

DISINFECTION AND UNIVERSAL PRECAUTIONS

The terms “standard precautions” and additional (transmission-based) precautions have replaced previous terms such as universal blood and body fluid precautions, universal precautions and barrier nursing.

Standard precautions require that health care workers assume that the blood and body substances of all patients are potential sources of infection, regardless of the diagnosis or presumed infectious status.

Additional (transmission-based) precautions are needed for diseases transmitted by air, droplets and contact.

A number of RTIs can be spread from patient to health care provider or to other patients if basic precautions are not followed. Hepatitis B and C viruses and HIV are incurable infections that are easily transmitted by reuse of contaminated sharps. Because RTIs are often asymptomatic, it is not possible to know which patients have an infection. For this reason, standard precautions should be followed by all the health care workers.

Standard precautions

Standard precautions include the following-

1. Hand washing and antisepsis (hand hygiene)
2. Use of personal protective equipment when handling blood, body substances, excretions and secretions
3. Appropriate handling of patient equipment and soiled linen
4. Prevention of needle-stick/sharp injuries
5. Management of health care waste

1. Hand washing and antisepsis (hand hygiene)

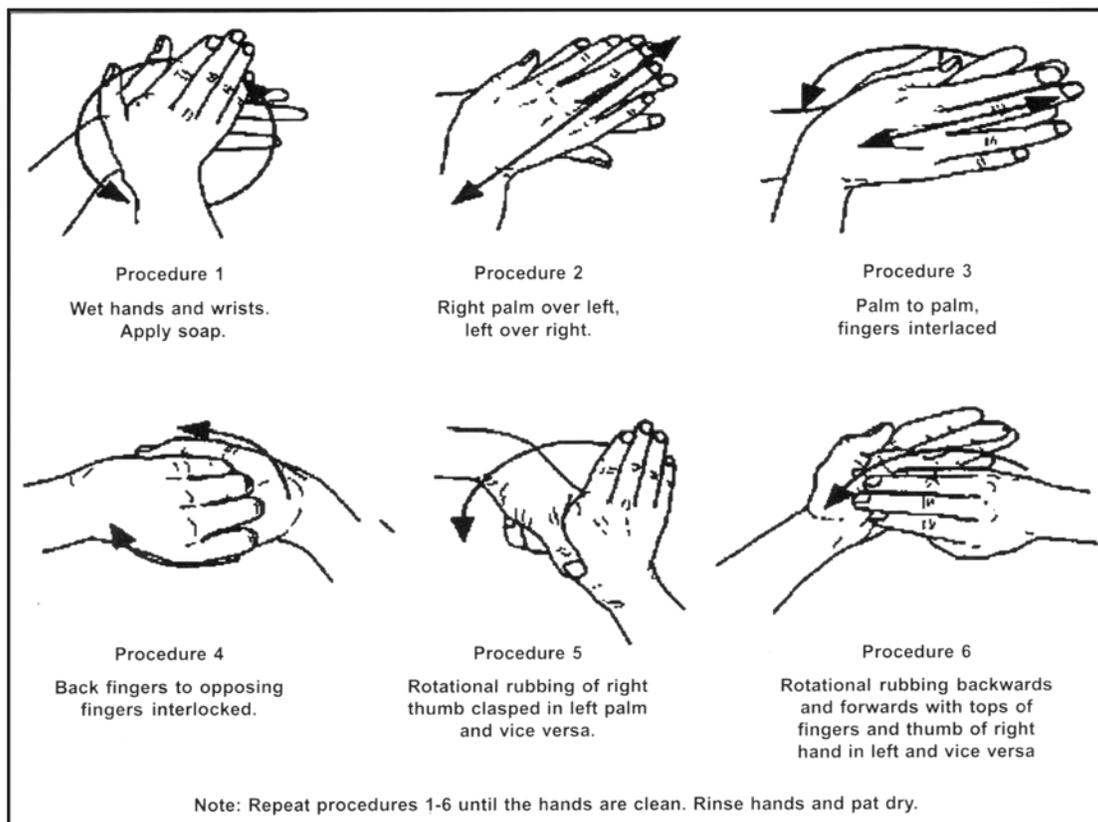
Hand washing breaks the chain of infection transmission and reduces person—to-person transmission. It is the most important way to kill germs on the skin. You need to wash your hands even more thoroughly and for a longer time in the following situations:

- before and after helping someone give birth;
- before and after touching a wound or broken skin;
- before and after giving an injection, or cutting or piercing a body part;
- after touching blood, urine, stool, mucus, or fluid from the vagina; and
- after removing gloves;

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- between contact with different patients

The hands must be washed for a minimum of 10-15 seconds, count to 30 as you scrub your hands all over with the soapy lather. Use soap or other disinfectant to remove dirt and germs. Use a brush or soft stick to clean under your nails, then rinse, using running water. Do not reuse the same water. Immersion of hands in bowls of antiseptics is not recommended. Common towels must not be used as they facilitate transmission of infection. If there is no clean dry towel, it is best to air-dry hands.



Source: World Health Organization Regional Office for Western Pacific. *Interim guidelines for national SARS preparedness*. Manila: WHO, 2003, Page 45.

Fig A5a : Hand Washing Procedures

- Hand washing is the simplest and most cost-effective way of preventing the transmission of infection
- The hands must be washed for a minimum of 10-15 seconds with soap or other disinfectant
- Common towels must not be used as they facilitate transmission of infection

2. Use of personal protective equipment when handling blood, body substances, excretions and secretions

Using personal protective equipment offers protection by helping to prevent micro-organisms from-

- Contamination of hands, eyes, clothing, hair
- Being transmitted to other patients and staff

Personal protective equipment includes:

- Gloves
- Masks
- Aprons
- Gowns
- caps/hair covers

Gloves –

- Use of gloves (clean, non-sterile) or a piece of plastic for handling dirty bandages, cloths, blood, vomit or stool.
- Disposable gloves should not be reused
- Gloves must be changed not only between contacts with different patients but between tasks/procedures on the same patient to prevent cross-contamination between different body sites.

Personal protective equipment must be used effectively, correctly and at all times where there is contact with patient's blood, body fluids, excretions and secretions may occur

3. Appropriate handling of patient equipment and soiled linen

Ensure that all reusable equipment is cleaned and reprocessed appropriately before being used on another patient.

Keep bedding and clothing clean. This helps in keeping sick people comfortable and helps in preventing skin problems. Handle clothing and/ or sheets carefully, which are stained with blood, urine, stool or other body fluids. Separate from other laundry for washing. Dry laundry thoroughly in the sun if possible or iron after drying.

4. Prevention of needle-stick/sharp injuries

All the used disposable syringes and needles, scalpel blades and other sharp items should be placed in a puncture resistant container having a proper lid. These containers must be located close to the area. Never recap or bend needles.

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5. Management of health-care waste

Daily collection of waste must be encouraged and uncollected, long stored waste or waste within the premises must be avoided. The bio-medical waste should be segregated into containers/bags at the point of its generation into colour coded containers/bags. Table 12a gives the colour, coding, type of containers used and multiple treatment options for disposal of the bio-medical waste.

Table A5a: Management of health care waste

Colour coding	Type of container	Waste category	Treatment and disposal
Yellow/Red	Plastic bag	Human anatomical waste (Human tissues, organs, body parts)	Incineration/deep burial*
Blue/ white translucent	Puncture proof container	Waste sharps (Needles, syringes, scalpels, blades, glass etc. that may cause puncture and cuts)	Chemical treatment# / autoclaving /shredding##
Black	Plastic bag	Discarded medicines (Wastes comprising of outdated, contaminated and discarded medicines)	Incineration, destruction and drug disposal in secured landfills
Yellow/Red	Disinfected container/plastic bag	Solid waste (Items contaminated with blood and body fluids including cotton, dressings, linen, beddings or other material contaminated with blood)	Incineration/autoclaving
-	-	Liquid waste (waste generated from laboratory and washing, cleaning, housekeeping and disinfecting activities)	Disinfection with chemical treatment# and discharge into drains

* Deep burial should be done in a secure area. Burial should be 2 to 3 meters deep and at least 1.5 meters above the groundwater table.

Chemical treatment using at least 1% hypochlorite solution or any other equipment chemical reagent. It must be ensured that chemical treatment ensures disinfection

Shredding must be such so as to prevent unauthorized use of sharp waste.

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Disinfection of instruments

Disinfect or sterilize equipment and instruments. Instruments must first be washed and then disinfected if they are to be used to:

- cut or pierce skin;
- give an injection;
- cut the cord during childbirth;
- examine the vagina, especially during or after childbirth, a miscarriage, or an induced abortion;
- perform any transcervical procedure.

High-level disinfection: three steps

Cleaning instruments and equipment to get rid of nearly all the germs is called high-level disinfection. The following procedures could be followed to achieve it:

1. **Soaking:** Soak instruments for 10 minutes in 0.5% solution of bleach (chlorine). Soaking instruments in bleach solution will help protect you from infection when cleaning them. If you do not have bleach, soak your instruments in water.
2. **Washing:** Wash all instruments with soapy water and a brush until each one looks very clean, and rinse them with clean water. Be careful not to cut yourself on sharp edges or points. Wear gloves when washing instruments; if possible, use heavy gloves.
3. **Disinfecting:** Steam or boil the instruments for 20 minutes.
 - To steam them, you need a pot with a lid. The water does not need to cover the instruments, but use enough water to keep steam coming out of the sides of the lid for 20 minutes. Do not overload with instruments. No instruments should protrude above the rim of the pot.
 - To boil them, you do not need to fill the whole pot with water. But you should make sure the water covers all the instruments in the pot for the entire time. Put a lid on the pot.
 - For both steaming and boiling, start timing the 20 minutes after the water with the instruments is fully boiling. Do not add any new instrument to the pot once you begin to count.

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Table shows how to make a disinfection solution of 0.5%, 1% and 2% available chlorine

Table A5b: Hypochlorite solution of 0.5 % 1% and 2 % available chlorine

Product	Chlorine available	How to dilute to 0.5%	How to dilute to 1%	How to dilute to 2%
Sodium hypochlorite – liquid bleach	3.5%	1 part bleach to 6 parts water	1 part bleach to 2.5 parts water	1 part bleach to 0.7 parts water
Sodium hypochlorite - liquid	5%	1 part bleach to 9 parts water	1 part bleach to 4 parts water	1 part bleach to 1.5 parts water
NaDCC (sodium dichlor – oisocyanurate) - powder	60%	8.5 grams to 1 litre water	17 grams to 1 litre water	34 grams to 1 litre water
NaDCC (1.5g / tablet) - tablets	60%	6 tablets to 1 litre water	11 tablets to 1 litre water	23 tablets to 1 litre water
Chloramine - powder	25%	20 grams to 1 litre water	40 grams to 1 litre water	80 grams to 1 litre water

Note: Bleach solution becomes unstable rapidly, hence it needs to be freshly prepared daily or changed on becoming dirty/ turbid. Chlorine bleach can be corrosive. Protect metal instruments by thoroughly rinsing them with water after soaking for 10 minutes.

Cleaning of the Heath Centers

Patient care areas must be cleaned by wet mopping. Only dry sweeping is not recommended. Any areas visibly contaminated with blood or body fluids should be cleaned immediately with detergent and water.

Table A5c: Common disinfectants used for environmental cleaning in health centers

Disinfectants	Recommended use	Precautions
Sodium hypochlorite 1% In-use dilution, 5% solution to diluted 1:5 in clean water	Disinfections of material contaminated with blood and body fluids	<ul style="list-style-type: none"> • Should be used in well-ventilated areas • Protective clothing required while handling and using undiluted solutions • Do not mix with strong acids to avoid release of chlorine gas • Corrosive to metals
Bleaching powder 7g/litre with 70% available chlorine (Table shows dilutions for bleach)	Toilets / bathrooms – If liquid bleach is not available, this may be used	Same as above
Alcohol (70%) Isopropyl, ethyl alcohol, methylated spirit	Smooth metal surfaces, tabletops and other surfaces on which bleach cannot be used	<ul style="list-style-type: none"> • Flammable, toxic, to be used in well-ventilated area, avoid inhalation • Kept away from heat source, electrical equipment, flames, hot surfaces • Allow it to dry completely, particularly when using diathermy as it can cause diathermy burns

Note: A neutral detergent and warm water solution should be used for all routine and general cleaning. When a disinfectant is required for surface cleaning, e.g. after spillage or contamination with blood or body fluids, the manufacture's recommendation for use and occupational health and safety instruction should be followed.

