

# Literature review

Hand Hygiene: Skin Care

Version 5.0

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## Key Information

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## Document information

Document information	Description
<b>Description</b>	This literature review examines the available professional literature on hand hygiene skin care in health and care settings.
<b>Purpose</b>	To inform the hand hygiene section in the National Infection Prevention and Control Manual to facilitate the prevention and control of infections in NHSScotland health and care settings.
<b>Target audience</b>	All staff involved in the prevention and control of infection in Scotland.
<b>Update/review schedule</b>	Updated as new evidence emerges with changes made to recommendations as required.  Review will be formally updated every 3 years with next review in 2026.
<b>Cross reference</b>	<a href="#">National Infection Prevention and Control Manual</a>
<b>Update level:</b>	Practice <ul style="list-style-type: none"> <li>Barrier creams should not be used in the work place</li> </ul> Future research <ul style="list-style-type: none"> <li>The effect of moisturisers or emollients on the efficacy of ABHR.</li> <li>The use, benefit, and harms of using barrier (pre-work) creams.</li> </ul>

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## 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/policy.

Version	Date	Summary of changes
1.0	January 2012	Defined as final
2.0	April 2014	Updated after review of current literature
3.0	January 2016	Updated after review of current literature
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 'How can skin integrity be maintained when performing hand hygiene in order to minimise the development of irritant contact dermatitis?'</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>
5.0	December 2023	<p>Updated after review of current literature.</p> <p>New questions added:</p> <ul style="list-style-type: none"> <li>• What is skin integrity and why is it important to maintain in relation to hand hygiene?</li> <li>• What is contact dermatitis and what are the associated signs and symptoms of this skin condition?</li> <li>• What factors related to hand hygiene increase the likelihood of developing contact dermatitis?</li> <li>• Are there any legislative requirements relating to skin care to prevent or minimise</li> </ul>

Version	Date	Summary of changes
		<p>contact dermatitis associated with hand hygiene?</p> <p>Following recommendation has been updated:</p> <ul style="list-style-type: none"> <li>Barrier creams are not recommended for use by healthcare workers in health and care settings</li> </ul>

## Approvals

Version	Date Approved	Name
1.0	January 2012	Steering (Expert Advisory) Group for SICPs and TBPs
2.0	April 2014	Steering (Expert Advisory) Group for SICPs and TBPs
3.0	January 2016	Steering (Expert Advisory) Group for SICPs and TBPs
4.0	July 2020	National Policy Guidance and Outbreaks Steering and Consensus groups
5.0	August 2023	NPGE and CIPC working groups

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# 1. Objectives

The aim is to review the extant scientific literature regarding hand hygiene skin care in health and care settings to inform evidence-based recommendations for practice.

The specific objectives of the review are to determine:

- What is skin integrity and why is it important to maintain in relation to hand hygiene?
- What is contact dermatitis and what are the associated signs and symptoms of this skin condition?
- What is an emollient?
- What factors related to hand hygiene increase the likelihood of developing contact dermatitis?
- Which hand hygiene products should be used to maintain skin integrity?
- Are there any legislative requirements relating to skin care to prevent or minimise contact dermatitis associated with hand hygiene?
- When should moisturising agents be used to maintain skin integrity?
- How should moisturising agents be used to maintain skin integrity?

# 2. Methodology

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

Note: This review excluded studies that primarily centred on clinical treatment and the effects of personal protective equipment (PPE) on skin care, such as examining the impact of gloves on the condition of the hands' skin, as they were not within the scope of the study.

## 3. Discussion

### 3.1 Implications for practice

#### What is skin integrity and why is it important to maintain in relation to hand hygiene?

This is a new research question for this iteration of this literature review. In total, three expert opinion guidance documents were identified relating to this question with no primary studies identified.<sup>1-3</sup> All three documents were graded according to the SIGN50 methodology as SIGN level 4.<sup>1-3</sup> These include expert opinion guidance from the North American Nursing Diagnosis Association (NANDA), the Australian Commission on Safety and Quality in Health Care (ACSQHC) Hand Hygiene manual, and the Department of Health Australia guidance on best care for older people.

According to NANDA, skin integrity is defined as skin being a sound and complete structure in unimpaired condition.<sup>1</sup> While the Department of Health, Australia defines skin integrity as the skin being whole, intact and undamaged.<sup>3</sup>

Intact skin acts as a first line of defence against infection. The significance of maintaining skin integrity is highlighted by NANDA who contend that damaged skin may lead to infection and hence increase the risk of transmission to others.<sup>1</sup> This is in line with the ACSQHC that states that damaged skin can harbour higher numbers of microorganisms than intact skin and hence increase the risk of transmission to others.<sup>2</sup> Additionally, a healthy skin condition is an important element in ensuring good hand hygiene practice.<sup>1, 2</sup> Dry, chapped or irritated skin can be factors in low hand hygiene compliance which can in turn increase transmission risk, therefore it is important to maintain skin integrity among healthcare workers.<sup>1</sup>



## What is contact dermatitis and what are the associated signs and symptoms of this skin condition?

This is a new research question for this iteration of this literature review. Evidence for this question consists of eight publications; three SIGN50 level 3 primary studies which included three self-reported cross-sectional surveys.<sup>4-6</sup> one AGREE 'recommend' guidance document published by the British Association of Dermatologists (BAD)<sup>7</sup> and four SIGN50 level 4 expert opinion guidance published by the Health and Safety Executive (HSE), the Australian Commission on Safety and Quality in Health Care (ACSQHC) Hand Hygiene manual and the Ontario Agency for Health Protection and Promotion.<sup>2, 8-10</sup>

According to extant guidance, contact dermatitis often used interchangeably with hand eczema, is the inflammation of the skin (epidermis and adjacent dermis) resulting from direct contact of a substance with the surface of the skin.<sup>2, 7-9</sup> These substances can act either as irritants, where a cell-mediated immune response is not involved, or as allergens, where cell-mediated immunity is involved. Although contact dermatitis can affect all parts of the body, the hands are most affected.<sup>7</sup> Within the evidence, there were two common types of occupational contact dermatitis identified that were considered relevant to this review.<sup>2, 7-9</sup>

- Irritant contact dermatitis (ICD), caused by substances or agents that dry out and damage the skin for example detergents, solvents, oils and prolonged or frequent contact with water.
- Allergic contact dermatitis (ACD) which occurs when a person develops an allergy to something that comes into contact with their skin. The allergic reaction can appear over hours or days, or even months.

The self-reported signs and symptoms of contact dermatitis as reported by surveys from the UK, Ethiopia and Turkey are dryness, redness, fissure (splits/cracks/tear), itchiness/irritation which usually appear as first signs and are usually followed by flaking/scaling, blistering, crusting, cracking, swelling and pain.<sup>2, 4-8</sup>

## What is an emollient?

No primary studies were identified for this question, however, two expert opinion guidance documents were identified and graded as SIGN50 level 4.<sup>10, 11</sup> These were published by the Ontario Agency for Health Protection and Promotion and the NHS UK.

The term emollient is often used interchangeably with the term moisturiser, however, moisturiser ingredients include emollients, occlusive agents and humectants.<sup>10</sup> Within the evidence, an emollient is a product used to moisturise the skin which works by covering the skin with a protective film which traps in moisture.<sup>11</sup> Emollients can be applied directly to the skin in products such as lotions, creams, sprays and ointments or can be added to products such as ABHR or hand hygiene products.<sup>10</sup> These help soften and smooth the scales of the skin, thus reducing rough, flaky skin.<sup>11</sup>

## What factors related to hand hygiene increase the likelihood of developing contact dermatitis?

This is a new research question for this iteration of this literature review. Thirteen studies were identified for this question.<sup>6, 12-23</sup> One was graded SIGN50 level 4 expert opinion guidance published by Healthcare Infection Control Practices Advisory Committee (HICPAC)/Society for Healthcare Epidemiology of America (SHEA)<sup>19</sup>, one AGREE 'recommend' by the World Health Organization<sup>18</sup>, two were RCTs graded SIGN50 level 1+, and nine studies were graded SIGN50 level 3 (five cross-sectional studies<sup>6, 13, 14, 16, 21</sup> and four experimental/observational studies<sup>12, 15, 20, 22</sup>). Within the evidence, studies explored different factors related to hand hygiene that may increase the likelihood of developing contact dermatitis within health and care settings. These are discussed in the sections below.

### Water exposure and temperature

Within the evidence, water exposure and high-water temperatures have been highlighted as factors that may increase the risk of developing contact dermatitis. Two primary studies (experimental)<sup>12, 15</sup> and two expert opinion guidance documents explored these factors.<sup>18, 19</sup>

An experimental study carried out in Denmark investigated the impact of skin hydration prior to ABHR application on skin barrier function in 20 healthy volunteers. There was a significant increase in trans-epidermal water loss value (TEWL) (the amount of water that passively evaporates through skin to the external environment) from baseline to day 3 ( $P = 0.04$ ) with a 30-minute water immersion before ABHR application (6 separate applications of ABHR for 30 seconds over the space of an hour). This suggests that hydration of the skin (in this case caused by prolonged exposure to water) before ABHR use may increase the risk of developing contact dermatitis.<sup>15</sup> This was a small study with a young cohort (<30 years) of participants, and the forearms rather than the hands were used in the experimental set up.

An experimental study conducted in Granada investigated the impact of water exposure on the epidermal barrier among 50 participants with no active skin disease.<sup>12</sup> The study compared hot water (44°C) vs cold water (4°C). There was a significant increase in the TEWL (8.74 vs. 9.98 grams of water square meter per,  $p = 0.003$ ) and erythema index (a marker of skin redness) (209.07 vs. 227.79 arbitrary units (AU),  $p = 0.017$ ) when in contact with hot water vs cold water suggesting that exposure to hot water may damage the skin barrier and increase the likelihood of developing contact dermatitis. This experimental study did not explore the frequency of water exposure, which is a limitation. These experimental findings are in line with guidance from the World Health Organization (WHO) which states that frequent hand cleansing including using hot water may contribute to dermatitis.<sup>18</sup> The Healthcare Infection Control Practices Advisory Committee and Society for Healthcare Epidemiology guidelines for healthcare settings also recommend to avoid the use of hot water for hand washing since repeated exposure to hot water may increase the risk of dermatitis.<sup>19, 24</sup>

### **Frequency of hand washing**

Five cross-sectional primary studies explored the association of hand washing frequency and contact dermatitis.<sup>6, 13, 14, 16, 21</sup> In these studies, hand washing frequency of more than 10 times a day was associated with a deterioration in skin barrier integrity.<sup>6, 13, 14, 16, 21</sup> A study conducted in Thailand among 805 participants found that a frequency of handwashing of more than 10 times per day increased the risk of hand eczema (adjusted odds ratio [OR] [95% confidence interval [CI], 1.70

[1.05-2.75],  $P = 0.032$ )]<sup>13</sup> Similarly, a study from Brunei found that HCWs who washed their hands more than 20 times a day (24%) reported more skin disorder symptoms (SDS) than HCWs who washed their hands 20 times or less a day (16%;  $p < 0.05$ ).<sup>14</sup> A study conducted in Ethiopia to investigate the prevalence and risk factors of occupational contact dermatitis among 422 HCWs found that participants who washed their hands 11 or more times per day were more likely to develop contact dermatitis than those who washed five or fewer times a day (adjusted odds ratio [AOR] 1.801, 95% CI [1.10, 3.20]).<sup>6</sup> A cross-sectional questionnaire study based in Denmark, presented data on 2,125 HCWs revealing that the odds of developing hand eczema were increased by frequent hand washing of more than 10 times a day by 73% (OR 1.73 CI: 1.26-2.36).<sup>16</sup> A cohort analysis of the data from 12,288 hospital employees in Sweden revealed frequent hand washing with soap was associated with an increased risk (OR 1.43 (1.12–1.83)) for hand eczema.<sup>21</sup> However, in all these studies the skin condition was self-assessed with a high risk of recall and self-report bias. Further, it is difficult to compare these studies due to different selections of study populations, and different assessment measures of contact dermatitis. However, there is consensus within the evidence that hand washing beyond 10 times a day may increase the likelihood of developing contact dermatitis.

The WHO guidance on hand hygiene states that frequent hand washing leads to progressive depletion of surface lipids as a result of deeper action of detergents into the superficial skin layers.<sup>18</sup>

### **Hand washing with soap and water**

Four studies (2 RCTs and 2 experimental studies) explored the impact of using soap and water on skin integrity across different contexts and settings.<sup>17, 20, 22, 23</sup>

A randomised controlled trial conducted among 62 HCWs in Granada assessed the impact of using water and soaps, ABHR, and disinfectant wipes on skin barrier function after an 8-hour shift.<sup>17</sup> Significant differences were noted in TEWL between using soap and water and ABHR ( $p=0.020$ ), with soap and water having greater loss than using ABHR. These results are similar to those from a prospective RCT among 32 ICU HCWs at a tertiary hospital in the US to ascertain the degree of skin irritation and dryness when using two hand hygiene regimens.<sup>23</sup> The average final

self-assessment score with soap-and-water hand washing was significantly worse than the average final score with the ABHR regimen (4.8 versus 2.0,  $P=0.0003$ ).

The above findings are supported by findings from two SIGN50 level 3 primary studies.<sup>20, 22</sup> A prospective multicentre study conducted in France across nine healthcare facilities showed that the frequency of handwashing with soap and water was significantly related to irritation of the hands (adjusted OR 1.02;  $P=9.10^{-4}$ ), whereas the frequency of disinfection with an ABHR was not.<sup>20</sup> An experimental study conducted in Denmark compared the effects of repeated exposure to an ABHR, a liquid soap and water and their combined effects (alternate applications of the ABHR and soap) for 10 days.<sup>22</sup> An increased irritant response was observed for the soap ( $P < 0.001$ ).

Despite the different contexts and settings, the findings from these studies suggest that the use of soap and water for hand hygiene within clinical settings may increase the likelihood of developing hand dermatitis when compared to using ABHR.

In summary, regular hand washing with soap and water, repeated water exposure of particularly hot water, and hand washing frequency of more than 10 times a day may increase the likelihood of developing contact dermatitis among HCWs.

## Which hand hygiene products should be used to maintain skin integrity?

Evidence regarding the microbiological efficacy of hand hygiene products is covered in a separate literature review – [Hand Hygiene Products Literature Review](#).

This research question is concerned with evidence regarding the product features that promote or preserve skin integrity. A total of 18 publications were identified in relation to this question.<sup>7, 10, 17-23, 25-33</sup> Five publications were identified in this current update<sup>17, 25-27</sup> and 13 publications were included from the previous update (version 4.0).<sup>10, 18-23, 28-33</sup> Of these included publications, six are RCTs<sup>17, 23, 25, 29, 31, 32</sup> graded SIGN50 level 1+, five primary studies were graded SIGN50 level 3, including three observational studies, one cross-sectional survey and one experimental study<sup>20-22, 26, 30</sup>, and four SIGN50 level 4 expert opinion guidance.<sup>10, 19, 27, 33</sup> Three evidence-

based guidance documents, published by the WHO, the British Association of Dermatologists and epic3 were graded AGREE 'recommend'.<sup>7, 18, 28</sup>

As covered in the research question "[What factors related to hand hygiene increase the likelihood of developing contact dermatitis?](#)", findings from five primary studies indicated that the use of soap and water for hand hygiene may increase the likelihood of developing hand dermatitis when compared to using ABHR.<sup>17, 20, 22, 23</sup>

Evidence from five primary studies (four RCTs and one observation study) suggest that ABHR containing an emollient or a moisturising agent should be used if skin integrity is to be maintained.<sup>23, 25, 26, 29, 32</sup> A double-blinded RCT conducted in an intensive care unit in a Brazilian hospital compared skin tolerance associated with the use of four locally manufactured ABHR formulations and found that most of the skin reactions occurred in the ABHR without glycerol cohort, with participants likely to have lower skin tolerance ratings when using the solution without the emollient agent.<sup>25</sup> The largest variation in ratings occurred for the visual rating of the skin, with worse results for the formulation without glycerol (37.5%).

A before and after study conducted in Ukraine that looked at the use of ABHRs followed by additional regular use of a fragrance-free emollient among HCWs reported significantly more self-reported improvements of hand skin condition in the group that used an ABHR containing glycerin, (29 from 38 versus 6 from 28 respectively,  $P < 0.001$ ).<sup>26</sup> Additionally, two RCTs from the US had comparable results.<sup>23, 29</sup> One compared the use of a chlorhexidine gluconate containing antiseptic hand wash (CHG) to a 61% ethanol ABHR with emollients and their impact on skin condition among 50 HCWs at a tertiary hospital. Participants in the ABHR group had significant improvements in the hand skin assessment scores at week 4 (baseline 22.7 vs 25.4 at week 4) ( $p = 0.04$ ) and in Visual Skin Scaling scores at week 4 (5.08 at baseline vs 5.65 at week 4) ( $p = 0.0005$ ).<sup>29</sup> The second RCT investigated the degree of skin irritation and dryness when using two hand hygiene regimens (ABHR containing an emollient, versus soap and water) among 32 HCWs in ICUs.<sup>23</sup> The average final self-assessment score with soap and water hand washing was significantly worse than the average final score with the ABHR regimen containing emollients.

Further, a double blinded RCT conducted in Germany, to assess the impact of emollients in a propanol-based hand rub on skin dryness and erythema in a cohort of 35 volunteers with no active skin condition, revealed that the mean sum score for erythema and dryness was significantly lower for the hand rub with emollients ( $0.8 \pm 2.4$ ) in comparison to the rub without emollients ( $1.5 \pm 3.5$ ;  $P=0.022$ ).<sup>32</sup> The use of ABHRs with added moisturisers devoid of allergenic surfactants, preservatives, fragrances, or dyes is also supported by the included expert opinion guidance.<sup>18, 27, 33</sup> These documents further encourage use of ABHRs containing moisturiser within healthcare settings.

The use of hand lotions, emollients and moisturising agents after hand washing to maintain skin integrity was also identified within the evidence.<sup>7, 10, 18, 19, 28, 31</sup>

A double-blinded RCT was conducted among 132 volunteers with no active skin condition at Leeds General Infirmary to compare the effect of moisturiser application after repeated hand washing with a hand soap and water, with a control group using hand washing regimen alone.<sup>31</sup> There was a statistically significant deterioration in skin health and integrity as measured by the Hand Eczema Severity Index (a clinical grading system of dermatitis) (HECSI) from baseline to day 14 ( $P = 0.003$ ) in those subjects repeatedly washing their hands with soap and water without subsequent application of moisturiser, with no change noted in the groups using moisturiser.

Looking to extant guidance, epic3 guidance recommends that HCWs should be encouraged to use an emollient hand cream regularly to maintain the integrity of the skin.<sup>28</sup> Similarly, the WHO, the British Association of Dermatologists, HICPAC/SHEA/APIC and the Ontario Agency for Health Protection and Promotion recommend that healthcare workers should be provided with hand lotions or creams to minimize the occurrence of irritant contact dermatitis associated with hand antisepsis or handwashing.<sup>7, 10, 18, 19</sup>

Another aspect that should be considered when introducing hand creams is their effect on the efficacy of hand hygiene products or the integrity of gloves (oil-based products are known to have a potentially damaging effect on gloves).<sup>18</sup> The WHO advises that, in addition to the efficacy and acceptability of hand hygiene products including skin care products, product selection committees should also take into account any known interactions between these products and the types of gloves



utilised within the facility. This aligns with the CDC 2002 hand hygiene guidelines, which advise seeking information from manufacturers regarding the impact of hand lotions, creams, or alcohol-based hand antiseptics on the lasting effectiveness of antimicrobial soaps used in the facility.<sup>19</sup> Further, the CDC caution that the use of petroleum-based hand lotions or creams may adversely affect the integrity of latex gloves.<sup>19</sup>

Although barrier creams have been marketed for the prevention of contact dermatitis, the WHO and the Ontario Agency for Health Protection and Promotion advise against these products as they often form a protective layer that is not removed by standard hand cleansing.<sup>10, 18</sup>

In summary, the use of ABHR versus soap and water, the use of ABHR containing emollients, and the application of hand lotions/creams and moisturising agents all have significant impact in maintaining skin integrity as noted from the evidence.

## **Are there any legislative requirements relating to skin care to prevent or minimise contact dermatitis associated with hand hygiene?**

Two UK Government legislations are included; the Control of Substances Hazardous to Health (COSHH) Regulations 2002 (UK Statutory Instruments 2002, No. 2677) and the Reporting of Injuries, Diseases and Dangerous Occurrences Regulations (RIDDOR) 2013 (UK Statutory Instrument 2013, No. 1471).<sup>34, 35</sup> Both are mandatory legislations.

The COSHH regulations, 2002, requires employers to prevent or, where that is not reasonably practicable, adequately control exposure to materials in the workplace (including health and care settings) that may cause ill health for example dermatitis.<sup>34</sup>

The RIDDOR 2013 regulations require that where, in relation to a person at work, the responsible person receives a diagnosis of occupational dermatitis, and the person's work involves significant or regular exposure to a known skin sensitiser or irritant, the responsible person must follow the reporting procedure, subject to regulations 14 and 15.<sup>35</sup> This involves employers keeping records of and reporting any work-related



diseases and dangerous occurrences to the Health and Safety Executive. These should be reported as soon as a registered medical practitioner notifies the employer in writing.

## When should moisturising agents be used to maintain skin integrity?

The evidence identified in relation to this question included nine publications from the UK and the US.<sup>7, 8, 10, 18, 19, 27, 28, 31, 33</sup> Two publications were identified in this current update<sup>7, 27</sup> while seven were included from the previous update (version 4.0).<sup>8, 10, 18, 19, 28, 31, 33</sup> There was only one primary study included which was a RCT graded as SIGN50 level 1+<sup>31</sup>, three AGREE 'recommend' guidance documents published by the WHO, the British Association of Dermatologists and epic3<sup>7, 18, 28</sup> and five expert opinion guidance graded SIGN50 level 4.<sup>8, 10, 19, 27, 33</sup>

The positive impact of applying hand emollients after handwashing was evidenced in a RCT conducted among 132 volunteers with no active skin condition at Leeds General Infirmary.<sup>31</sup> Findings showed statistically significant worsening of the clinical condition of the skin as measured by the Hand Eczema Severity Index (HECSI) from baseline to day 14 (-5.5, P = 0.003) in those subjects repeatedly washing their hands with an antiseptic soap and water without subsequent application of moisturiser but no change noted in the groups using moisturiser.

There is consensus in the published literature that to maintain skin integrity, emollient hand creams should be used regularly, for example after hand washing, every three to four hours, and after finishing work. The WHO and the American Contact Dermatitis Society (ACDS) recommend the use of moisturiser after hand washing,<sup>18, 27</sup> with the ACDS adding that application of a moisturiser should be every three to four hours.<sup>27</sup> Further, the British Association of Dermatologists, Dermatitis Guideline Development Group UK, UK Health and Safety Executive (HSE), Ontario Agency for Health Protection and Promotion, SHEA/APIC/IDSA Hand Hygiene Guidelines and the epic3 guidelines recommend that staff should be encouraged to use an emollient hand cream or hand lotions regularly (although frequency is not defined).<sup>7, 8, 10, 33</sup> The HSE add that emollient creams are also recommended to be applied after finishing work.

## How should moisturising agents be used to maintain skin integrity?

There is a lack of high-quality evidence regarding the application technique for emollients. No primary studies were identified in relation to this question. Five guidance documents were identified, all graded SIGN50 level 4 due to their methodology.<sup>10, 24, 27, 36, 37</sup> These documents 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 hand.

The best practice statement from Wounds UK states that before use of emollients, staff should be trained in the application of emollients.<sup>36</sup> The UK HSE recommends that before applying any emollient cream, hands should be thoroughly rinsed to remove any residual soap/cleanser.<sup>37</sup> This should be followed by thoroughly drying hands.<sup>37</sup> The ACDS further add that, to effectively use moisturising agents after hand washing and non-frictional (pat) drying, HCWs should apply a minimum amount of 2 fingertips of moisturiser to each hand and evenly spread a thin layer across the hand, between fingers, on cuticles, and on fingertips and wait 1 to 3 minutes before resuming activity.<sup>27</sup> The emollient should follow the direction of the body hair, and be gently smoothed into the skin.<sup>36</sup>

The Ontario Agency for Health Protection and Promotion and SHEA recommend that in order to prevent contamination, emollient hand lotions/moisturisers should be provided by the facility in dispensers or pumps that are not topped up or refilled.<sup>10, 24</sup> This recommendation was based on results from a controlled laboratory study that found that bacteria on the hands increased after washing with soap from contaminated bulk-soap refillable dispensers.<sup>38</sup>

### 3.2 Implications for research

Conducting additional research on interventions aimed at minimising irritant contact dermatitis among HCWs workers would enhance the existing evidence base, thereby enabling the development of more robust recommendations for practice.

Research is required to establish the effect of moisturisers or emollients on the efficacy of ABHR as well as research to determine the association between dermatitis and infection transmission.

Whilst there is known expert opinion consensus that the risk of contamination may increase when reusable tubs/dispensers are used, primary research investigating the establishment of re-usable dispensers or pumps for emollients, as well as the reprocessing of dispensers, is currently not well established. The review did not identify evidence regarding the use of barrier (pre-work) creams; therefore, research is required to determine whether benefits do exist from their use and what harms may result. More information on this may provide guidance for future recommendations.

## 4. Recommendations

This review makes the following recommendations based on an assessment of the extant scientific literature on hand hygiene skin care in the health and care setting.

### **What is skin integrity and why is it important to maintain in relation to hand hygiene?**

Note: Recommendations are not applicable to this objective. The below statements are summaries of the evidence.

Skin integrity refers to skin being intact, and in an unimpaired condition.

#### **(No recommendation)**

Skin integrity should be maintained to reduce the risk of irritant dermatitis and to support compliance with hand hygiene.

#### **(Category C recommendation)**

### **What is contact dermatitis and what are the associated signs and symptoms of this skin condition?**

Note: Recommendations are not applicable to this objective. The below statements are summaries of the evidence.

Contact dermatitis is the inflammation of the skin (epidermis and adjacent dermis) resulting from direct contact of a substance that could either be an irritant (irritant contact dermatitis) or allergen (allergic contact dermatitis) with the surface of the skin.

The common signs and symptoms of contact dermatitis are dryness, redness, fissures (splits/cracks/tear), itchiness/irritation that may appear as first signs and usually followed by flaking/scaling, blistering, crusting, cracking, swelling and pain.

### **What factors related to hand hygiene increase the likelihood of developing contact dermatitis?**

The use of hot water for hand hygiene should be avoided.

**(Category B recommendation)**

Where appropriate, consider utilising alternatives to handwashing, such as ABHR, to reduce the frequency of washing with soap and water.

**(Category B recommendation)**

### **What is an emollient?**

Note: Recommendations are not applicable to this objective. The below statement is a summary of the evidence relating to this objective.

An emollient is a product used to moisturise the skin; it works by covering the skin with a protective film which traps in moisture.

### **Which hand hygiene products should be used to maintain skin integrity?**

Where appropriate, ABHRs should be used in line with [the indication and techniques for Hand Hygiene literature review](#).

**(Category B recommendation)**

ABHRs used for hand hygiene should contain emollients in their formulation.

**(Category B recommendation)**

Emollient hand creams/lotions and/or moisturising agents 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 C recommendation)**

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

**(Category C recommendation)**

### **Are there any legislative requirements relating to skin care to prevent or minimise contact dermatitis associated with hand hygiene?**

As per the COSHH regulations, 2002, employers are required to prevent or, where that is not reasonably practicable, adequately control exposure to materials in health and care settings that cause contact dermatitis.

**(Mandatory)**

As per RIDDOR regulations 2013, employers should keep a record of and report any work-related diseases such as contact dermatitis to the HSE as soon as a diagnosis is made by a registered medical practitioner.

**(Mandatory)**

### **When should moisturising agents be used to maintain skin integrity?**

Emollient hand creams (moisturisers) should be used at regular intervals (for example when off duty, going for breaks).

**(Category B recommendation)**

### **How should moisturising agents be used to maintain skin integrity?**

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

**(Category C recommendation)**

Refillable emollient dispensers or refillable pumps should not be used.

**(Category C recommendation)**

Communal tubs of hand cream should not be used.

**(Category C recommendation)**

## Appendices

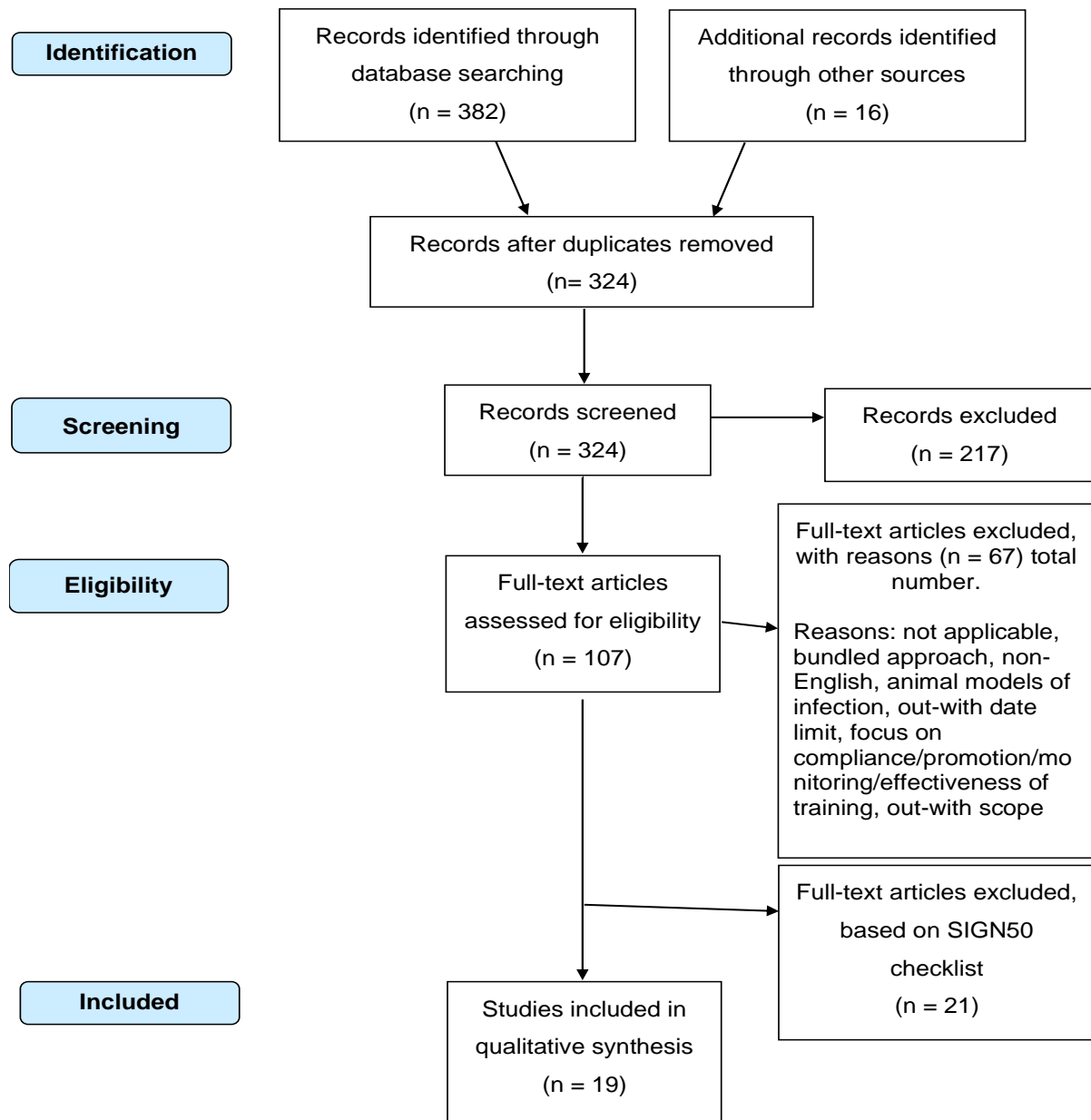
### Appendix 1: Grades of recommendation

Grade	Descriptor	Levels of evidence
<b>Mandatory</b>	'Recommendations' that are directives from government policy, regulations or legislation	N/A
<b>Category A</b>	Based on high to moderate quality evidence	SIGN level 1++, 1+, 2++, 2+, AGREE strongly recommend
<b>Category B</b>	Based on low to moderate quality of evidence which suggest net clinical benefits over harm	SIGN level 2+, 3, 4, AGREE recommend
<b>Category C</b>	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
<b>No recommendation</b>	Insufficient evidence to recommend one way or another	N/A



## Appendix 2: PRISMA Flow Diagram

PRISMA Flow Diagram of the evidence identified during the three-year update between June 2020 and August 2022. For more details on the search strategy, see [National Infection Prevention and Control Manual: Development Process](#).



## Appendix 3: Search Strategy

### EMBASE and MEDLINE search 2019 to current

1. exp Hand Disinfection
2. exp Hand Hygiene
3. handwash\$.mp.
4. (hand\$ adj2 wash\$).mp.
5. hand disinfect\$.mp.
6. hand hygiene.mp.
7. hand clean\$.mp.
8. hand saniti\$.mp.
9. 1 or 2 or 3 or 4 or 5 or 6 or 7 or 8
10. exp Dermatitis, Contact
11. exp Dermatitis, Atopic/
12. dermatit\$.ti,ab,kw.
13. exp Eczema/
14. eczema.ti,ab,kw.
15. Hand Dermatoses
16. exp Skin/
17. exp Skin Care/
18. 10 or 11 or 12 or 13 or 14 or 15 or 16 or 17
19. soap\$.mp. 8424
20. Anti-Infective Agents, Local/
21. alcohol based hand rub\$.mp.
22. alcohol based hand?rub\$.mp.

23. ABHR.mp.
24. exp Emollients/
25. emollient\$.mp.
26. exp Dermatological Agent/
27. skin protect\$.mp.
28. 19 or 20 or 21 or 22 or 23 or 24 or 25 or 26 or 27
29. 9 and 18 and 28
30. exp "Surveys and Questionnaires"/
31. (health adj2 surveillance).ti,ab.
32. screen\$.ti,ab,kw.
33. questionnaire\$.ti,ab,kw.
34. exp Skin Tests/ or (skin adj2 examination\$).mp. or (skin adj2 surveillance).mp.
35. surveillance.ti,ab,kw.
36. Biological Monitoring/ or monitor\$.ti,ab,kw.
37. 30 or 31 or 32 or 33 or 34 or 35 or 36
38. 9 and 18 and 37
39. 29 or 38
40. limit 39 to english language

**CINAHL search 2019- current**

S34 S24 OR S33

S33 S8 AND S15 AND S32

S25 OR S26 OR S27 OR S28 OR S29 OR S30 OR

S32 S31

S31 monitor\*

S30 skin examination\*

S29 (MH "Skin Tests+")

S28 (MH "Questionnaires+")

S27 screen\*

S26 health N2 surveillance

S25 (MH "Surveys+")

S24 S8 AND S15 AND S23

S23 S16 OR S17 OR S18 OR S19 OR S20 OR S21 OR S22

S22 skin protect\*

S21 (MH "Dermatologic Agents+")

S20 emollient\*

S19 ABHR

S18 alcohol based hand rub

S17 (MH "Antiinfective Agents, Local+")

S16 soap\*

S15 S9 OR S10 OR S11 OR S12 OR S13 OR S14

S14 (MH "Skin Care+")

S13 (MH "Skin+")

S12 eczema

S11 hand dermat\*

S10 (dermat\*) N2 (irritant\*)

S9 (MH "Dermatitis+") OR (MH "Dermatitis, Contact+")

- S8 S1 OR S2 OR S3 OR S4 OR S5 OR S6 OR S7
- S7 hand\* N2 wash\*
- S6 hand disinfect\*
- S5 hand saniti\*
- S4 hand clean\*
- S3 hand wash\*
- S2 hand hygiene
- S1 (MH "Handwashing+")

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