



# Hand Hygiene

## As I continue to write these

Infection Prevention Columns, I find what is common knowledge in the medical community is not easily translated and adapted in the dental community. This month's subject, Hand Hygiene, is no exception.

A comprehensive guideline for Hand Hygiene in Health-Care Settings from the Centers for Disease Control and Prevention (CDC) was published October 25, 2002. This guideline, based on evidence-based practices, is now widely accepted in the medical community but seems to have had a slow start in dentistry. It is interesting to note that what was heralded in the CDC Hand Hygiene guideline was not emphasized in the CDC Guidelines for Infection Control in Dental Health-Care Settings published the following year, December 19, 2003.<sup>1</sup> As dentistry seems to look only to the dental guidelines, we sometimes miss out on other important information that the CDC provides. I have always been impressed with the hand hygiene efforts of dentists. In my observations, dentists are much more likely to practice appropriate hand washing protocol than physicians. So let us look at this subject more closely and see what can be adapted for use in dentistry that will be beneficial for you.

First, let's define hand hygiene. According to the CDC, hand hygiene is "a general term that applies to either

hand washing, antiseptic hand wash, antiseptic hand rub, or surgical hand antisepsis."

## History

As early as 1822, a French pharmacist demonstrated that solutions derived from chlorides could serve as disinfectants and antiseptics. At a Vienna hospital in 1846, women in childbirth

were found to have a higher maternal mortality rate if they were cared for by physicians as compared to women cared for by midwives. Ignaz Semmelweis determined that there was a correlation between the surgeons delivering babies immediately after performing autopsies and a higher mortality. After Semmelweis required physicians to use a chlorine solution between each patient, the maternal mortality rate plummeted.

For over 150 years, studies have been performed with the same conclusion that handwashing is one of the most important ways to prevent the spread of disease pathogens in healthcare facilities. As research determined time after time that handwashing was effective in quelling the spread of infection, disinfectants were rarely applied to the hands between each patient and used only in emergencies or where sinks were not available. Hand washing with soap and water continued to be the standard of care for hand hygiene for virtually the entire 20<sup>th</sup> century. I imagine that the early disinfectants were extremely harsh on the hands and when wearing gloves for invasive patient care became the norm, using hand antiseptics fell into disuse. In the 1970's and 80's CDC guidelines were published for handwashing and recommended washing hands with soap and water, only using

## Learning Objectives

After reading this article, the reader should be able to:

- locate detailed information on evidence-based research and CDC recommendations regarding hand hygiene for healthcare workers;
- identify the fastest, most effective way to clean hands during patient care;
- and list at least three basic elements to consider when selecting a suitable hand hygiene product for patient care.

Turn to page 62 to take your Infection Prevention Quiz for 1.0 CEU!

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an antiseptic hand wash for performing invasive procedures or working on high-risk patients. Government requirements for hospitals and nursing homes continued to emphasize sink placement so that handwashing with soap and water could be performed near to patient care.

The “mature” individuals among us remember the big push to use the antiseptic handwash. For dentistry, however, almost every procedure we did was invasive. A steady use of the antiseptic handwash turned our hands into painful, cracked and bleeding specimens for introducing microorganisms into our bodies. That got old fast for most of us. Even plain old soap and water was very hard on our hands and many suffered from the effects of depletion of lipids and water from our skin. Then as glove use accelerated with the AIDS epidemic, we were told that we had to be very careful about hand lotions. Depending upon the composition of the product it could compromise the integrity of the latex gloves that we were using. Therefore, we had to be careful what we used to soothe our dry hands.

In 1988 and 1995, the Association for Professionals in Infection Control (APIC) published their own hand hygiene guidelines. Recommendations regarding the use of alcohol-based hand rubs were not initiated until the 1995 guidelines. These rubs are not used with water and usually contain 60%-95% ethanol or isopropanol alcohol.

It has been difficult doing research in this arena as there has been much resistance by healthcare professionals to try an alcohol-based product for hand hygiene. After dealing with the antiseptic hand washes of the 70's and 80's, nurses balked at using anything other than soap and water. Even though the soap and water was hard on their hands, it seemed the lesser of two evils. In one prospective study conducted by Elaine Larsen, PhD, a foremost researcher in hand hygiene,

nurses who refused to use the alcohol rub were finally convinced to do so and within one month would not give up the product. They found that their hands were in much better shape than when they used soap and water to clean their hands. This and other studies showed that the rubs were safe and effective.

### Read the Guidelines

In 2002, the CDC published a hand hygiene guideline that was based on recommendations from several infection control entities, including APIC and SHEA, the Society for Healthcare Epidemiology of America, founded by Infectious Disease Physicians. This guideline is well written, comprehensive, summarizes the research and indicates findings that still serve the healthcare community today. Known as the CDC's Guideline for Hand Hygiene in Healthcare Settings, Oct 25, 2002, it can be found at <http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5116a1.htm>

This document (34.5 pages; 56 pages counting the references) is a fairly easy read. It would be well worth your while to read it in its entirety. However, if like most healthcare professionals, your time is limited, I will hit some main points for you from this document.

- The guideline states that alcohol-based hand rubs are the most efficacious agents for reducing the number of bacteria on the hands of healthcare personnel. Antiseptic soaps are the next most

effective and non-antimicrobial soaps are the least effective.

- Research showed that even after hand washing with soap and water, enough bacteria were left on the hands to transmit to patient-care devices.
- Antiseptic handwash products intended for use by Health Care Workers are regulated by the FDA. The process required for product acceptance involves several hand washings with the test material; at certain intervals, results from hand residue are sampled for culture. Surgical hand scrubs are subject to a more rigorous testing over a period of days.
- Alcohols have excellent germicidal activity against gram-positive and gram-negative bacteria including multidrug resistant pathogens such as methicillin-resistant *Staphylococcus aureus* (MRSA) and vancomycin-resistant *enterococci* (VRE), *Mycobacterium Tuberculosis* (TB) and many viruses, including influenza (flu).
- Alcohol based hand rubs do not kill spores. *Clostridium difficile* is a spore. During the treatment of a *C. diff* patient, gloves must be worn. Following glove removal, hand rubs or hand washing should be performed. Fortunately, this is not a common situation in dentistry.
- Historically, surgical staff have been required to scrub for 10 minute in preparation for a surgical procedure. This prolonged scrub can lead to skin damage. Studies have shown that a short 1 to 2 minute scrub with chlorhexidine gluconate or providone-iodine followed by an alcohol-based surgical scrub product is just as effective or more effective in reducing bacteria counts. In this new procedure, the scrub brush also be eliminated; shorter time, less trauma to the skin.



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- Allergic reactions to antiseptic products are many.
- Allergic contact dermatitis associated with alcohol-based hand rubs are uncommon.
- It is not necessary to wash hands between use of alcohol-based hand rubs, but if personnel feel a “build up” of emollients on their hands after repeated use, they may wash their hands with soap and water.

## Office Trials

I introduced an alcohol-based hand rub in my husband’s dental office a few years ago. I have dragged all sorts of infection control products into the practice with which to experiment. Dick and the staff suffered at times when the products were not as they were represented, but I continued to bring more products to the office with high hopes that some would work for us. I was a little concerned with the cost of the hand hygiene product we selected but I pressed on. What I liked

about the product was that there was a small bar on the unit that dispensed the rub in just the right amount necessary to use. To my pleasant surprise, because of the unit dosing, it was months before we had to replace the original containers with refills. My budget was intact. The staff loved it. Their hands were in much better shape as a result. I could not have taken it away from them if I tried. Soap was removed from the operatories and was only available in the lab, kitchen, and bathrooms.

So by now, I hope that I have convinced you that an alcohol rub is worth looking into for use at your office. It is really up to you as to what you choose. Acceptance is very valuable for compliance so include staff in the decision-making process. Here are some points to be considered. We know that the rubs are safe and effective but aesthetics are also important. Try different brands. Use one at least for several days. After use, what is the condition of your skin? Do you like the smell? Do you like the feel? When we were evaluating products at

our office, one product I really wanted to use seemed to feel sticky for an extended period of time. The product we finally selected felt refreshing and dried quickly.

In dentistry, we have to add one more thing, availability. One of the products that I favored I was unable to get through our dental supply representative. Some of the products are not available to the dental community because of the medical supply company division they are placed in. If the dental company does not supply the whole division line, you will not be able to obtain the product from them. You may have to look elsewhere.

Training is always important for a new idea and direction. For staff training, try the CDC Hand Hygiene Interactive Training Course at <http://www.cdc.gov/handhygiene/training/interactiveEducation/>

It is directed at medical healthcare personnel but the handwashing portion can easily be applied to dentistry. The following are excerpts from the course.

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## What’s So Great About Alcohol Hand Rubs?

- Alcohol-based hand rubs (foam or gel) kill more effectively and more quickly than handwashing with soap and water.
- They are less damaging to skin than soap and water, resulting in less dryness and irritation.
- They require less time than handwashing with soap and water.
- Bottles/dispensers can be placed at the point of care so they are more accessible.

Source: CDC Hand Hygiene Interactive Education

## Timelines for Hand Hygiene

- Hand washing: rub hands together at least 15 seconds
- Alcohol-based hand rubs: rub hands together until dry

Source: CDC Hand Hygiene Interactive Education

## Q & A

### When should I use alcohol-based hand rubs?

An alcohol-based hand rub is the preferred method for hand hygiene in all situations, except when your hands are visibly dirty or contaminated.

Source: CDC Hand Hygiene Interactive Education



## How Do I Practice Hand Hygiene Correctly?

### Hand Rub (foam and gel)

- (1) Apply to palm of one hand (the amount used depends on specific hand rub product).
- (2) Rub hands together, covering all surfaces, focusing in particular on the fingertips and fingernails, until dry. Use enough rub to require at least 15 seconds to dry.

### Handwashing

- (1) Wet hands with water.
- (2) Apply soap.
- (3) Rub hands together for at least 15 seconds, covering all surfaces, focusing on fingertips and fingernails.
- (4) rinse under running water and dry with disposable towel.
- (5) Use the towel to turn off the faucet.

### Caveat

Be aware that the products one can obtain at the bulk clubs are not the medical-based products. The medical-based products offer residual antimicrobial activity, have the alcohol percentage required (60-95%) and also have emollients to keep the integrity of the skin intact.

### But Wait... There's More!

With the advent of self-contained water systems with dental units, it significantly reduced the cost of plumbing a dental operatory. Now we have the added incentive to use alcohol-based hand rubs in the operatories, eliminating the need for nearby multiple sinks and further reducing the overall cost of a new operatory. Interesting thought, isn't it?

Source: CDC  
Hand Hygiene  
Interactive  
Education



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<sup>1</sup> J Am Dent Assoc. 2008 Jul;139(7):948-57. Hand hygiene among general practice dentists: a survey of knowledge, attitudes and practices. Myers R, Larson E, Cheng B, Schwartz A, Da Silva K, Kunzel C. <http://jada.ada.org/cgi/content/full/139/7/948>.

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## Remember!

Alcohol-based hand rubs are faster to use and more effective in killing bacteria than soap and water. When you have visible soil on your hands, or know that you do (urine or feces), wash with soap and water to physically remove the debris.

You can use the hand rub the rest of the time. A caveat: it does not work with powdered gloves. The powder cannot be removed by the rub and stays on the hands as an irritant.

And ladies, keep those fingernails short.



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- Which of the following products are the most efficacious agents for reducing the number of bacteria on the hands of healthcare personnel?  
 a. Antiseptic soaps  
 b. Non-antimicrobial soaps  
 c. Alcohol-based hand rubs  
 d. None of the above
- Which United States government agency regulates hand hygiene products for healthcare workers?  
 a. FDA  
 b. CDC  
 c. OSHA  
 d. EPA
- Correctly complete the following sentence: When using alcohol-based hand rubs,  
 a. it is important to remember to wash your hands with soap and water after every 5<sup>th</sup> use.  
 b. it is not necessary to wash hands with soap and water between use.  
 c. be aware of possible allergic reactions.  
 d. be aware that it is not the most efficacious hand hygiene product to use.
- OSHA must approve hand hygiene products before you can use them in the dental office.  
 a. True  
 b. False
- When using soap and water to wash your hands, how long do you rub your hands together?  
 a. 10 seconds  
 b. 15 seconds  
 c. 30 seconds  
 d. one minute
- When using alcohol-based hand rubs to clean your hands, how long should you rub your hands together?  
 a. Until hands are dry  
 b. 30 seconds  
 c. 15 seconds  
 d. 10 seconds
- The advantages of using a surgical alcohol-based hand scrub are:  
 a. Shorter prep time  
 b. Less trauma  
 c. Elimination of the use of a scrub brush  
 d. All of the above
- It is not necessary to involve your staff in the decision-making process of selecting an alcohol-based hand rubs for use, and no training is needed.  
 a. True  
 b. False
- A reason to use alcohol-based hand rubs is:  
 a. The rubs kill more effectively and more quickly than handwashing with soap and water.  
 b. The rubs are less damaging to skin than soap and water, resulting in less dryness and irritation.  
 c. Less time is required for their use.  
 d. All of the above.
- When planning for a dental operator,  
 a. less sinks will be necessary for hand hygiene purposes.  
 b. more sinks will be necessary for hand hygiene purposes.  
 c. alcohol-based hand rubs should be placed in accessible areas for staff use.  
 d. a. and c. only.

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