# Continuing Education Material:

# HAND HYGIENE

OVERVIEW OF CDC GUIDELINES

ABP, LLC

# HAND HYGIENE

## OBJECTIVES

1. Discuss the importance of hand hygiene.
2. Review definitions associated with handhygiene.
3. Explain CDC guidelines for hand decontamination and handwashing.

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# HAND HYGIENE IN HEALTHCARE

## OVERVIEW

Hand hygiene is not a new concept. As far back as the 1800s pharmacists and physicians did studies which revealed that physicians and other persons attending patients with contagious diseases would benefit from moistening their hand with a liquid chloride solution. Handwashing has gradually become accepted as one of the most important measures for preventing the transmission of pathogens in healthcare facilities. In 1975 and 1985, CDC published formal written guidelines on handwashing practices. These guidelines recommended handwashing with non-antimicrobial soap between patient contacts and washing with antimicrobial soap before and after performing invasive procedures or caring for patients at high risk. Use of waterless antiseptic agents was recommended only in situations when sinks were not available.

CDC estimates that each year nearly 2 million patients in the United States acquire nosocomial infection in hospitals, and about 90,000 of these patients die as a result of their infection. Clean hands are the single most important factor in preventing the spread of pathogens and antibiotic resistance in healthcare settings. The most recent studies have shown that healthcare associated infection rates were lower when antiseptic handwashing was performed by personnel and went down when adherence to recommended hand hygiene practices improved.

## BACTERIAL SKIN FLORA

Normal skin is "colonized" with bacteria. People who carry bacteria without evidence of infection, i.e. fever and increased WBC count, are 'colonized.' If an infection develops, it is usually from bacteria that colonize patients. Bacteria that colonize patients can be transmitted from one patient to another by the hands of healthcare workers. Bacteria can be transmitted even if the patient is not infected. **Transient flora**, which colonize the superficial layers of the skin, are more amenable to removal by routine handwashing. Healthcare workers often acquire transient flora during direct contact with patients or contact with contaminated environmental surfaces within close proximity of the patient. Transient flora are the organisms most frequently associated with healthcare – associated infections. **Resident flora**, which are attached to deeper layers of the skin, are more resistant to removal. In addition, resident flora, i.e. coagulase-negative staphylococci and diphtheroids, are less likely to be associated with such infections. Up to 41% of healthcare worker's hands sampled after patient care and before hand hygiene were positive for VRE (Vancomycin-resistant enterococci). VRE survived on a countertop for up to 7 days.

## REASONS FOR POOR HAND HYGIENE BY HEALTHCARE WORKERS

It is estimated that the overall adherence rates to hand hygiene procedures by healthcare workers is about 40%. Healthcare workers cite the following reasons for not washing their hands:

- Handwashing agents cause irritation and dryness
- Sinks are inconveniently located
- There are a lack of accessible sinks
- Lack of soap and paper towels
- Too busy and/or not enough time to wash hands
- Understaffed/overcrowded
- Patient needs come first
- Believe that there is a low risk of acquiring infections from pateints

Lack of knowledge of guidelines/protocols, forgetfulness and disagreement with the recommendations were also self-reported factors for poor adherence with hand hygiene.

## DEFINITIONS ASSOCIATED WITH HAND HYGIENE

- **alcohol-based hand rub –** an alcohol containing preparation designed for application to the hands to reduce the number of microorganisms on the hands – usually contain 60 – 95% ethanol or isopropanol.
- **antimicrobial soap –** soap that contains an antiseptic agent.
- **antiseptic agent –** antimicrobial substances that are applied to the skin to reduce the number of microbial flora. Examples: alcohols, chlorhexidine, chlorine, idodophors, quaternary ammonium compounds and triclosan.
- **antiseptic handwash –** washing hands with an antiseptic agent.
- **antiseptic hand rub –** applying an antiseptic hand rub product to all surfaces of the hands to reduce the number of microorganisms present.
- **decontaminate hands –** reducing bacterial counts on hands by performing antiseptic hand rub or antiseptic handwash.
- **detergents –** compounds that possess a cleaning action.
- **hand antisepsis** – refers to either antiseptic handwash or antiseptic hand rub.
- **hand hygiene** – a general term that applies to handwashing, antiseptic handwash, antiseptic hand rub or surgical hand antisepsis.
- **handwashing** – washing hands with plain (non-antimicrobial) soap and water
- **nosocomial infection** – an infection acquired in a hospital or other healthcare facility after admission.
- **plain soap** – detergents that do not contain antimicrobial agents or contain very low concentrations of antimicrobial agents that are effective solely as preservatives.
- **surgical hand antisepsis** – antiseptic handwash or antiseptic hand rub performed preoperatively by surgical personnel to eliminate transient bacteria and reduce resident hand flora. Antiseptic detergent preparations often have persistent antimicrobial activity.
- **visibly soiled hands** – hands showing visible dirt or visibly contaminated with proteinaceous body substances, i.e. blood, fecal material, urine.
- **waterless antiseptic agent** – an antiseptic agent that does not require the use of exogenous water; the hands are rubbed together until the agent has dried.

## EVIDENCE OF TRANSMISSION OF PATHOGENS ON HANDS

Transmission of healthcare associated pathogens from one patient to another via the hands requires the following sequence of events:

1 – Organisms present on the patient's skin, or that have been shed onto inanimate obejcts in close proximity to the patient, must be transferred to the hands of healthcare workers.

2 – These organisms must then be capable of surviving for at least several minutes on the hands of personnel.

3 – Next, handwashing or hand antisepsis by the worker must be inadequate or omitted entirely, or the agent used for hand hygiene must be inappropriate.

4 – Finally, the contaminated hands of the caregiver must come in direct contact with another patient, or with an inanimate object that will come into direct contact with the patient.

**The single most important reason for healthcare workers to practice good hand hygiene is to prevent the spread of nosocomial infections in healthcare settings.**

## INDICATIONS FOR HAND HYGIENE

When hands are visibly dirty, contaminated, or soiled, wash with non-antimicrobial or antimicrobial soap and water. If hands are not visibly soiled, use an alcohol-based hand rub for routinely decontaminating hands. Perform hand hygiene before patient contact, before putting on gloves when inserting a CVC, inserting urinary catheters, peripheral vascular catheters or other invasive devices that do not require surgery. Perform hand hygiene after contact with a patient's skin, after contact with body fluids or excretions, non-intact skin or wound dressings and always after removing gloves. Always wash hands before eating, after using the restroom, or when exposure to the anthrax bacillus is proven or suspected.

## CDC RECOMMENDATIONS

CDC identifies two effective procedures for hand hygiene – hand decontamination and hand washing – with specific recommendations for each.

**Hand decontamination** is defined as cleaning your hands with an alcohol-based antiseptic. Alcohol removes germs rapidly and slows bacterial regrowth. CDC studies indicate that alcohol-based skin decontamination is more effective than soap and water. Alcohol-based antiseptics are available in rinses, gels and foams. Some gels can leave a residue after five to ten applications. Washing with soap and water at that point solves the problem.

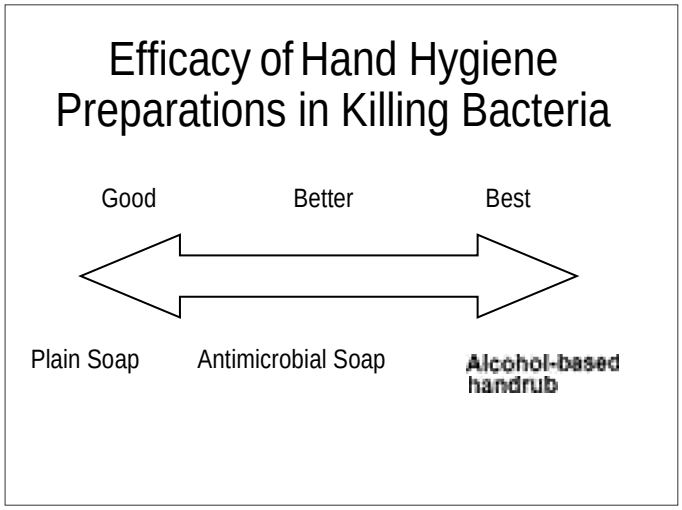
Procedure:
- →apply the recommended amount to one of your palms;
- →vigorously rub your hands together, spreading the solution thoroughly over both, particularly around nail beds and under jewelry;
- →continue until your hands are completely dry because un-evaporated alcohol can be ignited by static electricity;
- →remember to store products away from heat or flame

Handwashing can be done with a plain, non-abrasive soap or with an antimicrobial soap.

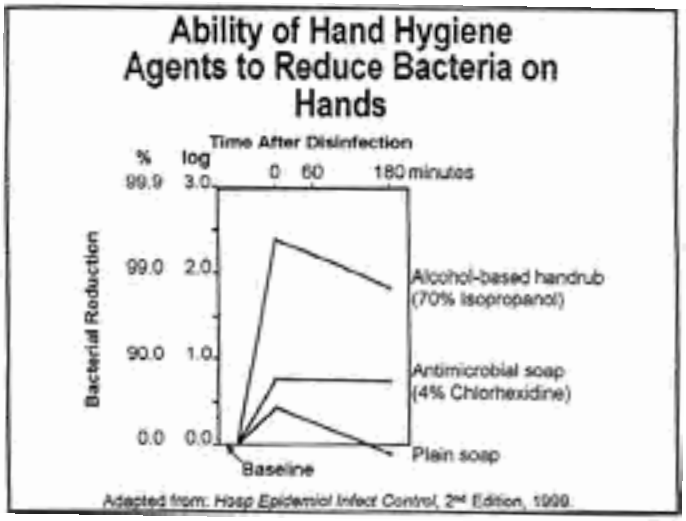
Procedure:
- →thoroughly wet your hands with warm running water – never hot water;
- →lather up using the amount of soap recommended by the manufacturer;
- →vigorously rub your lathered hands together for 15 seconds, and be sure to include all parts of your hands and wrists;
- →minimize splashes and do not touch the sink;
- →rinse thoroughly under a stream of running water to flush away dirt and debris;
- →point hands and fingers DOWNWARD so dirty water runs into the sink;
- →pat hands completely with a clean, disposable towel;
- →use another dry towel to turn off the faucet to avoid hand recontamination

*One precaution – never top off a partially empty soap container, because of the potential for bacterial contamination of the soap.

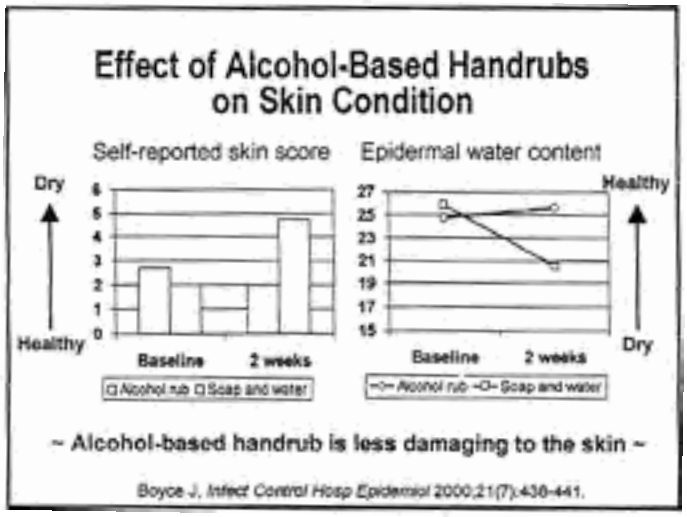
When evaluating hand hygiene products consider the relative efficacy of antiseptic agents against various pathogens as well as the acceptability of the products by personnel. Such things as smell, consistency, color and whether or not it irritates the skin or causes dryness can affect product acceptance. Easy access to the product is essential for acceptance and use. Dispenser systems should function adequately and deliver an appropriate volume of product.



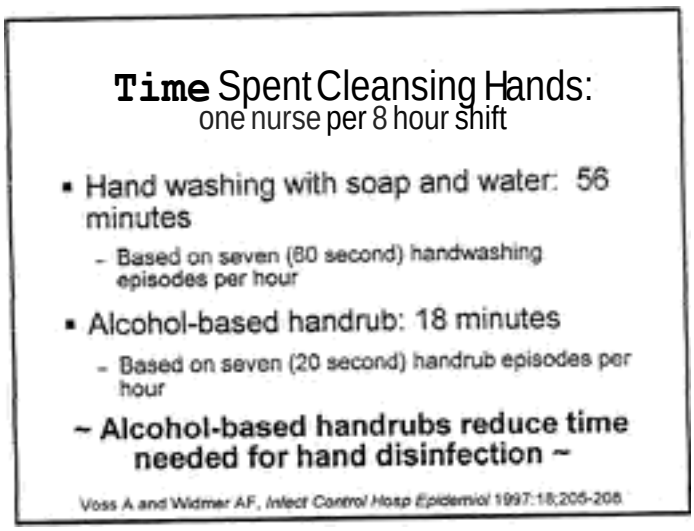

Plain soap is good at reducing bacterial counts but antimicrobial soap is better, and alcohol-based hand rubs are the best.




This graph shows that alcohol-based hand rub is better than handwashing at killing bacteria.




Participants using soap and water reported a significant increase in dryness, cracking, and irritation after 2 wks., while those that used the alcohol-based hand rub reported improvement in skin dryness.




Alcohol-based hand rubs may be a better option than traditional soap and water or antiseptic handwashing because the rubs require less time, act faster, and irritate hands less often.

## SURGICAL HAND ANTISEPSIS

Surgical personnel preoperatively to eliminate transient bacteria and reduce resident hand flora perform antiseptic hand rub or handwash. In the past, strict procedures required 10 minutes of preoperative scrubbing with a brush or sponge and antimicrobial soap.

Recent studies by CDC have shown that 5 minutes of scrubbing is equally effective in reducing bacterial levels. When the scrub is immediately followed by an alcohol-based rub, that period drops to just 2 minutes. There is no indication that brushes are even necessary when an alcohol-based rub is used. Brushless scrubs are less damaging to the skin and they avoid the bacterial shedding often caused by brushes.

Always make sure to remove rings, watches and other jewelry prior to the scrub or the rub. Clean fingernails with a nail cleaner under running water to remove debris.

If you elect to use an alcohol-based surgical scrub, it should contain a broad-spectrum, fasts-acting, persistent antiseptic to reduce the survival or multiplication of skin microorganisms.

## HAND HYGIENE AND GLOVES

It is more important than ever to use hand hygiene when wearing gloves. Hand decontamination is required before and after each use. Hands sweat when wearing gloves and this creates a nice dark, warm, moist environment for microorganisms already on your hands. Also gloves can tear and allow organisms to pass through to you or to pass through from you to the patient.

When removing gloves grasp one glove and peel it from top to bottom. Then with the exposed hand, repeat the procedure on the other gloved hand, tucking the first glove inside the second. Never allow the outside of the gloves to touch your skin. Discard immediately and then decontaminate your hands.

## FINGERNAILS AND ARTIFICIAL NAILS

Numerous studies have shown that even after handwashing, healthcare workers harbor high concentrations of bacteria in the subungual (under the nail) areas of the hand. Nail tips should be kept at ¼ inch length and of neutral color. A growing amount of evidence also has indicated that wearing artificial nails has contributed to the transmission of pathogens in the healthcare setting. Artificial nails are more likely to harbor gram negative pathogens, i.e. *Pseudomonas*, on their fingertips than those who have natural nails, both before and after handwashing. Artificial nails pose a significant risk of causing nosocomial infections in patients, especially those of high risk.

## DERMATITIS AND HAND HYGIENE

Chronic, irritant contact dermatitis is a by-product of conscientious hand hygiene. Healthcare workers may wash their hands up to 50 times per shift. Up to 85% of workers report a history of hand problems. Studies indicate that staph and gram negative bacilli more frequently colonize damaged skin. Use approved hand lotions, i.e. oil free or latex compatible, to decrease skin damage. Alcohol-based rubs with emollients show dramatic improvement in skin condition.

**Practicing good hand hygiene is a professional responsibility to you, your family, and patients!**

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**REFERENCES:**

1. Guideline for Hand Hygiene in Health-care Settings. MMVR 2002; vol 51, no RR-16

2. www.cdc.gov/handhygiene

# HAND HYGIENE – Self-Assessment Quiz

Please place all answers on the Continuing Education Registration Form.
Mail form to ABP LLC to be graded so that you can get your P.A.C.E. certificate.

1. What number of hospital patients acquire nosocomial infections each year?
   a. 90,000 b. 500,000 c. 1 million d. 2 million

2. Bacteria that colonize the superficial layers of the skin are referred to as:

   a. transient flora
   b. diphtheroids
   c. coagulase negative staphylococcus
   d. resident flora

3. The adherence to hand hygiene procedures by healthcare workers is about:

   a. 20% b. 30% c. 40% d. 60%

4. Which of the following is not an antiseptic agent?

   a. plain soap
   b. 70% isopropyl alcohol
   c. idophors
   d. triclosan

5. Cleaning your hands with an alcohol-based antiseptic rub is called:

   a. handwashing
   b. nosocomial hand rub
   c. hand decontamination
   d. antimicrobial hand wash

6. It is important to continuously top off soap containers so that they remain full at all times.

   a. True b. False

7. Preoperative scrubbing followed immediately by an alcohol-based rub drops the time to:

   a. 5 mins. b. 2 mins. c. 1 min. d. 30 secs.

8. Subungual areas of the hand are located:

   a. on the palmar surface
   b. under the nails
   c. on the dorsal surface
   d. at the fingertips

9. Handwashing is 50% more effective than using an alcohol-based hand rub for killing bacteria.

   a. True b. False

10. The best temperature to use for handwashing is:

    a. cold b. warm c. hot d. any temperature