

**Standard Infection Control Precautions Literature Review:
Hand Hygiene:
Use of Alcohol Based Hand Rub**

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This literature review will be updated in real time if any significant changes are found in the professional literature or from national guidance/policy.			
Version	Date	Summary of changes	Changes marked
2.0	July 2016	<p>When should ABHR not be used for Hand Hygiene</p> <p>New recommendation added: 'ABHR should not be used when caring for patients with vomiting or diarrhoeal illnesses.'</p> <p>Grading of recommendation changed from D to C for 'ABHR should specifically not be used for hand hygiene when exposure to spore-forming pathogens, such as Clostridium difficile, is suspected or proven'</p>	
1.0	January 2012	Defined as final	

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	July 2016	NPGO Steering Group		
1.0	January 2012	Steering (Expert Advisory) Group for SICPs and TBPs		

HPS ICT Document Information Grid	
Description:	This literature review examines the available professional literature on Hand Hygiene (Use of ABHR) in the hospital setting.
Purpose:	To inform the Standard Infection Control Precaution (SICP) section on Hand Hygiene (Use of alcohol based hand rub) in the National Infection Prevention and Control Manual in order to facilitate the prevention and control of healthcare associated infections in NHSScotland healthcare settings.
Target audience:	All NHS staff involved in the prevention and control of infection in NHSScotland.
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.scot.nhs.uk/
Update level:	Change to practice – No significant change to practice Research – No significant change to research

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1. Objectives

The aim of this review is to examine the extant professional literature regarding the use of alcohol based hand rub (ABHR) for standard infection control purposes in health and social care settings. The specific objectives of the review are to determine:

- When should ABHR be used for hand hygiene?
- When should ABHR not be used for hand hygiene?
- What steps should be performed (technique) when using ABHR for hand hygiene?
- Where should ABHR products be placed in the patient care environment?

Recommendations relating to ABHR and non-alcohol containing hand rub products can be found within the [Hand Hygiene: Hand Hygiene Products SICP Literature Review](#).

Recommendations relating to key moments where hand hygiene using ABHR is indicated can be found within the [Hand Hygiene: Indications for Hand Hygiene SICP Literature Review](#).

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 use of ABHR for standard infection control purposes in health and social care settings:

When should ABHR be used for hand hygiene?

ABHR is the recommended product for hand hygiene provided hands are not soiled or visibly dirty.

(AGREE rating: Recommend)

(Grade B recommendation)

When should ABHR not be used for hand hygiene?

ABHR should not be used for hand hygiene when hands are soiled or visibly dirty.

(AGREE rating: Recommend)

(Grade D recommendation)

ABHR should not be used when caring for patients with vomiting or diarrhoeal illnesses.

(AGREE rating: Recommend)

ABHR should specifically not be used for hand hygiene when exposure to spore-forming pathogens, such as *Clostridium difficile*, is suspected or proven. In this instance hand hygiene should be performed using non-antimicrobial liquid soap and water (unless carrying out a clean/aseptic procedure, where use of antimicrobial liquid soap is indicated).

(AGREE rating: Recommend)

(Grade C recommendation)

In addition, ABHR should not be used for hand hygiene when exposure to norovirus is suspected or proven. In this instance hand hygiene should be performed using non-antimicrobial liquid soap and water (unless carrying out a clean/aseptic procedure, where use of antimicrobial liquid soap is indicated).

(Good Practice Point (GPP))

What steps should be performed (technique) when using ABHR for hand hygiene?

Follow the manufacturer's instructions for the volume of ABHR required to provide adequate coverage of the hands. In the absence of manufacturer instructions, volumes of approximately 3 mL are recommended to ensure full coverage.

(AGREE rating: Recommend)

(Grade D recommendation)

Rub hands together to ensure that the ABHR solution covers all surfaces of the hands.

(AGREE rating: Recommend)

(Grade D recommendation)

Hand rubbing should be performed until the hands are dry, typically for a minimum of 20-30 seconds.

(AGREE rating: Recommend)

(Grade D recommendation)

Where should ABHR products be placed in the patient care environment?

ABHR should be made available to staff as near to each individual patient as possible.

A risk assessment should be carried out considering aspects such as location, dispenser size and use of personal dispensers. This assessment should also take into account the risk in relation to fire, ingestion or unintended use.

(Mandatory)

4. Discussion

4.1 Implications for practice

When should ABHR be used for hand hygiene?

There is a substantial volume of evidence published in the literature, comparing hand washing with soap and water to use of alcohol based hand rubs (ABHRs). Specifically, the extant professional literature comprises of international guidelines, randomized controlled trials (RCTs), observational studies and systematic and non-systematic reviews. ABHR has consistently been found to be more effective at reducing microorganisms on hands, compared with hand washing using soap and water.¹⁻¹⁶ This is the case for both antimicrobial and non-antimicrobial soaps. In contrast, a recent RCT found that use of ABHR was equally as effective as hand washing using an antimicrobial soap.¹⁷

There is also a further body of evidence generated through both experimental and observational studies demonstrating the antimicrobial efficacy of ABHRs against a variety of HAI causing microorganisms.¹⁸⁻³⁰

ABHR is the recommended product for hand hygiene providing that hands are not soiled or visibly dirty.^{1;31;32}

(AGREE rating: Recommend)

(Grade B recommendation)

When should ABHR not be used for hand hygiene?

As ABHRs are disinfectant agents as opposed to cleansing agents, they should not be used for hand hygiene when hands are soiled or visibly dirty.^{1;3;11;31-34}

(AGREE rating: Recommend)

(Grade D recommendation)

UK guidance also states that ABHR should not be used when caring for patients with vomiting or diarrhoeal illnesses.³²

(AGREE rating: Recommend)

A significant number of studies and guidance documents highlight that ABHRs exhibit limited efficacy against bacterial spores and therefore should not be used for hand hygiene when exposure to spore-forming pathogens, such as *Clostridium difficile*, is suspected or proven.^{1;3;11;31;32;34-40} In these instances, hands should be washed using non-antimicrobial liquid soap and water (unless carrying out a clean/aseptic procedure, where use of antimicrobial liquid soap is indicated, as per The World Health Organization's '5 moments for hand hygiene').⁴¹

(AGREE rating: Recommend)

(Grade C recommendation)

A number of laboratory based experimental studies have focused on determining the efficacy of ABHRs against both surrogates of norovirus and human norovirus genogroups. However, the experimental evidence is inconsistent and a grade of recommendation cannot be given.^{29;42-49}

ABHR should therefore not be used for hand hygiene when norovirus infection is suspected or proven. In these instances hand hygiene should be performed using non-antimicrobial liquid soap and water (unless carrying out a clean/aseptic procedure, where use of antimicrobial liquid soap is indicated).

(Good Practice Point (GPP))

What steps should be performed (technique) when using ABHR for hand hygiene?

Manufacturer's instructions regarding the volume that will provide adequate coverage of the hands should be followed. A number of experimental and observational studies indicate that relatively large volumes (approximately 3 mL) are recommended to ensure full coverage and associated increased antimicrobial activity.^{3;24;33;50-53;53;54}

(AGREE rating: Recommend)

(Grade D recommendation)

The technique for hand rubbing recommended by the World Health Organization ensures a methodological approach is taken.⁴¹ The technique can be summarised thus:

- Dispense ABHR into the cupped palm of one hand.
- Rub hands palm to palm.

- Rub right palm over the back of the other hand with interlaced fingers and vice versa.
- Rub palm to palm with the fingers interlaced.
- Rub the backs of fingers to opposing palms with fingers interlocked.
- Use rotational rubbing of the left thumb clasped in the right palm and vice versa.
- Use rotational rubbing, backwards and forwards with clasped fingers of the right hand in the left palm and vice versa.

This is in agreement with the Health Protection Scotland recommended hand washing technique.⁵⁵ An observational study found this technique to be effective in reducing the bacterial bioburden on the hands.²⁶ A recent RCT⁵⁶ also demonstrated that this technique was superior to use of the CDC recommended technique, which provides less procedural detail. In contrast, a further RCT¹⁷ found the WHO and CDC methods to be comparably effective.

Based on consensus within the literature, a technique ensuring that all surfaces of the hands are covered should be utilised. ^{3;13;17;31-33;48;57}

(AGREE rating: Recommend)

(Grade D recommendation)

Several experimental studies have tested the antimicrobial efficacy of various ABHRs at short application times (≤ 15 seconds) and yielded mixed results.^{19;23;58;59} It is therefore recommended that hand rubbing should be performed until hands are dry, typically for a minimum of 20-30 seconds. ^{1;3;13;31-33;41;53;60}

(AGREE rating: Recommend)

(Grade D recommendation)

Where should ABHR products be placed in the patient care environment?

Adequate placement of hand hygiene products is crucial to encourage and assist staff in complying with correct hand hygiene practices.⁴¹ The Chief Nursing Officer (CNO) circulated a letter⁶¹ in February 2005, which detailed the Executive's proposal for establishing widespread use of ABHRs in NHSScotland. This document recommended that ABHRs should be made available to staff as near to each individual patient as possible. This is supported by national

guidance which states that ABHRs should be made available at the point of care in all healthcare facilities.³² Products may be placed on a wall mounted dispenser, or one attached to the end of each bed. A personal dispenser may also be carried by staff on the belt or in the pocket, in certain clinical situations (i.e. with very young patients). Furthermore, a Health Technology Assessment (HTA) published by NHS Quality Improvement Scotland,⁶² states that the potential benefit of the provision of ABHRs for use by all NHSScotland staff in clinical areas, is likely to outweigh the costs. It also recommended that ABHRs should be made available for the use by visitors, particularly where hand washing facilities are limited. A recent observational study assessed HCW ABHR use compliance based on ABHR placement. Statistically higher rates of compliance were associated with ABHR dispensers which were easily visible upon entry to the clinical area, as well as those placed close to an entrance or exit.⁶³ Health Facilities Scotland (HFS) guidance⁶⁴ states that local risk assessments should be undertaken to guide the placement of ABHR dispensers and the number of these required within clinical areas. In addition, risks related to fire, ingestion or unintended use should also be considered.^{61;62;65;66}

(Mandatory)

4.2 Implications for research

There is a substantial evidence base examining the efficacy of ABHR products. Due to the increase in studies relating to the efficacy and tolerability of non-alcohol based hand rubs; the potential utility of these may have to be evaluated in future literature reviews.

In terms of the efficacy of ABHRs against norovirus, further research is required to gain a consensus on whether these products are suitable for hand hygiene. At present, due to the inconsistency of the evidence, no recommendations can be made. The evidence base would also benefit from further microorganism specific research, particularly relating to ABHR efficacy against a wider range of viruses, fungi and parasites.

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