GUIDELINE FOR HAND HYGIENE IN HEALTH-CARE SETTING
RECOMMENDATIONS OF THE HEALTHCARE INFECTION CONTROL PRACTICES
ADVISORY COMMITTEE AND THE HICPAC/SHEA/APIC/IDSA HAND HYGIENE
TASK FORCE

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Regarding Hand Hygiene
Historical Perspective

For generations, handwashing
with soap and water has been
considered a measure of
personal hygiene. The concept of cleansing
hands with an antiseptic agent probably emerged
in the early 19th century. As early as 1822, a
French pharmacist demonstrated that solutions
containing chlorides of lime or soda could
eradicate the foul odors associated with human
corpse and that such solutions could be used as
disinfectants and antiseptics. In a paper
published in 1825, this pharmacist stated that
physicians and other persons attending patients
with contagious diseases would benefit from
moistening their hands with a liquid chloride
solution.

In 1846, Ignaz Semmelweis observed that
women whose babies were delivered by students
and physicians in the First Clinic at the General
Hospital of Vienna consistently had a higher
mortality rate than those whose babies were
delivered by midwives in the Second Clinic. He
noted that physicians who went directly from the
autopsy suite to the obstetrics ward had a
disagreeable odor on their hands despite
washing their hands with soap and water upon
entering the obstetrics clinic. He postulated that
the puerperal fever that affected so many
parturient women was caused by "cadaverous
particles" transmitted from the autopsy suite to
the obstetrics ward via the hands of students and
physicians. Perhaps because of the known
deodorizing effect of chlorine compounds, as of May 1847, he insisted that students and physicians clean their hands with a chlorine solution between each patient in the clinic. The maternal mortality rate in the First Clinic subsequently dropped dramatically and remained low for years. This intervention by Semmelweis represents the first evidence indicating that cleansing heavily contaminated hands with an antiseptic agent between patient contacts may reduce health-care-associated transmission of contagious diseases more effectively than handwashing with plain soap and water.

In 1843, Oliver Wendell Holmes concluded independently that puerperal fever was spread by the hands of health personnel. Although he described measures that could be taken to limit its spread, his recommendations had little impact on obstetric practices at the time. However, as a result of the seminal studies by Semmelweis and Holmes, handwashing gradually became accepted as one of the most important measures for preventing transmission of pathogens in health-care facilities. In 1961, the U.S. Public Health Service produced a training film that demonstrated handwashing techniques recommended for use by health-care workers (HCWs). At the time, recommendations directed that personnel wash their hands with soap and water for 1-2 minutes before and after patient contact. Rinsing hands with an antiseptic agent was believed to be less effective than handwashing and was recommended only in emergencies or in areas where sinks were unavailable.

In 1975 and 1985, formal written guidelines on handwashing practices in hospitals were published by CDC. These guidelines recommended handwashing with nonantimicrobial soap between the majority 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 (e.g., alcohol-based solutions) was recommended only in situations where sinks were not available.

In 1988 and 1995, guidelines for handwashing and hand antisepsis were published by the Association for Professionals in Infection Control (APIC). Recommended indications for handwashing were similar to those listed in the CDC guidelines.

The 1995 APIC guidelines included more detailed discussion of alcohol-based hand rubs and supported their use in more clinical settings than had been recommended in earlier guidelines. In 1995 and 1996, the Healthcare Infection Control Practices Advisory Committee (HICPAC) recommended that either antimicrobial

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**BOX 1. Factors influencing adherence to hand hygiene practices**

**Observed risk factors for poor adherence to recommended hand-hygiene practices**
- Physician status (rather than a nurse)
- Nursing assistant status (rather than a nurse)
- Male sex
- Working in an intensive-care unit
- Working during the week (versus the weekend)
- Wearing gowns/gloves
- Automated sink
- Activities with high risk of cross-transmission
- High number of opportunities for hand hygiene per hour of patient care

**Self-reported factors for poor adherence with hand hygiene**
- Handwashing agents cause irritation and dryness
- Sinks are inconveniently located / shortage of sinks
- Lack of soap and paper towels
- Often too busy / insufficient time
- Understaffing / overcrowding
- Patient needs take priority
- Hand hygiene interferes with health-care worker relationships with patients
- Low risk of acquiring infection from patients
- Wearing of gloves / believes that glove use obviates the need for hand hygiene
- Lack of knowledge of guidelines / protocols
- Not thinking about it / forgetfulness
- No role model from colleagues or superiors
- Skepticism regarding the value of hand hygiene
- Disagreement with the recommendations
- Lack of scientific information of definitive impact of improved hand hygiene on health-care-associated infection rates

**Additional perceived barriers to appropriate hand hygiene**
- Lack of active participation in hand hygiene promotion at individual or institutional level
- Lack of role model for hand hygiene
- Lack of institutional priority for hand hygiene
- Lack of administrative sanction of noncompliers / rewarding compliers
- Lack of institutional safety climate

Guideline for hand hygiene in health care setting

Soap or a waterless antiseptic agent be used for cleaning hands upon leaving the rooms of patients with multidrug-resistant pathogens (e.g., vancomycin-resistant enterococci (VRE) and methicillin-resistant Staphylococcus aureus (MRSA). These guidelines also provided recommendations for handwashing and hand antisepsis in other clinical settings, including routine patient care. Although the APIC and HICPAC guidelines have been adopted by the majority of hospitals, adherence of HCWs to recommended handwashing practices has remained low.

Recent developments in the field have stimulated a review of the scientific data regarding hand hygiene and the development of new guidelines designed to improve hand hygiene practices in health-care facilities. This literature review and accompanying recommendations have been prepared by a Hand Hygiene Task Force, comprising representatives from HICPAC, the Society for Healthcare Epidemiology of America (SHEA), APIC, and the Infectious Diseases Society of America (IDSA).

Current Recommendations

These recommendations are designed to improve hand hygiene practices of HCWs and to reduce transmission of pathogenic microorganisms to patients and personnel in healthcare settings. This guideline and its recommendations are not intended for use in food processing or food-service establishments.

As in previous CDC/HICPAC guidelines, each recommendation is categorized on the basis of existing scientific data, theoretical rationale, applicability, and economic impact. The CDC/HICPAC system for categorizing recommendations is as follows:

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 regulation or standard.

Category II. Suggested for implementation and supported by suggestive clinical or epidemiologic studies or a theoretical rationale.

No recommendation. Unresolved issue. Practices for which insufficient evidence or no consensus regarding efficacy exist.

1. Indications for handwashing and hand antisepsis

A. When hands are visibly dirty or contaminated with proteinaceous material or are visibly soiled with blood or other body fluids, wash hands with either a non-antimicrobial soap and water or an antimicrobial soap and water (IA).

B. If hands are not visibly soiled, use an alcohol-based hand rub for routinely decontaminating hands in all other clinical situations described in items IC-J (IA). Alternatively, wash hands with an antimicrobial soap and water in all clinical situations described in items (IB).

C. Decontaminate hands before having direct contact with patients (IB).

D. Decontaminate hands before donning sterile gloves when inserting a central intravascular catheter (IB).

E. Decontaminate hands before inserting indwelling urinary catheters, peripheral vascular catheters, or other invasive devices that do not require a surgical procedure (IB).

F. Decontaminate hands after contact with a patient’s intact skin (e.g., when taking a pulse or blood pressure, and lifting a patient) (IB).

G. Decontaminate hands after contact with body fluids or excretions, mucous membranes, nonintact skin, and wound dressings if hands are not visibly soiled (IA).

H. Decontaminate hands if moving from a contaminated-body site to a clean-body site during patient care (II).

I. Decontaminate hands after contact with inanimate objects (including medical equipment) in the immediate vicinity of the patient (II).

J. Decontaminate hands after removing gloves (IB).

K. Before eating and after using a restroom, wash hands with a non-antimicrobial soap and water or with an antimicrobial soap and water (IB).

L. Antimicrobial-impregnated wipes (i.e., towelettes) may be considered as an
alternative to washing hands with non-antimicrobial soap and water. Because they are not as effective as alcohol-based hand rubs or washing hands with an antimicrobial soap and water for reducing bacterial counts on the hands of HCWs, they are not a substitute for using an alcohol-based hand rub or antimicrobial soap (IB).

M. Wash hands with non-antimicrobial soap and water or with antimicrobial soap and water if exposure to Bacillus anthracis is suspected or proven. The physical action of washing and rinsing hands under such circumstances is recommended because alcohols, chlorhexidine, iodophors, and other antiseptic agents have poor activity against spores (II).

N. No recommendation can be made regarding the routine use of nonalcohol-based hand rubs for hand hygiene in healthcare settings. Unresolved issue.

2. Hand hygiene technique
A. When decontaminating hands with an alcohol-based hand rub, apply product to palm of one hand and rub hands together, covering all surfaces of hands and fingers, until hands are dry (IB). Follow the manufacturer’s recommendations regarding the volume of product to use.

B. When washing hands with soap and water, wet hands first with water, apply an amount of product recommended by the manufacturer to hands, and rub hands together vigorously for at least 15 seconds, covering all surfaces of the hands and fingers. Rinse hands with water and dry thoroughly with a disposable towel. Use towel to turn off the faucet (IB). Avoid using hot water, because repeated exposure to hot water may increase the risk of dermatitis (IB).

C. Liquid, bar, leaflet or powdered forms of plain soap are acceptable when washing hands with a non-antimicrobial soap and water. When bar soap is used, soap racks that facilitate drainage and small bars of soap should be used (II).

D. Multiple-use cloth towels of the hanging or roll type are not recommended for use in healthcare settings (II).

3. Surgical hand antisepsis
A. Remove rings, watches, and bracelets before beginning the surgical hand scrub (II).

B. Remove debris from underneath fingernails using a nail cleaner under running water (II).

C. Surgical hand antisepsis using either an antimicrobial soap or an alcohol-based hand rub with persistent activity is recommended before donning sterile gloves when performing surgical procedures (IB).

D. When performing surgical hand antisepsis using an antimicrobial soap, scrub hands and forearms for the length of time recommended by the manufacturer, usually 2-6 minutes. Long scrub times (E.g., 10 minutes) are not necessary (IB).

E. When using an alcohol-based surgical hand-scrub product with persistent activity, follow the manufacturer’s instructions. Before applying the alcohol solution, prewash hands and forearms completely. After application of the alcohol-based product as recommended, allow hands and forearms to dry thoroughly before donning sterile gloves (IB).

4. Selection of hand hygiene agents
A. Provide personnel with efficacious hand hygiene products that have low irritancy potential, particularly when these products are used multiple times per shift (IB). This recommendation applies to products used for hand antisepsis before and after patient care in clinical areas and to products used for surgical hand antisepsis by surgical personnel.

B. To maximize acceptance of hand hygiene products by HCWs, solicit input from these employees regarding the feel, fragrance, and skin tolerance of any products under consideration. The cost of hand hygiene products should not be the primary factor influencing product selection (IB).

C. When selecting non-antimicrobial soaps, antimicrobial soaps, or alcohol-based hand rubs, solicit information from manufacturers regarding any known interactions between products used to clean hands, skin care products, and the types of gloves used in the institution (II).

D. Before making purchasing decisions, evaluate the dispenser systems of various product manufacturers of distributors to ensure that dispensers function adequately and deliver an appropriate volume of product (II).

E. Do not add soap to a partially empty soap...
dispenser. This practice of “topping off” dispensers can lead to bacterial contamination of soap (IA).

5. Skin care
A. Provide HCWs with hand lotions or creams to minimize the occurrence of irritant contact dermatitis associated with hand antisepsis or handwashing (IA).
B. Solicit information from manufacturers regarding any effects that hand lotions, creams, or alcohol-based hand antiseptics may have on the persistent effects of antimicrobial soaps being used in the institution (IB).

6. Other Aspects of Hand Hygiene
A. Do not wear artificial fingernails or extenders when having direct contact with patients at high risk (e.g., those in intensive-care units or operating rooms) (IA).
B. Keep natural nails tips less than 0.6 cm long (II).
C. Wear gloves when contact with blood or other potentially infectious materials, mucous membranes, and nonintact skin could occur (IC).
D. Remove gloves after caring for a patient. Do not wear the same pair of gloves for the care of more than one patient, and do not wash gloves between uses with different patients (IB).
E. Change gloves during patient care if moving from a contaminated body site to a clean body site (II).
F. No recommendation can be made regarding wearing rings in health-care settings. Unresolved issue.

7. Health-care worker educational and motivational programs
A. As part of an overall program to improve hand hygiene practices of HCWs, educate personnel regarding the types of patient-care activities that can result in hand contamination and the advantages and disadvantages of various methods used to clean their hands (II).
B. Monitor HCWs’ adherence with recommended hand-hygiene practices and provide personnel with information regarding their performance (IA).
C. Encourage patients and their families to remind HCWs to decontaminate their hands (II).

8. Administrative measures
A. Make improved hand hygiene adherence an institutional priority and provide appropriate administrative support and financial resources (IB).
B. Implement a multidisciplinary program designed to improve adherence of health personnel to recommended hand hygiene practices (IB).
C. As part of a multidisciplinary program to improve hand hygiene adherence, provide HCWs with a readily accessible alcohol-based hand-rub product (IA).
D. To improve hand hygiene adherence among personnel who work in areas in which high workloads and high intensity of patient care are anticipated, make an alcohol-based hand rub available at the entrance to the patient’s room or at the bedside, in other convenient locations, and in individual pocket-sized containers to be carried by HCWs (IA).
E. Store supplies of alcohol-based hand rubs in cabinets or areas approved for flammable materials (IC).

Performance Indicators
1. The following performance indicators are recommended for measuring improvements in HCWs’ hand hygiene adherence:
A. Periodically monitor and record adherence as the number of hand hygiene episodes performed by personnel/number of hand hygiene opportunities, by ward or by service. Provide feedback to personnel regarding their performance.
B. Monitor the volume of alcohol-based hand rub (or detergent used for handwashing or hand antisepsis) used per 1,000 patient-days.
C. Monitor adherence to policies dealing with wearing of artificial nails.
D. When outbreaks of infection occur, assess the adequacy of health-care worker hand hygiene.
Definition of Terms

- **Alcohol-based hand rub.** An alcohol-containing preparation designed for application to the hands for reducing the number of viable microorganisms on the hands. Such preparations usually contain 60%-95% ethanol or isopropanol.

- **Antimicrobial soap.** Soap (i.e., detergent) containing an antiseptic agent.

- **Antiseptic agent.** Antimicrobial substances that are applied to the skin to reduce the number of microbial flora. Examples include alcohols, chlorhexidine, chlorine, hexachlorophene, iodine, chloroxylenol (PCMX), quaternary ammonium compounds, and triclosan.

- **Antiseptic handwash.** Washing hands with water and soap or other detergents containing 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.** To reduce bacterial counts on hands by performing antiseptic hand rub or antiseptic handwash.

- **Hand antisepsis.** Refers to either antiseptic handwash or antiseptic hand rub.

- **Hand hygiene.** A general term that applies to either handwashing, antiseptic handwash, antiseptic hand rub, or surgical hand antisepsis.

- **Handwashing.** Washing hands with plain (i.e., non-antimicrobial) soap and water.

- **Surgical hand antisepsis.** Antiseptic handwash or antiseptic hand rub performed preoperatively by surgical personnel to eliminate transient 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 material, blood, or other body fluids (e.g., fecal material or urine).

- **Surgical hand scrub.** An antiseptic-containing preparation that substantially reduces the number of microorganisms on intact skin; it is broad-spectrum, fast-acting, and persistent.