development of laboratory standards to test the efficacy of wipes.

Nurses may be purchasers and users of wipes, or delegate the use of wipes to other staff in the clinical setting. It is therefore important that any decisions regarding the use or selection of wipes are informed.

*Note: this guidance only applies to non-skin wipes – in other words, wipes used for the cleaning or disinfection of the patient environment or equipment (detergent or disinfectant wipes). It does not apply to cloths or hand wipes, or wipes used for invasive items such as nasendoscopes.*

This resource may be of value to:

- nurses working in infection prevention
- ward/nurse managers and matrons
- link nurses/practitioners
- nurses and health and social care workers working in community settings including care homes and nurseries
- procurement staff.

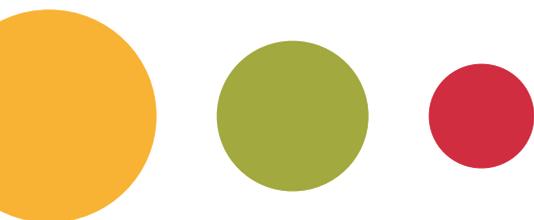




## RCN recommendations

The following recommendations have been developed as a result of work reviewing the use and selection of wipes in health care.

- Advice should be sought from Infection Prevention and Control (IPC) advisers when considering the use of wipes and decisions should reflect local IPC policies on the decontamination of low risk equipment and the near-patient environment.
- The decision to use a particular disinfectant wipe should be made following a comparative review of evidence relating to the wipe products under consideration. This evidence may be obtained from a number of sources and may include evidence from peer reviewed literature or evaluation from bodies such as the Rapid Review Panel (RRP).
- Wipes should be considered as single-use products unless a product is specifically designed to be reused in line with the manufacturer's recommendations.
- Collaboration between all stakeholders (scientific and professional organisations, users, manufacturers, and standards organisations) should take place to investigate the development of realistic standard test methods that match real-life applications of wipe products to support wipe selection and purchase in health care.
- Manufacturers should provide information on ingredients within wipes in an easy-to-understand format for users, including any limitations in regard to product use. The disclosure of any antimicrobial ingredient, including the class of disinfectant, for example, quaternary ammonium compound (QAC), should be made to support any antimicrobial activity claim made.
- In the absence of a current defined standard for wipes, manufacturers should provide activity test data on the efficacy of any active ingredients within a short contact time – 30 seconds for example – in the presence of realistic levels of organic matter.
- Work investigating the causes and management of occupationally acquired contact dermatitis should include a consideration of the impact of use of wipes on the hands of staff and the potential for association with dermatitis in the workplace.



# Introduction

Pre-prepared wipes are increasingly being used in clinical situations for the cleaning or disinfection of low risk equipment and the near-patient environment. Examples of common usage include the cleaning or disinfection of tables, lockers, mattresses and bed frames, commodes, examination couches, blood pressure cuffs, pulse oximeters, keyboards, drug trolleys, intravenous pumps, stands and many other items.

As pre-prepared products, wipes are a convenient and quick means of cleaning or disinfection at ward or department level. Despite their growing popularity however, there is a poor level of evidence to support the efficacy of disinfectant wipes in real-life use. This is particularly important when wipes are used to support a reduction in the transmission of micro-organisms via the environment, including spores such as *Clostridium difficile* (“C.diff”).

If wipe products prove ineffective, there is a potential risk to the provision of a safe environment. There is also susceptibility for wipes to dry out and lose efficacy during use, or as a result of storage once a tub of wipes has been opened.

Regulatory and other standards require that decontamination – whether via wipes or any other means – is achieved as a result of an adequate and informed process. If wipes are to accomplish their intended purpose, it is essential to consider whether wipes do contribute to an effective intervention and to ensure the correct selection and management of wipes.

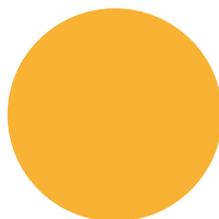
This guidance aims to support informed decision making based on current knowledge and standards on the use of wipes.



# Principles of wipe usage

The main purpose of wipes is to remove contamination from surfaces. Additionally, some wipes may provide some antimicrobial activity by the inclusion of a disinfectant although this activity might be limited based on contact time, type of surface and contamination present.

*Note: in the context of this document contamination means both dirt and microbial contamination.*



# Why is it important to consider wipe selection?

## Efficacy

Properly selected and used, wipes can be an effective intervention for supporting the decontamination of low risk patient equipment.

## Popularity

Pre-prepared wipes are convenient and often more practical than a traditional bowl of water and detergent. Many wipes available contain disinfectant ingredients, which users may assume are more effective for infection prevention interventions, making them a popular option.

## Cost

A significant cost can be attributed to the volume of wipes used. Nurses should influence a reasoned approach to product selection and consequent expenditure.



# Terminology



The variety of wipes available, and the data and language used to describe their benefits can make it confusing for staff when selecting wipes. Understanding manufacturer's information and the effectiveness of any active disinfectant ingredient is crucial to selecting an appropriate product.

Current terms include: sanitising, disinfectant, sporicidal, virucidal and antibacterial. Such terms can be confusing and, as there are no tests for the specific activities of wipes, can be misleading.



# How do wipes work?

Surfaces may have dirt, micro-organisms (as a liquid or in dry soiling), or both present. Understanding how wipes work is crucial to achieving the intended result from the product in question.

There are two main categories of wipe to consider: detergent and disinfectant wipes.

*Note: equipment or surfaces which are visibly dirty will require cleaning prior to disinfection. Disinfectant wipes are suitable only for items that appear visibly clean otherwise the disinfectant will be inactivated by the dirt as well as failing to penetrate through it to the target micro-organisms.*

## 1. Detergent wipes

Detergents are essential to the cleaning process, acting to release dirt from a surface (for example, the immediate patient environment or equipment). Following use, dirt and a proportion of the micro-organisms will be retained by the wipe and removed on it. Any micro-organisms not removed from the surface will remain inactivated but available for transfer to patients or other locations via the wiped equipment or hands of staff.

## 2. Disinfectant wipes

These contain a disinfectant and may or may not contain an additional detergent. Just like a damp cloth, wipes that do not contain a detergent will have only limited cleaning properties, due to the friction created during cleaning. Therefore it is important that the area has been cleaned properly before use. Some wipes contain disinfectants that also have some detergency, but these can be inactivated by too much dirt.

The effectiveness of disinfectant wipes will depend on a number of factors.

**Detergency:** the ability of the wipe to remove dirt if a surface is visibly soiled; users should be aware of the potential risk of transferring micro-organisms/spores from one surface to another if wipes are used on multiple surfaces.

**Wetness:** the ability of the wipe to leave a layer of liquid disinfectant behind on the surface it is applied to.

**Disinfectant efficacy:** once the wiped surface dries, all disinfectant activity stops and, should any residue of disinfectant be left behind, it will have no effect on further dry contamination such as microbes (including spores) in dust, which will inevitably settle on it or be transferred to it soon after cleaning.



# Current standards for selecting disinfectant wipes and their ingredients

There are currently no accepted standards to support the selection and purchase of disinfectant wipes in health care. This is due in part to wipes being a relatively new concept and the absence of a current consensus on what such a test might include. In practice this means that the disparate claims by manufacturers need to be evaluated carefully.

Disinfection testing is complex and requires expert interpretation as there are many experimental factors that can give a false impression of what is actually achieved. Caution on the interpretation of results is advised and local or independent expert IPC analysis should be sought wherever possible in order to analyse clinical information provided by manufacturers.

Without an accepted standard test for wipes, information on their effectiveness can only be gained from laboratory testing data (for example non-standard tests for wipes or standard tests on surfaces or in solution as suspension tests – see Table 1).

As outlined previously there are two components to disinfection with wipes: the physical removal of visible dirt and disinfection.

## 1. Physical removal of contamination

There is no standard test that simulates the physical removal of dirt or microbes by wipes. Best practice recommends that surfaces should be physically clean prior to disinfection in order for any disinfectant to be effective.

There is currently no evidence supporting the use of disinfectant wipes containing detergents as being superior in action over a two stage (cleaning then disinfection) process. In practice, this means that any assessment that only tests the disinfectant contained within a wipe will underestimate the additional proportion of micro-organisms that are physically removed by the wipe. However, see over the page for an important caveat about the assessment of disinfection by a wipe.



## 2. Disinfection

The currently accepted European Committee for Standardization (CEN) tests usually involve testing disinfectants against microbes either in suspension – an aqueous microbial suspension in a solution of the disinfectant – or on a surface (Fraise, 2010). In tests a suspension of microbes is commonly exposed to a disinfectant for up to 60 minutes (the contact time) before looking for an effect and this can be carried out in simulation of clean or dirty conditions.

As disinfectants in wipes will only work while wet – in other words before they dry on a surface (usually only a matter of seconds) – the contact time in some tests can grossly overestimate the level of disinfection that will be achieved by the wipe in practice.

Other tests for wipes can use repeated wiping so that a surface is wet for far longer than will occur in real-life use. This too will greatly overestimate performance in everyday use.

It should also be remembered that standard disinfection tests are highly reproducible single situations and are therefore conducted in conditions that are likely to be far more controlled and far less variable than real life use would be.

*Note: some wipe manufacturers do employ simulations of real-life use (actually using the disinfectant wipe on contaminated surfaces). Such information may be useful and should be checked to ensure whether tests simulate conditions similar to those in the proposed area of use; if not then these tests will be of limited relevance. The use of a soil substitute should ideally be included as this is more representative of real-life situations.*



# Disinfectants used in wipes

The most common disinfectants used in wipes are chemicals such as alcohols or surface active disinfectants – quaternary ammonium compounds (QACs) or triamines. These biocides will achieve limited disinfection (that is with nil or minimal sporicidal activity or activity against non-enveloped viruses such as norovirus) within the exposure times that are achieved in practice (typically a few seconds). It should also be noted that the microbicidal activity will be further compromised if soiling (dirt, vomit, blood, faeces, etc.) is present.

Other wipes, usually substantially more expensive, can contain chlorine dioxide or peracetic acid. These may have activity against spores and non-enveloped viruses, but again their efficacy will be limited by exposure time, how well the disinfectant is applied to surfaces (coverage), and the presence of contamination.

# Tests used to assess efficacy of wipes

As previously discussed, there is currently no agreed standard for assessing the potential efficacy of wipes. Common proxy test methods include non-standard wipe tests, surface tests and suspension tests. Table 1 provides a brief explanation for each test method.

**Table 1 – Comparison of present test methods for disinfectants frequently extrapolated for use with wipes**

Current available test	Interpretation of test in practice
<p><b>Non-standard wipe tests</b></p>	<p>Tests where the product is used to wipe a contaminated surface formulated by the producer or a test laboratory. Such tests need to be assessed by purchasers for the relevance of the test method to the proposed real-life use.</p> <p>Users/purchasers should consider the following:</p> <ul style="list-style-type: none"> <li>• the exposure time must be similar to that which would occur in practice before drying (30 seconds or less)</li> <li>• the disinfectant must have been neutralised by a validated method to stop it continuing to inhibit microbes in the recovery phase of the test method used</li> <li>• there must be sufficient organic matter in the test to simulate use in dirty conditions.</li> </ul> <p>The action of the disinfectant wipe should be compared to a disinfectant-free wipe.</p>
<p><b>Suspension tests</b></p> <p>These should be a European Standard (EN) test, such as:</p> <p><b>BS EN 13727</b> Chemical disinfectants and antiseptics. Quantitative suspension test for the evaluation of bactericidal activity of chemical disinfectants for instruments used in the medical area. Test method and requirements (Phase 2/Step 1).</p> <p><b>Note:</b> Phase 1 EN tests (for example, the EN1040 quantitative suspension test for the evaluation of basic bactericidal activity) are very basic tests and should not, of themselves, be judged to be a determinant of suitability of a disinfectant in a wipe.</p>	<p>In a suspension test a liquid suspension of the test microbe is mixed with the liquid disinfectant. Suspension tests give greater exposure of the microbe to the disinfectant than is likely to occur with a wipe in practice and tend to use exposure times that would be far longer than would occur in practice.</p> <p>Tests under dirty conditions should be included and a disinfection neutralisation validation step must be used</p> <p>Suspension tests may not provide a good guide to how the ingredients in a wipe would work in real-life applications and are less stringent than surface tests.</p>
<p><b>Surface tests</b></p> <p>These should be a European Standard (EN) test, such as:</p> <p><b>BS EN 14561</b> Chemical disinfectants and antiseptics. Quantitative carrier test for the evaluation of bactericidal activity for instruments used in the medical area. Test method and requirements (Phase 2, Step 2).</p>	<p>In a surface test microbes are dried onto a surface which is then exposed to the disinfectant. The microbes are then recovered to test survival rates.</p> <p>Tests under dirty conditions should be included and a disinfection neutralisation validation step must be used.</p> <p>As long as the exposure of microbes to the disinfectant being tested reflects the time before the disinfectant from a wipe would dry in practice, these tests provide a reasonable reflection of what a wipe could achieve under ideal conditions.</p>

## Claims of wipes with sporicidal action

### Interpretation of a theoretical example

The following example has been provided to support you when it comes to interpreting manufacturer-supplied information on the effectiveness of wipes.

#### Example

A nurse is considering purchasing sporicidal wipes in her ward to help reduce the contamination of commodes by *C. difficile*.

Manufacturer's data indicates that the disinfectant in wipes it uses passed a sporicidal test that gave a 10,000 fold ( $4 \log_{10}$ ) reduction in the number of spores in 60 minutes.

However, this evidence should not be taken as a guarantee that the product will be sporicidal when used in a wipe, where the exposure to liquid disinfectant before it dries can be 30 seconds or less.





# Selecting a wipe or wipes for trial

As part of your role, it may be your responsibility to source and select wipes for your workplace. Given the importance of selecting the right product for the intended purpose and the need for assurance as far as possible for its effectiveness, the following points should be considered for wipes selection (please note this list is not exhaustive and is based on best practice principles).

Local infection prevention teams should be consulted for advice during the selection process.

## Prior to trial

Investigate all available products for information on the following and review:

- compatibility with local infection prevention policies
- equipment manufacturers' guidance on cleaning and disinfection
- active ingredients
- dermatological assessment for impact on the skin of staff (such as hands)
- manufacturer's data on testing methods and results
- manufacturer's safety data sheets
- the level of support required for training on use of wipes and the cleaning/disinfection procedure – including who provides this support (supplier or in-house teams) and whether this input is a 'one-off' or needs to be repeated as staff change.

## Trial criteria

Once the type of wipe required has been decided and a choice of products/product for evaluation selected, the following should be considered:

- effectiveness of the wipe on the type of surfaces intended for use
- texture of wipe
- moistness of wipe
- number of wipes required for effective use
- robustness of the wipe in use
- staff preference/acceptability
- packaging design to support use (for example, ease of removing wipe, lid design, closure mechanism)
- value for money
- value above and beyond current products (if wipes already in use).

*Note: some criteria could be objective (in other words judged by assessable pre-set criteria), while others may have to be subjective (in other words the opinion of users).*

# Managing wipes in everyday use

The following key points should be considered and managed so that wipe products maintain their effectiveness and are used properly:

- manufacturer's instructions for storage guidance (where to store and length of storage life)
- ensure stock rotation and undertake regular checks for wipes in packets/containers to make sure these have not dried out or expired
- consider the need to clean wipes containers/packets depending on risk of contamination of external container surfaces
- ensure wipes are only used for their intended purpose according to local ward/dept policies or guidance – for example detergent or disinfectant wipes specifically for use on the environment should not be used for decontamination of skin
- ensure all staff who will use wipes have received training on how and when to use them (the process of wiping as part of cleaning training) to help guarantee consistency and efficacy of use in practice.



# Selection and use of wipes checklist

The following checklist can be used to help you, your team and other colleagues in the selection and use of wipes in your workplace. Please note, it is not an exhaustive checklist and we have left space for you to add your own, localised points.

- Do your research first. What is the intended purpose for using the wipes?
- Refer to local policies and procedures regarding cleaning and disinfection to determine if a wipe can be used.
- Check any relevant manufacturer's guidance to determine if wipes can be used (applies mostly to medical equipment).
- Consult with your local infection prevention team for advice and guidance.
- Consider whether detergent and/or disinfectant wipes are required.
- Investigate manufacturer's information and efficacy claims carefully.
- Consider potential product limitations, for example, efficacy limited by active ingredients (if disinfectant used) and exposure time.
- Trial a number of different wipes if possible before making an informed decision on their suitability.
- Review any potential dermatological effects on staff using the wipes and liaise with occupational health advisers.
- Consider any training requirements for wipes use and who will provide this.
- Consult staff during trials so they can inform any purchase decisions.
- Evaluate any trial thoroughly.
- Ensure processes are in place for stock checks and rotation to ensure product's continued suitability and effectiveness in practice.
- Set a review date to ensure your workplace uses the most suitable and effective wipes available (both in terms of outcomes and costs).

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# Further reading

Fraise A (2011) Currently available sporicides for use in healthcare, and their limitations. *Journal of Hospital Infection* 77, pp.210-212.

Humphreys PN (2011) Testing standards for sporicides. *Journal of Hospital Infection* 77(3), pp.193-198.

Panousi MN, Williams GJ, Girdlestone S and Maillard JY. (2009) Use of alcoholic wipes during aseptic manufacturing, *Letters in Applied Microbiology* 48, pp.648-651.

Sattar S (2010) Promises and pitfalls of recent advances in chemical means of preventing the spread of nosocomial infections by environmental surfaces, *American Journal of Infection Control*, 38 (5) Supplement 1 S34-S40.

Siani H, Cooper C, Maillard J-Y (2011) Efficacy of “sporicidal” wipes against *Clostridium difficile*. *American Journal of Infection Control* 39, pp.212-218.

Wilcox MH, Fraise AP, Bradley CR, Walker J, Finch RG (2011), Sporicides for *Clostridium difficile*: the devil is in the detail, *Journal of Hospital Infection* 77( 3), pp.187-188.

Williams GJ, Denyer SP, Hosein IK, Hill DW and Maillard JY (2007) The development of a new three-step protocol to determine the efficacy of disinfectant wipes on surfaces contaminated with *Staphylococcus aureus*, *Journal of Hospital Infection*, 67(4), pp.329-335.

Williams GJ, Denyer SP, Hosein IK, Hill DW and Maillard JY (2009) Limitations of the efficacy of surface disinfection in the healthcare setting, *Infection Control and Hospital Epidemiology*, 30(6), pp.570-573.

# Additional resources

The Health Protection Agency has convened the Rapid Review Panel (RRP) at the request of the Department of Health to provide a prompt assessment of new equipment and materials or protocols that may be of value to the NHS in improving hospital infection control.

You can review a variety of resources and reports at [www.hpa.org/ProductsServices/InfectiousDiseases/ServicesActivities/RapidReviewPanel](http://www.hpa.org/ProductsServices/InfectiousDiseases/ServicesActivities/RapidReviewPanel) (Accessed 19 January 2011) (Internet).



# Glossary

**Antibacterial** – a chemical that destroys bacteria or inhibits bacterial growth.

**Antimicrobial** – a chemical that kills or inhibits the growth of micro-organisms.

**Biocide** – a substance used to kill or inhibit a wide range of unwanted living organisms; biocides include insecticides, weed killers and rodenticides. Biocides that kill micro-organisms are termed ‘disinfectants’.

**Contamination** – a generic term used to describe both organic soiling and contamination by micro-organisms.

**Decontamination** – an umbrella term used to describe processes that render items safe for reuse. The processes always include cleaning and may also involve disinfection and/or sterilisation, depending on the purpose of the item.

**Detergent** – a water-soluble cleaning agent that can remove water-soluble and oily dirt.

**Dirt** – a generic term used to describe organic soiling.

**Disinfectant** – a chemical or mixture of chemicals that inactivates microorganisms.

**Low risk equipment** – equipment which is either not in contact with the patient or comes into contact with intact skin only – for example bed mattresses, lockers, bedside tables, blood pressure cuffs and commodes. While having a lower infection transmission potential than items in contact with breaks in the skin (‘high risk’) or with mucous membrane (‘medium risk’), low risk equipment can still be of significance in many situations.

**Non-enveloped virus** – a virus lacking an outer lipoprotein envelope, for example norovirus, rotavirus, or human papilloma virus (HPV). Note: blood borne viruses such as hepatitis B, C and HIV are enveloped viruses and are more susceptible to disinfectants than non-enveloped viruses.

**Quaternary ammonium compound (QAC)** – a chemical used as an active ingredient in some disinfectants that disrupts membranes and other sub-cellular microbial components.

**Sanitiser** – a term popular in the food industry for a chemical disinfectant.

**Sporicide** – a chemical agent capable of killing spores produced by bacteria such as *Clostridium difficile* (“C.diff”).

**Triamines** – a chemical used as an active ingredient in some disinfectants that disrupts membranes and other sub-cellular microbial components. Related in chemical structure to QACs.

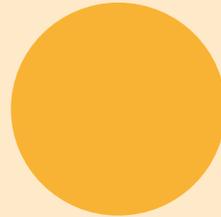
**Virucide** – a chemical which inactivates viruses.

**Wipe** – in health care settings, a pre-moistened fabric material used for wiping in order to clean or disinfect surfaces.



# wipe it out

One chance to get it right



## RCN guidance on the selection and use of disinfectant wipes

The RCN represents nurses and nursing, promotes excellence in practice and shapes health policies.

June 2011

Published by the  
Royal College of Nursing  
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London W1G 0RN

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