

Infection control 6: hand hygiene using soap and water

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Abstract Hand hygiene is one of the most effective methods of preventing healthcare-associated infections. However, prevention depends on hand hygiene being performed when necessary, and the appropriate cleansing agent and technique being used. This article, the final part in a six-part series, briefly explains the importance of hand hygiene, when it should be performed and which cleansing agent to use; it also outlines the procedure for decontaminating the hands using soap and water and how to protect skin integrity.

Citation Wigglesworth N (2019) Infection control 6: hand hygiene using soap and water. *Nursing Times* [online]; 115: 11, 37-38.

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This article is funded by an unrestricted educational grant from Medipal

Box 1. Reducing risk of work-related dermatitis

- Where possible use machinery and tools rather than hands (for example equipment cleaning machines)
- During handwashing, thoroughly rinse off residual soap/cleanser
- Ensure your hands are thoroughly dry before continuing work
- Use emollient creams, especially after finishing work. Ensure all parts of the hand are covered
- Check your skin for early signs of skin problems and report concerns to occupational health

Source: Health and Safety Executive (Bit.ly/HSEdermatitis)

Healthcare-associated infections (HCAIs) are a serious risk to patients, staff and visitors and are costly to the NHS. Hand hygiene is the primary measure in preventing HCAIs and is the cornerstone of good infection prevention and control (IPC) practice (World Health Organization, 2009).

Hand decontamination can be achieved using alcohol-based handrub (ABHR) or liquid soap and water. Staff should receive regular training on how to undertake the correct hand hygiene technique. This article, the last in a six-part series on infection prevention and control, discusses the procedure for washing the hands with soap and water and how to protect skin integrity.

When to perform hand hygiene

The WHO (2009) advises that health professionals' hands should be decontaminated at five critical points known as My Five Moments for Hand Hygiene:

- Before touching a patient;
- Before clean/aseptic procedure;
- After body fluid exposure/risk;
- After touching a patient;
- After touching patient surroundings.

Hand hygiene resources and health professionals' compliance with hand hygiene guidelines should be audited at regular intervals and the results should be fed back to health professionals to improve and sustain levels of compliance (Loveday et al, 2014).

Which cleansing agent to use

The correct method of hand decontamination depends on a number of factors:

- The nature of the care intervention being provided;
- The availability of resources at or near the point of care;
- What is practically possible;
- The acceptability of preparations or materials in terms of ease of use and access, as well as dermatological effects (Loveday et al, 2014).

While either effective handwashing or effective use of ABHR will remove transient microorganisms to make the hands socially clean, ABHR will also substantially reduce resident microorganisms. It is, therefore, recommended for routine use

due to its increased efficacy, easy availability at the point of care and general acceptability to health professionals (Loveday et al, 2014).

However, while ABHR reduces some resident microorganisms, it is not effective against all organisms (for example, some viruses including norovirus and spore-forming microorganisms such as *Clostridium difficile*). In addition, it will not remove dirt and organic material and may not be effective in some outbreak situations. In such situations, handwashing with liquid soap and water is required.

Loveday et al (2014) recommend that ABHR is used to decontaminate hands before and after direct patient contact and clinical care except in the following situations, when soap and water must be used:

- When hands are visibly soiled or may be contaminated with body fluids;
- When caring for patients with vomiting or diarrhoeal illness, regardless of whether or not gloves have been worn.

Skin care

Frequent hand hygiene can dry out the skin and lead to contact dermatitis, so it is important to protect the skin by adhering to recommended practice. Symptoms include redness, scaling/flaking, blistering, weeping, cracking, swelling, itching and pain. Expert opinion suggests that skin damage is generally associated with detergents contained in hand hygiene preparations and/or poor handwashing/drying technique, although the frequent use of some hand hygiene agents may damage the skin and alter normal hand flora. In addition, washing hands regularly with liquid soap and water before or after using ABHR is associated with dermatitis and is unnecessary (Loveday et al, 2014). Allergic contact dermatitis is a less common condition is caused by a reaction to ingredients in hand hygiene products, such as fragrances and preservatives (Health Protection Scotland, 2016).

The irritant and drying effects of liquid soap and antiseptic soap preparations have been identified as one reason why health professionals fail to practise good hand hygiene. Sore hands are also associated with

Fig 1. Rub hands palm to palm

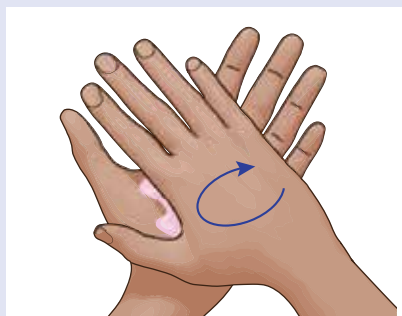


Fig 2. Rub back of each hand with palm of the other

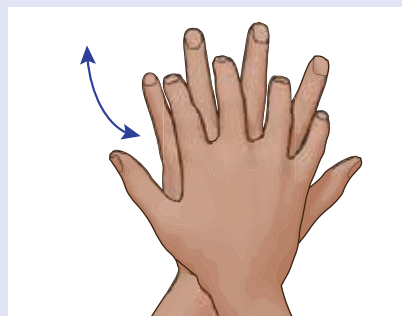


Fig 3. Rub hands with fingers interlaced

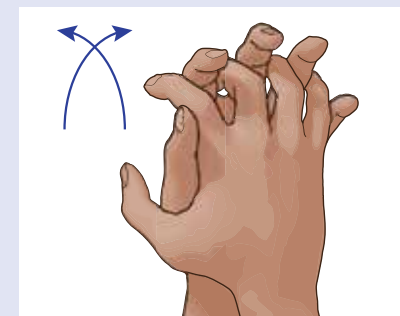


Fig 4. Rub with back of fingers to opposing palms

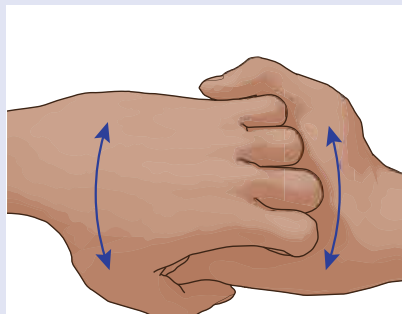


Fig 5. Rub each wrist with opposite hand

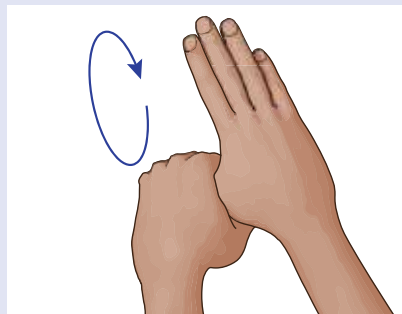
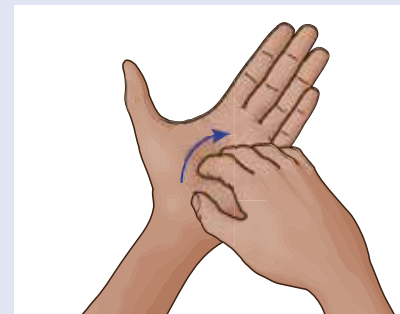


Fig 6. Rub tips of fingers in opposite palm



increased colonisation by potentially pathogenic microorganisms and increase the risk of transmission (Loveday et al, 2014).

A range of studies comparing the use of ABHR with liquid soap and water found that ABHR was associated with less skin irritation (Loveday et al, 2014), while a seven-year longitudinal study of the introduction and use of ABHR found no reports of irritant and contact dermatitis associated with its use. ABHR should therefore be used for hand hygiene instead of liquid soap and water when:

- Hands are not visibly soiled or dirty;
- Diarrhoeal disease is not suspected or proven.

Health Protection Scotland (2016) recommends staff be supplied with ABHR containing emollients, and that hands should not be washed immediately after using ABHR, as this may remove any emollients present in the hand rub and the superficial skin sebum.

Box 1 (page 37) lists steps to reduce the risks of dermatitis; if dermatitis is suspected advice should be sought from occupational health, particularly if it is thought to be associated with a skin product.

Staff should also have access to emollient hand creams, which should be applied before a shift, during breaks and after a shift. Emollients should be applied all over the hands, including between the

fingers and the back of the hand. Communal tubs should not be used, although communal pump dispensers are acceptable. It is also important to ensure emollients do not impair the efficacy of gloves; oil-based products can damage gloves and so should be avoided (HPS, 2016).

The procedure

In healthcare environments staff must:

- Ensure fingernails are always clean and short and artificial nails or nail products are not worn;
- Expose forearms (bare below the elbows);
- Remove all hand/wrist jewellery (staff members should be bare below the elbows at all times when working so should not be wearing any jewellery other than a single, plain metal ring, which should be removed or moved up the finger to wash underneath it, then moved back during hand hygiene if required by local policy);
- Cover any cuts or abrasions with a waterproof dressing.

The procedure to decontaminate hands using soap and water procedure involves three stages – preparation, washing and rinsing, and drying and should take 40-60 seconds (Loveday, 2014; WHO, 2009).

1. Wet hands under tepid running water.

2. Apply enough soap to cover all surfaces.

3. Rub hands palm to palm (Fig 1).

4. Rub back of each hand with palm of other hand with fingers interlaced (Fig 2).

5. Rub hands with fingers interlaced (Fig 3).

6. Rub with back of fingers to opposing palms with fingers interlocked (Fig 4).

7. Rub each thumb clasped in opposite hand using a rotational movement (Fig 5).

8. Rub tips of fingers in opposite palm in a circular motion (Fig 6).

9. Rub each wrist with opposite hand.

10. Rinse hands thoroughly with tepid running water.

11. Use elbow to turn off tap.

12. Dry thoroughly with single-use towel.

References

- Health Protection Scotland (2016) *Standard Infection Control Precautions Literature Review. Hand Hygiene: Skin Care*. [Bit.ly/HPSHandHygiene](http://bit.ly/HPSHandHygiene)
- Loveday HP et al (2014) epic3: National evidence-based guidelines for preventing healthcare-associated infections in NHS Hospitals in England. *Journal of Hospital Infection*; 86, S1, 1-70.
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