Ambulatory Care Risk, Quality, & Safety Guidance

Hand Hygiene

Executive Summary

Everyone knows that a surgeon who walks into an operating room with dirty hands is putting the patient at risk. In the primary care setting, especially when providing care to apparently healthy patients, the risk of infection from dirty hands can seem remote. However, healthcare-acquired infections (HAIs), once called hospital-acquired infections, occur in all healthcare settings. According to the Centers for Disease Control and Prevention (CDC), hand hygiene, that is, soap-and-water handwashing or the use of waterless alcohol-based handrubs (ABHRs) in the form of liquids, gels, or foams is the best way to prevent the transmission of germs that cause HAIs.

Unfortunately, while most healthcare workers do clean their hands throughout the day, many don’t recognize all the moments when they should clean their hands or they do it the wrong way.

This guidance article covers the following:

- The transmission of germs in the primary care setting
- Standards and guidelines addressing hand hygiene
- Factors affecting compliance with hand hygiene requirements
- Methods to promote hand hygiene among personnel

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The Transmission of Germs in the Primary Care Setting

During a day of providing patient care, caregivers constantly touch many potentially contaminated surfaces, including patient skin, mucous membranes, and bodily fluids; physical objects, such as countertops; and even their own bodies, clothing, and medical devices, such as stethoscopes. With each touch, germs such as bacteria, viruses, and fungi can move in two directions: from the healthcare worker's hand to the surface touched (which includes the patient) and from the surface touched to the healthcare worker's hand.

Sometimes these germs cause an HAI, other times they live on and colonize the skin but cause no infection. This means that a person does not need to be sick to be infectious—healthy skin is colonized with germs that can cause HAIs. Caregivers can, for example, contaminate their hands by touching a patient's groin to take a femoral pulse or by palpating the abdomen. And not only can caregivers transfer these germs to another patient, they can transfer them to the same patient—in other words, germs already living on a patient's own body can cause an HAI for that patient. Healthcare workers' hands can also transfer germs to a patient if the worker touches a contaminated object, since the primary care workplace itself is contaminated by germs brought in by patients, staff, and others. For example, a patient who has infectious diarrhea caused by Clostridium difficile but who is treated and no longer shows symptoms can still shed bacterial spores into the environments for five to six weeks (Sethi et al.).

The types of germs that can be found on hands or surfaces vary depending on the population served and services provided. Primary care practices in low-income areas may have more patients with community-acquired infections, while those with a significant student population may see more sexually transmitted diseases. Virtually all health centers need to be concerned about methicillin-resistant Staphylococcus aureus (MRSA), which usually only causes painful skin infections in the outside community, but when it is in the healthcare setting, can cause more severe illnesses such as bloodstream infections or pneumonia. Vancomycin-resistant enterococci (VRE), which can cause urinary tract and other infections, should also be a concern. MRSA, VRE, and C. difficile bacterial spores can survive for many days on surfaces (Pyrek). In fact, CDC recommends that caregivers avoid unnecessary touching of surfaces in close proximity to patients in order to prevent both the contamination of clean hands from surfaces and the transmission of germs from their hands to those surfaces (Siegel et al.).

Standards and Guidelines

CDC and the World Health Organization (WHO) have both developed very similar hand hygiene guidelines (Siegel et al.; CDC “Guideline for Hand Hygiene”; WHO “WHO Guidelines”). While these recommendations are not legally binding, they do establish best practices and are the primary way to prevent infections in both patients and personnel. Additionally, federally supported health centers accredited by the Joint Commission or the Accreditation Association for Ambulatory Health Care are required to take actions to mitigate HAIs, and the Joint Commission lists compliance with CDC or WHO guidelines as one of its National Patient Safety Goals. Medicare's Conditions for Coverage also require facilities to take actions to mitigate HAIs (HRSA; AAAHC).

The guidelines applicable in the nonsurgical, outpatient setting are set forth below but can be easily summed up as follows: use ABHR before and after most patient contact. Handwashing should be the exception, used mainly to remove visible soiling and occasionally to remove germs such as C. difficile bacterial spores that are not killed by alcohol. (Surgical hand cleaning is not addressed in this article other than to note that CDC does not prefer either method. If ABHRs are used, personnel must prewash their hands and forearms with regular soap before using the ABHR, and if they wash using an antimicrobial soap, they must scrub hands for the length of time recommended by the manufacturer, usually two to six minutes.)

When to Use ABHRs

Using ABHR is the preferred way to decontaminate hands that are not visibly dirty in the situations described below. CDC does allow caregivers to wash their hands with soap and water if they wish, but CDC clearly states that using ABHRs is the CDC-preferred method to cleanse hands. Caregivers should use ABHRs in the following situations:

- Before having direct contact with patients. This protects the patient against harmful germs on the caregiver's hands.
- Before inserting invasive devices that do not require a surgical procedure, even if gloves are worn. This protects the patient against harmful germs on the caregiver's hands—for example, when giving an injection.
- After contact with blood, body fluids, excretions, mucous membranes, nonintact skin, or wound dressings. This protects future patients, the caregiver, and the environment from harmful patient germs.
- After contact with a patient's intact skin. This protects future patients, the caregiver, and the environment from harmful patient germs.
- After contact with a patient's intact skin.
If hands will be moving from a contaminated-body site to a clean-body site during patient care. This prevents harmful germs, including the patient’s own germs, from entering the patient’s body.

After contact with inanimate objects (including medical equipment) in the immediate vicinity of the patient. This protects the patient, future patients, and the caregiver from harmful patient germs.

After removing gloves. This protects future patients, the caregiver, and the environment from harmful patient germs. Germs that are on the surface of a glove can contaminate the hand when the glove is removed. They can also permeate some ordinary, nonsurgical gloves (Kampf et al.) or contaminate hands through minuscule tears in the glove.

Before handling medication. This is only recommended by WHO.

How to Use Handrubs
CDC recommends that healthcare workers apply the manufacturer-recommended amount of liquid, gel, or foam to the palm of one hand (WHO simply says a “palmful”) and rub hands together, covering all surfaces of hands and fingers, until hands are dry.

Research indicates that personnel often rub the wrong way. For example, they may not rub their hands together long enough to achieve disinfection (i.e., until hands are dry) or they may not use enough liquid, foam, or gel to cover all areas of the hand (Laustsen et al.). Frequently missed areas are finger tips, between the fingers, backs of hands, and base of the thumbs (British Columbia Ministry of Health).

How to Wash Hands
First, wet hands with water (to decrease the risk of dermatitis, do not use hot water). Then, using the manufacturer-recommended amount of soap, rub hands together vigorously for at least 15 seconds (WHO does not specify time), covering all surfaces of the hands and fingers. As with ABHR, frequently missed areas are finger tips, between the fingers, backs of hands, and base of the thumbs (British Columbia Ministry of Health). Next, rinse hands with water and dry thoroughly with a disposable towel that should be used to turn off the faucet, which can be a reservoir of germs.

Research has shown that some staff wash their hands the wrong way, often skipping the first step (wetting hands before applying soap) and/or the final step (using a towel to turn off the faucet). Primary care practices should post signs or posters with instructions on the proper hand hygiene techniques in restrooms, above sinks, and in other convenient locations. CDC has easily downloadable posters illustrating proper techniques for both forms of hand hygiene on its website; see “Web Resources.”

Gloves
The Occupational Safety and Health Administration (OSHA) requires all workers to wear gloves if they may be exposed to blood or other fluids (29 CFR § 1910.1030). OSHA also requires workers to wash their hands after removing gloves and any time they have contact with blood or other potentially infectious materials. In other words, gloves are NOT a substitute for hand hygiene. Additionally, gloves should be changed between patients and when moving from a contaminated-body site to a clean-body site on the same patient.

Fingernails
Germs can live near and under fingernails. WHO recommends that no healthcare worker wear artificial fingernails or extenders, while CDC only prohibits this for critical care hospital workers. Both recommend keeping natural fingernail tips less than one-quarter inch long.
Factors Affecting Compliance with Hand Hygiene

While the majority of healthcare personnel would probably advocate the need for clean hands, many don’t practice what they preach. According to CDC (CDC “Guideline for Hand Hygiene”), some of the reasons healthcare workers give for not performing hand hygiene include the following:

- Being too busy, understaffed, or overcrowded
- Thinking that wearing gloves negates the need for hand hygiene
- Not knowing (or having) written hand hygiene protocols at their facility
- Believing that there is a low risk of getting an infection from patients
- Believing that hand hygiene products cause skin irritation and dryness
- Sinks are inconveniently located or lack soap and paper towels
- Simply not thinking about it or forgetfulness
- Not having any role models from colleagues or superiors

Health centers should be prepared to address these barriers to compliance by, for example, correcting misperceptions during training programs or making sinks and ABHR dispensers more convenient.

How to Promote Hand Hygiene

Compliance with either the CDC or WHO hand hygiene guidelines should be a stated component of a primary care practice’s infection prevention and control plans, policies, and procedures. But simply stating that as a goal is not enough; a multimodal approach is needed. Researchers reviewing the effectiveness of different strategies (including those recommended by the Joint Commission and WHO) suggested eight approaches that can be bundled to improve hand hygiene (Pincock et al.). The following six would be appropriate for the primary care setting:

- Administrative leadership and support
- System change
- Training and education
- Behavior reinforcement and accountability
- Ongoing evaluation and feedback
- Reminders in the workplace

Administrative Leadership and Support

Senior administration support is crucial to change a facility’s hand hygiene practices. This includes visible and vocal support from both management and clinical leaders (research shows that healthcare personnel in a room with a higher-ranking medical staff member who did not wash their hands were much less likely to wash their own hands [Joint Commission]); budgetary support for hand hygiene products, monitoring, and training; and a culture change that emphasizes hand hygiene as a component of patient safety.

System Change

This means making sure that the health center has put into place the necessary organizational systems, as well as equipment, so that staff can perform hand hygiene. Organizational systems are the written plans, policies, or procedures that describe when and how staff are expected to clean their hands and how staff will be educated.

Hand hygiene resources should be accessible throughout the practice and within “arms reach” of the actual point of patient care whenever possible. Placing ABHR dispensers (or using pocket-size bottles) at the point of patient care will overcome compliance issues such as lack of time or inconvenient location. Having a standardized and very visible placement of ABHR dispensers, including placing them at the proper height and making them clearly visible, has been shown to increase compliance (Kendall et al.). If ABHR dispensers are already in place, they should be reevaluated periodically to ensure that they are truly convenient for personnel and that they are working properly.

All ABHR should be installed in compliance with national and local fire protection standards (see Fire Safety and ABHR Dispensers). Touch-free ABHR dispensers that meet fire protection standards are also available, and at least one study showed that they were used significantly more often than manual dispensers (Kendall et al.). The CDC recommends that ABHR dispensers should not be installed near sinks in order to reduce the likelihood that the handrub is used in place of soap during handwashing.

Sinks should be deep enough to prevent splashing of contaminants from the drain to adjacent surfaces (Bartley et al.). In addition, sinks should be provided with enough soaps and disposable towels. Hands-free activation for sinks should be considered, including automatic and paddle-, foot-, or knob-activated faucets.

Staff also should be involved when first selecting the ABHR agents and soaps or when reevaluating their use. See Choosing Hand Hygiene Products for factors to consider. In a small health center, it may be possible for all personnel with patient contact to participate in the selection process; larger centers may need to create a hand hygiene team. It is also important to consider
the design and function of the dispenser itself. Well-designed dispensers will function properly for long periods of time without requiring regular mechanical maintenance.

Dispensers that break easily, frequently become clogged, dispense an inadequate volume of product, or are messy (for example, dispensing too much product or squirting it in all directions) will discourage compliance.

**Training and Education**

Staff must participate in training and education when they are first hired and then at least once a year about the importance of hand hygiene, when it should be done, and the proper way to do it. Research has found that while most staff believe they know enough about hand hygiene, many do not have a clear understanding of all the times it should be done (Joint Commission). For example, staff often neglect to clean their hands after touching objects in a patient’s surroundings (Felembam et al.).

The number of hand hygiene moments per patient care hour may surprise some. According to WHO, during a typical primary care hour, a caregiver could have between 8 and 12 hand hygiene moments (assuming each visit lasts 10 to 15 minutes), a phlebotomist could have as few as 12 and as many as 40 moments, and personnel involved in a public vaccination campaign—where they could see as many as 30 patients per hour—could experience between 30 to 60 hand hygiene moments (depending on whether their hands got contaminated between vaccine administrations) (WHO “Hand Hygiene”). Staff should be reminded that moments for hand hygiene can be compared with wearing a safety belt while driving. Although the risk through neglecting a single preventive gesture may be very low, cumulative negligence results in a high total number of serious outcomes due to the sheer frequency of the risk situations (Sax et al.).

Different techniques can be used for training. For large health centers, formal presentations could be given by trainers, including practical demonstrations and examples of how and when to perform hand hygiene. For smaller facilities, self-guided learning programs and either paper or e-learning modules are a good option.

Education aimed at patients and other visitors to the primary care workplace, such as providing information fact sheets, brochures, and posters both in the waiting room and in patient care areas, should also be done.

**Behavior Reinforcement and Accountability**

Making sure that staff learn and continue to use proper hand hygiene techniques is an ongoing process that requires reinforcement and accountability. Reinforcement could include having hand hygiene knowledge contests; providing incentives, such as low-value gift cards; or having an employee recognition program. Reinforcement must be supported by top administrators through clear policies that assign accountability to staff. Accountability could be promoted by first gently reminding staff about proper techniques and then, if that doesn’t work, issuing “tickets” or notice letters to staff who are lax about their hand hygiene; in extreme cases, some sort of personnel action may be taken. Both positive and negative feedback techniques should be used (Pincock et al.).

**Evaluation and Feedback**

Facilities should conduct annual evaluations and monitoring of staff hand hygiene compliance, knowledge, and perception. For example, does anyone still think that ABHRs are more drying to the skin? If so, this mistaken belief should be corrected so that there will be one less reason for poor hand hygiene performance. An assessment of worker knowledge of hand hygiene practices and principles should also be done. Unfortunately, getting a handle on whether workers are actually cleaning their hands (despite what they may say in a survey) is hard in the primary care setting since it is impractical to hire a full-time infection control practitioner who can directly observe staff behavior or install costly electronic monitoring sensors. CDC recommends using soap and ABHR consumption as an indicator of compliance. After determining worker knowledge of hand hygiene and product use baselines, facilities should set realistic goals for improvement (if needed) and periodically resurvey or otherwise monitor adherences to hand hygiene and provide feedback to the staff (CDC “Infection Prevention”). This can also help demonstrate the changes induced by implementation of new ABHRs, dispensers, or initiatives to promote better hand hygiene practices. Facilities should also set goals for improvement.

Feedback of the results of these investigations is crucial. Providing follow-up data to workers after implementation of new hand hygiene promotion efforts can validate the effectiveness of the hand hygiene program and sustain staff members’ motivation to follow the recommended practices. It will inform future action plans by identifying areas for improvement. Feedback can be provided during staff meetings, via email, by posting results in employee lunch areas, or through other means.
Choosing Hand Hygiene Products

When choosing hand hygiene products such as ABHRs, soaps, and hand lotions, consider the following matters:

- **Staff preferences regarding**
  - Skin tolerance
  - Color
  - Texture
  - Fragrance
  - Stickiness

- **Manufacturer information about the effects of products on:**
  - Types of gloves used at the facility
  - Each other, such as effect of ABHR on the persistent effects of antimicrobial soap

- **Time for drying—workers are likely to continue rubbing until their hands are dry, so products with longer drying times will likely lead to workers cleaning more thoroughly**

- **Dispenser functionality, convenience, and dispensation of appropriate volume of product**

- **Cost and availability issues**

Reminders

Posters are the most common type of reminder (WHO and CDC offer a variety of posters on their websites, as do manufacturers of hand hygiene products). As noted earlier, posters with drawings or photographs can remind staff of the correct way to wash hands or rub them with ABHRs. Since clinics usually have a lot of posters, other types of reminders are a good idea, such as brightly colored stickers posted at the point of care or on dispensers, eye-catching computer screen savers, or periodic e-mail or voice mail messages.

References

29 CFR § 1910.1030.


Centers for Disease Control and Prevention (CDC):


World Health Organization:


Resources

American Society for Healthcare Engineering
One North Franklin 28th Floor Chicago, IL 60606
http://www.ashe.org
  Alcohol Based Hand Rubs (http://www.ashe.org/ashe/codes/handrub/index.html)

Centers for Disease Control and Prevention
1600 Clifton Road, Atlanta, GA 30333
(888) 232-4636  |  http://www.cdc.gov
  Hand hygiene resources, educational slide presentations, educational video, and posters (http://www.cdc.gov/handhygiene; http://www.cdc.gov/handhygiene/training.html)

Centers for Medicare & Medicaid Services
7500 Security Boulevard, Baltimore, MD 21244
(877) 267-2323  |  http://www.cms.hhs.gov
  29 CFR § 482.42 (http://www.cms.hhs.gov/EOG/downloads/EO%200120.pdf)

Hand Hygiene Resource Center
Hospital of St. Raphael 1450 Chapel Street New Haven, CT 06511
(203) 739-3000  |  http://www.handhygiene.org

Institute for Healthcare Improvement
20 University Road 7th Floor, Cambridge, MA 02138
(866) 787-0831  |  http://www.ihi.org
  How-to Guide: Improving Hand Hygiene

Johns Hopkins Healthcare Epidemiology and Infection Control
Johns Hopkins Hospital 600 N Wolfe Street Baltimore, MD 21287
(410) 955-5000  |  http://www.hopkinsmedicine.org
  Hand hygiene resource page (http://www.hopkinsmedicine.org/heic/Hand_Hygiene)

Joint Commission
One Renaissance Boulevard Oakbrook Terrace, IL 60181
(630) 792-5000  |  http://www.jointcommission.org
  Frequently asked questions about the National Patient Safety Goals
  National Patient Safety Goals
  Speak Up™ Campaign

Minnesota Department of Health
PO Box 64975, St. Paul, MN 55164-0975 (888) 345-0823
http://www.health.state.mn.us/index.html
  Hand hygiene resources (http://www.health.state.mn.us/handhygiene/index.html)

National Fire Protection Association
1 Battery March Park, Quincy, MA 02169-7471
(617) 770-3000  |  http://www.nfpa.org
  Life Safety Code®

National Patient Safety Agency
4-8 Maple Street London W1T 5HD England
(020) 7927 9500  |  http://www.npsa.nhs.uk
  Cleanyourhands campaign Web site (http://www.npsa.nhs.uk/cleanyourhands)

World Health Organization
Avenue Appia 20, 1211 Geneva 27 Switzerland
41 (22) 791 21 11  |  http://www.who.int/en
  If installed in corridors, the corridors must be at least six feet wide and the dispensers must be placed at least four feet apart.
  They are not installed over an ignition source or less than six inches directly adjacent to an ignition source, such as an electrical outlet or switch.
  If installed directly over carpeted surfaces, they must be in sprinkler-protected smoke compartments. They are maintained in accordance with dispenser manufacturer guidelines.
  If touch-free dispensers, they must meet additional requirements, such as:
    They only release product when the devices are activated.
    They will not release any product unless something is within four inches of the sensing device.
    An object placed within the activation zone and left in place will not cause more than one activation.


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