Hand Hygiene: Understanding and Implementing the CDC's New Guideline

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LAST YEAR, THE CENTERS FOR DISEASE CONTROL and Prevention (CDC) released a guideline on hand hygiene that's changing the way clinicians protect their patients—and themselves—from infections. No longer is the mantra “Wash your hands”; according to the CDC, “Practice good hand hygiene” makes more sense.

The revolution in hand hygiene isn’t limited to which products clinicians use to clean their hands. It also encompasses a change in how long we wash our hands with soap and water, whether we can wear artificial fingernails, and issues surrounding surgical scrub.

For managers, this revolution will provide many challenges in terms of reeducating clinicians, ensuring that they change old habits, and evaluating how these changes have affected patient care. Managers will also be challenged to comply with safety codes and other federal and local laws, sometimes in the face of conflicting interests. Remember that the CDC’s guideline doesn’t carry the weight of law, although some recommendations listed are the law and therefore are codified elsewhere. That doesn’t mean the guideline should or even can be ignored; instead, managers must find ways to follow the law and implement the guideline, for the sake of patient and staff safety.

Indications for hand washing

The CDC guideline hasn’t declared hand washing obsolete. In fact, the first recommendation describes when hands should be washed with soap and water. Given the high profile alcohol-based hand rubs have recently attained, staff may forget that hand washing still has a crucial role in the armamentarium of disease prevention. If hands are visibly soiled, the only option recommended by the CDC is hand washing with nonantimicrobial or antimicrobial soap and water for 15 seconds (recommendation 1A, category IA; see What the Categories Mean).

What the Categories Mean

The recommendations for practice in the new hand hygiene guideline from the Centers for Disease Control and Prevention (CDC) are grouped under eight overall headings, which are, logically, numbered 1 through 8. Within each grouping are several specific recommendations, which are assigned alphabetical letter codes.
In addition, each recommendation has a category designation. This is the CDC’s shorthand method of indicating that not all recommendations are equal because not all have the same weight of science behind them. Here’s what the categories mean, according to the guideline document:

| Category IA— | Strongly recommended for implementation and strongly supported by well-designed experimental, clinical, or epidemiologic studies. |
| Category IB— | Strongly recommended for implementation and supported by certain experimental, clinical, or epidemiologic studies and a strong theoretical rationale. |
| Category IC— | Required for implementation, as mandated by federal or state regulations or standards. |
| Category II— | Suggested for implementation and supported by suggestive clinical or epidemiologic studies or theoretical rationale. |
| Unresolved issue— | No recommendation is made. Practices for which insufficient evidence or no consensus regarding efficacy exists. |

The reason for this is simple, and it reflects the old saying “There is no sterilization without cleaning.” Although hands aren’t technically sterilized, the concept is the same: Unless gross debris is removed, the antibacterial cleanser can’t penetrate and kill organisms on the hands.

Hand washing is also still acceptable in other clinical situations, if antimicrobial soap is used (recommendation 1B, category IB). Functionally, however, more and more data suggest that if given the choice between hand washing and using an alcohol-based hand rub, staff should choose the alcohol-based hand rubs. Why? Hand washing makes sense only in clinical situations in which time constraints aren’t an issue and hand hygiene facilities are easily accessible, or when the clinician can’t tolerate the alcohol-based hand rub. In addition, staff and patients taking the drug disulfiram (Antabuse) shouldn’t use alcohol-based hand rubs.

**Use of alcohol-based hand rubs**

The most radical change in the new CDC guideline is the recommendation for using alcohol-based hand rubs, which have replaced soap as the primary agent for hand hygiene. The reason for this has to do with time, hand health, and effectiveness.

**Timing issues**

A novel article on the time hand hygiene takes, published in the journal *Infection Control and Hospital Epidemiology*, concluded that 100% compliance with traditional hand washing when indicated would consume 16 hours of nursing time on day shift alone and would interfere with patient care. This claim was almost blasphemous in infection control circles. The authors were basically saying that nursing staff would be jeopardizing patients’ lives if they complied with then-current guidelines on hand washing. They pointed out that by comparison, the use of an alcohol-based hand rub took only 3 hours of nursing time on day shift.

This article and others point out the myth of the 10-second hand wash. Most patient-care areas are so crowded with medical equipment that a clinician must search out a sink, adjust the water temperature, wash and dry his or her hands, then go back to the patient. According to the article in *Infection Control and Hospital Epidemiology*, this process took an average of 61.7 seconds, not 10 seconds. By contrast, using an alcohol-based hand rub took 15 seconds per patient, getting the nurse back to the bedside faster.

**Hand health issues**
The stratum corneum, the upper layer of the epidermis, is constantly shedding dead skin cells, forming a new layer almost daily. If the stratum corneum is shed more rapidly or is stripped away by chemical or mechanical means, the skin can become damaged. This damage changes the environment for resident and transient microbes, which can be harmful to the clinician and his or her patient. Using less irritating hand hygiene products can help to prevent skin damage.

Clinicians may be concerned about using alcohol-based hand rubs because in the past, these products were thought to dry the skin. Current data, however, demonstrate that alcohol-based hand rubs can actually be less irritating and drying to the skin than traditional hand washing with soap and water. Some alcohol-based hand rubs even contain emollients.

Education and training to dispel the myths about alcohol-based hand rubs will be of paramount importance in changing behavior and improving acceptance of these products. Making alcohol-based hand rubs easily available will also help staff quickly become accustomed to using them at every opportunity.

**Effectiveness issues**

Numerous studies in the United States and Europe have demonstrated the benefits of alcohol-based hand rubs. Effectiveness of these products can be measured two ways:

- **ability to kill organisms on the hands.** The currently available alcohol-based hand rubs are backed by clinical data supporting claims of 99.9% effectiveness in killing organisms on the hands.

- **ability to stop nosocomial infections.** Can alcohol-based hand rubs prevent nosocomial infections? The answer in published peer-reviewed journal articles is an emphatic yes. This outcome is by far more important than the laboratory data showing effectiveness because it demonstrates that in real-life settings, these products can save lives.

**Indications for alcohol-based hand rubs**

The CDC guideline recommends using alcohol-based hand rubs when:

- coming into direct contact with patients (recommendation 1C, category IB)

- before donning sterile gloves when inserting a central intravascular catheter (recommendation 1D, category IB)

- before inserting indwelling urinary catheters, peripheral vascular catheters, or other invasive devices that don’t require surgical procedures (recommendation 1E, category IB)

- after contact with intact skin (recommendation 1F, category IB)

- after contact with body fluids or excretions, nonintact skin, and wound dressings, assuming the clinician’s hands aren’t visibly soiled (recommendation 1G, category IB)

- moving from a contaminated body site to a clean site (recommendation 1H, category II)

- after contact with inanimate objects, both medical and nonmedical, in proximity to patients; these objects have been shown in many studies to be contaminated, although such contamination hadn’t been directly linked with clinicians subsequently infecting other patients (recommendation 1I, category II)

- after taking off gloves because gloves aren’t assumed to be an impervious barrier (recommendation 1J, category IB).
For decontaminating hands before eating and after using the lavatory, the CDC still recommends washing with either bland soap and water or antimicrobial soap and water (recommendation 1K, category IB). For the time being, one of the few areas where alcohol-based hand rubs shouldn't be found is beside a sink.

Antimicrobial-impregnated wipes (i.e., towelettes) have had a mini-revival as the alcohol-based hand rub movement has taken off. However, research reviewed by the CDC doesn't definitively show them to be as effective as alcohol-based hand rubs or hand washing with antimicrobial soap. Therefore, they can only be considered as a replacement for washing hands with bland soap (recommendation 1L, category IB).

In the last 18 months, the risk of bioterrorism has taken on an importance that many hadn't considered. Even the hand hygiene guideline recognizes this fact. One potential agent of bioterrorism is Bacillus anthracis, the causative agent of anthrax. A unique property of B. anthracis is that it’s a spore-forming agent, which protects it from noxious agents or conditions. It’s impervious to destruction by alcohol-based hand rubs or antimicrobial soap. Because the alcohol-based hand rubs can’t kill B. anthracis, this organism must be washed away. Therefore, hand washing with a nonantimicrobial soap after exposure to B. anthracis is recommended (recommendation 1M, category II).

This recommendation poses a quandary. Although most health care workers probably won’t see a case of anthrax, the common hospital pathogen Clostridium difficile is also a spore-forming organism. This means it shares the same properties that make alcohol-based hand rubs ineffective against B. anthracis. But the CDC has made no recommendation on the use of alcohol-based hand rubs and patients with C. difficile.

Many new nonalcohol-based hand rubs have entered the market on the heels of the demonstrated effectiveness of the alcohol-based products. However, the science behind them isn’t strong enough for the CDC to issue an endorsement for their use in a health care setting at this time (recommendation 1N, unresolved issue).

No matter how many years clinicians have been trained to wash their hands, most miss the first step: getting their hands wet.

**Hand hygiene technique**

After all the discussion of the advantages of alcohol-based hand rubs, most clinicians are curious about how to use them. The CDC recommends applying the solution to the palm of one hand, then rubbing the hands together to cover all surfaces of the hands and fingers (recommendation 2A, category IB). The hands should be rubbed together until dry, about 15 to 25 seconds. If staff members’ hands are drying in 3 to 5 seconds, they aren’t using enough solution. Most manufacturers of alcohol-based hand rubs provide wall-mounted dispensers that deposit the correct amount of solution onto the hands. Ultimately, follow the manufacturer’s recommendation about the amount to dispense per use.

The hand-washing description has changed only on one point: The duration of the wash has increased to 15 seconds, reflecting that hands being washed now are visibly contaminated. Cleaning contaminated hands will obviously take longer than washing hands that have been in contact with a visibly clean yet contaminated surface.

Many staff have no idea how long 15 seconds are, so they should be given an easy way to learn. Simply saying “Wash your hands for 15 seconds” isn’t adequate; many rooms in health care facilities lack a clock with a second hand in view of the wash sink. Instead of relying on a clock, staff can be taught to sing “Row, Row, Row Your Boat” three times or “Happy Birthday” twice.

Staff should also be told not to use hot water when washing their hands, as repeated use of hot water may increase the risk of dermatitis (recommendation 2B, category IB). Studies have shown dermatitis and skin dryness to be major impediments to good hand hygiene because they discourage staff from washing their hands or using alcohol-based hand rubs.
No matter how many years clinicians have been trained to wash their hands, they don’t always get it right. Most staff miss the first step when washing hands: getting their hands wet. Instead, they start by applying soap. Starting with water has two advantages. First, it allows for better lather when soap is applied later. Second, it reduces the chances of dermatitis caused by applying soap directly to dry hands.

After wetting the hands, the next step is applying soap in a measure recommended by the product’s manufacturer. The hands should be rubbed together vigorously for at least 15 seconds, covering all surfaces of the hands and fingers. The hands are rinsed with the water until the water runs clear, then dried with a towel. The towel should be used to turn off the faucet.

This recommendation implies some essential points. Towels are needed in health care settings, which means rest rooms shouldn’t be supplied with air hand-drying machines only. When washing hands with a nonantimicrobial soap in the health care setting, liquid, bar, or leaflet form is acceptable. However, when using bar soap in the health care setting, a soap rack should be available to allow the soap to dry (recommendation 2C, category II). Multiple-use cloth towels (hanging or roll type) aren’t recommended for use in the health care setting because of their potential as a reservoir for pathogens (recommendation 2D, category II).

**Surgical hand asepsis**

Some of the recommendations under the surgical hand asepsis section of the new guideline may be surprising and may seem to go against training and tradition. They do, to a degree. The reason? Significant research and expert assessment of: (1) product efficacy, (2) effects of hand asepsis products and methods of use on clinicians’ skin, and (3) time devoted to hand asepsis. Here’s a closer look at the recommendations.

Clinicians in the surgical suite must remove rings, watches, and bracelets before beginning the surgical hand scrub (recommendation 3A, category II). Because these jewelry items can potentially act as hiding places for organisms, removal will allow for full skin contact with the surgical scrub product. Debris should be removed from underneath fingernails using a nail cleaner under running water (recommendation 3B, category II).

Surgical hand asepsis, using either an alcohol-based hand rub or an antimicrobial soap, is recommended before donning sterile gloves when performing surgical procedures (recommendation 3C, category IB). Clinicians using antimicrobial soap for surgical hand asepsis should scrub their hands and forearms the length of time recommended by the manufacturer, usually 2 to 6 minutes (recommendation 3D, category IB). The option for using an antimicrobial soap for surgical asepsis prior to gloving for a surgical procedure isn’t new; what’s been added is the option of using an alcohol-based hand rub. The importance of following the manufacturer’s recommendations has also been added.

When using an alcohol-based surgical hand-scrub product with persistent activity, the clinician should prewash his or her hands and forearms with a nonantimicrobial soap and dry them completely. After applying the alcohol-based product, the clinician should allow the hands and forearms to dry thoroughly before donning sterile gloves (recommendation 3E, category IB).

Several studies conducted in the 1990s examined antimicrobial efficacy. These studies showed that products containing alcohol were at least as effective as, and in some cases more effective than, products containing only 4% chlorhexidine or 7.5% or 10% povidone-iodine.

Alcohol-based scrub products with persistent activity may also be gentler on the hands. A 6-week single hospital trial using a product containing 61% ethyl alcohol and 1% chlorhexidine gluconate (CHG) demonstrated significant reductions in microbial counts on the hands and improved skin health among participants.

On the subject of gentleness, brushes have long been part of surgical asepsis—so long, in fact, that they’ve taken the form of a sacred cow. Studies have shown that brush use can be counterproductive.
Brushes can cause skin irritation, change normal flora, and potentially shed harmful organisms from the user's skin.

Time is the final issue. Regardless of the method of surgical asepsis chosen, time should be saved. The 10-minute scrub is unnecessary. Studies with current products have demonstrated that scrub time can be decreased to as little as 2 to 5 minutes. Facilities will need to determine which products work best for the majority of users and monitor that manufacturer guidelines are followed.

Selecting hand hygiene products

Deciding which hand hygiene products will be used at a facility should be a process, not a single event. Think of it as similar to the process of evaluating sharps safety products, with a cross-functional group (including product end-users) coming together to objectively collect and assess data.

According to the new CDC guideline, the following considerations are essential in introducing hand hygiene products in a facility:

• The selected hand hygiene products should be effective and have a low potential to irritate the skin, particularly when they'll be used multiple times per shift (recommendation 4A, category IB). This recommendation applies to products used for hand asepsis before and after patient care in clinical areas and to products used for surgical hand asepsis by surgical personnel.

• Because clinicians will be more likely to use hand hygiene products that don't harm the skin, the facility should solicit input from clinicians regarding the feel, fragrance, and skin tolerance of any products under consideration. The cost of hand hygiene products shouldn't be the primary factor influencing product selection (recommendation 4B, category IB).

Managing costs, of course, is always a consideration for facilities. However, cost can be measured not only as the actual cost of the product but also: (1) the cost of hospital-acquired infections, (2) the cost of workers’ compensation claims associated with hand hygiene products, and (3) the potential time savings from hand hygiene products.

• How the product is dispensed is important as well. Before deciding which hand hygiene product to purchase, the facility should evaluate the dispenser systems of various product manufacturers or distributors to ensure that the dispensers will function adequately and deliver the right volume of product (recommendation 4D, category II). Look at the layout of each unit at the facility, including patient room design and traffic patterns, to determine where dispensers will fit. Also make sure the dispensers work as designed, without drips.

• Soap should never be added to a partially empty soap dispenser. This practice of “topping off” dispensers may lead to bacterial contamination of the soap (recommendation 4E, category IA). Therefore, selecting dispensers that can’t be topped off or tampered with is ideal.

As mentioned earlier, one reason why clinicians don’t practice good hand hygiene is because it can be a pain, literally. Frequent hand washing can break down the skin, making future hand-washing experiences painful. This can also make the transition to alcohol-based hand rubs difficult, as the alcohol can cause a burning sensation when applied to broken skin.

To improve hand hygiene, hand health needs to improve as well. Lotions and creams play a critical role in this. They must be supplied in adequate quantities and in easily accessible places so that staff can use them (recommendation 5A, category IB).

Unfortunately, some lotions can also act as reservoirs for pathogens. Although not specifically mentioned in the CDC guideline, many of the same rules apply to lotions as apply to soap. For example, don’t top off lotions because they could become contaminated. Avoid lotions with screw tops; instead, select lotions in wall mounts that discourage or make it impractical to top off. Also, select dispensers that won’t allow for easy direct contact between hands and the dispensing nozzle.
Remember that the lotion selected for use at the health care facility should not interfere with the activity of antimicrobial soap (recommendation 5B, category IB). Some antimicrobial soaps are more prone to inactivating interactions, so in some cases it may be simpler to change antimicrobial soaps than to change a lotion. In addition, if the facility is still using latex gloves, find out the effect of the hand lotion on the latex integrity; some lotions can break down gloves, making them less effective barriers.

Other aspects of hand hygiene

Since the early 1970s, compelling research has been conducted regarding bacteria and fingernails, particularly with regard to artificial fingernails (visit [http://www.med.umich.edu/ice/nails/nailreferences.htm](http://www.med.umich.edu/ice/nails/nailreferences.htm) for a summary of the research). Use of artificial nails and the length of natural nails are personal issues and attempts to regulate them in health care settings have met with varied success. The new CDC guideline may give some resolution. According to the guideline, clinicians who are in direct contact with patients at high risk for infection, such as intensive care or surgical patients, shouldn’t wear artificial fingernails or extenders (recommendation 6A, category IA). Facilities are left to define which patient care areas or patient populations are considered high risk. However, after reading the research the CDC used as the basis for its recommendations, some clinicians may decide to remove their artificial nails to reduce the possibility of a nosocomial infection, even if their facilities don’t require it.

In addition, the guideline says that fingernails should be kept to less than ¼ inch long (recommendation 6B, category II). Longer nails are more likely to puncture a disposable glove, possibly resulting in hand exposure to blood or other potentially infectious materials.

When used correctly, disposable gloves can protect both clinicians and patients. The CDC recommends that clinicians wear gloves when they can reasonably anticipate that they’ll be in contact with blood or other potentially infectious materials, mucous membranes, and nonintact skin (recommendation 6C, category IC). This is more than a recommendation, however; it addresses a federal Occupational Safety and Health Administration (OSHA) requirement and is intended to protect clinicians from infection with bloodborne pathogens (such as hepatitis B, C, and D and human immunodeficiency virus).

The guideline also says that gloves shouldn’t be washed between patients, based on OSHA’s requirement that disposable gloves not be washed or decontaminated for reuse (recommendation 6D, category IB).

A facility may make several types of disposable gloves available; the clinician is responsible for knowing which type of glove to use based on the task and latex issues. Medical-grade disposable gloves are made of natural rubber latex or synthetic rubber materials, such as vinyl, nitrile, neoprene, or polyurethane. Clinicians should ask themselves the following questions when selecting the type of glove to use:

- What’s the likelihood of exposure to blood or body fluids?
- How long will the procedure take?
- Are there product sensitivity or allergy issues (clinician or patient)?

Disposable vinyl gloves are appropriate for short-term procedures that have a low risk of exposure to body substances and minimal strain on the glove, such as changing bed linen.

Disposable natural rubber latex gloves offer optimal barrier protection and are preferred when there is a moderate to high probability of exposure to blood or other potentially infectious materials. Latex gloves may need to be changed every 15 to 30 minutes, depending on the amount of body substance exposure and the degree of contact with needles or other sharps.
Latex gloves shouldn’t be used when there’s a known or suspected allergy, reactivity to natural rubber latex protein, and prolonged contact with high-level disinfectants, such as glutaraldehyde. In addition, the clinician shouldn’t use hand care products containing mineral oil, petroleum, or lanolin when wearing natural rubber latex gloves; these products can cause the gloves to break down, compromising barrier protection.

Nitrile gloves are the superior option for clinicians when there is both a latex allergy/sensitivity and a moderate to high likelihood of exposure to blood and other potentially infectious materials. These gloves may be used with chemotherapeutic agents and cleaning solutions.

The new guideline contains other recommendations regarding gloves. It says, for example, that gloves should be removed after caring for a patient and that the same pair shouldn’t be worn to care for more than one patient (recommendation 6D, category IB). Also, the clinician should change gloves during patient care if moving from a contaminated body site to a clean body site (recommendation 6E, category II). Both recommendations are directed at minimizing the likelihood of infection transmission from patient to patient or from one site to another on the same patient.

Let’s look at how transmission occurs. Within a hospital, transmission requires a source of infecting microorganisms, a susceptible host, and a means of transporting the microorganisms. Direct and indirect contact transmission accounts for most hospital-acquired infections. Direct contact transmission requires body surface-to-body surface contact in which microorganisms are transferred between a susceptible host and an infected or colonized person. Indirect contact transmission involves contact of a susceptible host with a contaminated go-between, an object that transfers the microorganisms.

How does this apply to the CDC guideline? Wearing the same gloves between patients can cause indirect contact transmission of microorganisms from patient to patient. Likewise, failure to change gloves after completing a procedure and moving onto a second procedure with the same patient can result in infection.

Part of using gloves correctly includes washing hands after the gloves are removed. The two reasons for hand washing after glove removal are the potentials for glove leakage and hand contamination during glove removal.

Two sobering studies demonstrate that clinicians may not know when their gloves have leaked or when contamination has occurred.

- Tenorio et al. found that 5 of 17 clinicians had a patient strain of vancomycin-resistant Enterococcus on their hands after glove removal. Hand contamination was attributed to leakage or hand contamination that occurred when gloves were removed.

- Olsen et al. examined 137 procedures involving clinicians’ gloves that had come in contact with a patient’s mucous membranes. Microbial contamination occurred on 13% of clinicians’ hands. Only 22% were aware that their gloves had leaks.

Finally, the CDC has declined to make a recommendation on wearing rings in health care settings (recommendation 6F, unresolved issue).

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<th>Year Published and Researchers</th>
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<td>2001; McGuckin M, Waterman R, Storr IJ, et al.</td>
<td>A controlled prospective interventional study was conducted, in which medical and surgical patients asked all clinicians who were going to have direct contact</td>
<td>Hand washing increased an average of 50%. Hand washing occurred more often with surgical than with medical patients. Alcohol gel was used on less</td>
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with them, "Did you wash your hands?" Compliance was measured by the amount of soap/alcohol used and hand washings per bed day before and after introduction of the program.

From 1994 to 1997, a program involving seven hospitals was conducted to promote hand hygiene, with an emphasis on bedside, alcohol-based hand disinfection. Overall nosocomial infections, MRSA transmission rates, and use of alcohol-based hand disinfection were measured. Hand-washing observational studies were done twice per year. More than 20,000 opportunities for hand washing were observed.

Compliance improved from 48% (1994) to 66% (1997). Soap and water use was stable throughout the study; alcohol-based hand disinfection increased. Overall nosocomial infection prevalence rate dropped from 16.9% (1994) to 9.9% (1998). MRSA transmission decreased from 2.16 to 0.93 incidents per 10,000 patient days. Consumption of alcohol-based hand hygiene products increased from 3.5 to 15.4 liter per 1,000 patient days between 1993 and 1998.

A 6-week controlled prospective interventional study involving four community hospitals was conducted, in which patients were educated within 24 hours of admission about the importance of asking clinicians to wash their hands. Education included written material. Soap usage and hand washing were calculated by bed days. Patient interviews were conducted by phone 2 weeks postdischarge.

Of the patients interviewed, 81% stated that they read the hand-washing educational material; 57% stated that they asked clinicians whether they'd washed their hands. Of the 57% who asked, 81% stated that they received positive responses. Soap usage increased an average of 34%.

A five-phase study that included: (1) unobtrusive observation to obtain a baseline hand-washing rate; (2) observation following written notification; (3) observation after giving motivational devices, including movies, brochures, and posters; (4) cessation of observation and motivation; (5) unobtrusive observation to obtain an interventional residual hand-washing rate. The study was conducted at a tertiary care pediatric hospital and involved 60 medical staff members, 37 nurses, and 15 paramedical staff.

There were no significant differences among hospital staff in any phase of the study.

A 5-week behavior modification program was conducted. Participants included 61 ICU medical staff. In phase 1, a 4-week period was used to determine a baseline hand-washing rate using unobtrusive study. In phase 2, overt observation was done for 5 weeks. In phase 3, overt observation with performance feedback was done for 4 weeks. In phase 4, all activities were discontinued for 7 weeks. In phase 5, a 5-week period was used to determine a residual hand-washing rate using unobtrusive study.

In phase 1, the hand-washing rate was 12.4% before patient contact and 10.6% after patient contact. In phase 2, the hand-washing rate was 32.7% before patient contact and 33.3% after patient contact. In phase 3, the hand-washing rate was 68.3% before patient contact and 64.8% after patient contact. In phase 5, the hand-washing rate was 54.6% before patient contact and 54.9% after patient contact.

This study examined the efficacy of techniques to increase hand washing by ICU nurses. Baseline hand-washing data

There was an immediate increase in hand washing that was followed by a return to baseline over 4 weeks.
Educational and motivational programs

Hand hygiene has had its advocates since the 1100s, when Moses ben Maimon (Maimonides) wrote in the Mishnah Torah, “Never forget to wash your hands after having touched a sick person.” It’s been an uphill battle ever since.

Imagine hand hygiene in the United States and Europe in the 1800s. No indoor plumbing. If warm water was desired for washing or bathing, it had to be heated over a fire. Malaria and typhoid were rampant and associated with contaminated water. Women giving birth in hospitals had a 25% mortality rate due to puerperal sepsis.

Now we have warm water from the spigot, a plethora of hand hygiene products, and numerous studies linking hand-washing failures to the transmission of infections. Yet nosocomial infections are still problematic. What will it take for us to do better?

For more than a decade, that question has been at the heart of several large-scale, probing studies, which the CDC panel reviewed in developing the hand hygiene guideline (See Recent Hand-Washing Studies for more information). The guideline details the following recommendations regarding educational and motivational programs:

• Educate clinicians about the types of patient-care activities that can result in hand contamination and the advantages and disadvantages of the various methods to clean their hands as part of an overall program to improve hand hygiene practices (recommendation 7A, category II).

• Monitor how well clinicians adhere to recommended hand hygiene practices and provide them with feedback about their performance (recommendation 7B, category IA).

• Encourage patients and their families to remind clinicians to decontaminate their hands (recommendation 7C, category II).

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Administrative measures

Hand hygiene won’t be effective unless facilities make it a priority. This will require sufficient funding and enough time for staff to be in-serviced (recommendation 8A, category IB). A facility that chooses to buy fewer dispensers for alcohol-based hand rubs because it’s cheaper or provides little or no time for staff to go through staff-development sessions on hand hygiene is doomed to poor hand hygiene—and the infections and increased costs that will result.

Implementing a multidisciplinary program to improve hand hygiene has been shown to be effective in increasing compliance with hand hygiene recommendations (recommendation 8B, category IB). Hand hygiene is often viewed as the sole domain of infection control professionals, who may develop programs that appeal to them but not to the bedside nurse, physician, or other clinician. Creating a message that’s likely to succeed will happen only if representatives of all groups of clinicians are consulted.

Where and how to store alcohol-based hand rubs and mount dispensers for these solutions can be a
major challenge in the rollout. Environmental services staff need to understand that alcohol-based hand rubs are flammable and therefore must be stored in fire cabinets or in areas approved for flammable materials (recommendation 8E, category IC). Before moving forward, make sure that areas where the dispensers are to be mounted comply with local fire codes.

The major advantage of alcohol-based hand rubs is that they can be made readily available. This advantage must be utilized to its maximum benefit by placing alcohol-based hand rubs at entrances to patient rooms, at the bedside, and at other places where they’d be convenient for clinicians. For good measure, individual pocket-size containers can be provided to the staff (recommendation 8D, category IA). Deciding where to conveniently place alcohol-based hand rubs is best accomplished by looking at the area where the product will be used. This should be done when the area is at its busiest, not when all the patient equipment is gone and the room is empty.

While fire marshals are generally agreeable about placing alcohol-based hand rubs at the entry to patient rooms, at the patient's bedside, and in a clinician's pocket, they are more wary about placing these dispensers in hallways. Check with the local fire marshal before asking staff where they want the dispensers to be placed. Remember, making alcohol-based hand rubs readily accessible is one of the keys to the success of a hand hygiene program (recommendation 8B, category IA), but the facility must also comply with the law.

Despite the concerns about fire and alcohol-based hand rubs, few clinicians have seen a patient die in a fire at a health care facility. Unfortunately, many, many more know patients who died because of poor hand hygiene.

**Performance indicators**

Many managers familiar with performance improvement efforts in health care have heard the phrase “A process monitored is a process improved.” Hand hygiene in health care has been largely unmonitored and is notoriously in need of improvement.

The CDC’s guideline includes an attempt to help health care facilities monitor hand hygiene compliance. Four performance indicators are suggested in Part III of the document; none has an evaluation of the science (category 1A) behind it. That’s because the literature from the field of human behavior and quality improvement isn’t comparable with the literature in the medical research field.

The most common approach to monitoring hand hygiene is to occasionally directly monitor clinicians as they’re giving patient care. For this to effectively improve care, feedback should be given immediately afterward to the individuals being monitored.

This approach has some obvious limitations, such as the availability of staff to do the monitoring, the ethical dilemma of monitoring a behavior that puts a patient at risk and not intervening, and insufficient resources to monitor behavior often enough to change it. A clinician who’s on light or moderate duty because of an injury can be used quite effectively to conduct these observations. This person will be trusted by his or her co-workers, who will be more likely to engage in their regular standard of hand hygiene and to take input from a peer. The light or modified duty clinician will also learn from these observations, making him or her a real advocate for better hand hygiene when returning to normal duty in the unit.

The second suggested approach is to monitor the volume of alcohol-based hand rub, liquid soap, or other hand hygiene product used per 1,000 patient days. This approach uses fewer resources than the direct observation approach, but it also has its limitations. First, a system must be developed to allow for unit-based consumption totals to be monitored. In many hospitals, environmental services pays for all alcohol-based hand rubs or soaps, making it difficult to monitor unit-based consumption. Second, acuity would also impact consumption of hand hygiene products. Lastly, such general information is less likely to drive changes in individual behavior. This data would have to be fed back to the unit quickly so that it could have an impact on the unit’s consumption of hand hygiene products.

Another suggestion is to monitor adherence to policies dealing with artificial nails. Once again, this
requires some resource dedication, but it's probably the easiest to implement. Nevertheless, it must be
done in a collegial fashion. With the nursing shortage showing no signs of abating, losing nurses over
this issue may actually increase infection rates more than the long nails would have.

Lastly, when outbreaks occur, the adequacy of hand hygiene should be evaluated. This is almost
common sense to infection control practitioners, but it's thought to have a real impact on hand
hygiene. Staff can understand the link, and if poor hand hygiene is linked to adverse patient outcomes,
staff are more likely to improve hand hygiene.

And that's what the CDC's new guideline is all about—preventing patient death resulting from poor
hand hygiene.

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