

Section 5

Disinfect Reusable Supplies and Equipment



This section describes how to:

- Prepare disinfectants.
- Clean and disinfect used gloves before reuse.
- Clean and disinfect used medical instruments and supplies.
- Disinfect patient waste and spills of infectious body fluids.
- Disinfect and discard infectious waste and non-reusable supplies.
- Clean and disinfect protective clothing, boots, and patients' sheets.
- Give first aid for accidental exposures.



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What to Disinfect: Disinfection kills almost all bacteria, fungi, viruses, and protozoa. It reduces the number of microorganisms to make equipment and surfaces safer for use. When VHF is suspected in the health facility, **all medical, nursing, laboratory and cleaning staff** should disinfect:

- Hands and skin after contact with a VHF patient or infectious body fluids
- Gloved hands after contact with each VHF patient or after contact with infectious body fluids (when gloves cannot be changed)
- Thermometers, stethoscopes and other medical instruments after use with each VHF patient
- Spills of infectious body fluids on the walls and floors
- Patient excreta and containers contaminated by patient excreta
- Reusable supplies such as protective clothing and patient bedding
- Used needles and syringes.

Note: All health facility staff — including cleaning, waste disposal, and laundry staff — who handle, disinfect, or clean VHF-contaminated supplies and equipment should **wear the same protective clothing as health care workers who provide direct patient care**. Wear thick gloves for the second pair of gloves. Follow the steps in Section 4 for putting on and taking off protective clothing.



5.1 Prepare Bleach Solutions

In a central place in the health facility, prepare two solutions of ordinary household bleach. Normally, ordinary household bleach has a 5.0% chlorine concentration.⁷

- 1:10 bleach solution⁸ is a strong solution used to disinfect excreta and bodies. It is also used to prepare the 1:100 bleach solution.
- 1:100 bleach solution⁹ is used to disinfect:
 - Surfaces
 - Medical equipment
 - Patient bedding
 - Reusable protective clothing before it is laundered.

It is also recommended for:

- Rinsing gloves between contact with each patient
- Rinsing gloves, apron, and boots before leaving the patient's room
- Disinfecting contaminated waste for disposal.

Bleach solutions must be prepared daily. They lose their strength after 24 hours. Anytime the odour of chlorine is not present, discard the solution.

Note: 1:10 bleach solution is caustic. Avoid direct contact with skin and eyes. Prepare the bleach solutions in a well-ventilated area.

7 The recommendations in this section assume ordinary bleach solution has a 5% chlorine concentration. Annex 8 contains a table describing quantities to use when preparing chlorine solutions from other chlorine products.

8 This is a solution with 0.5% chlorine concentration.

9 This is a solution with 0.05% chlorine concentration.

To prepare the bleach solutions

1. Gather the necessary supplies:
 - 1 container that holds 10 measures (for example, 10 litres) to make the base 1:10 bleach solution
 - 1 large or several smaller containers (1 for each station) with covers or lids to hold the 1:100 bleach solutions. These containers should be a different colour than the container holding the 1:10 bleach solution, or they should be clearly labelled "1:100."
 - Chlorine bleach (for example, 1 litre of Javel)
 - Clean water
 - A measuring cup or other container (for example, a bottle that holds 1 litre).
2. To prepare the containers for mixing the bleach solutions, determine where to mark the measurements for "9 parts" and "1 part" on each container.

- Pour 9 measures of water into the container. Mark a line where "9 parts" has filled the container. For example, use a nail to scratch a line on a metal or plastic bucket.
- Add 1 measure of water to the first 9 parts. Using a nail, mark a line at the point where the total volume has filled the container.

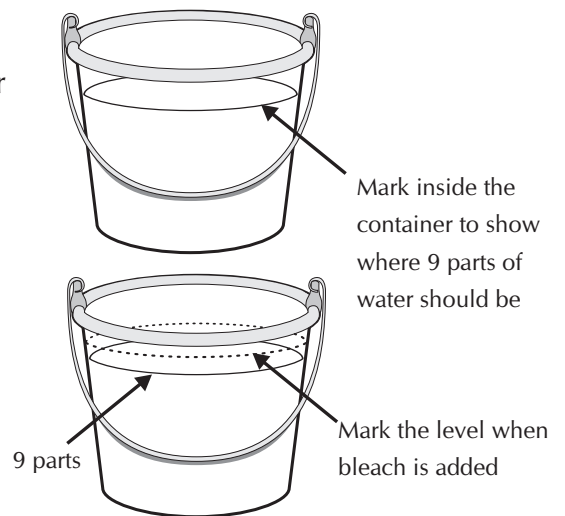


Fig. 45. Marking container for mixing 1:10 bleach solutions

3. To prepare 1:10 bleach solution:
 - Fill the marked container with water up to the mark for 9 parts.
 - Then pour the ordinary household bleach into the container up to the top mark.



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4. To prepare 1:100 bleach solution:

- Measure and pour 9 parts of water into the large container. Then measure and pour 1 part of 1:10 bleach solution into the water to make 1:100 bleach solution.

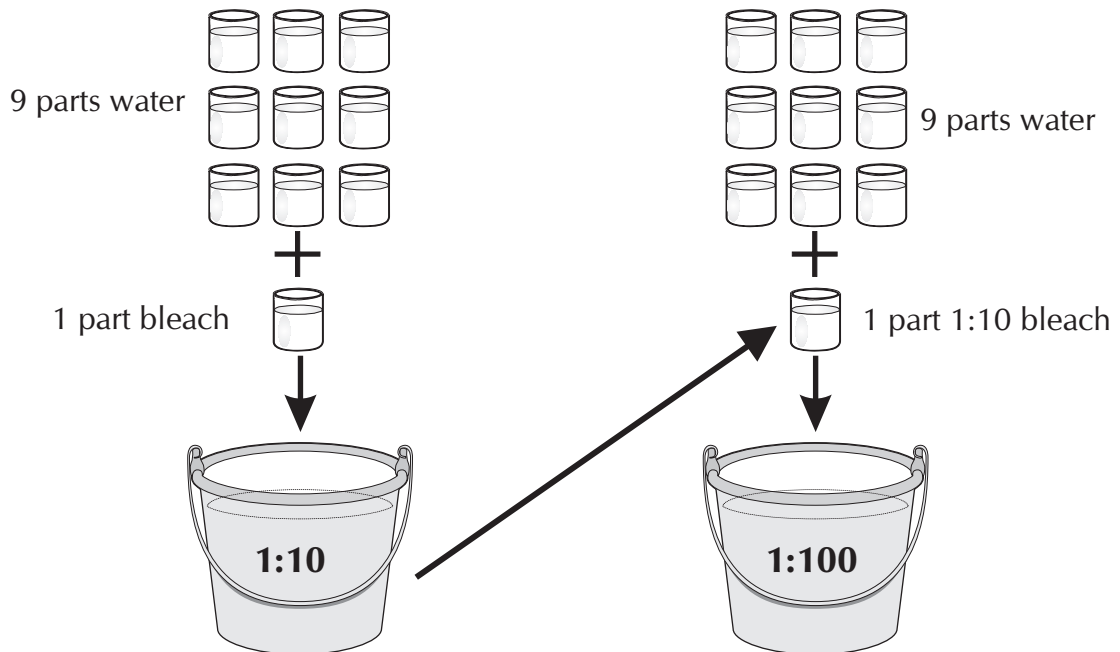


Fig. 46. Preparing bleach solutions

- Distribute a container to each station.
- Fill the container at each station in the isolation area with the 1:100 bleach solution as shown in Section 3.2.
- Place the remaining 1:10 bleach solution in the isolation area to disinfect spills and excreta.
- When there is a large outbreak, make larger quantities of bleach solutions. Prepare the disinfectants daily and distribute them as described in Section 3.
- **Remove the disinfectants everyday or whenever the solutions become cloudy or bloody.** Replace the solution with a fresh supply. Safe disposal of bleach solutions is described in Section 6.1.

- ***If you cannot smell chlorine in the bleach solution, the concentration is no longer strong enough for disinfection.*** Replace the solution with a fresh supply.
- Make a schedule for the cleaning staff so they know when to bring a fresh solution into the isolation area, when to change them, and when to remove them.

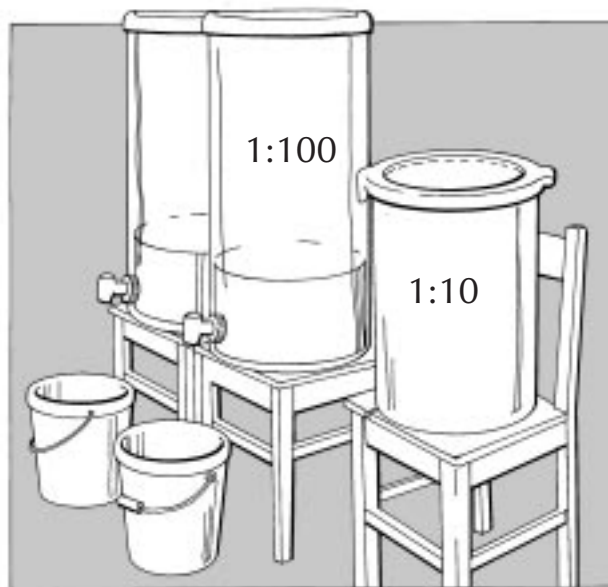


Fig. 47. Preparing bleach solutions during an outbreak



5.2 Prepare Supply of Soapy Water

Prepare a daily supply of soapy water.

1. Gather the necessary supplies:
 - Ordinary cake soap or powdered laundry detergent
 - Supply of clean water
 - Large bucket
 - Container for measuring 1 litre.
2. Cut a small piece of cake soap.

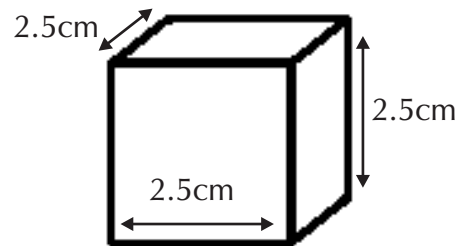


Fig. 48. Small piece of cake soap

3. Mix one piece of cake soap with 4 litres (1 gallon) of water.
4. Make sure the soap is well mixed with the water so there are suds. Pour into pan or bucket for use in cleaning (see Section 3.3).

OR

5. Mix powdered laundry detergent according to instructions on packet.

5.3 Disinfect Gloved Hands between Patients

Health care workers should change outer gloves between each patient.

If there are not enough gloves to allow health care workers to change to a new pair of outer gloves after examining or treating each patient, disinfect gloved hands in 1:100 bleach solution after working with each patient.

To disinfect gloved hands:

1. Place a bucket of 1:100 bleach solution in the isolation room.
2. If gloved hands are visibly soiled, wash them first in soap and water.
3. Dip the gloved hands into the 1:100 bleach solution for 1 minute.
4. Dry the gloved hands with a one-use (or paper) towel, or let the gloved hands air-dry.
5. If a bleach solution is not available, wash gloved hands with soap and water.
6. After several rinses in bleach solution, the gloves may become sticky and will need to be changed.
7. If gloves will be reused, place gloves in a bucket of soapy water. See Section 5.4 for instructions about washing used gloves.

If gloves are not going to be reused, discard them in the container for disposable infectious waste.



5.4 Disinfect Used Gloves before Reuse

Reusing gloves is **not** recommended. If it is necessary to reuse gloves because the supply in the health facility is limited, clean and disinfect them. Also check them for holes.

When cleaning staff handle contaminated supplies, make sure they wear the same protective clothing as health care workers. They should wear thick gloves as the second pair of gloves.

To clean and disinfect gloves for reuse:

1. Take the bucket with soaking gloves to the VHF laundry area. Carefully move the gloves to a bucket with fresh soapy water.
2. Gently rub the gloves to remove visible soiling and cover with water.
3. Soak them overnight.
4. Wearing at least an apron and thick gloves, rinse the gloves in clean water. To check for holes, fill each glove with rinse water. If any water squirts out, there is a hole in the glove. Discard any gloves with holes.
5. Air-dry the remaining gloves.
6. If available, put talcum powder in dry gloves.
7. Return clean gloves to the storage shelf in the entry to the isolation area.



Fig. 49. Checking gloves for holes

5.5 Disinfect Reusable Medical Instruments

In the isolation room, each time health care workers wash their hands between patients, they should also disinfect thermometers and stethoscopes they have used to examine the patient.

To disinfect thermometers and stethoscopes with alcohol:

1. Use rubbing alcohol (70% isopropyl).
2. Place the alcohol in a covered container and put it in the patient's room. Change the alcohol at least once a week.
3. Use a clean cloth or paper towel and dip it in the alcohol solution.
4. Carefully wipe the thermometer with the alcohol solution and hold the cloth around it for 30 seconds. Discard the cloth. Let the thermometer air-dry.
5. Use another clean cloth and dip it in the alcohol solution.
6. Carefully wipe the metal part of the stethoscope and hold the cloth against the surface for 30 seconds. Let it air-dry.
7. Discard the cloth in the laundry container. Discard paper towels in the bucket for waste to be burned.

To disinfect thermometers and stethoscopes with bleach solution:

1. Place a covered container of 1:100 bleach solution in the isolation room. Change the bleach solution each day.
2. Use a clean cloth or paper towel and dip it in the bleach solution. Never dip a soiled cloth back into the bleach solution. Use a cup or dipper to pour the bleach solution on a soiled cloth.
3. Wipe the thermometer with the cloth soaked in bleach solution. Or, soak the thermometer for 10 minutes in the bleach solution. Let the thermometer air-dry.
4. Use a clean cloth or new paper towel and dip it in the bleach solution.
5. Wipe the metal part of the stethoscope with 1:100 bleach solution. Let it air-dry.



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6. Discard the cloth in the laundry container. Discard paper towels in the bucket for waste to be burned.

How to disinfect and dispose of used needles and syringes is described in Sections 1.4 through 1.6.

5.6 Disinfect Bedpan or Waste Bucket

1. Cover the contents with 1:10 bleach. Empty the bedpan contents directly into the isolated toilet or latrine.
2. Clean the bedpan with soap and water to remove solid waste. Pour into toilet or latrine. Rinse the bedpan in 1:100 bleach solution and return it to patient's room.

If a family member is responsible for carrying out this task, make sure the family member wears protective clothing.

5.7 Disinfect Patient's Utensils

If families will assist with patient care, provide 1:100 bleach solution and soap and water so the family member can wash the patient's eating utensils. After washing the utensils, rinse them in 1:100 bleach solution, and let them air-dry.

5.8 Disinfect Spills of Infectious Body Fluids

Place a bucket containing 1:100 bleach solution in the isolation area.

To disinfect spills of infectious body fluids:

1. Use a cup or dipper to pour bleach solution on spills. Cover the spill completely with 1:100 bleach solution. If the spill is heavy or dense, cover with 1:10 bleach solution. Take care to prevent drops or splashes of the contaminated body fluid from reaching anyone when pouring bleach solution on the spill.



Fig. 50. Disinfecting a spill on the floor

2. Soak the spill for at least 15 minutes.
3. Remove the disinfected blood or spilled material with a cloth soaked with 1:100 bleach solution.
4. Discard any waste in the container for collecting disposable infectious waste or in the isolated latrine or toilet.
5. Wash area as usual with soap and clean water.



To clean the walls or other surfaces:

Surfaces such as tabletops, sinks, walls and floors are not generally involved in disease transmission. However, in a VHF patient's room, if walls are visibly soiled with blood or other body fluids, clean them as follows:¹⁰



Fig. 51. Disinfecting a spill on the wall

1. Use a sprayer or mop to wash the walls with 1:100 bleach solution. Rinse the mop in a fresh supply of 1:100 bleach solution. (If using a sprayer, apply the spray close to the surface to minimize splashing and aerosols.)
2. Wash the wall as usual with soap and clean water to remove visible soil.
3. Discard any waste in container for collecting infectious waste or in the isolated latrine or toilet.

5.9 Disinfect Infectious Waste and Non-Reusable Supplies for Burning

Place a bucket or other container containing 1:100 bleach solution in the patient's room. Use it to collect infectious waste, contaminated items, and non-reusable supplies that will be burned.

How to carry out safe waste disposal is described in Section 6.

10 Favero, MS, and Bond, WW. Sterilization, disinfection, and antisepsis in the hospital. In: Murray PR ed. Manual of Clinical Microbiology. Washinton, D.C.: American Society for Microbiology. pp. 183-200, 1991

5.10 Clean and Disinfect Protective Clothing

Set aside a special part of the laundry or cleaning area for laundry from suspected VHF patients. Make sure health facility staff who handle contaminated laundry wear protective clothing, including thick gloves as the second pair of gloves.

1. Transfer laundry as soon as possible to area set aside for VHF laundry.
2. Carefully move the laundry to a bucket with fresh 1:100 bleach solution.
3. Soak laundry in 1:100 bleach solution for 30 minutes. Be sure that all items are completely soaked.
4. Remove items from the bleach solution and place in soapy water.
5. Soak overnight in soapy water.
6. Scrub thoroughly to remove stains. Rinse and line-dry.
7. Use a needle and thread to repair any holes or torn areas.
8. The clean clothing is now ready for use. It can be ironed although this is not necessary. (It is not necessary to wear protective clothing when ironing cleaned clothing.)



Fig. 52. Transferring laundry to the cleaning area

Items that are very worn out should be discarded or used as cleaning rags.

5.11 Clean and Disinfect Boots

Place a sprayer or pan with 1:100 bleach solution at the exit of the patient's room. Change the pan often. Steps for disinfecting boots are described in Section 4.4.



5.12 Clean and Disinfect Patient's Bedding

For plastic sheeting:

1. If the plastic sheeting becomes soiled during its use with the same patient, remove liquid or solid waste with absorbent towels. Discard them in the container for collecting infectious waste for burning. Then, wash the plastic sheeting with 1:100 bleach solution.
2. Change the plastic sheeting between patients.
3. If the plastic sheeting cannot be changed between patients, wash it with 1:100 bleach solution after each patient.



Fig. 53. Cleaning patient's bedding

For patient's sheets:

1. Remove sheets from bed. Put them in a container (plastic bag or bucket) in the patient's room.
2. Take the container directly to the laundry area.
3. Soak in 1:100 bleach solution for 30 minutes. Be sure all items are completely soaked.
4. Remove items from the bleach solution and place them in soapy water. Soak overnight.
5. Scrub thoroughly to remove stains. Rinse and line-dry.

Mattresses:

If a mattress is heavily soiled, remove it from the isolation area to the outdoors and burn it. Make sure health facility staff wear protective clothing and gloves when touching and carrying the soiled mattress.

If mattresses must be reused:

1. Pour 1:10 bleach solution directly on the mattress. Let the solution soak through completely to the other side.
2. Flood the soiled area with soapy water and rinse with clean water.
3. Let the mattress dry in the sun for several days.
4. Turn the mattress often so it dries on both sides.

5.13 Give First Aid for Accidental Exposures

Accidental needlestick injury: Assume any needlestick injury is a suspected contact for VHF whether or not a break in the skin can be seen. If an accidental needlestick injury occurs, treat the exposure site.

1. Immerse the exposed site in 70% alcohol for 20 to 30 seconds, and wash with soap and clean water.
2. Flush the site in running water for 20 to 30 seconds.
3. If needed, cover with a dressing.
4. Report the incident to a supervisor or the physician-in-charge.

The purpose of notifying the physician-in-charge is:

- To identify what caused the problem
- To take corrective action to solve the problem and prevent accidental transmission
- To provide appropriate care for the possible case of VHF.



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Remind the health facility staff that accidents do happen even when every precaution to prevent them has been taken. Reassure health facility staff that reporting the accidental exposure will have no negative consequences. Explain that reporting the accidental exposure is essential for protecting themselves, their families, other health workers and patients.

Accidental contact with infectious body fluids: An accidental contact can occur if there is unprotected contact between infectious body fluids and broken skin or the mouth, nose or eye. For example, vomit may run under a glove, a patient might cough blood which runs into the health care worker's eye, or coughed blood may run underneath a health care worker's mask and get into the mouth. Treat any accidental contact as a suspected contact with VHF. As soon as the contact occurs:

1. Flush the area in the most appropriate manner with soap and clean water. If a splash occurs in the eye, flush it with clean water.
2. Leave the isolation area and remove the protective clothing as recommended.
3. Take a shower and put on street clothes.
4. Report the exposure to a supervisor or the physician-in-charge. Complete the necessary forms.

Follow up accidental exposures:

1. Monitor the condition of the health facility staff. Take a measured temperature two times per day.
2. If a fever occurs – temperature is 38.5°C (101°F) or higher – the health facility staff should not do patient care activities. Treat as a suspected case of VHF if the health facility staff's signs and symptoms meet the case definition (Please see page 23 and Annex 4).