

Section 4

Wear Protective Clothing



This section describes how to:

- Prepare a supply of protective clothing for use with VHF Isolation Precautions.
- Make adaptations from locally available materials when an item is not available, or if the supply is limited.
- Put on and take off protective clothing in the changing room.

Section 4 Wear Protective Clothing

4.1 Specify Who Should Wear Protective Clothing

- All doctors, nurses, and health care workers who provide direct patient care to suspected VHF patients.
- All support staff who clean the isolation room, handle contaminated supplies and equipment, launder reusable supplies, and collect and dispose of infectious waste from VHF patients.
- All laboratory staff who handle patient specimens and body fluids from suspected VHF cases.
- Laboratory support staff who clean and disinfect laboratory equipment used to test VHF specimens.
- Burial teams who remove bodies of deceased VHF patients and prepare them for burial.
- Family members who care for VHF patients.

When a VHF case is suspected in the health facility, the following protective clothing should be worn in the isolation area:

- A scrub suit or inner layer of clothing (an old shirt and trousers brought from home)
- A pair of thin gloves
- Rubber boots or overshoes (only if the floor is soiled)
- A gown or outer layer of clothing (surgical or disposable gown with long sleeves and cuffs)
- A plastic apron worn over both layers of clothes
- A second pair of thin or thick gloves. Wearing a second pair of gloves provides an added measure of safety during patient care and when handling contaminated supplies
- A HEPA-filter (high-efficiency particulate air respirator) or other biosafety mask (or surgical mask if HEPA-filter or other biosafety mask is not available)

Boots: Boots or overboots must be worn over street shoes when infectious waste is on the floor. Common rubber boots are recommended. The sides of the boots should be at least 30 cm (12 inches) high and have textured soles.

If boots are not available, wear two layers of plastic bags.



Fig. 15. Using plastic bags as boots

Assign those staff who are entering the isolation area their own pairs of boots. Staff members will be responsible for storing their boots in a covered shelf or in a plastic sack between each use.



Fig. 16. Storing boots

Gown or Outer Layer: Wear a disposable surgical gown or a cotton gown over the first layer of clothes.

Disposable surgical gowns can be reused by the same staff member if they are not contaminated and are not obviously dirty and torn.

When the supply of disposable gowns is limited, wear a cotton surgical gown that can be washed and reused.

When a supply of commercial plastic aprons is not available, make aprons from plastic sheeting, rubber, or plastic cloth normally used to cover kitchen tables.

The apron should:

- Have hooks or ties that fasten around the neck.
- Have ties at the waist that reach around and tie at the back.
- Be long enough to cover the top of the boots and provide additional protection from spills running inside the boots.

Thick gloves: These are worn over an inner pair of thin or latex gloves. They are worn to clean spills, launder reusable protective clothing and patient bedding, handle disposable waste, and conduct autopsies and burial preparations.



Fig. 19. Thick gloves

The gloves can be made of neoprene or thick rubber. They should reach well above the wrist, about 30 cm (12 inches) up the arm. When thick rubber gloves are not available, use normal kitchen gloves as the outer layer of gloves.

If the supply of gloves is limited, wear one pair of gloves. Disinfect them after each contact with the VHF patient or with infectious body fluids and contaminated material. How to disinfect and clean gloves during patient care and for reuse is described in Sections 5.3 and 5.4.

If gloves are not available, use plastic bags to cover the hands.



Fig. 20. Using plastic bags as gloves

Surgical mask: If HEPA-filter or other biosafety masks are not available, use surgical masks. Surgical masks will not filter out small particles, but they will protect the health care worker from droplets or splashing of body fluids.



Fig. 22. Surgical mask

A surgical mask can be reused by the same health care worker as long as it is not contaminated and not obviously dirty and torn.

Cotton mask: If surgical masks are not available, use cotton masks made from four or five layers of cotton cloth sewn together.

- Use a different colour for each side of the mask. This will help health care workers quickly identify which side should be worn inside.
- The mask should have ties that are long enough to reach behind the head.



Fig. 23. Cotton mask

Cotton masks will not provide protection from breathing in particles, but they will provide protection against splashes and other droplet contact with infectious body fluids. A cotton mask can be reused by the same health care worker as long as it is not contaminated and not obviously dirty and torn.

Head covering: A head covering or cap protects the hair and head against splashes from the patient's vomit, blood, or other body fluids.

Use disposable or cotton caps. If disposable caps are not available, make cotton caps from locally available cotton fabric. Include ties so the cap does not fall off when the health care worker bends over a patient.



Fig. 24. Head covering

4.3 Put On Protective Clothing

Make sure the changing room (and the changing area for cleaning and other staff) contains a supply of protective clothing. Section 3.4 describes how to set up a changing room.

1. Before entering the changing room, remove jewelry, wallets and other valuables. Store them safely outside the changing room.

2. Remove street clothes and hang them on a hook. **Put on the scrub suit** or set of old clothes.



Fig. 26. Scrub suit: the first layer of clothing

3. **Enter the changing room.**

4. **Put on rubber boots.**

Put on each boot and tuck the trouser leg inside the boot. If overboots are used, tape the top of the boot to the leg with plastic tape. This will help prevent spills from running inside the boots.



Fig. 27. Putting on boots

7. **Put on the plastic or rubber apron.**



Fig. 30. Putting on a plastic apron

8. **Put on the second pair of gloves.**

- Place the edge of the second pair of gloves over the cuff of the gown.
- If using plastic bags, place the second layer of plastic bags over the first. Close ends of the bags with plastic tape or elastic bands.



Fig. 31. Proper way to put on the second pair of gloves

- Health facility staff who do cleaning, laundering, disinfecting, waste disposal or handling the body should wear thick gloves as the second pair of gloves.
9. **Put on the mask.** Tie it at the back of the neck and towards the top of the head.



Fig. 32. Putting on mask

4.4 Take Off Protective Clothing

The steps for removing protective clothing include disinfection with bleach solutions and washing hands with soap and water. How to set up supplies for disinfection is described in Section 3.3. How to prepare the bleach solutions is described in Section 5.1.

Outer gloves and boots are likely to have the most contact with infectious body fluids during patient care.

Before leaving the patient's room:

1. **Disinfect the outer pair of gloves.**
 - Wash the gloved hands in soap and water.
 - Dip the gloved hands in 1:100 bleach solution for 1 minute.
2. **Disinfect the apron.** Spray or wipe it with 1:100 bleach solution.
3. **Disinfect the boots.**

Note: The soles of rubber boots are difficult to clean because they are textured. Disinfect them carefully and make sure to reach all surfaces of the textured soles.

- Use a sprayer containing 1:100 bleach solution to spray boots

OR

- Hold the foot over a pan or basin and ask another health worker to pour 1:100 bleach solution over the boots



Fig. 35. Disinfecting the boots

OR

- Step into a shallow pan containing 1:100 bleach solution and wipe boots on a bleach-drenched cloth.

5. **Remove the apron and outer gown.**

- Put the apron in a laundry container or hang it for reuse (if it will be reused).



Fig. 37. Removing the apron

- Remove the outer gown. Hang it on a hook for reuse. Make sure it is hung inside out. If the gown needs laundering, place it in the laundry container.



Fig. 38. Removing the gown

6. **Disinfect the gloved hands**
after contact with apron and outer gown.

- Rinse the gloved hands in 1:100 bleach solution. Then wash them in soap and water.
- Dry the gloved hands with a one-use towel.
- If bleach is not available, wash the gloved hands with soap and water.



Fig. 39. Washing the gloved hands

8. Remove the boots.

- Place a towel that has been soaked in 1:100 bleach solution on the floor for health facility staff to stand on when removing boots.
- Use a boot remover to take off the rubber boots. Avoid touching the boots with bare or gloved hands.

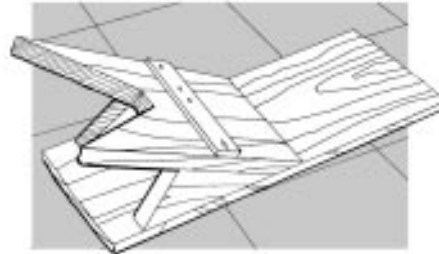


Fig. 43. A boot remover

- Store boots safely until next use. For example, store them in a plastic sack or on a covered shelf.

9. Remove the inner pair of gloves.

If gloves will be discarded:

- Remove the first glove with the other gloved hand. Pull the edge of the first glove back over the gloved hand so that the glove turns inside out as it is being pulled back.

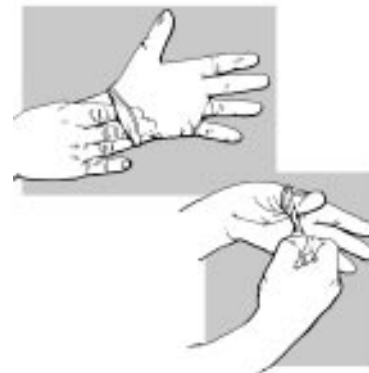


Fig. 44. Removing the inner gloves

- Place the inside-out glove in the palm of the gloved hand.
- Reach inside the glove to a clean area. Pull the glove back over the hand so that only the inside of the glove is exposed and covers the glove held in the palm. Discard the gloves in a bucket for disposal of contaminated waste.
- Wash ungloved hands with soap and water.

Note:

When gloves are in limited supply, use one pair of gloves only. Modify the order for removing protective clothing as follows:

1. Rinse gloved hands in 1:100 bleach solution upon leaving the patient isolation room.
2. Remove apron and outer gown as described in Section 4.4.
3. Remove the gloves.
4. Wash ungloved hands in soap and water.
5. Remove the inner gown or scrub suit, mask, head cover and eyewear.
6. Wash hands again.

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.

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.

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.

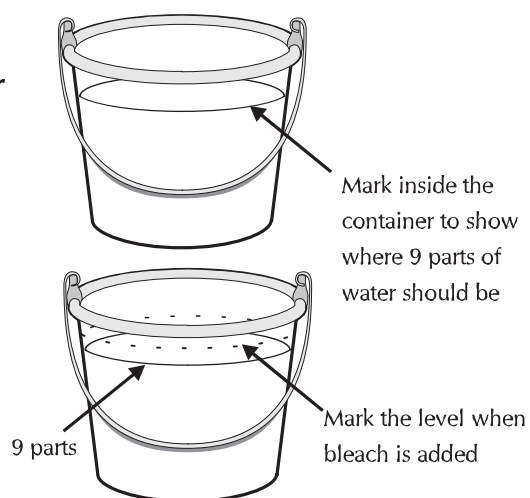


Fig. 45. Marking container for mixing 1:10 bleach solutions

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.

- ***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.

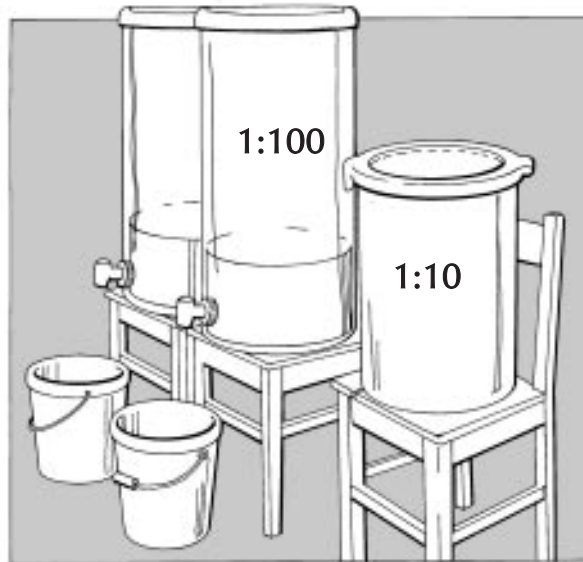


Fig. 47. Preparing bleach solutions during an outbreak

5.3 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.

5.5 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.

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.

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.