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Introduction

Healthcare-associated infections (HCAIs) are infections that are associated with interventions, devices or procedures carried out in healthcare facilities.

Epidemiological evidence indicates that hand-mediated transmission is a major contributing factor in the acquisition and spread of infection. The transfer of organisms between humans can occur directly via hands, or indirectly via an environmental source (e.g. wash basin) (Loveday et al 2013).

The association between hand decontamination, using liquid soap and water and waterless alcohol-base hand rub, and reductions in infection have been confirmed by clinically-based nonrandomised trials and observational studies (Loveday et al 2013).

The hands are colonised by two categories of microbial flora. The resident flora are found on the surface, just below the uppermost layer of skin which is generally of low pathogenicity.

The transient flora are made up of microorganisms acquired by touching contaminated surfaces such as the environment, patients or other people, and are readily transferred to the next person or object touched. They may include a range of antimicrobial-resistant pathogens such as MRSA, *Acinetobacter* or other multi resistant Gram-negative bacteria. If transferred into susceptible sites such as invasive devices or wounds, these microorganisms can cause life-threatening infections. Transmission to non-vulnerable sites may leave a patient colonised with pathogenic and antibiotic-resistant organisms, which may result in a HCAI at some point in the future.

Background

All staff have a responsibility to comply with Badger's infection prevention and control policies and procedures and to remind and challenge colleagues of their infection control responsibilities if there is a potential or actual breach of a policy.

When should hands be decontaminated?

Decontamination refers to a process for the physical removal of dirt, blood and body fluids, and the removal or destruction of microorganisms from the hands. Hands must be decontaminated at critical points before, during and after patient care activity to prevent cross transmission of microorganisms.

Hands must be decontaminated:

- immediately before each episode of direct patient contact or care, including clean/aseptic procedures;
- immediately after each episode of direct patient contact or care;
- immediately after contact with body fluids, mucous membranes and non-intact skin;
- immediately after other activities or contact with objects and equipment in the immediate patient environment that may result in the hands becoming contaminated;
- immediately after the removal of gloves.

Liquid soap and water or Alcohol-based hand rub

Choosing the method of hand decontamination will depend upon the assessment of what is appropriate for the episode of care, the availability of resources at or near the point of care and what is practically possible.

In general, effective hand washing with liquid soap and water or the effective use of alcohol-based hand rub will remove transient microorganisms and render the hands socially clean.

The effective use of alcohol-based hand rub will also substantially reduce resident microorganisms. This level of decontamination is sufficient for general social contact and most clinical care activities.

Alcohol-based hand rub is not effective against all microorganisms (e.g. some viruses such as Norovirus and spore-forming microorganisms such as *C. difficile*). It will not remove dirt and organic material, and may not be effective in some outbreak situations.

Routine hand washing using liquid soap and water

Routine hand washing removes soil, dirt and transient organisms from soiled hands. Liquid soap is supplied in wall mounted dispensers in all clinical settings. Bar soap **must not** be used by healthcare staff in clinical settings.

Effective hand washing technique involves three stages: preparation, washing and rinsing, and drying.

- **Preparation:** wet hands under tepid running water before applying the liquid soap or an antimicrobial preparation.
- **Washing:** the hand wash solution must come into contact with all of the surfaces of the hand. The hands should be rubbed together vigorously for a minimum of 10–15 seconds, paying particular attention to the tips of the fingers, the thumbs and the areas between the fingers. Hands should be rinsed thoroughly.
- **Drying:** use good-quality paper towels to dry the hands thoroughly. A number of laboratory-based studies that investigated methods of hand drying suggested that there is no significant difference in the efficacy of different methods of drying hands,

but that good-quality paper towels dry hands efficiently and remove bacteria effectively. Current guidance on infection control in the built environment suggests that air and jet driers are not appropriate for use in clinical areas. (Loveday et al 2013)

The following activities are examples of when hands must be washed using detergent and water.

- Whenever hands are visibly dirty.
- After removal of gloves.
- Following any inadvertent contact with blood or body fluids.
- After any microbial contamination (e.g. wound examination, wound dressing, sputum aspiration, etc.).
- After visiting the toilet.
- Before handling or eating food.
- After dealing with patients symptomatic with diarrhoea and vomiting e.g. *Norovirus* or *Clostridium Difficile*.

Please see 'Appendix 1' (page 6).

Alcohol-based hand rub

Alcohol-based hand rub products are highly effective at reducing hand carriage, whilst overcoming some of the recognised barriers to hand washing; most importantly, the ease of use at the point of patient care.

Use an alcohol-based hand rub for decontamination of hands before and after direct patient contact and clinical care; do not use alcohol-based hand rub in the following situations when soap and water must be used:

- when hands are visibly soiled
- potentially contaminated with body fluids
- when caring for patients with vomiting or diarrhoeal illness, regardless of whether or not gloves have been worn.
- Alcohol-based hand rub is not effective against all microorganisms (e.g. *C. difficile*).

Alcohol-based hand rub solution must come into contact with all surfaces of the hand; hands should be rubbed together vigorously, paying particular attention to the tips of the fingers, the thumbs and the areas between the fingers, until the solution has evaporated and the hands are dry. The duration of the entire procedure should take 20-30 seconds.

Bare below the elbows

Hands and wrists need to be fully exposed to the hand hygiene product and therefore should be free from jewellery and long-sleeved clothing.

Department of Health guidance on uniforms and work wear and NICE guidelines indicate that healthcare workers should remove rings and wrist jewellery, and wear short-sleeved clothing whilst delivering direct patient care.

In summary staff should ensure that their hands can be decontaminated effectively by:

- removing all wrist and hand jewellery
- wearing short-sleeved clothing when delivering patient care
- making sure that fingernails are short, clean, and free from false nails and nail polish
- covering cuts and abrasions with waterproof dressings

Hand care advice

It is thought that skin damage is generally associated with the detergent base of the preparation and/or poor hand washing technique. In addition, the frequent use of some hand hygiene agents may cause damage to the skin and alter normal hand flora. The irritant and drying effects of liquid soap and antiseptic soap preparations have been identified as one of the reasons why healthcare practitioners fail to adhere to hand hygiene guidelines.

Evidence shows that alcohol-based hand rub is associated with less skin irritation than liquid soap and water. In addition, washing hands regularly with liquid soap and water before or after the use of alcohol-based hand rub is associated with dermatitis and is not necessary.

Sore hands are also associated with increased colonisation by potentially pathogenic microorganisms and increase the risk of transmission.

Because hand decontamination products have potentially damaging effects, staff are encouraged to use an emollient hand cream regularly to maintain the integrity of the skin.

References

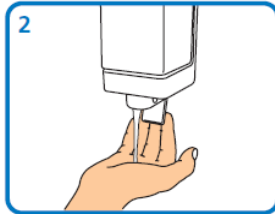
H.P. Loveday, J.A. Wilsona, R.J. Pratta, M. Golsorkhia, A. Tinglea, A. Baka, J. Brownea, J. Prietob, M. Wilcox (2013) epic3: National Evidence-Based Guidelines for Preventing Healthcare-Associated Infections in NHS Hospitals in England. *Journal of Hospital Infection* 86S1 (2014) S1–S70 available at http://www.his.org.uk/files/3113/8693/4808/epic3_National_Evidence-Based_Guidelines_for_Preventing_HCAI_in_NHSE.pdf

Appendix 1

Hand-washing technique with soap and water



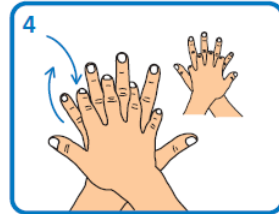
Wet hands with water



Apply enough soap to cover all hand surfaces



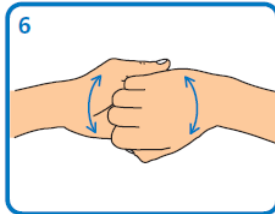
Rub hands palm to palm



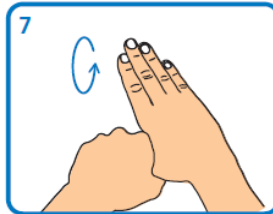
Rub back of each hand with palm of other hand with fingers interlaced



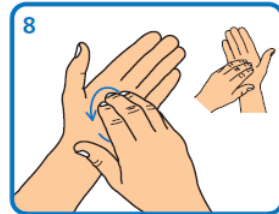
Rub palm to palm with fingers interlaced



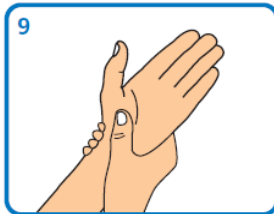
Rub with back of fingers to opposing palms with fingers interlocked



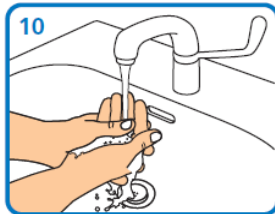
Rub each thumb clasped in opposite hand using a rotational movement



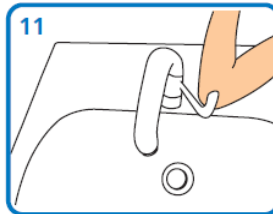
Rub tips of fingers in opposite palm in a circular motion



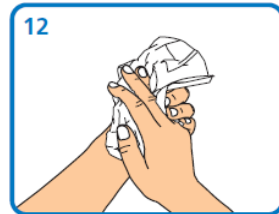
Rub each wrist with opposite hand



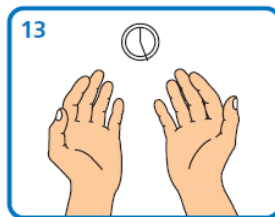
Rinse hands with water



Use elbow to turn off tap



Dry thoroughly with a single-use towel



Hand washing should take 15–30 seconds

