



Health
Protection
Scotland



**Standard Infection Control Precautions Literature Review:
Hand Hygiene:
Skin Care**

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| Approver: | Susie Dodd | |
| Approved by and Date: | January 2016 | |
| Contact | Name: | Infection Control Team |
| | Tel: | 0141 300 1175 |
| | Email: | nss.hpsinfectioncontrol@nhs.net |

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| 4.0 | July 2020 | <p>Update of the Hand Hygiene: Skin care literature review V3.0 using two-person NIPCM methodology.</p> <p>The research question set was expanded from the initial single research question '<i>How can skin integrity be maintained when performing hand hygiene in order to minimise the development of irritant contact dermatitis?</i>'</p> <p>Recommendations have been added based on the literature which highlights the use of warm/tepid water; patting instead of rubbing hands dry; and the formulation of alcohol based hand rubs containing emollients.</p> | |
| 3.0 | January 2016 | Updated after review of current literature | |
| 2.0 | April 2014 | Updated after review of current literature | |
| 1.0 | January 2012 | Defined as final | |

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| Description: | This literature review examines the available professional literature on Hand Hygiene (Skin care) in health and care settings. |
| Purpose: | To inform the Standard Infection Control Precaution (SICP) section on hand hygiene (Skin care) in the National Infection Prevention and Control Manual. |
| Target audience: | All NHS staff involved in the prevention and control of infection in NHSScotland. |
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1. Objectives

The aim of this review is to examine the extant scientific literature regarding skin care for standard infection control purposes. The specific objectives of the review are to determine:

- How should ABHR or liquid soap be used in order to maintain skin integrity?
- Which products should be used in order to maintain skin integrity and minimise the development of contact dermatitis?
- What is an emollient?
- When should moisturising agents be used in order to maintain skin integrity?
- How should moisturising agents be used in order to maintain skin integrity?

2. Methodology

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

3. Discussion

3.1 Implications for practice

How should ABHR or liquid soap be used in order to maintain skin integrity?

Irritant contact dermatitis and dry skin is often reported by healthcare workers following contact with irritants such as hand washing solutions.^{1, 2} Hand washing products contain surfactants which remove dirt from the surface of the skin however they can also compromise the lipid barrier of the skin leading to dryness, redness and irritation.³⁻⁶ High frequency of hand washing with soap has been associated with worsening skin condition or eczema.⁷⁻⁹ Additionally, repeated exposure to hot water may increase the risk of dermatitis and as such warm/tepid water should be used for hand washing.^{1, 3, 9, 10} When drying hands after washing, it is recommended that hands are patted with paper towels instead of rubbed to avoid irritation of the skin.³

Allergic contact dermatitis is a less common condition associated with hand hygiene products and is caused by a reaction to one of the ingredients (e.g. fragrances, preservatives).² Many of the symptoms of allergic contact dermatitis (with the exception of severe cases where it has been associated with respiratory distress and other symptoms of anaphylaxis) are similar to those of irritant contact dermatitis, therefore making it difficult to differentiate without specialist knowledge.²

Alcohol based hand rubs (ABHRs) containing emollients should be used for hand hygiene instead of liquid soap and water when hands are not visibly soiled or dirty and when spore-forming organisms are not suspected or confirmed.^{1, 5, 9, 11-13} Several experimental studies have demonstrated that ABHR is generally well tolerated following repetitive exposure over the study period¹⁴⁻¹⁶ and trials conducted within health and care settings have demonstrated high user acceptability and tolerability of ABHR.¹⁷⁻²² The use of ABHRs for hand hygiene has been found to cause less irritation than frequent hand washing with soap.^{5, 9, 10, 13, 22} ABHRs for routine hand hygiene have been found to be more effective at improving or maintaining skin condition when compared with frequent washing with soap and water.^{7, 15-17, 19} The introduction of ABHR use has also been found to reduce the number of undesirable effects on the skin of healthcare workers.²³

There is consensus in the literature that hands should not be washed immediately after using ABHR.^{1, 3, 5, 9-11} This procedure may remove any emollients that were present in the hand rub along with superficial skin sebum, thus leading to potential skin deterioration.

Which products should be used in order to maintain skin integrity and minimise the development of contact dermatitis?

It is recommended that formulations of ABHRs used in health and care settings should contain emollients.^{1, 9, 13} It has been demonstrated that inclusion of emollients in ABHR formulations is beneficial to skin condition.^{14, 24} There is limited evidence to suggest that glycerol emollients result in better skin condition than isopropyl emollients.²⁰

There is lack of high quality evidence in the literature;^{25, 26} however the use of emollient and barrier hand creams has been found to prevent loss of skin integrity caused by hand washing.^{6, 27} Additionally, hand lotions and creams containing humectants can improve skin condition as they increase skin hydration and replace altered or removed lipids.^{5, 13}

Another aspect that must be considered when introducing hand creams is their effect on the efficacy of hand hygiene products (e.g. antiseptic agents) or the integrity of gloves (oil-based products are known to have a potentially damaging effect on gloves).^{2, 5, 10, 11} Studies have shown that various hand lotions and creams have no significant impact on the efficacy of the hand hygiene products studied.²⁸⁻³⁰ However, it is recommended that the potential effects on product efficacy should be considered when implementing the use of hand lotions and emollients and appropriate products should be selected accordingly.²⁸⁻³⁰

What is an emollient?

The term “emollient” is often incorrectly used to describe a “moisturiser”.¹³ There are three main moisturising agents which are emollient, humectant and occlusive agents. The properties of these agents are shown in Appendix 2. Emollient agents improve hydration of the skin by replacing lost water; humectants agents increase water absorption by bonding with water

molecules; and occlusive agents form an inert layer on the skin to reduce trans-epidermal water loss. Moisturisers often contain a combination of these three moisturising agents.¹³

When should moisturising agents be used in order to maintain skin integrity?

Barrier creams and a lotions have been found to improve skin integrity.²⁷ However, barrier creams are not recommended for use by HCWs in health and care settings.¹³

There is consensus in published guidelines and in the literature that emollient hand creams should be used regularly, for example when off duty and during breaks, to prevent irritant contact dermatitis caused by frequent hand hygiene.^{1-4, 10, 13, 31, 32}

How should moisturising agents be used in order to maintain skin integrity?

There is a lack of high quality evidence regarding the application technique of emollients. However studies and guidelines are consistent in their recommendations that when hand creams are applied they should cover all of the hands including between the fingers and the backs of the hands.^{1, 3-5, 9, 11, 12, 27} Communal tubs and other containers of hand cream should not be used as these have the potential to become easily contaminated.¹ Additionally, to reduce the risk of contamination, dispensers which are refilled are not recommended.¹³

3.2 Implications for research

Further research, of robust methodological quality, on interventions to minimise irritant contact dermatitis among healthcare workers would increase the evidence base, facilitating the development of stronger recommendations for practice.

4. Recommendations

This review makes the following recommendations based on an assessment of the extant scientific literature regarding skin care for standard infection control purposes:

How should ABHR or liquid soap be used in order to maintain skin integrity?

Alcohol based hand rubs containing emollients should be used for hand hygiene instead of liquid soap and water when:

- hands are not visibly soiled, dirty; and/or
- spore forming organisms are not suspected/proven.

(Category B recommendation)

Hands should not be washed immediately after using ABHR as this may remove any emollients that were present in the hand rub and the superficial skin sebum.

(Category B recommendation)

Warm/tepid water should be used for hand washing to prevent dermatitis and maintain skin integrity.

When drying hands after washing, hand should be patted with a paper towel instead of rubbed to avoid irritation of the skin.

(Category C recommendation)

Which products should be used in order to maintain skin integrity and minimise the development of contact dermatitis?

Alcohol based hand rubs used for hand hygiene should contain emollients in their formulation.

(Category B recommendation)

Emollient hand creams should be used to maintain skin integrity and minimise the development of contact dermatitis.

(Category B recommendation)

Emollient hand creams used in the health and care setting must not affect the efficacy of the hand hygiene products or gloves used (oil-based products are known to have a potentially damaging effect on gloves).

(Category B recommendation)

When should moisturisers be used in order to maintain skin integrity?

Emollient hand creams (moisturisers) should be used regularly after washing hands (e.g. when off duty, going for breaks).

(Category B recommendation)

Barrier creams are not recommended for use by healthcare workers in health and care settings.

(Category B recommendation)**How should moisturisers be used in order to maintain skin integrity?**

Hand moisturisers should be applied all over the hands including between the fingers and the back of the hands.

(Category B recommendation)

Dispensers which are refilled should not be used.

(Category B recommendation)

Communal tubs of hand cream should not be used.

(Category C recommendation)

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Appendix 1

Final recommendations are given a grade to highlight the strength of evidence underpinning them, the NIPCM grades of recommendations are as follows:

| Grade | Descriptor | Levels of evidence |
|--------------------------|--|---|
| Mandatory | 'Recommendations' that are directives from government policy, regulations or legislation | N/A |
| Category A | Based on high to moderate quality evidence | SIGN level 1++, 1+, 2++, 2+, AGREE strongly recommend |
| Category B | Based on low to moderate quality of evidence which suggest net clinical benefits over harm | SIGN level 2+, 3, 4, AGREE recommend |
| Category C | Expert opinion, these may be formed by the NIPC groups when there is no robust professional or scientific literature available to inform guidance. | SIGN level 4, or opinion of NIPC group |
| No recommendation | Insufficient evidence to recommend one way or another | N/A |