

CONTAGIOUS COMMENTS

Department of Epidemiology

Hand Hygiene, the how, the why and the when.

Roberta Smith, RN, MSPH

The beginning of hand hygiene:

We all should be aware of why hand hygiene is so important but in history that knowledge has not always been known. An article on hand hygiene would not be complete without starting the introduction with a discussion of the seminal studies by Ignaz Philipp Semmelweis (1818-65). Dr. Semmelweis was one of the first to actually document the correlation between hand hygiene practices and disease transmission. In the 1840s, puerperal or childbirth fever, a bacterial infection of the female genital tract after childbirth, was taking the lives of up to 30% of women who gave birth in hospitals. Women who gave birth at home remained relatively unaffected. As assistant professor on the maternity ward of the Vienna General Hospital, Semmelweis observed that women examined by student doctors who had not washed their hands after leaving the autopsy room had very high death rates. When a colleague who had received a scalpel cut died of infection, Semmelweis concluded that puerperal fever was septic and contagious. He ordered students to wash their hands with chlorinated lime before examining patients; as a result, the maternal death rate was reduced from 12% to 1% in 2 years. Nevertheless, Semmelweis encountered strong opposition from hospital officials and left Vienna in 1850 for the University of Pest. As a professor of obstetrics at the University of Pest Hospital, he enforced antiseptic practices and reduced the death rate from puerperal fever to 0.85%.

Not only was Semmelweis key in starting hand washing as a standard of practice but in 1843, Wendell Holms concluded independently that puerperal fever was spread by the hands of health personnel. These two studies launched one of the most important measures for preventing transmission of pathogens in health-care facilities. Since that time hand hygiene has progressed as a healthcare standard. In 1961, the U.S. Public Health Service developed a training film on how healthcare workers should

properly wash their hands. The first formal guidelines developed by the Centers for Disease Control and Prevention (CDC) were developed in 1975 and 1985.

Today the CDC has extensive guidelines for hand hygiene in health-care settings. As healthcare workers we should understand the black and white connection between hand washing and disease transmission but yet have 30 page documents telling us why and when we need to wash our hands. The Joint Commission uses these CDC hand hygiene recommendations and those of the World Health Organization (WHO) to monitor for hospital hand hygiene compliance. What is remarkable is that even with hundreds of years of history proving the benefits of hand washing and several pages of recommendations on hand washing practices, hand hygiene in many studies show compliance among healthcare workers to be less than 40%.

Hand Hygiene Compliance:

There are many published articles that demonstrate low hand hygiene compliance among healthcare worker staff. Dr. James Todd, et al. published a study that monitored hand hygiene compliance in the neonatal intensive care unit (NICU). In this study, mounted cameras were used in in-patient rooms and the films were reviewed for hand washing compliance. Recorded data was viewed looking for patient contact episodes and then watching the video in reverse for hand hygiene compliance and potential contamination episodes. Nurse, physician, respiratory therapist and parent contacts were all reviewed. Hand washing compliance rates showed 24.7% for nurses, 31.8% for physicians, 20.5% for respiratory therapists, and 6.6% for parents.

There are a multitude of published works that have looked at hand hygiene compliance at many facilities. None of these studies tout 100% compliance. So the question that should be posed is why is there not 100% compliance with a standard of practice that has been evidence based since the 1800's?

The following are some reasons that have been cited why healthcare workers do not wash their hands as often as they should:

- Heavy work loads (too busy)
- Sinks are poorly located
- Skin irritation caused by frequent exposure to soap and water
- Hands not visibly soiled
- Hand washing takes too long.
- Lack of knowledge on when hand hygiene should take place

How can the problems with hand hygiene be overcome?

To help some of these perceived problems with hand hygiene there are some easy solutions that have been researched and recommended by several professional societies along with the CDC. One of these recommendations is the use of alcohol based hand rubs (ABHR) in health care settings. In a study by Voss and Weidmer, the time spent cleansing hands for one nurse per eight hour shift was 56 minutes using soap and water. This was based on seven (60 second) hand washing episodes per hour. When alcohol based hand rub was used, this time for the nurse in the same 8 hour shift decreased to 18 minutes. This was based on seven (20 second) hand rub episodes per hour. Alcohol based hand rubs can reduce the time that is devoted to hand hygiene most definitely.

At the new Children's Hospital we have had some challenges in having ABHR placed but we are responding to the needs and the preferences of each unit. Some of the challenges have been finding appropriate locations that meet code regulations. The design of the hospital has a sink in each patient room and in many of our exam rooms. However,

when compared to soap and water hand washing, ABHRs take less time to use, can be made more accessible than sinks, cause less skin irritation and dryness, and have led to improved hand hygiene compliance.

There is times however when hand washing with soap and water is appropriate. According to the CDC, You should wash your hands with soap and water if:

- hands are visibly soiled (dirty)
- hands are visibly contaminated with blood or body fluids
- before eating
- after using the restroom

If hands are not visibly soiled or contaminated with blood or body fluids, use an alcohol based hand rub for routinely cleaning your hands. The CDC recommendations ⁴ include:

- before having direct contact with patients
- after having direct contact with patients
- after touching equipment or furniture near the patient
- after removing gloves.

Many staff have been confused about hand hygiene and glove use. The recommendations are that hand hygiene is preformed before and after donning **STERILE** gloves. If someone is using **NON-STERILE** gloves, hand hygiene should be performed after their removal.

Gloves should be worn according to the CDC's standard precautions recommendations. This includes:

- Wearing gloves when contact with blood or other potentially infectious body fluids, excretions, secretions (except sweat), mucous membranes, and non-intact skin.
- Removing gloves after caring for a patient (personnel should not wear the same pair of gloves for the care of more than one patient).

- Changing gloves during patient care when moving from a contaminated body site to a clean body site.
- Performing hand hygiene immediately after removal of gloves.

Behavior Change

Studies using behavior change models have been developed to assess the behavior patterns surrounding hand hygiene. These have yielded varying success. In a study by Lankford et. al, it was found that health care workers in a room with a senior (e.g. higher ranking) medical staff person or peer who did not wash hands were significantly less likely to wash their own hands. In a hospital in Geneva, Switzerland, the Theory of Planned Behavior was used as a model to develop a survey to address adherence to hand hygiene. This study used a questionnaire to assess behavioral beliefs, normative beliefs, and control beliefs about hand hygiene among healthcare workers. This study concluded that behavioral beliefs were strongly in favor of hand hygiene (e.g. belief that good hand hygiene could prevent at least 50% of healthcare associated infections). However, the study found that adherence to hand hygiene was driven by peer pressure and the perception of high self-efficacy, rather than by reasoning about the impact that hand hygiene would have on patient safety.



Clean Hands Across Children's Handwashing campaign...have you taken the pledge?

The epidemiology program along with a multi-disciplinary task force from the main hospital and the network of care are working diligently on a hand hygiene campaign that will raise awareness about hand washing. This campaign will engage healthcare workers, patients, and parents to ask questions and to help change our hospital's culture around hand hygiene. Children's hospital staff members will be given a button to wear that states "Ask Me". With this we are hoping that other staff members, patients, and families will be asking about hand hygiene. Response stickers stating "I asked" will be available to acknowledge someone that inquired about hand hygiene. The task force is also encouraging staff members to take a pledge to appropriate hand hygiene. This will raise awareness that hand hygiene should be an integral part of the care of the patients.

Currently hand hygiene compliance is assessed by monthly audits done on units by assigned hand hygiene monitors. In addition, the epidemiology program gathers information on the amount of hand sanitizer and soap that is purchased on a monthly basis. The campaign that will be rolling out for the first quarter 2008 will include having parents asking questions of health care workers if they have washed their hands. With private rooms now it is difficult for a surveyor to follow a provider into a patient room. By having random parents observing for our compliance measures we hope to have a better assessment of patient care.

One study on hand hygiene looked at the Hawthorne effect and its relation to compliance. Briefly, the Hawthorne effect is an increase in output or accomplishment by the mere fact of being under observation. Simply, when a person is observed for a behavior such as hand hygiene they will do it correctly if being observed. In a study by Eckmanns et al., the Hawthorne effect showed a 55% increase of compliance with overt observation. Other studies have found similar results and thus using an auditing tool may give a higher compliance rate than what is the actual. It is because of this reason that many modalities need to be used to measure compliance.

Drastic measures...or not?

In October 2007, Medscape Medical News published a story about Cedars-Sinai Medical Center in Los Angeles, California and their hand hygiene campaign. The hospital had set a goal of achieving 90% compliance by March of 2005 and sustaining that rate for 3 months. A hospital- wide campaign was initiated with many of the same concepts that our hospital campaign is planning on using. By January, compliance in the hospital was 75% and to 86% in March. Nurses at Cedars-Sinai led the way with a compliance of 90%. For physicians, compliance never went above 69%. In an attempt to educate the physician staff, at a physician committee lunch meeting 20 physicians were asked to submit to unannounced cultures of their hands. The results were then displayed at the next meeting of the committee. This had a profound effect on compliance. This same hospital went to the extreme and actually had a physician's privileges suspended after repeated isolation violations among which included hand hygiene. Albeit with these events and word spreading among the physicians, the compliance among the physicians improved but fell short of the 90% goal.

Hand hygiene is not a very complex technique in itself. You clean your hands and you reduce your transmission of organisms. Maybe more motivators or hand hygiene role models are needed to drive home this message. If we think to ourselves how many people, surfaces, and objects that we touch on a daily basis maybe the behavior of hand hygiene might change. Alcohol hand rub is quick and easy. Saving lives is literally in your hands!

If you have any questions or would like to become a part of the hand hygiene task force please contact Roberta Smith at 720-777-6508 or smith.roberta@tchden.org

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Department of Epidemiology

EDITOR:

Melissa Gray, Staff Assistant III
The Children's Hospital, Dept. of Epidemiology, B-276
13123 E. 16th Avenue, Aurora, CO 80045
Phone: 720-777-6072; FAX: 720-777-7293

Gray.melissa@tchden.org
<http://www.thechildrenshospital.org>

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