

# Hand hygiene: a commonly missed lifesaving opportunity during patient care

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## Abstract

Health care-associated infections constitute one of the greatest challenges of modern medicine. Despite compelling evidence that proper hand washing can reduce the transmission of pathogens to patients and the spread of antimicrobial resistance, the adherence of health care workers to recommended hand-hygiene practices has remained unacceptably low. One of the key elements in improving hand-hygiene practice is the use of an alcohol-based hand rub instead of washing with soap and water. An alcohol-based hand rub requires less time, is microbiologically more effective, and is less irritating to skin than traditional hand washing with soap and water. Therefore, alcohol-based hand rubs should replace hand washing as the standard for hand hygiene in health care settings in all situations in which the hands are not visibly soiled. It is also important to change gloves between each patient contact and to use hand-hygiene procedures after glove removal. Reducing health care-associated infections requires that health care workers take responsibility for ensuring that hand hygiene becomes an everyday part of patient care.

**Keywords:** hygiene.

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## INTRODUCTION

For many years skin hygiene, particularly of the hands has been accepted as a primary mechanism to control the spread of infectious agent. But hand hygiene awareness started growing exponentially since the early 20<sup>th</sup> century. In 1938, Price established that bacteria recovered from the hands could be divided into two categories, namely resident or transient. The resident flora (resident microbiota) consists of microorganisms residing under the superficial cells of the stratum corneum and can also be found on the surface of the skin. Staphylococcus epidermidis is the dominant species, and oxacillin resistance is extraordinarily high, particularly among

health care workers (HCWs). Other resident bacteria include *S. hominis* and other coagulase-negative staphylococci, followed by *coryneform* bacteria (*propionibacteria*, *corynebacteria*, *dermobacteria*, and *micrococci*). Among fungi, the most common genus of the resident skin flora, when present, is *Pityrosporum* (*Malassezia*). So hand hygiene is very important in HCWs.<sup>1</sup> The new CDC Hand Hygiene Guidelines have been official since October, 2002.<sup>2</sup>

## HAND ASEPSIS – SOME IMPORTANT FACTS

1. About 88% of disease transmission occurs through hand contact. So there is a proverb which says “Hygiene is <sup>2</sup>/<sub>3</sub> of health”. It is most current public health threat. Severe acute respiratory syndrome (SARS) focused attention on the success of following recommendations to wash hands or use alcohol sanitizers to prevent transmission. Over the last 20 years, an alarming incidence of nosocomial infections has been reported.
  - a. ‘Poor hand hygiene practices’ was determined to be a major cause.

- b. Hospital studies between 2005 and 2009 show that on an average, compliance to hand washing protocol was less than 40%.
  2. Soap and water is important for cleaning, but fails as the only protocol to prevent cross-contamination.
  3. Recommended hand washing practices have failed due to:
    - a. Infrequent washing
    - b. Short hand washing times
    - c. Inconvenient or unavailable sink locations
    - d. Lack of awareness when cross-contamination exposure occurs
    - e. Misconception that using gloves reduces the need for hand asepsis
    - f. Skin sensitivity to soap, antimicrobials and water discourage compliance
  4. Cleaning vs. microbial kill: The new recommendations separate hand cleaning (washing with soap and water to remove debris) from skin antiseptics (killing or inactivating pathogens).
    - a. Organisms hide in debris
    - b. Cleaning is necessary prior to skin antiseptics
    - c. Alcohol skin sanitizers are not recommended for hands contaminated with debris
  5. Soap and water are still recommended when hands are soiled. Wash with soap and water using nonantimicrobial or antimicrobial soap when hands are visibly soiled, before and after eating, after using a restroom, and if exposure to *Bacillus anthracis* is suspected or proven.
  6. Alcohol based hand rubs are recommended because they:
    - a. Reduce bacterial counts more effectively than plain or anti-microbial soaps.
    - b. Can be made more accessible than sinks and other hand washing facilities
    - c. Require less time to use.
    - d. Cause less skin irritation and dryness than washing hands with soap and water.
- a) Inaccessible sinks
  - b) Lack of training and communication about hand hygiene protocol
  - c) Absence of enforcement of hand hygiene policy
  - d)  Problems common in both medicine and dentistry:
  - e) Failure to wash between patients
  - f) Short hand washing times
  - g) Lack of awareness when cross-contamination exposure occurs
  - h) Misconception that using gloves reduces the need for hand asepsis
  - i) Skin sensitivity to soap, antimicrobials and water. (Workers avoid hand washing.)

Knowing when to wash and when to use a high alcohol sanitizer (such as VioNexus): High alcohol rubs are meant to replace many of the daily hand washes, but not all. Because non-visible debris such as saliva is common in dentistry, hands should be washed when clinicians are aware of probable exposure to contaminants, not just when hands are visibly soiled. All debris, even invisible debris, should be washed off. Following indications and guidelines are given for proper hand hygiene decision-making. Hands must be decontaminated.<sup>3</sup>

The choice of using alcohol based hand rub, antimicrobial soap or surgical hand preparation is based on:<sup>3</sup>

- The degree of hand contamination
- The degree of activity which requires less or reduced bio burden
- Transmission
- Hands should be washed after contact with any substance, visible or non-visible, that “soils” the skin, because bio-burden compromises the effectiveness of alcohol’s antimicrobial action.
- Clinicians hands often do not need to be cleaned, but do need to be decontaminated.
- Alcohol hand rubs replace many “token” hand-washes that are often performed too quickly to truly remove microbes.
- Dental workers should use common sense and professional judgment to decide when to wash their hands and when to use no-rinse rubs. When alcohol rubs are used, some prefer to wash at intervals to remove any unseen debris, or build-up of residue from some alcohol products. The residue is from the emollient and anti-microbial agents added to persist activity after the alcohol evaporates. VioNexus emollient is compatible with latex, a great advantage.<sup>4</sup>

## PROBLEMS IN HOSPITAL SETTING

Research for the new guidelines studied cross-contamination in hospitals. Implementing the guidelines to dental settings requires addressing the differences between dental and hospital clinical practices. Common problems in hospitals and perhaps large dental clinics, but not applicable to many dental settings:

## CDC RECOMMENDATIONS

1. Wash with soap and water using non-antimicrobial or antimicrobial soap:

- a. When hands are visibly soiled
  - b. Before eating
  - c. After using a restroom
  - d. If exposure to *Bacillus anthracis* is suspected or proven.
2. Use an alcohol-based hand rub for routinely decontaminating hands in all other clinical situations [Alternatively, (second choice) washing with soap and water is recommended]:
- a. Before having direct contact with patients
  - b. Before donning sterile gloves when inserting a central intravascular catheter
  - c. Before inserting indwelling catheters and other invasive devices that do not require a surgical procedure
  - d. After contact with a patient's intact skin
  - e. After contact with body fluids or excretions, mucous membranes, non-intact skin, and wound dressings if hands are not visibly soiled
  - f. If moving from a contaminated-body site to a clean-body site during patient care
  - g. After contact with inanimate objects (including medical equipment in the immediate vicinity of the patient).
  - h. After removing gloves

Gentle, non-antimicrobial soaps are recommended for use in conjunction with alcohol hand sanitizers. Use of antimicrobial soaps can be considered overkill, and increases the probability of unnecessary skin damage.

- a) The Previous CDC guideline recommended hand washing with non-antimicrobial soap between the majorities of 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 (alcohol based solutions) was recommended only when soap and water were not available.
- b) Many state regulations state that workers should follow CDC Guidelines, even though their OSHA document (Occupational Safety and Health Administration) wording has not been updated yet. That clause can help guide workers to integrate alcohol waterless products into their daily routine, while still washing their hands when appropriate.
- a) The bottom line is to do what is scientifically sound, and to meet professional standards. Now that the CDC guideline is adopted and it has

appeared in professional literature, it can be considered current professional IP standard.

#### Chlorxylenol:<sup>5</sup>

- Chlorxylenol has been used in a variety of antimicrobial soaps including surgical scrubs, preoperative preparations and handwashes.
- It is a stable biocide; it shows good skin penetration and can remain persistent on the skin for a number of hours following application to provide a further bacteriostatic and fungistatic barrier.
- It is nontoxic at the concentrations typically used. Though it has a skin penetrating action, it is seldom, known to cause skin irritation or sensitivity.

Recent research, has demonstrated that **Alcohol Based Hand Rubs (ABHRs)** are better than traditional soap and water because they:

- Require less time to use
- Result in a significantly greater reduction in bacterial numbers than soap and water in many clinical situations
- Cause less irritation to the skin Can be made readily accessible to HCWs
- Are more cost effective

## KEY RECOMMENDATIONS

### WHY?

Thousands of people die every day around the world from infections acquired while receiving health care.

- Hands are the main pathways of germ transmission during health care.
- Hand hygiene is therefore the most important measure to avoid the transmission of harmful germs and prevent health care-associated infections.

### WHO?

- Any health-care worker, caregiver or person involved in direct or indirect patient care needs to be concerned about hand hygiene and should be able to perform it correctly and at the right time.

### HOW? (See Fig.1)

- Clean your hands by rubbing them with an alcohol-based formulation, as the preferred mean for routine hygienic hand antisepsis if hands are not visibly soiled.
- It is faster, more effective, and better tolerated by your hands than washing with soap and water.
- Wash your hands with soap and water when hands are visibly dirty or visibly soiled with blood or other body fluids or after using the toilet.

- If exposure to potential spore-forming pathogens is strongly suspected or proven, including outbreaks of *Clostridium difficile*, hand washing with soap and water is the preferred means.



Figure 1: Steps of Hand Rub

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