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## Hand Hygiene and Use of Antiseptics for Skin Preparation

### I. Description

Describes the indications and methods for hand hygiene and skin antisepsis

### II. Rationale

Hand hygiene and skin antisepsis are critical components of infection prevention. Hospital personnel can be the mode of transmission for preventable healthcare-associated infections and, in many outbreaks, hands of personnel have been identified as the probable means of cross-transmission of infection. Hand hygiene has been shown to eliminate or markedly reduce hand carriage of pathogenic organisms, most of which are transient flora. Thus, it is an important means of preventing additional patient exposure to pathogens that have already colonized or infected other patients.

### III. Policy

#### A. Definition of Terms

Term	Definition
Alcohol-based hand rub (ABHR)	A solution containing 60-95 percent alcohol (ethanol or isopropanol) and is designed to be applied to the hands to reduce the number of viable microorganisms.
Antimicrobial soap	Soap containing an antiseptic agent.
Antiseptic agent	Antiseptics are antimicrobial substances that are applied to the skin to reduce the number of microbial flora. Examples include alcohols, chlorhexidine, chlorine, hexachlorophene, iodine, para-chloro-meta-xyleneol,

Term	Definition
	and quaternary ammonium compounds.
Antiseptic hand-wash	Washing hands with water and soap or other detergents containing an antiseptic agent.
Antiseptic hand rub	Applying a waterless antiseptic agent to all surfaces of hands to reduce the number of microorganisms present.
Artificial Nails	Substances or devices applied or added to the natural nails to extend or augment (ie, sculpt, shape) the wearer's nails. These included extensions, tips, acrylic overlays, and wraps.
Hand antisepsis	Refers to either antiseptic hand-wash 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 a non-antimicrobial or antimicrobial soap and water
Persistent activity	Antimicrobial activity that persists after the agent has been rinsed off the skin or has dried.
Plain soap	Plain soap refers to products that do not contain antimicrobial agents, or contain very low concentrations of antimicrobial agents.
Surgical hand antisepsis	Antiseptic hand-wash or antiseptic hand rub performed preoperatively by surgical personnel to eliminate transient and reduce resident hand flora. Antimicrobial soap preparations often have persistent antimicrobial activity.
Visibly soiled hands	Hands showing visible dirt or visibility contaminated with blood or other body fluids/substances (e.g., blood, fecal material, urine).

## B. Transmission of Pathogens on Hands

Transmission of healthcare-associated pathogens from one patient to another via the hands of health care personnel (HCP) requires four elements:

1. Organisms present on the patient's skin, or that has been shed onto inanimate objects immediately surrounding the patient, must be transferred to the hands of HCP.
2. Organisms must be capable of surviving for at least several minutes on the hands of HCP.
3. Handwashing or hand antisepsis by the worker must be inadequate or omitted altogether, or the agent used for hand hygiene inappropriate.
4. The contaminated hands of the caregiver must come in direct contact with another patient, or with an inanimate object that will come in contact with the patient.

## C. Indications for Hand Hygiene

1. 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.
2. If hands are not visibly soiled, use an alcohol-based hand rub for routinely decontaminating hands in all other clinical situations described below in items 2a-g. Alternatively, HCP may wash hands with an antimicrobial soap and water in all clinical situations described in items 2a-g.
  - a. Perform hand hygiene before having direct contact with patients, even if gloves are worn.
  - b. Perform hand hygiene before donning sterile or clean gloves and before inserting devices.
  - c. Perform hand hygiene after contact with a patient's intact skin (e.g., taking a pulse, taking blood pressure, lifting a patient)
  - d. Perform hand hygiene after contact with mucous membranes, non-intact skin, or wound dressings, as long as hands are not visibly soiled (if soiled see item 1).
  - e. Perform hand hygiene if moving from a contaminated body site to a clean body site during patient care.
  - f. Perform hand hygiene after contact with inanimate objects (including medical equipment) within the patient's environment.
  - g. Perform hand hygiene after removing gloves.
3. Before eating and after using a restroom, wash hands with a non-antimicrobial soap and water or with an antimicrobial soap and water.
4. HCP should use an antimicrobial soap and water when providing care for patients on Enteric Precautions for a suspected or known case of infectious gastroenteritis (e.g., *C. difficile* or norovirus). See Infection Prevention policy: [Isolation Precautions](#), Attachment 1-Type and Duration of Precautions Recommended for Selected Infections and Conditions for a complete list of infectious gastrointestinal diseases requiring enteric isolation.
5. Wash hands with either non-antimicrobial soap and water or antimicrobial soap and water if exposure to Anthrax (*Bacillus anthracis*) is suspected or proven. The physical action of washing and rinsing hands under such circumstances is recommended because alcohols and other antiseptic agents have poor activity against Anthrax (*Bacillus anthracis*) spores.
6. Antimicrobial-impregnated wipes (i.e., towelettes) have not been found to be as

effective as alcohol-based hand rubs or washing hands with an antimicrobial soap and water for reducing bacterial counts on the hands of HCPs. Wipes should not be used by HCPs in clinical areas; however, they may be used in limited situations (e.g., cleaning small children's hands before going to the playroom, for patient use before or after eating).

## D. Preparations Used for Hand Hygiene

Chlorhexidine, iodophors, and alcohols are the active antimicrobial ingredients recommended for hand hygiene and skin antiseptics. The hand hygiene products that are most commonly used within UNC Medical Center are chlorhexidine gluconate and alcohol-based waterless hands rub. For additional information regarding effectiveness of antiseptic agents, refer to Attachment 1 - Characteristics of Antisepsis (Antimicrobial Agents) of this policy.

1. **Alcohol:** It is effective against bacteria, mycobacteria, fungi and viruses. However, it is also flammable, evaporates quickly, dries the skin, and has no residual antimicrobial effect.
2. **Iodophors:** (e.g., Betadine). These are water-soluble complexes of iodine with organic compounds, which are effective against all Gram-positive bacteria, Gram-negative bacteria, and viruses. The iodophors are not long lasting and, if used frequently, may cause considerable drying of the skin.
3. **Chlorhexidine gluconate** (e.g., CHG). This antiseptic is 2% chlorhexidine gluconate (CHG) with 4% isopropyl alcohol in a sudsing base. CHG is an effective antiseptic for reducing transient and resident microbial hand flora and has a sustained antimicrobial effect. It is also approved for surgical hand antiseptics. It does not appear to have adverse actions on the skin as do some of the other handwashing agents.
4. **Alcohol-based antiseptics (alcohol-based hand rubs):** Use of a product containing at least 62% alcohol is recommended based on multiple studies (SHEA, 2014). Most contain 60-95% isopropanol, ethanol, or a combination of these two products. The antimicrobial activity of alcohols is due to their ability to denature proteins. Alcohols have excellent *in vitro* germicidal activity against Gram-positive and Gram-negative vegetative bacteria.
5. **Other agents:** Other antiseptic agents for hand hygiene include quaternary ammonium compounds, para-chlorometa-xlenol (PCMX), iodine compounds, phenol derivatives, iodophors, and Triclosan. Infection Prevention and/or Occupational Health Service (OHS) must first approve use of these agents for individual use. Studies have shown these agents to be less active in reducing some types of microbes from the hands and some agents may be too irritating for hand hygiene.

## E. Availability and Management of Hand Hygiene Products

1. Liquid soap dispensers are monitored by Environmental Services and should be replaced when empty. Dispensers must not be "topped off" since this can lead to bacterial contamination of the soap.
2. Alcohol-based waterless hand rubs must be available in all patient care areas. They should be located at the entrance to the patient's room, at the bedside, or in other convenient locations. For areas where hand rubs may not be readily available (e.g., inpatient psychiatric units), the healthcare provider should carry pocket-sized containers.
3. Alcohol-based waterless hand rubs should also be made available in the public waiting areas to promote hand hygiene among patients and visitors.

## F. Hand Hygiene Technique

1. 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. Follow the manufacturer's recommendations on the volume of product to use. If an adequate volume of an alcohol-based hand rub is used, it should take 20 seconds for hands to dry.
2. When washing hands with a non-antimicrobial or antimicrobial soap, wet hands first with warm water, apply 3 to 5 mL of detergent to hands, and rub hands together vigorously for at least 15 seconds, covering all surfaces of the hands and fingers to include the nail beds and between the fingers. Rinse hands with warm water and dry thoroughly with a disposable towel. Use towel to turn off the faucet.

## G. Other Aspects of Hand Care and Protection

1. HCP with a cast or splint below the wrist that is non-removable are not allowed to provide direct patient care as they cannot perform hand hygiene. HCP with a removable splint can only provide direct patient care if the splint is not worn during the entire period of providing patient care.
2. **Gloves:** Single-use, disposable nitrile gloves must be worn when coming into contact with blood or other potentially infectious materials (OPIM).
  - a. Hand Hygiene with soap and water or with an alcohol-based antiseptic hand rub should be performed prior to donning gloves. Gloves are not intended to replace hand hygiene.
  - b. Hand hygiene with soap and water or with an alcohol-based antiseptic hand rub should be performed after glove removal.

- c. Remove gloves after caring for patient.
- d. Do not wear the same pair of gloves for the care of more than one patient. Do not wash gloves or use alcohol-based hand rub on gloves between patients.
- e. Change gloves and decontaminate hands during patient care when moving from a contaminated site to a clean site.

### 3. Fingernails/Artificial Nails/Nail Polish

- a. Follow hygiene standards for nails from the Human Resources policy: [Professional Business Attire](#).
- b. Long nails are known to promote growth of Gram-negative bacteria and yeast. Nails will be kept less than ¼ inch long for HCP providing direct patient care.
- c. Artificial fingernails are prohibited for all HCP who provide direct patient care in high risk areas where published outbreaks have been linked to long, artificial nails: NCCC, areas following the peri-operative attire policy, all ICUs, dialysis, and BMTU/5CH.
- d. Nail polish, if used, must be intact and well maintained. Polish should be removed/replaced when chipped.

### 4. Jewelry

- a. Rings can make donning gloves more difficult and may cause gloves to tear more readily.
- b. Certain high risk areas may prohibit wrist jewelry and rings.

## H. Surgical Hand Antisepsis

1. Surgical hand antisepsis, using either an alcohol-based waterless surgical hand antiseptic or an antimicrobial soap, will be performed **before** donning sterile gloves when performing surgical procedures.
2. All rings, watches, and bracelets must be removed prior to performing surgical hand antisepsis.

## I. Dermatitis

1. Personnel with cracked skin or dermatitis pose an infectious risk and are required to be evaluated by Occupational Health Services (OHS) as to work status and methods to relieve the condition.
2. To prevent and manage irritant contact dermatitis:

- a. Encourage use of alcohol-based antiseptics for routine hand hygiene. These are well tolerated and associated with less irritant contact dermatitis than soap and water handwashing. This does not apply to a situation that requires soap and water hand hygiene (e.g., patients with *C. difficile* infections).
- b. Wash hands with warm or cold water. Hot water should be avoided because it can irritate the skin, leading to dermatitis and bacterial colonization.
- c. If dermatitis occurs, OHS may recommend the use of cotton glove liners. Glove liners may help individuals with irritant contact dermatitis to maintain healthy skin.
  - i. When used, cotton glove liners should be replaced at the beginning of each shift with a clean pair. If they become contaminated with blood or OPIM or become generally soiled in appearance, they should be removed promptly and replaced.

## J. Skin Care/Lotions

1. HCP should use hand lotion in order to minimize the occurrence of irritant contact dermatitis associated with hand antisepsis and hand hygiene.
2. Hand lotions/creams must be compatible with both the antimicrobial agent and use of nitrile gloves.
  - a. Some lotions and creams interfere with the effectiveness of the antimicrobial handwashing agents. CHG in particular can be inactivated by a number of ingredients found in common hand lotion/cream brands.
3. Compatible lotion may be ordered from Lawson (#050939) and should be available for use in clinical areas.
  - a. The Maintenance Department will install the hand lotion dispenser when requested.

## K. Healthcare Worker Behavior and Compliance

Efforts to improve hand hygiene practice will be multifaceted and will include continuing education and feedback to staff on behavior or infection surveillance data. Clean In, Clean Out is UNC Health's system-wide hand hygiene program to measure hand hygiene compliance.

## L. Disaster Planning

In the event of interruption of water supply, alcohol-based hand rubs and alternative methods of performing hand hygiene, including portable hand washing sinks, will be available. In situations where soiling occurs, baby wipes (Lawson # 135812) should be used to cleanse the hands;

alcohol-based hand rubs should then be used to achieve hand antisepsis.

## M. Skin Antisepsis: Preparation of Patient's Skin for Surgical/Nonsurgical Procedures and CLABSI Prevention

### 1. Indications for Skin Antisepsis in Clinical Practice:

- a. Before invasive procedures
- b. Preoperative whole body CHG treatment with CHG-containing wipes (e.g., ReadyPrep CHG<sup>®</sup>, SAGE<sup>®</sup> cloths)
  - i. Refer to the following Nursing policy: [Operative/Procedural Management](#) for contraindications, exceptions, and specific instructions regarding application of wipes.
- c. Daily whole body CHG treatments with CHG-containing wipes (e.g., ReadyPrep<sup>®</sup>, SAGE<sup>®</sup> cloths) in all ICUs, step-downs, and for inpatients with a central line in the adult oncology unit, adult bone marrow transplant unit, and 5CH.
  - i. For pediatric patients, follow manufacturer's weight-based guidance on using CHG wipes.
  - ii. For preterm babies (< 37 weeks), follow [NCCC Guidelines for Skin Care for the Preterm/Ill Infant](#).
  - iii. For Oncology Patients follow: the Nursing policy: [Care of the Oncology Patient: Skin Care and External Radiation Therapy](#).

### 2. Antiseptic Agents

- a. Preparing Patient's Skin for Medical Procedures
  - i. Intravenous Device
    - Chlorhexidine gluconate with alcohol (e.g., ChlorPrep™) is the preferred antiseptic agent to use for skin preparation prior to insertion of intravenous devices and should be applied per manufacturer's recommendations.
  - ii. Minor Procedures (IM, Subcutaneous Injections, or heel sticks)
    - Alcohol is adequate for preparing skin for these types of procedures.
  - iii. Minor or Major Surgical Procedures



- A surgical skin prep of the operative site will be performed in the assigned operating room before surgery using standard aseptic technique and manufacturer's instructions for use. Chlorhexidine gluconate with alcohol (e.g., ChloraPrep) is the antiseptic that should be used unless there is a medical contraindication in which case iodophors with alcohol (e.g., PurePrep) may be used. The only contraindication to betadine (iodophors) is reaction to previous use of topical iodine preparation or ingested iodine. Chlorhexidine-alcohol (e.g., ChloraPrep) has been demonstrated to be the most effective agent to use for skin antisepsis prior to surgery. The preoperative antiseptic skin preparation should be applied per manufacturer's recommendations. The prepped area must be large enough to extend the incision or create new incisions or drain site.



**NOTE:** For neurosurgery and spinal surgery involving the meninges, Chlorhexidine-alcohol (e.g., ChloraPrep) may be used with strict adherence to the manufacturer's application and drying instructions. Care should be taken to avoid direct contact with the meninges as per manufacturer's instructions. Chlorhexidine-alcohol (e.g., ChloraPrep) has been demonstrated to be the most effective agent for skin antisepsis prior to surgery and a thorough review of the literature has not revealed any reported complications that can be attributed to the use of Chlorhexidine-alcohol (e.g., ChloraPrep) in such procedures. The benefits of reducing surgical site infection outweigh the theoretical risk of contact with the meninges. The surgeons will take care that this agent, which is applied to the skin and allowed to dry, does not have contact in its wet form with the central nervous system or meninges.

- Follow the manufacturer's directions for use and warnings. (Refer to Attachment 2 - Recommendations for Hand Hygiene and Cleaning Patients' Skin before Procedures of this policy for detailed recommendations

for preparing hands and cleaning skin before some common procedures.)

- iv. Urinary catheter insertion: Betadine is the preferred antiseptic agent to use for skin preparation prior to insertion of urinary catheters. Allow area to dry or allow at least 2 minutes of contact time prior to inserting catheter.

b. Antiseptic Agents for Neonates and Infants

- i. Always allow the prep to dry completely.
- ii. All skin prep must be thoroughly removed with sterile water or sterile saline after procedures to prevent burns and absorption of the prep; pay special attention to removing the prep solution that may have pooled beneath the baby during the procedure.

iii. Antiseptic agents for all babies >1000 g

- Chlorhexidine gluconate with alcohol (ChloraPrep™) is to be used for the following procedures:
  - Starting an IV
  - Performing a venous/arterial puncture
  - Umbilical line placement
  - PICC placement or dressing change
- Betadine is to be used for the following procedures:
  - Lumbar punctures
  - Circumcisions
  - Urinary catheter insertion

- iv. For recommendations for skin antiseptics for babies <1000 g, refer to the Nursing policy: [Skin Integrity](#) and [NCCC Guidelines for Skin Care for the Preterm/III Infant](#).

- c. Plain soap, triclosan, PCMX, and aqueous quaternary ammonium compounds are not recommended as single agents for operative site preparation. Contact Infection Prevention if a patient's skin is sensitive to all acceptable antimicrobial products.
- d. When preparation of the patient's skin requires cleaning with an antiseptic agent, a fast acting one is desirable.
- e. "Defatting" agents such as acetone are not recommended.

## N. Implementation

Implementation of this policy is the responsibility of Infection Prevention, Service Line Directors, Nursing Service, Phlebotomy, and the Medical Staff.

## IV. References

The Society for Healthcare Epidemiology of America (SHEA). Strategies to Prevent Healthcare-Associated Infections through Hand Hygiene. August 2014.

Centers for Disease Control and Prevention. Guideline for Hand Hygiene in Health Care Settings. Atlanta, GA, October 2002.

Larson, Elaine. APIC Guidelines for Handwashing and Hand Antisepsis in Health Care Settings. American Journal of Infection Control. August 1995.

APIC Infection Control and Applied Epidemiology Principles and Practice. Mosby. 1996.

## V. Related Policies

[Human Resources Policy: Professional Business Attire](#)

[Infection Prevention Policy: Isolation Precautions](#)

[Infection Prevention Policy: Infection Prevention Guidelines for Perioperative Services](#)

[Nursing Policy: Care of the Oncology Patient: Skin Care and External Radiation Therapy](#)

[Nursing Policy: Operative/Procedural Management](#)

[Nursing Policy: Skin Integrity](#)

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## Attachments

[01: Characteristics of Antisepsis \(Antimicrobial Agents\)](#)

[02: Recommendations for Hand Hygiene and Cleaning Patients' Skin before Procedures](#)

## Approval Signatures

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