

Handwashing in Healthcare Settings

Indications for Hand Hygiene in Healthcare Facilities

Both the Centers for Disease Control and Prevention (CDC) and the World Health Organization (WHO) recommend using soap and water when hands are visibly soiled with dirt, blood or other body fluids.

Both also recommend alcohol-based hand rub (ABHR) for routine decontamination if hands are not visibly soiled. Although soap and water can be used as an alternative, alcohol-based hand rub is the preferred method of decontamination in these clinical situations:

- Before and after touching any patient
- Before starting any invasive procedure
- After removing gloves
- After contact with body fluids, excretions, mucous membranes, non-intact skin and wound dressing as long as hands are not visibly soiled
- After contact with objects in the immediate vicinity of the patient
- If moving from a contaminated-body site to a clean-body site during care of the same patient

Both the CDC and the WHO recommend washing hands with soap and water if exposure to spores is suspected or proven, with the WHO using *Clostridium difficile* as an example. The CDC guideline includes "before eating" and "after using a restroom" as specific indications for soap and water hand cleansing.

The WHO utilizes a pictorial educational guide "Your 5 Moments for HAND HYGIENE" to help healthcare workers perform hand hygiene indications according to their workflow.

1. Before patient contact
2. Before aseptic task
3. After body fluid exposure
4. After patient contact
5. After contact with patient surroundings

Alcohol-Based Hand Rub or Alcohol-Based Sanitizer for Hand Antisepsis

When applied to hands, waterless alcohol-based hand rubs (liquids, gels or foams) inactivate microorganisms and/or temporarily suppress their growth by breaking down the cell wall or outer protein coat of microorganisms.

Thus alcohol-based hand rubs are classified as hand antiseptics. The drying effect of alcohol can be reduced or eliminated by adding moisturizers and ingredients called humectants which attract moisture from the atmosphere, slow evaporation and help hold water in the skin.

Effectiveness of Alcohol-Based Hand Rubs or Sanitizers

A review of publications between 1992 and 2002 on the effectiveness of alcohol-based hand rubs showed that they remove organisms more effectively, require less time, and irritate skin less often than handwashing with soap or antimicrobial soap and water. In studies examining Multi-Drug Resistant Organisms (MDROs), alcohol-based products reduced the number of MDROs recovered from the hands of healthcare workers more effectively than did handwashing with soap and water.

Above text references

2009 WHO Guidelines on Hand Hygiene in Health Care, p. 32. http://whqlibdoc.who.int/publications/2009/9789241597906_eng.pdf

Ibid. 1 p. 33.

2002 CDC Guideline for Hand Hygiene in Health-Care Settings, p. 11. <http://www.cdc.gov/mmwr/PDF/rr/rr5116.pdf>

Proper Alcohol-Based Hand Rub or Sanitizer Technique

When using alcohol-based hand rub, it's important to follow the manufacturer's recommendation regarding the amount of product. According to the WHO, the entire procedure for applying alcohol-based hand rub should last only 20-30 seconds. To use:

1. Apply product to palm of one hand
2. Rub hands together, covering all surfaces of hands and fingers
3. Rub hands until dry

Mandatory Use of Alcohol-Based Hand Rub or Sanitizer

According to the Joint Commission, accredited organizations are required to provide healthcare workers with a readily accessible alcohol-based hand product. However, use of such a product by any individual healthcare worker is not required. If a healthcare worker chooses not to use the alcohol-based hand product, then soap and water should be used.

The CDC makes this Category IA recommendation regarding alcohol-based hand rub:

"To improve hand hygiene adherence among personnel who work in areas in which high workloads and high intensity of patient care are anticipated, make an alcohol-based handrub available at the entrance to the patient's room or at the bedside, in other convenient locations, and in individual pocket-sized containers to be carried by healthcare workers.²"

¹http://www.jointcommission.org/standards_information/jcfaqdetails.aspx?StandardsFAQId=188&StandardsFAQChapterId=11 (Updated June 08, 2010)

²2002 CDC Guideline for Hand Hygiene in Health-Care Settings, p. 34.

<http://www.cdc.gov/mmwr/PDF/rr/rr5116.pdf>

Fire Safety and Alcohol-Based Hand Rubs or Sanitizers

The risk of fires associated with alcohol-based hand rubs is very low. In a published survey of 766 U.S. healthcare facilities with an estimated 1,430 hospital-years of alcohol-based hand rub, not a single fire was attributed to an alcohol-based hand rub dispenser.¹ Nonetheless, alcohol is flammable and it remains crucial that alcohol-based hand rub be stored away from high temperatures and that healthcare workers using alcohol-based hand rubs be educated to rub hands together until all the alcohol has evaporated.

When it comes to enforcement of fire codes, the authority at the most local levels typically takes precedent. So, while it is a good practice to utilize national and state regulations to help guide your decisions, ultimately, the local fire authority has the final say. When making decisions about placing ABHRs in a hospital facility it is important to involve team members and key decision makers at the healthcare facility with knowledge and responsibility for safety.

Alcohol Based Hand Sanitizers in Aerosol Dispensers

The NFPA and IFC allow aerosol containers however the maximum capacity of the aerosol dispenser must be 18 oz and be limited to Level 1 aerosols.

Fire Code Guidelines as it relates to Touch Free Dispensers

When ABHRs were first recognized by fire codes, the technology for touch free dispensers didn't exist and all dispensers were essentially manual. Since that time, it has become more common for hand hygiene product dispensers to be touch free.

Proposals to the NFPA Life Safety Code and the NFPA Uniform Fire Code addressing the requirements that touch free dispensers need in order to be compliant with the code have been submitted, discussed and approved. The IFC, the Life Safety Code and the Uniform Fire Code have all accepted the proposals at the committee level and are in process to be incorporated into the 2012 edition of each document.

***Higher Alcohol Levels**

It is becoming more common for customers to desire hand sanitizers with a higher content of alcohol. Currently the IFC defines an ABHR as an "alcohol-containing preparation designed for application to the hands for reducing the number of viable organisms on the hands and containing ethanol or isopropanol in an amount not exceeding 70% by volume. (IFC 3402.1)

Proposals to the NFPA Life Safety Code and the NFPA Uniform Fire Code expanding the level of alcohol to a maximum of 95% were submitted, discussed and approved in committee. The IFC, the Life Safety Code and the Uniform Fire Code have all accepted the proposals and they are in process to be incorporated into the next edition of each document.

Regulatory Compliance

How do fire code authorities define ABHRs?

An alcohol-containing preparation designed for application to the hands for anti micro-bacterial or other medicinal purpose and containing ethanol or isopropanol in an amount not exceeding 70 percent by volume.^{2,7}

How large can the packages of ABHR be?

The maximum individual dispenser fluid capacity shall be:

- a. 1.2 Liters (1200mL; 0.3 gallons) for dispensers in patient rooms, corridors and areas open to corridors.¹
- b. 2.0 Liters (2000mL; 0.5 gallons) for dispensers in suites of rooms.¹

How much ABHR product can be stored in a control area?

Storage of quantities greater than 5 gallons (18.9 Liters) in a single smoke compartment will need to meet the requirements of NFPA 30 Flammable and Combustible Liquid Code.¹ The maximum allowable quantity per control area is 120 gallons. The quantity shall be increased by 100% in buildings equipped with an approved automatic sprinkler system. Quantity shall be increased by 100% when stored in an approved storage cabinet.²

What are the requirements to comply with Americans with Disabilities Act (ADA)?

- a. Operation** - The dispenser needs to be operable with one hand without grasping, pinching or twisting of the wrist and the force required to activate must not be greater than 5 lbf.⁴
- b. Protrusion** - Objects with their leading edges between 27 inches and 80 inches above the finished floor shall protrude no more than 4 inches into walks, halls, corridors, passageways or aisles.⁵
- c. Accessibility** - Dispensers should be mounted so the operating mechanisms are at a height less than 48 inches from the floor.⁶

Product Placement

What is the total amount of ABHR product that can be used in any one area?

No more than 10 gallons (37.8 L) of ABHR shall be in use in a single smoke compartment.¹

How close can the ABHR dispensers be to each other?

Dispensers shall be separated from each other by horizontal spacing of not less than 48 inches (1220 mm).

How close can the ABHR dispenser be to an electrical outlet?

Dispensers should not be installed directly adjacent to, directly above, or below an electrical receptacle, switch, appliance, device, or other ignition source.² This rule has been formally interpreted by JAHCO to be 6 inches from the center line of the dispenser to the ignition source.

Is it acceptable to install the ABHR dispenser over a carpeted area?

Yes, but dispensers installed directly over carpeted floors shall be permitted only in sprinkler smoke compartments.³

Product Specification

Are gels, foams, liquids and aerosol ABHRs all acceptable to use?

Yes, but aerosol ABHRs were just recently added to the National Fire Code, so it would be prudent to check with your local fire marshal to confirm they have adopted the new standards before installing.

What is the maximum allowable level of alcohol content in an ABHR?

70% isopropyl or ethyl alcohol per NFPA.^{2*}

¹NFPA 101 Life Safety Code, 2009 Edition

²International Fire code, 2006 Edition

³NFPA 101 Life Safety Code, 2009 Edition; International Fire code, 2006 Edition

⁴ADA section 4.27.4

⁵ADA section 4.4.1

⁶ADA sections 4.271 - 4.27.3

⁷2008 New York City Fire Code (as added by LL 26 of 2008 and amended by LL 37 & 41 of 2009)

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[HCE-LIT-FCODE.pdf](#)

Alcohol-Based Hand Rub Dispenser Placement Regulations

The Life Safety Code® (NFPA), 2006 International Fire Code (IFC), Joint Commission on Accreditation of Healthcare Organizations (JCAHO) Guidelines, and the Centers for Medicare and Medicaid Services (CMS) all allow ABHR dispensers with the following guidelines:

CORRIDOR PLACEMENT	QUANTITIES FOR OTHER LOCATIONS	EXCEPTIONS
<ul style="list-style-type: none"> • Limit quantities to 1.2 L (0.32 gal) per dispenser • Minimum corridor width is 72" • Dispensers may project 6" from walls (Exception: IFC limits projection to 4") • Dispensers spaced at least 1220 mm 48" apart • Up to 37.8 L of ABHR allowed in each smoke compartment 	<ul style="list-style-type: none"> • Individual rooms 1.2 L (Exception IFC allows 2.0 L) • Suites of rooms 2.0 L • Areas open to corridors 1.2 L • Max. Storage Quantities per Smoke Compartment 18.9 L 	<ul style="list-style-type: none"> • IFC allows only manual dispensers • Recent JCAHO clarification specifically allows aerosol foam product pending subsequent testing • IFC specifically prohibits aerosol products • CMS requires precautions to minimize leaks and spills

National Fire Protection Agency NFPA 101® *Life Safety Code*® 2003 edition, Reference Chapters 18 and 19, TIA 03-6 (NFPA 101), (SC-04-4-17/Log 787)

International Code Council - 2006 International Fire Code Section 3405.5

Centers for Medicare and Medicaid Services (CMS) 42 CFR Parts 403, 416,450, 482, 483, and 485 (Letter to State Survey Agency Directors / State Fire Authorities June 9, 2005)

Joint Commission on Accreditation of Healthcare Organizations (JCAHO) 2005, 2006 National Patient Safety Goals and Joint Commission Perspectives® Volume 26, Issue 3

The testing upon which the NFPA and CMS requirements were based was done on gel products, not on foam. However, industry experts and CMS have indicated that alcohol-based hand rub foam dispensers may be handled the same as for alcohol-based hand rub gel. Therefore, pending further review, both the Joint Commission and CMS allows any alcohol-based hand rub foam installation that meets the location and volume criteria stated above for alcohol-based hand rub gel.²

¹Boyce JM, Pearson ML. Low frequency of fires from alcohol-based hand rub dispensers in healthcare facilities. *Infect Control Hosp Epidemiol* 2003;24:618-19.

²http://www.jointcommission.org/AccreditationPrograms/Hospitals/Standards/09_FAQs/NPSG/Healthcare_associated_infections/NPSG.07.01.01/Hand+hygiene.htm (Updated June 08, 2010)