**Guideline for Hand Hygiene in Health-Care Settings**

1. **Definition of terms**

**Hand hygiene**. A general term referring to any action of hand cleansing

**Hand hygiene products**

**Alcohol-based (hand)rub**. An alcohol-containing preparation (liquid, gel or foam)

designed for application to the hands to reduce the growth of microorganisms. Such preparations may contain one or more types of alcohol, and other active ingredients

**Antimicrobial (medicated) soap**. Soap (detergent) containing an antiseptic agent at a concentration which is sufficient to reduce or inhibit the growth of microorganisms.

**Antiseptic agent**. An antimicrobial substance which reduces or inhibits the growth of microorganisms on living tissues. Examples include alcohols, chlorhexidine gluconate, chlorine derivatives, iodine, chloroxylenol (PCMX), quaternary ammonium compounds, and triclosan.

**Detergent (surfactant)**. Compounds that possess a cleaning action. Although products used for handwashing or antiseptic handwash in health care represent various types of detergents, the term “soap” will be used to refer to such detergents in these guidelines.

**Plain soap**. Detergents that do not contain antimicrobial agents, or that contain very low concentrations of antimicrobial agents effective solely as preservatives.

**Waterless antiseptic agent**. An antiseptic agent that does not require the use of water. After application, the individual rubs the hands together until the agent has dried. The term includes different types of handrubs (liquid formulations, gels, foams).

**Hand hygiene practices**

**Antiseptic handwashing**. Washing hands with water and soap or other detergents containing an antiseptic agent.

**Antiseptic handrubbing (or handrubbing)**. Applying an antiseptic handrub to reduce or

inhibit the growth of microorganisms without the need for a source of water and requiring no rinsing or drying with towels or other devices.

**Hand antisepsis/decontamination/degerming**. Reducing or inhibiting the growth of

microorganisms by the application of an antiseptic handrub or by performing an antiseptic handwash.

**Hand care**. Actions to reduce the risk of skin irritation.

**Handwashing**. Washing hands with plain or antimicrobial soap and water.

**Surgical hand antisepsis/surgical hand preparation**. Antiseptic handwash or antiseptic

handrub performed pre-operatively by the surgical team to eliminate transient and reduce

resident skin flora. Such antiseptics often have persistent antimicrobial activity.

1. **Perspective on hand hygiene in health care**

Hand hygiene is considered the most important measure for preventing the spread of pathogens in health-care settings

1. **Normal Bacterial Skin Flora**

To understand the objectives of different approaches to hand cleansing, a knowledge of normal bacterial skin flora is essential. Normal human skin is colonized (the presence of bacteria on a body surface (like on the skin, mouth, intestines or airway) without causing disease in the person. with bacteria).

Bacteria recovered from the hands are divided into two categories: Transient and resident

**Transient flora**, which colonize the superficial layers of the skin, are easily removed by routine handwashing. They are often acquired by HCWs 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 health-care–associated infections.

**Resident flora,** which are attached to deeper layers of the skin, are more resistant to removal. In addition, resident flora are less likely to be associated with health-care–associated infections.

1. **Transmission of pathogens on hands**

Transmission of health care-associated pathogens from one patient to another via HCWs’ hands requires five sequential elements:

* + Organisms are present on the patient’s skin, or have been shed onto inanimate objects immediately surrounding the patient
  + Organisms must be transferred to the hands of HCWs
  + Organisms must be capable of surviving for at least several minutes on HCWs’ hands
  + Handwashing or hand antisepsis by the HCW must be inadequate or entirely omitted, or the agent used for hand hygiene inappropriate; And
  + The contaminated hand or hands of the caregiver must come into direct contact
  + With another patient or with an inanimate object that will come into direct contact with the patient.

Evidence supporting each of these elements is given below.

**4.1 Organisms present on patients’ skin or in the inanimate environment**

Health care-associated pathogens can be recovered not only from infected or draining

wounds, but also from frequently colonized areas of normal, intact patient. The

perineal areas tend to be most heavily colonized, but the armpit, chest, back

including the hands also are frequently. Diabetics, patients undergoing dialysis for chronic renal failure, and those with chronic dermatitis (red, itchy skin rash) are particularly likely to have areas of intact skin that are colonized with pathogens. Patient gowns, bed linen, bedside furniture and other objects in the immediate environment of the patient become contaminated with patient flora. Contamination of the inanimate environment has also been detected on ward handwash station surfaces. Tap/faucet handles are more likely to be contaminated.

**4.2 Organisms transferred to health-care workers’ hands**

patient-care activity is strongly associated with the intensity of bacterial contamination of HCWs’ hands. Nurses contaminate their hands during “clean” activities such as lifting patients, taking the patient’s pulse, blood pressure or oral temperature; or touching the patient’s hand, shoulder or groin. Use of gloves does not fully protect HCWs’ hands from bacterial contamination.

**4.3 Organisms capable of surviving on hands**

Several studies have demonstrated that the microorganisms survive on hands for several minutes’ hours and even days

**4.4 Defective hand cleansing resulting in hands remaining contaminated**

Eg using only 1 ml of liquid soap or alcohol-based handrub yield lower log reductions (greater number of bacteria remaining on hands) than using 3 ml of product to clean hands.

-A study of handrubbing with an alcohol- based solution and handwashing with an unmedicated soap was conducted - The study’s results were: 15% of HCWs’ hands were contaminated with transient pathogens beforehand hygiene; no transient pathogens were recovered after handrubbing

-A Study of three hand hygiene agents (62% ethyl alcohol handrub, medicated hand wipe, and handwashing with plain soap and water). They also studied the impact of ring wearing on hand contamination. Their results showed that hand contamination with transient organisms was significantly less likely after the use of an alcohol-based handrub compared with the medicated wipe or soap and water. Ring wearing increased the frequency of hand contamination with potential nosocomial pathogens. Wearing artificial acrylic fingernails can also result in hands remaining contaminated with pathogens after use of either soap or alcohol-based hand gel. Handwash with water alone produced no change in contamination, , a 5-second wash with two soaps did not remove the organisms completely, with a 30-seconds wash with either soap was necessary to remove the organisms completely from the hands.

**4.4 Several HCAI outbreaks have been associated with contaminated HCWs’ hands**

Finally, several studies have shown that pathogens can be transmitted from out-of-hospital sources to patients via the hands of personnel.

For example, an outbreak of postoperative wound infections was traced to a contaminated jar of exfoliant cream in a nurse’s home. An investigation suggested that the organism was transmitted to patients via the hands of the nurse, who wore artificial fingernails.

In another outbreak, a pathogen was probably transmitted from a nurse’s pet dogs to infants in an intensive care nursery via the hands of the nurse

* 1. **Cross-transmission of organisms by contaminated hands**

There are several studies showing cross-transmission of organisms by hands. Factors that influence the transfer of microorganisms from surface to surface and affect cross-contamination rates are type of organism, source and destination surfaces, moisture level.

A study showed that contaminated hands could contaminate a clean paper towel dispenser and vice versa.

A study showed that fingers contaminated could sequentially transfer virus to up to seven clean surfaces, and from contaminated cleaning clothes to clean hands and surfaces.

A study *provided* evidence that pathogenswere transmitted from contaminated soap and hand lotions to patients via the hands of HCWs.

1. **Recommendations for handwashing and hand antisepsis**

* 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 nonantimicrobial soap and water or an antimicrobial soap and water.
* If hands are not visibly soiled, use an alcohol-based hand rub for routinely decontaminating hands in all other clinical situations described in items

Alternatively,

* wash hands with an antimicrobial soap and water in all clinical situations described in items
* Decontaminate hands before having direct contact with patients
* Decontaminate hands before donning sterile gloves
* Decontaminate hands after contact with a patient’s intact skin (e.g., when taking a pulse or blood pressure, and lifting a patient
* Decontaminate hands after contact with body fluids or excretions, mucous membranes, nonintact skin, and wound dressings if hands are not visibly soiled
* Decontaminate hands if moving from a contaminated-body site to a clean-body site during patient care
* Decontaminate hands after contact with inanimate objects (including medical equipment) in the immediate vicinity of the patient. Decontaminate hands after removing gloves
* Before eating and after using a restroom, wash hands with a non-antimicrobial soap and water or with an antimicrobial soap and water.

1. **Hand-hygiene technique**

Regardless of which method you’re using, it’s important that you first:

* Remove any wristwatches or other items of jewellery (so you can clean the skin they usually cover).
* Roll your sleeves up.

A. **Alcohol-based hand rub** –

* Dispense ABHR into the cupped palm of one hand.
* Rub hands palm to palm.
* Rub right palm over the back of the other hand with interlaced fingers and vice versa.
* Rub palm to palm with the fingers interlaced.
* Rub the backs of fingers to opposing palms with fingers interlocked.
* Use rotational rubbing of the left thumb clasped in the right palm and vice versa.
* Use rotational rubbing, backwards and forwards with clasped fingers of the right hand in the left palm and vice versa

After application of the alcohol-based product as recommended, allow hands and forearms to dry thoroughly before donning sterile gloves.

**B. Washing hands with soap and water**

1. **Wet** your hands with clean, running water (warm or cold), turn off the tap, and apply soap.
2. **Lather** your hands by rubbing them together with the soap. Lather the backs of your hands, between your fingers, and under your nails.
3. **Scrub** your hands for at least 20 seconds. Need a timer? Hum the “Happy Birthday” song from beginning to end twice.
4. **Rinse** your hands well under clean, running water.
5. **Dry** your hands using a clean towel or air dry them.
6. Use towel to turn off the faucet.

Avoid using hot water, because repeated exposure to hot water may increase the risk

of dermatitis

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

**Medical glove**

Medical gloves are defined as disposable gloves used during medical procedures; they include:

**1.** Examination gloves (non-sterile or sterile)

**2.** Surgical gloves that have specific characteristics of thickness, elasticity and strength and are sterile

**Rationale for using medical gloves:**

Medical gloves are recommended to be worn for two main reasons:

**1.** To reduce the risk of contamination of health-care workers hands with blood and other body fluids.

**2.** To reduce the risk of germ dissemination to the environment and of transmission from the health-care worker to the patient and vice versa, as well as from one patient to another.

**Inappropriate glove use:**

The use of gloves when not indicated represents a waste of resources and does not contribute to a reduction of cross-transmission.

