

Fact Sheet

Alcohol-Based Hand Rub

Evidence suggests that alcohol-based hand rubs (ABHRs) eliminate micro-organisms from the hands more effectively and cause less irritation than soap and water hand washing.¹ There are now a variety of products on the market, and the following information is intended as a guide to determine the most appropriate formulation for use by clinicians and visitors in health care settings.

Product selection

Clinical Use

Routine hand hygiene products are required to meet the following criteria:

- > contains alcohol concentration in the range 60 – 80% (v/v)
- > complies with EN1500 testing standard for bactericidal effect
- > registered with the Therapeutic Goods Administration as a medicine
- > contains an emollient to minimise the risk of contact dermatitis.

Alcohol-based **surgical hand scrub solutions** are not commonly used in Australia at this time; however they have been widely used in Europe for some time.² Products are required to meet the criteria listed above and must also comply with recognised testing standards for surgical scrubs, for example EN 12791 or the US Food and Drug Administration.

Clinicians with skin problems

In some circumstances an alternative non-alcohol hand hygiene product may be required if a health care worker has either irritant or allergic contact dermatitis. Products containing quaternary ammonium compounds or triclosan are generally well tolerated and can be used as a *temporary strategy* if other avenues have failed to improve skin damage.

Non-clinical Use

SA Health recommends that products are made available for visitors and patients (where appropriate and safe to do so) to use, particularly during the flu season or during outbreaks of gastroenteritis. If facilities provide an ABHR product for non-clinical use then this is not required to be TGA registered. However the use of soap and water in general public areas such as toilets is still recommended.

Liquid *versus* gel *versus* foam formulations

Laboratory studies have found that ABHR **liquid** preparations are generally more effective than **gels** that contain the equivalent concentration of alcohol. Liquid alcohol preparations have been shown to reduce bacterial counts on the hands to a significantly greater extent than tested alcohol-based gels.^{1,2} This is due to the difficulty in manufacturing a product with >70% alcohol whilst maintaining viscosity.

ABHR **foam** products are also available. Although there have been *in vitro* studies indicating efficacy, the literature is somewhat inconclusive on whether these formulations are equivalent to liquid preparations for routine use.³ The main question about foams has been whether there is sufficient product dispensed to allow complete coverage of the hands and remain wet for the recommended amount of time.^{4,5} However, some newer formulations have addressed this problem.

In practice, the percentage of alcohol and the contact time for disinfection (30 seconds) are of more importance than the delivery method.



Indications for use

Preparations containing ethyl alcohol (ethanol) or isopropyl alcohol (isopropanol) are suitable for use in most health care settings. In high risk areas such as intensive care or haematology/oncology, isopropanol + chlorhexidine 0.5%, may be the product of choice, since chlorhexidine provides a residual antibacterial effect.

Safe ABHR product placement recommendations are available via the Hand Hygiene Australia website. <https://hha.org.au/hand-hygiene/alcohol-based-handrubs/product-placement>.

Activity of alcohols

Alcohol solutions in the concentration range of 60 – 80% (v/v) give optimum antimicrobial activity. Isopropanol and ethanol both have *in-vitro* activity against bacteria, fungi and some viruses. However when tested at the same concentration, isopropanol is more effective than ethanol; e.g. ABHR containing **60% isopropanol** is associated with similar cutaneous bactericidal activity as ABHR that contains **77% ethanol**. However ethanol has greater activity against some viruses than isopropanol.

Of note, although **n-propanol** is used as the reference alcohol for bactericidal testing and is used in some hand sanitisers in Europe, it is not included in the list of approved active agents for hand antisepsis in the USA, and it is not currently used in products commonly used in SA Health hospitals, due to some concerns with safety.

The alcohol content of solutions may be expressed as a percentage by weight (**w/w**) which is not effected by temperature or other variables during preparation or as a percentage by volume (**v/v**) which may be effected by these factors. This should be taken into account when comparing the alcohol content of different products. For example, ethanol at 60% (w/w) is equivalent to 67.7% (v/v) at 20°C, and ethanol at 70% (w/w) is equivalent to 76.9% (v/v).

Staff acceptance

It is important that all products be acceptable to users so that staff compliance with hand hygiene is not compromised. If a gel or foam is more acceptable to staff and therefore more frequently used, the overall outcome is still expected to be better, even though a liquid formulation is theoretically more effective.

SA Health Procurement and Supply Chain Management Unit should be contacted prior to trialling or purchasing any new hand hygiene products.

References

1. World Alliance for Patient Safety. (2009). WHO Guidelines on Hand Hygiene in Health Care. . World Health Organization, Geneva.
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3. Larson, E. L., Cohen, B. and Baxter, K. A. (2012). Analysis of alcohol-based hand sanitizer delivery systems: efficacy of foam, gel, and wipes against influenza A (H1N1) virus on hands. *Am J Infect Control* 40, 9: 806-9.
4. Kampf, G., Marschall, S., Eggerstedt, S., et al. (2010). Efficacy of ethanol-based hand foams using clinically relevant amounts: a cross-over controlled study among healthy volunteers. *BMC Infect Dis* 10: 78.
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6. Hand Hygiene Australia Product Placement (accessed online 16.04.19)

For more information

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