

## 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.



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### 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)



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- Cotton head covering
- Clear eyeglasses or non-fogging goggles.

**Note:** *When protective clothing is not available or is in short supply, adaptations must be made and used.*

### 4.2 Gather a Supply of Protective Clothing

Obtain and store the following items outside the changing room or in a storage cabinet inside the changing room.

**Scrub suit or inner layer:** Wear a scrub suit or a set of old clothes brought from home (such as a loose-fitting shirt and trousers). Avoid wearing long skirts to prevent contact between clothing and spills of infectious waste on the floor.



Fig. 13. Inner layer of clothing

**Thin gloves:** These permit fine-motor function when examining or caring for patients. They can be latex, vinyl, or surgical gloves; they do not need to be sterile. The gloves must reach well above the wrist, preferably 10 cm to 15 cm long (4 inches to 6 inches), measuring from the wrist up along the arm.



Fig. 14. Thin gloves

**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.



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The gown should:

- Open at the back and close with ties at the neck and waist.
- Be knee-length with collar wraps around the neck and elastic bands to close the gown around the wrist. If elastic bands are not used, sew on cotton loops. They can be hooked around the thumb to hold the sleeve in place.

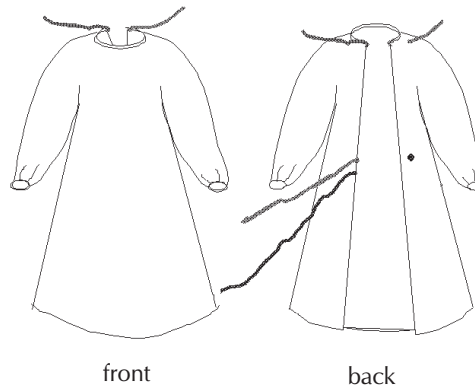


Fig. 17. Illustration of gown with ties

If the supply of cotton surgical gowns is limited, make additional gowns from local cotton fabric. Instructions for making cotton gowns are listed in Annex 5. Specifications for ordering gowns and other pieces of recommended clothing are listed in Annex 6.

**Plastic Aprons:** Wear a plastic apron over the outer gown. The apron prevents contact with infectious body fluids that may soak through protective clothing when the patient bleeds, coughs or vomits.

Plastic aprons should be worn by anyone who has direct contact with a suspected VHF case or infectious body fluids. These aprons are strongly recommended for:

- Nurses
- Laboratory staff
- Cleaning staff
- Staff who perform autopsies or prepare bodies for burial.



Fig. 18. Wearing a plastic apron

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



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If nothing is available to serve as a glove or hand covering, make sure health facility staff wash their hands with soap and water **immediately:**

- After every contact with the VHF patient
- Before leaving the patient's room
- After any contact with infectious body fluids
- After contact with any contaminated material.

How to set up handwashing stations is described in Section 1.3.

**Mask:** Masks protect the health care worker's face from contact with blood or droplets of infectious body fluids. Use masks that cover the mouth and nose. Use a HEPA-filter or other biosafety mask, a surgical mask, or a cotton mask made locally.

**HEPA-filter or biosafety mask:** A HEPA-filter mask filters the air to prevent breathing in small particles and harmful microorganisms. It provides protection from airborne transmission of microorganisms.



Fig. 21. HEPA-filter mask

A HEPA-filter or biosafety mask is lightweight and easy to use. It can be reused by the same health care worker as long as it continues to fit comfortably and the mask does not become contaminated, crushed, or splattered with body fluids.

Do not touch the mask after it has been put on. The mask may become contaminated once it is touched. To avoid the necessity for touching the mask, make sure it fits comfortably before entering the patient's room.

When handling a reused mask, hold it by the strings. Be careful that the outside surface does not touch the health care worker's face.



**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



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If cotton caps are not available:

- Use a scarf, bandanna, or large piece of cloth.
- Fold the scarf, bandanna, or cloth and wrap it around the head.

**Eyewear:** Wear clear eyeglasses or non-fogging goggles to protect the eyes from splashes or spills of infectious body fluids.



Obtain clear eyeglasses from a local eyeglass shop or in the market. Place ties on the ear holders. Tie the eyeglasses around the back of the head so they will not fall off when a health care worker bends over a patient. If available, wear commercial non-fogging goggles instead of eyeglasses.

*Fig. 25. Wearing clear eyeglasses or goggles*

### 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



5. **Put on the first pair of gloves.**

- Look at your hands for cut or broken skin. If the skin is cut or broken, refrain from direct patient contact.
- Put on one glove at a time. If the scrub suit or set of old clothes has long sleeves, place the edge of each glove *under* the cuff.
- When only one pair of gloves is worn, place the edge of the glove over the cuff or gown.
- If gloves are not available, use plastic bags. Put on one layer now. Attach and close the first layer with tape or elastic bands.



Fig. 28. Putting on the first pair of gloves

6. **Put on the outer gown.**

- Pick up the gown from the inside. This is especially important if the gown is being reused.
- Place arms through the armholes.
- Tie the gown in back. Or, ask another health care worker to tie the gown.



Fig. 29. Putting on the outer gown

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



10. **Put on a head cover.**



*Fig. 33. Putting on head cover*

11. **Put on the protective eyewear.** Attach the eyeglasses or goggles behind the head with string or cord to prevent the eyewear from falling off when working with patients in the isolation ward.



*Fig. 34. Putting on eyewear*

**Remember!** Make sure the mask, head cover and eyewear fit comfortably. Once gloved hands have touched a patient, do not touch the mask, headcover and eyewear.

Plan ahead to bring everything into the isolation area for examining the patient. Once protective clothing has been put on, do not re-enter the general health facility. In an emergency, ask the guard or a health assistant to go and obtain any needed items from other parts of the health facility.

## 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

OR

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



Fig. 35. Disinfecting the boots



4. **Remove the outer pair of gloves.**

If two pairs of gloves are worn:

- Pull the edge of the glove back over the gloved hand so that the glove turns inside out as it is being pulled back.
- If gloves will be reused, place the glove in a bucket containing soapy water.



*Fig. 36.  
Disinfecting used  
gloves in soapy  
water for reuse or  
disposing of them  
in waste bucket*

- If gloves will *not* be reused, discard them in a bucket for disposal of contaminated waste.
- Remove the other glove in the same way.

If only one pair of gloves is worn:

- Do not remove the gloves now.
- Rinse the gloved hands in 1:100 bleach solution for 1 minute before leaving the patient's room.

After disinfecting the boots and removing the outer gloves, go into the changing room.



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



7. **Remove the eyewear, head cover and mask.**

- If eyewear is heavily soiled, wash the eyeglasses in soapy water and wipe them clean. Store them in a drawer or shelf with the clean supply of eyeglasses.



Fig. 40. Removing the eyewear

- Remove the head cover and, if unsoiled, store it with the cleaned eyewear. If it is soiled, place it in the laundry container or discard it in the bucket for disposal of contaminated waste.



Fig. 41. Removing the head cover

- Remove the mask and hang it on a hook or store it for reuse.
- A HEPA-filter or other biosafety mask can be reused by the same health care worker as long as it is not soiled.



Fig. 42. Removing the mask

If the HEPA-filter or other biosafety mask is soiled, discard it in a bucket for disposal of contaminated waste.

- A locally made cotton mask can be reused as long as it is not obviously dirty and torn.

If it is soiled, place it in the laundry container.

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.

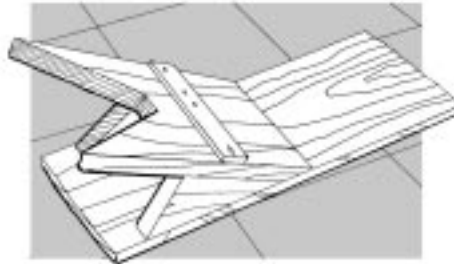


Fig. 43. A boot remover

- 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.

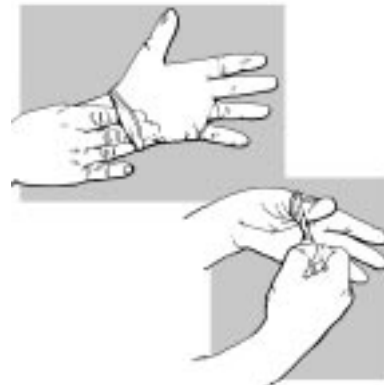


Fig. 44. Removing the inner gloves

- 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.



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If gloves will be reused:

- Reach inside the first glove to a clean area. Pull the glove back over the hand so the glove turns inside out as it is pulled back. Place the glove in a bucket of soapy water.
- Remove the second glove in the same way.
- Place the second glove in soapy water.
- Immediately wash ungloved hands with soap and water.

10. **Remove inner layer of clothes** and dress in street clothes.

- If the inner layer is not soiled, store the clothing for reuse.
- If soiled, place the clothing in the laundry container.
- If personal shower facilities are available, shower before dressing in street clothes.
- If skin has contact with soiled material, follow guidelines for accidental exposure in Section 5.13.
- Put on street clothes.

11. **Wash hands with soap and clean water** before leaving the changing room.

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.



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