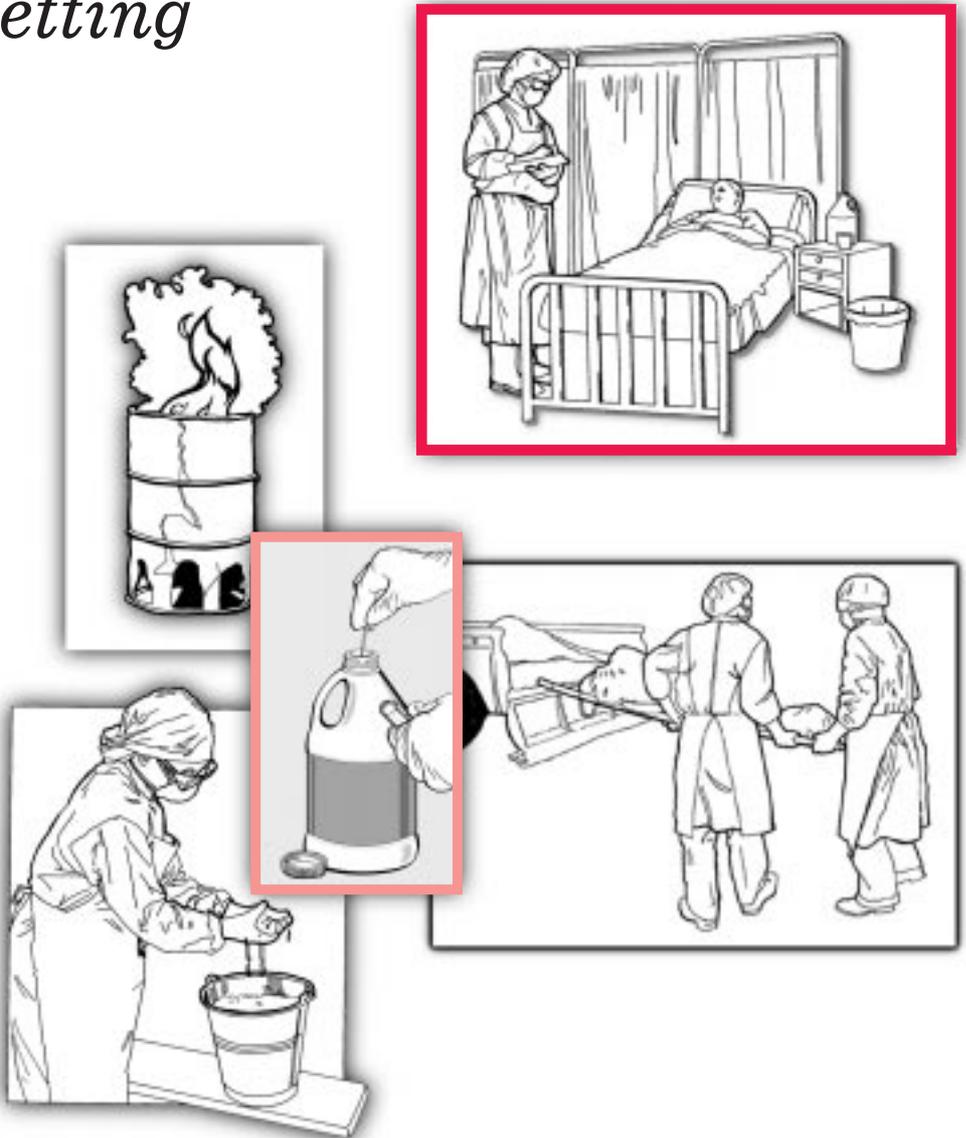


Infection Control for Viral Haemorrhagic Fevers in the African Health Care Setting



World Health Organization



U.S. DEPARTMENT OF HEALTH & HUMAN SERVICES
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Infection Control for Viral Haemorrhagic Fevers in the African Health Care Setting

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Introduction



African countries (shaded areas) where viral haemorrhagic fevers have been documented in the past

Viral Haemorrhagic Fevers: An Overview

In Africa, viral haemorrhagic fevers (VHFs) include Lassa fever, Rift Valley fever, Marburg and Ebola haemorrhagic fevers, Crimean-Congo haemorrhagic fever (CCHF) and yellow fever. Humans initially contract an infection with a haemorrhagic fever virus through exposure to rodents or insects (for Ebola and Marburg VHFs, the natural reservoir is unknown). Person-to-person transmission of Lassa, Ebola, Marburg and CCHF viruses can occur through direct contact with VHF-infected material.

Typically, during the course of a VHF, the blood vessels and many organ systems are damaged. VHFs are often accompanied by bleeding, reflecting the widespread presence of the virus throughout the patient's body. As a result, the blood, urine, vomitus, pus, stool, semen and saliva from the VHF patient are infectious. This is why VHFs pose a serious risk to caregivers in the health care setting and in the community.

The transmission risk of VHFs in the health care and laboratory setting is well documented. During the 1995 Ebola haemorrhagic fever outbreak in Kikwit (former Zaire, and now the Democratic Republic of the Congo), one fourth of the cases were in health care workers with a history of recent patient care.¹ After barrier nursing practices (such as wearing protective clothing) were implemented, the risk of transmission was reduced. No new cases were reported among health care workers who used these practices. (Fig.1)

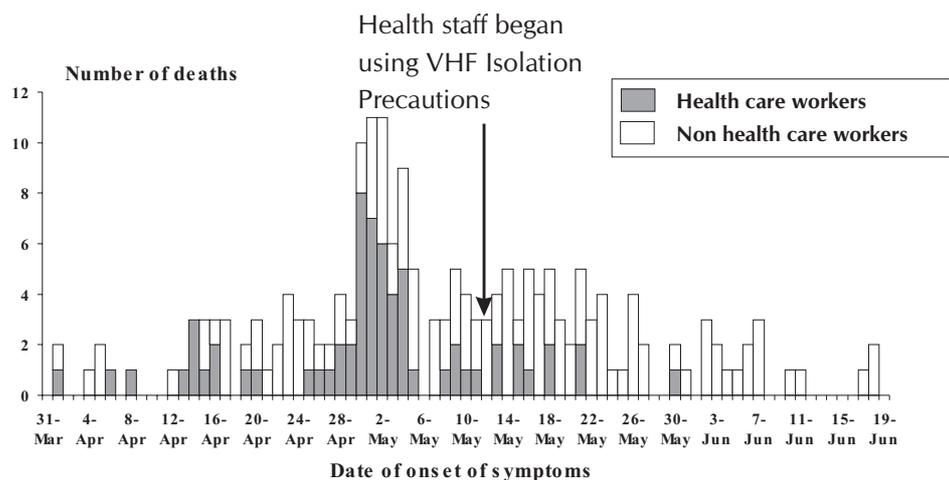
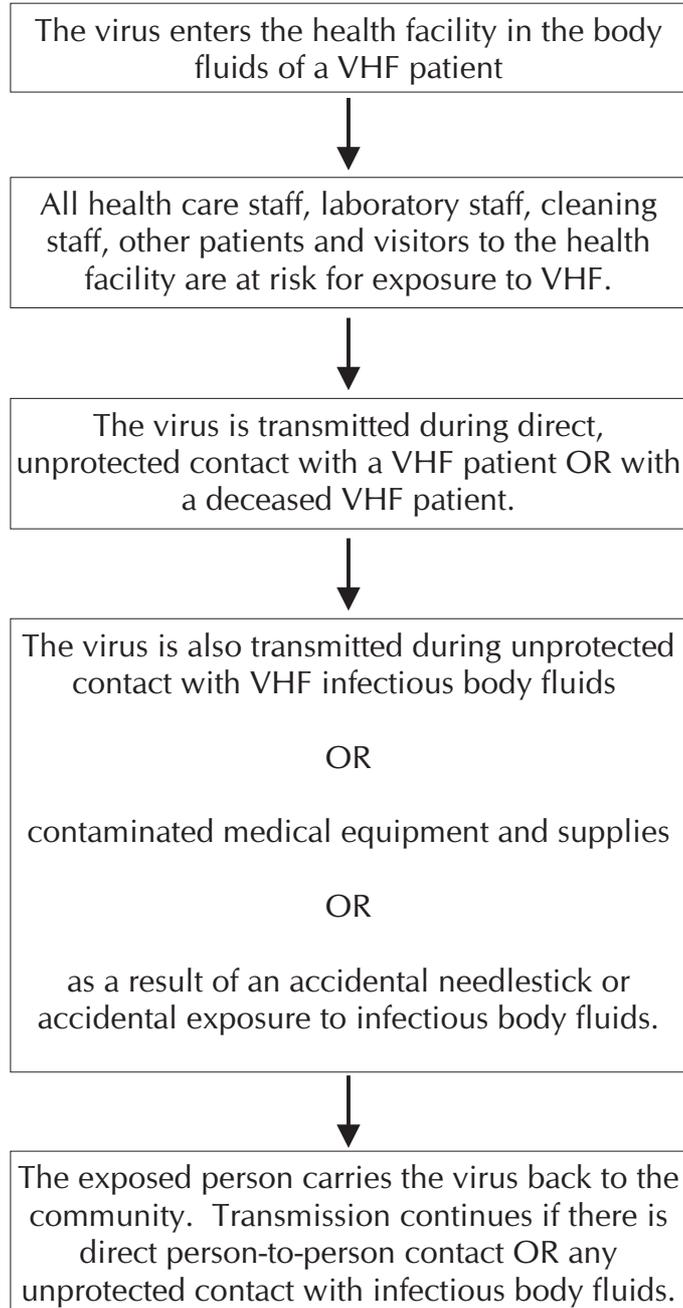


Fig. 1. The number of infected health care workers declined after barrier nursing practices were begun during the Ebola haemorrhagic fever outbreak at Kikwit, 1995. One case resulted from an inappropriate use of barrier nursing practices.

1 Khan AS et al. The Reemergence of Ebola Hemorrhagic Fever, *Journal of Infectious Diseases*, in press, 1998.



How VHF Is Transmitted in the Health Care Setting



What Is in This Manual

This manual describes a system for using VHF Isolation Precautions to reduce the risk of transmission of VHF in the health care setting. The VHF Isolation Precautions described in the manual make use of common low-cost supplies, such as household bleach, water, cotton cloth, and plastic sheeting. Although the information and recommendations are intended for health facilities in rural areas in the developing world, they are appropriate for any health facility with limited resources.

Who the Manual Is For

The manual is intended primarily for health officers who implement infection control in the health care setting, and for:

- Health facility administrators
- Hospital outbreak coordinators
- Chief medical officers
- Chief nursing officers
- Medical and nursing staff
- Medical and nursing educators
- Public health officers and programme administrators.

Objectives

The information in this manual will help health facility staff to:

1. Understand what VHF Isolation Precautions are and how to use them to prevent secondary transmission of VHF in the health facility.
2. Know when to begin using VHF Isolation Precautions in the health care setting.
3. Apply VHF Isolation Precautions in a large-scale outbreak. (When a VHF occurs, initially as many as 10 cases may appear at the same time in the health facility.)



-
4. Make advance preparations for implementing VHF Isolation Precautions.
 5. Identify practical, low-cost solutions when recommended supplies for VHF Isolation Precautions are not available or are in limited supply.
 6. Stimulate creative thinking about implementing VHF Isolation Precautions in an emergency situation.
 7. Know how to mobilize community resources and conduct community education.

How to Use the Manual

This manual can be used as a rapid reference when one or two cases of a VHF appear in a health facility and no previous preparations for VHF Isolation Precautions have been done. Administrators or hospital outbreak coordinators can use the information and instructions to set up an isolation area quickly and make adaptations from local materials so that an effective system of infection control can be implemented as soon as possible.

The manual can also be used for planning and carrying out in-service training aimed at strengthening VHF Isolation Precautions. It can be accompanied by workshop activities, in which participants discuss and practice the recommendations made in this manual.

The manual should be used to help health facilities make advance preparations for responding with appropriate precautions when a VHF case is suspected.

This manual consists of nine sections:

- Section 1** **Use Standard Precautions with All Patients** describes how to establish routine precautions for infection control. The section emphasizes the importance of using Standard Precautions consistently, especially handwashing before and after examining patients with fever.
- Section 2** **Identify Suspected Cases of VHF** lists common signs and symptoms of VHF and the immediate precautions to take when a VHF is suspected.
- Section 3** **Isolate the Patient** lists recommended supplies and describes how to set up an isolation area. It includes checklists that can be used in an emergency situation and practical suggestions for alternate equipment when recommended items are not available.
- Section 4** **Wear Protective Clothing** describes the protective clothing that should be worn when VHF is present in the health facility. It also provides information about selecting appropriate items when recommended clothing is not available.
- Section 5** **Disinfect Reusable Supplies and Equipment** describes the use of VHF Isolation Precautions during patient care and when disinfecting and cleaning contaminated surfaces, supplies and equipment. This section also presents recommended first aid for accidental exposures.
- Section 6** **Dispose of Waste Safely** describes step-by-step procedures for disposing of VHF-contaminated waste. It also lists detailed instructions for building an incinerator from available material.
- Section 7** **Use Safe Burial Practices** describes how to prepare bodies of deceased VHF patients safely for burial and how to prevent disease transmission through contact with the deceased patient.
- Section 8** **Mobilize the Community and Conduct Community Education** provides guidance for involving the community in disease prevention and control activities when VHF is suspected. It also describes how to choose a VHF Coordinator.
- Section 9** **Make Advanced Preparations to Use VHF Isolation Precautions** lists steps for preparing in advance to use VHF Isolation Precautions. If advance preparations have been carried out, and a VHF is suspected, the supplies are ready and health facility staff are trained in recommended practices. When advance preparations are not possible, VHF Isolation Precautions must be implemented in an emergency situation.

The **Annexes** provide additional details about specific topics described in the manual.

Glossary for Use with This Manual

Changing room	Area next to isolation ward where health workers dress in protective clothing, disinfect hands and gloves, and dispose of soiled and contaminated protective clothing.
Cleaning	Removal of any soiling or other material on equipment or surfaces before disinfection or sterilization.
Contamination	Presence of infectious agent in blood and other body fluids, on body surfaces and medical equipment, clothing and supplies. Contact with contaminated body fluids or items is a risk for disease transmission.
Disinfection	Elimination of <i>most</i> microorganisms from a surface, making it safe for reuse. "Sterilization" means eliminating <i>all</i> microorganisms.
Health care worker	Any person trained to provide patient care (medical, nursing, paramedical, emergency room nurses, community health workers).
Health facility	Any hospital, health centre or clinic with inpatient facilities. Also any facility providing emergency or first-service care.
Health facility staff	All patient care, laboratory, cleaning, disposal, reception, and administrative staff who are likely to have contact with suspected VHF cases, VHF infectious body fluids, and infectious waste.
Isolation area/ward	The area in the health facility used for housing suspected VHF patients. It includes the patient's room or area, isolated latrine or toilet, family entrance, and changing room.
Protective clothing	Masks, gloves, gowns, eyeglasses, caps, aprons, and boots. Provides protection against splashes or spills of infectious material when examining suspected VHF cases or handling infectious waste and laundry.
Sharps container	Puncture-resistant container for collecting used needles and syringes.
Standard Precautions	Practices for limiting or preventing disease transmission in the health care setting.
Sterilization	Elimination of all microorganisms (viral, bacteria, and fungal) through heat, using an autoclave or steam sterilizer, or other appropriate methods.
VHF Coordinator	Designated health officer who coordinates infection control and outbreak response, and provides liaison with the community and other agencies involved in outbreak control.
VHF Isolation Precautions	Barrier nursing and other infection control practices for preventing contact between VHF infectious body fluids and non-infected persons.

Section 1

Use Standard Precautions with All Patients



This section describes how to:

- Identify a minimum level of Standard Precautions for use with all patients regardless of their infection status.
- Establish routine handwashing practices.
- Establish safe handling and disposal of used needles and syringes.
- Be prepared to intensify Standard Precautions and include VHF Isolation Precautions.
- Identify a VHF Coordinator to oversee and coordinate activities associated with VHF Isolation Precautions.

1.1 Use Standard Precautions

Health workers throughout the world are aware of the risks for transmitting human immunodeficiency virus (HIV) and hepatitis viruses in the health care setting. Many use precautions (such as wearing gloves) for preventing contact with infected blood.

Other dangerous diseases are also transmitted through contact with blood or other body fluids and pose a significant risk in the health care setting. For instance, a patient with a VHF may come to the health facility at any point in his or her illness,

- When the possibility of exposure is often highest, and
- Before the specific cause of the patient's illness is known.

Because a health worker cannot always know when a patient's body fluids are infectious, Standard Precautions² should be used with all patients in the health care setting, regardless of their infection status.

Standard Precautions are designed to prevent unprotected contact between the health care worker and

- Blood and all body fluids whether or not they contain blood
- Mucous membranes.

When a specific diagnosis is made, additional precautions are taken, based on how the disease is transmitted.³

2 See Annex 1 for more information about Standard Precautions.

3 This manual describes the Isolation Precautions to use when a patient is known to have or suspected of having a VHF. Annex 1 describes other precautions for various modes of disease transmission.



1.2 Establish and Maintain a Minimum Level of Standard Precautions

Limited supplies and resources may prevent a health facility from using all the Standard Precautions all the time. However, health facilities should establish and maintain a basic, practical level of Standard Precautions that can be used routinely with patients in their health facility.

At a minimum, consider the services in the health facility that present a risk of disease transmission due to potential contact with blood and all body fluids, broken skin or mucous membranes.

For health facility staff who work in such areas, establish at least:

- A source of clean water (Please see Annex 7)
- Routine handwashing before and after any contact with a patient who has fever
- Safe handling and disposal of sharp instruments and equipment, including needles and syringes.

1.3 Establish Routine Handwashing

Handwashing is the most important precaution for the prevention of infections.

Handwashing before and after contact with a patient who has fever should be a routine practice in the health facility — even when VHF is not present. Washing hands with soap and water eliminates microorganisms from the skin and hands. This provides some protection against transmission of VHF and other diseases.

In services where health care workers see patients with fever, provide at least:

- Cake soap cut into small pieces
- Soap dishes. Microorganisms grow and multiply in humidity and standing water. If cake soap is used, provide soap dishes with openings that allow water to drain away.
- Running water, or a bucket kept full with clean water

- A bucket for collecting rinse water and a ladle for dipping, if running water is not available
- One-use towels. Sharing towels can result in contamination. Use paper towels. If they are not available, provide cloth towels that can be used once and then laundered. If towels are not available, health care workers and health facility staff can air-dry their hands.



Fig. 2. An example of a handwashing station

Make sure health facility staff know the steps of handwashing:

1. Place a piece of soap in the palm of one hand.
2. Wash the opposite hand and forearm. Rub the surfaces vigorously for at least 10 seconds. Move soap to the opposite hand and repeat.
3. Use clean water to rinse both hands and then the forearms. If running water is not available, pour clean water from a bucket over the soapy hands and forearms. The rinse water should drain into another bucket.
4. Dry the hands and forearms with a clean, one-use towel. First dry the hands and then the forearms. Or let rinsed hands and forearms air-dry.

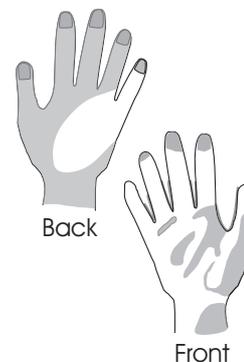


Fig. 3. The shading shows the parts of hands that are often missed during handwashing. Make sure to wash all parts of your hands: front, back, between the fingers and under nails.

1.4 Handle and Dispose of Sharp Instruments Safely

Disease transmission can occur through accidental needlestick injuries. Make sure health facility staff always handle sharp instruments safely. Do not recap needles after use.

Limit invasive procedures to reduce the number of injectable medications. This will limit the opportunities for accidental needlestick injuries.

When an injection *is* necessary, always use a sterile needle and sterile syringe for each injection.

To discard disposable needles and syringes safely: Disposable needles and syringes should be used only once. Discard the used disposable needle and syringe in a puncture-resistant container. Then burn the container in an incinerator or pit for burning.

Instructions for using incinerators and pits for burning are described in Section 6.

If puncture-resistant containers are not available, use empty water, oil, or bleach bottles made with plastic or other burnable material. Adapt them for use as puncture-resistant containers.

Detailed instructions for making a puncture-resistant container are listed in Annex 9.



Fig. 4. Standard sharps container



Fig. 5. Using plastic bottle to dispose of used needles

1.5 Disinfect Reusable Needles and Syringes Safely

Reusable needles and syringes are **not** recommended. If reusable needles and syringes are used, clean, disinfect and sterilize them before reuse, according to your hospital's policy.

Note: Needles and syringes used with VHF patients require special care. Cleaning staff should wear two pairs of gloves when handling needles and syringes used with any patient with a known or suspected VHF. See the recommendations for wearing protective clothing when handling contaminated supplies in Section 4.

1.6 Disinfect Disposable Needles and Syringes That Must Be Reused

Remember! *Whenever possible, use disposable needles and syringes only once and then discard them safely.*

In situations when disposable needles and syringes **must** be reused, make sure they are cleaned and disinfected after each use. Disinfection with bleach will reduce the risk of transmission of VHF and blood-borne diseases, such as HIV infection and viral hepatitis.

1. Obtain a jar or pan. Clean and disinfect it. Use it in Step 8 to store the disinfected needles and syringes.
2. Place the disposable needle and syringe in a pan of soapy water after use. Fill the needle and syringe with soapy water. Leave them to soak until they are cleaned.
3. Take the soaking needles and syringes to the cleaning area.
4. Clean them very carefully in soap and water. Remove any blood or other biological waste, especially from the area around the syringe fittings. Blood or other biological products may collect in these small openings.



Fig. 6. Placing the disposable needle and syringe in soapy water



5. Draw full-strength bleach into the needle and syringe.
6. Soak for 30 seconds, and then expel bleach into a container for contaminated waste.
7. Soak again by once more drawing full-strength bleach into the needle and syringe. Soak for 30 seconds, and then expel bleach into the container for contaminated waste.
8. Let the disinfected needle and syringe air-dry. Store them in a clean jar or pan that has been disinfected.

1.7 Use VHF Isolation Precautions

Section 2 of this manual describes how to identify a suspected case of VHF so that relevant health facility staff can begin using VHF Isolation Precautions. When a VHF is suspected, those health facility staff who will have contact with the patient or with the patient's blood or other body fluids should intensify Standard Precautions and use VHF Isolation Precautions.

VHF Isolation Precautions: The VHF Isolation Precautions described in this manual have been shown to be effective in reducing the transmission of VHFs in the health care setting.

As soon as a case of VHF is suspected in the health facility, alert authorities and start VHF Isolation Precautions.

To reduce the risk of VHF transmission in a health care setting:

- | USE VHF ISOLATION PRECAUTIONS | |
|--------------------------------------|---|
| 1. | Isolate the patient. |
| 2. | Wear protective clothing in the isolation area, in the cleaning and laundry areas and in the laboratory. Wear a scrub suit, gown, apron, two pairs of gloves, mask, headcover, eyewear, and rubber boots. |
| 3. | Clean and disinfect spills, waste, and reusable equipment safely. |
| 4. | Clean and disinfect soiled linens and laundry safely. |
| 5. | Use safe disposal methods for non-reusable supplies and infectious waste. |
| 6. | Provide information about the risk of VHF transmission to health facility staff. Reinforce use of VHF Isolation Precautions with all health facility staff. |
| 7. | Provide information to families and the community about prevention of VHF and care of patients. |

Regular in-service training will strengthen skills for using VHF Isolation Precautions. When a VHF is suspected, efforts will have to be focused on providing care. There will not be enough time or opportunity to provide initial training in skills for VHF Isolation Precautions.

If health facility staff already know how to use VHF Isolation Precautions when a VHF is suspected, authorities can be alerted and VHF Isolation Precautions started without delay.

If health facility staff do not know how to use VHF Isolation Precautions when a VHF case is suspected, training will need to take place immediately.

1.8 Select a VHF Coordinator

Being prepared for an emergency situation can save lives. In addition to using a basic level of Standard Precautions with all patients, health facilities can also prepare in advance for situations when protective clothing, disinfection materials, and isolation procedures are needed urgently.

Many health facilities already have an emergency coordinator or emergency team who could assume the role of a “VHF Coordinator.” The “VHF Coordinator” will:

- Oversee advance preparations and ensure that health facility staff are prepared to use VHF Isolation Precautions.
- Serve as the focal point and coordinate activities when a VHF case is suspected.
- Take the lead in mobilizing the community when an urgent situation occurs.

Once a staff person is identified to serve as the VHF Coordinator, he or she can review the recommendations in this manual and begin the preparations described in Section 9. The VHF Coordinator can also encourage efforts to strengthen and reinforce the routine practice of a basic level of Standard Precautions with all patients.

Remember! Using a minimum level of Standard Precautions routinely will prevent transmission of contagious diseases, such as HIV infection, viral hepatitis and VHF.

Section 2

Identify Suspected Cases of VHF



This section describes how to:

- In a non-outbreak situation, suspect VHF in patients with fever, severe illness, and signs of unexplained bleeding.
- Alert relevant health facility staff and begin VHF Isolation Precautions as soon as VHF is suspected.
- Report the suspected case to designated health authorities.

Section 2 Identify Suspected Cases of VHF

In an outbreak situation, several cases occur around the same time. They may be grouped together, and there may be person-to-person transmission. An initial diagnosis of a VHF can be made based on the signs and symptoms of the specific VHF.

Suspecting a VHF during a non-outbreak situation in a single case is more difficult. The early symptoms of a VHF include high fever and headache. These are also symptoms for many infections seen at the health facility.

Most patients who present with fever do not have a VHF. Their fever is more often caused by malaria, typhoid fever, dysentery, severe bacterial infection or other fever-producing illnesses usually seen in the area.

The health worker probably will not suspect a VHF until more severe signs develop and the patient does not respond to recommended treatment for other illnesses.

However, health workers should be aware of the possibility for suspecting a VHF in a non-outbreak situation. As soon as a VHF is suspected, VHF Isolation Precautions should begin. This will help reduce the number of people exposed to the VHF.



2.1 Use Information from Previous Outbreaks to Suspect a VHF

When a patient presents with fever, use the available diagnostic tools in your health facility to identify or exclude the cause of fever. For example, do a malaria smear or take a stool culture as soon as possible.

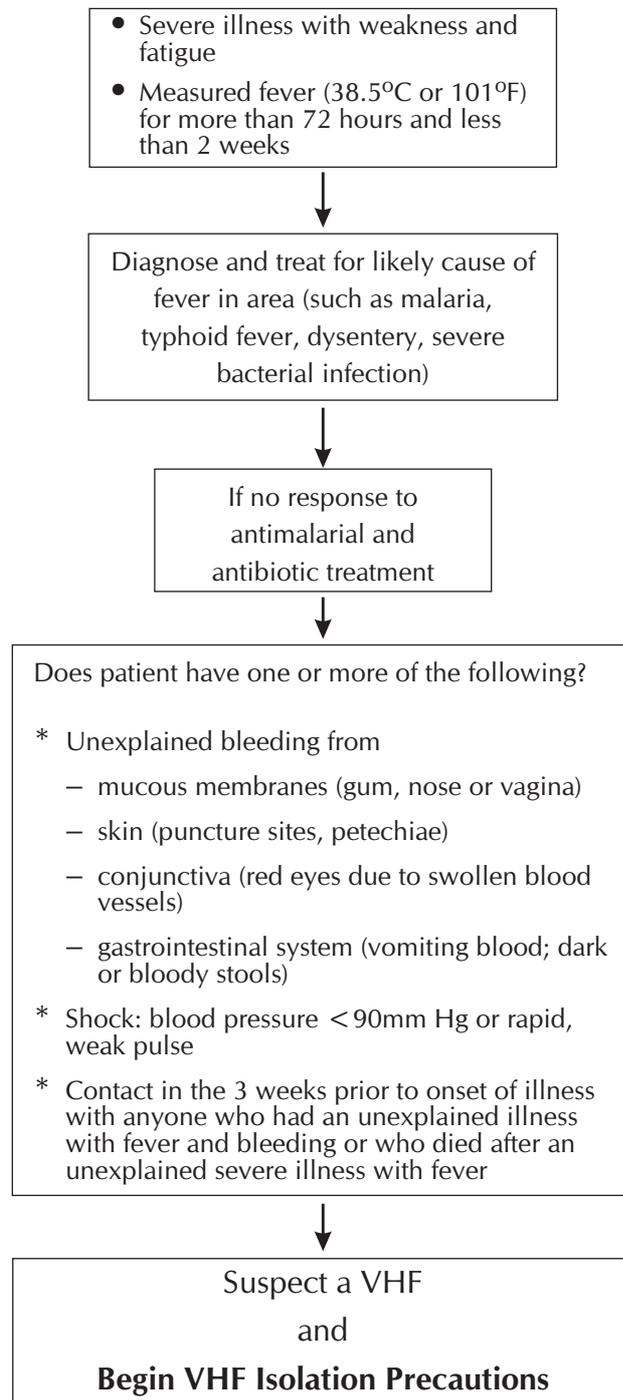
- Treat the most likely cause of the fever according to the appropriate treatment guidelines.
- If the fever continues after 3 days of recommended treatment, and if the patient has signs such as bleeding or shock, consider a VHF.
- Review the patient's history for any contact with someone who was ill with fever and bleeding or who died from an unexplained illness with fever and bleeding.
- If no other cause is found for the patient's signs and symptoms, suspect a VHF. Begin VHF Isolation Precautions.

The flowchart on the next page shows how to

- Suspect a VHF and
- Decide to use VHF Isolation Precautions.

The flowchart applies to a non-outbreak situation. Annex 4 gives examples of VHF case definitions in outbreak situations.

Use Isolation Precautions for Suspected VHF Cases





Section 2

If VHF have occurred in the area before:

Talk with the district or national surveillance officer about VHF that have been reported in your area.⁴ Use the information when making a diagnosis of a suspected VHF case.

Record here the case definitions for VHF that have been reported in your area:

VHF	Case Definition

4 Annex 2 provides more information about VHF seen in the area of your health facility.

2.2 Begin VHF Isolation Precautions

Every health facility has its own procedures for responding to an urgent situation. Adapt VHF Isolation Precautions as needed. Designate the health officer who will coordinate VHF Isolation Precautions. How to select a VHF Coordinator is described in Section 9.1. As soon as a health care worker suspects a VHF, he or she should notify the health facility administrator and the VHF Coordinator who will:

- Refer the patient to the isolation area and take the necessary steps to begin VHF Isolation Precautions (See Section 3).
- Limit the number of health facility staff and visitors in the patient's room.
- Limit the use of invasive procedures and reduce the number of injectable medications.

Important! Between the time when VHF is suspected and when the patient is received in the isolation area, there is a risk for disease transmission from the patient's blood and other body fluids (stool, urine, vomit). Prevent disease transmission to other patients, visitors and health staff in the waiting area by placing the suspected VHF patient apart from other patients. Make every effort to reduce this waiting time.

2.3 Alert Health Facility Staff about Specific Risks for VHF Transmission

As soon as a VHF is suspected, alert the relevant health staff who should begin using VHF Isolation Precautions, especially:

- Doctors or nurses providing direct patient care
- Cleaning, laundry, and waste disposal staff who clean and disinfect contaminated material and supplies
- Laboratory staff who handle samples from the suspected VHF cases
- Medical or support staff who prepare or handle deceased VHF patients.



Section 2

Explain how VHF transmission can occur in the health facility and the risks to health facility staff.⁵ Remind the staff that VHF is a highly infectious disease. They must use VHF Isolation Precautions whenever they have contact with the VHF patient, the patient's blood or other body fluids, or contaminated supplies and equipment.

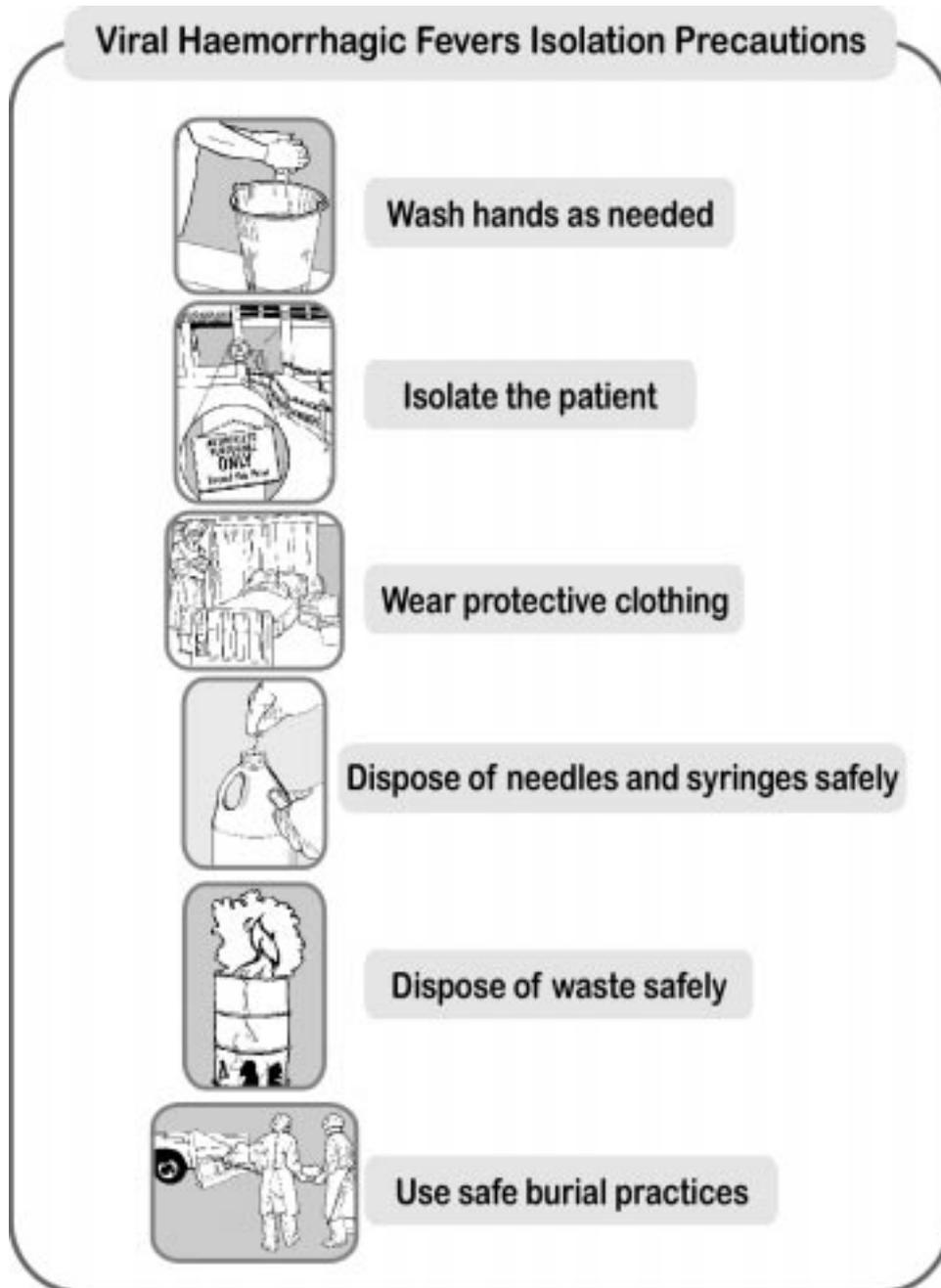


Fig. 7. An example of VHF Isolation Precautions poster.

5 The chart on page 4 of the Introduction summarizes the risk of VHF transmission in the health care setting.

2.4 Report the Suspected Case to the Health Authorities

Report suspected cases of VHF according to national level surveillance guidelines.

If your district is conducting special surveillance activities for a VHF, the district officer will provide specific information about whom you should contact and how. If serum samples are needed, the contact person will give you special instructions for collecting and shipping serum samples. The table below can be used to record information about whom to contact if a VHF is suspected.

Contact Person	Agency	Telephone and/or Fax Number	Information to Report	Samples to Collect



2.5 Identify Patient's Contacts and Travel History

Ask the patient (or a family member who can answer for the patient):

- Where do you live?
- When did the symptoms begin?
- Who else is sick in your family (or village)?
- Where have you travelled recently?

Use the answers to identify others who had contact with the patient. Provide them with information about VHF and when to seek care.

Section 8 describes the steps for giving information to the community about VHF and preventing VHF transmission.

Section 3

Isolate the Patient



This section describes how to:

- Gather supplies to set up an isolation area.
- Make a substitute item from available materials whenever a recommended item is not available.
- Select a site for the VHF isolation area and set up:
 - The patient's room
 - A changing room for health care workers to use when changing clothes
 - A changing room for other health facility staff to use near their work area
 - A family entrance, if necessary
 - A security barrier around the entire isolation area.
- Counsel family members about patient care.

Section 3 Isolate The Patient

Isolating the VHF patient will:

- Restrict patient access to health facility staff trained to use VHF Isolation Precautions.
- Establish a barrier between the VHF patient and uninfected patients, other health facility staff, and visitors.

3.1 Select Site for the Isolation Area

Ideally, an isolation area should already be available to admit patients requiring isolation.

If an isolation area is not available or if advance preparations have not been done, and VHF is suspected, immediately identify and set aside:

- A single room with an adjoining toilet or latrine.

If a single room is not available, select one of the following in order of preference:

- A separate building or ward that can be used with VHF patients only (especially if Ebola haemorrhagic fever is suspected, or if there is a large number of patients)
- An area in a larger ward that is separate and far away from other patients in the ward
- An uncrowded corner of a large room or hall
- Any area that can be separated from the rest of the health facility (TB rooms, isolation ward for infectious diseases, private or semiprivate rooms).



Section 3

Make sure the selected site has:

1. **An isolated toilet:** If a toilet is not next to the patient's room, select and isolate a toilet near the isolation area. Use it to receive the patient's disinfected waste and other liquid waste.

If a toilet is not available, prepare a latrine for disposal of the patient's and other liquid waste.

2. **Adequate ventilation:** The isolation room should have adequate ventilation because chlorine disinfectants will be used. To prevent airborne or droplet transmission of infectious agents, avoid rooms with air conditioning.
3. **Screened windows:** If windows are left open for cooling, screen them to prevent transmission of mosquito- and other insect-borne diseases.

Restrict access. Tie a rope or line around the area outside the window to restrict the area and prevent entry through the window.

3.2 Plan How to Arrange the Isolation Area

Make use of the available space and design of the health facility to arrange the isolation area. The diagram below shows an ideal arrangement for an isolation area. The next page shows examples for a single patient's room and for a ward with several patients.

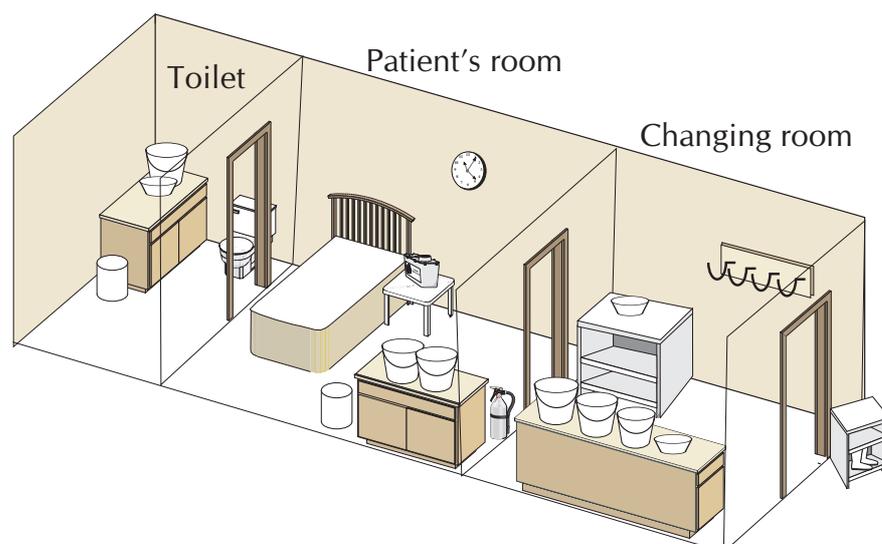


Fig. 8. A sample layout of an isolation area

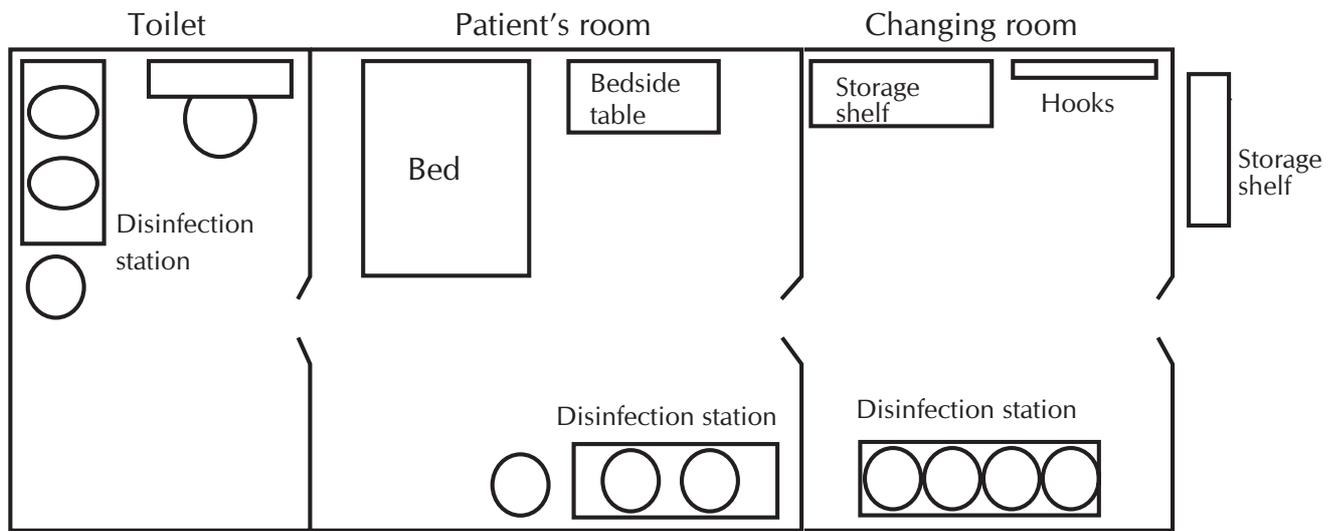


Fig. 9. A sample layout for a single patient

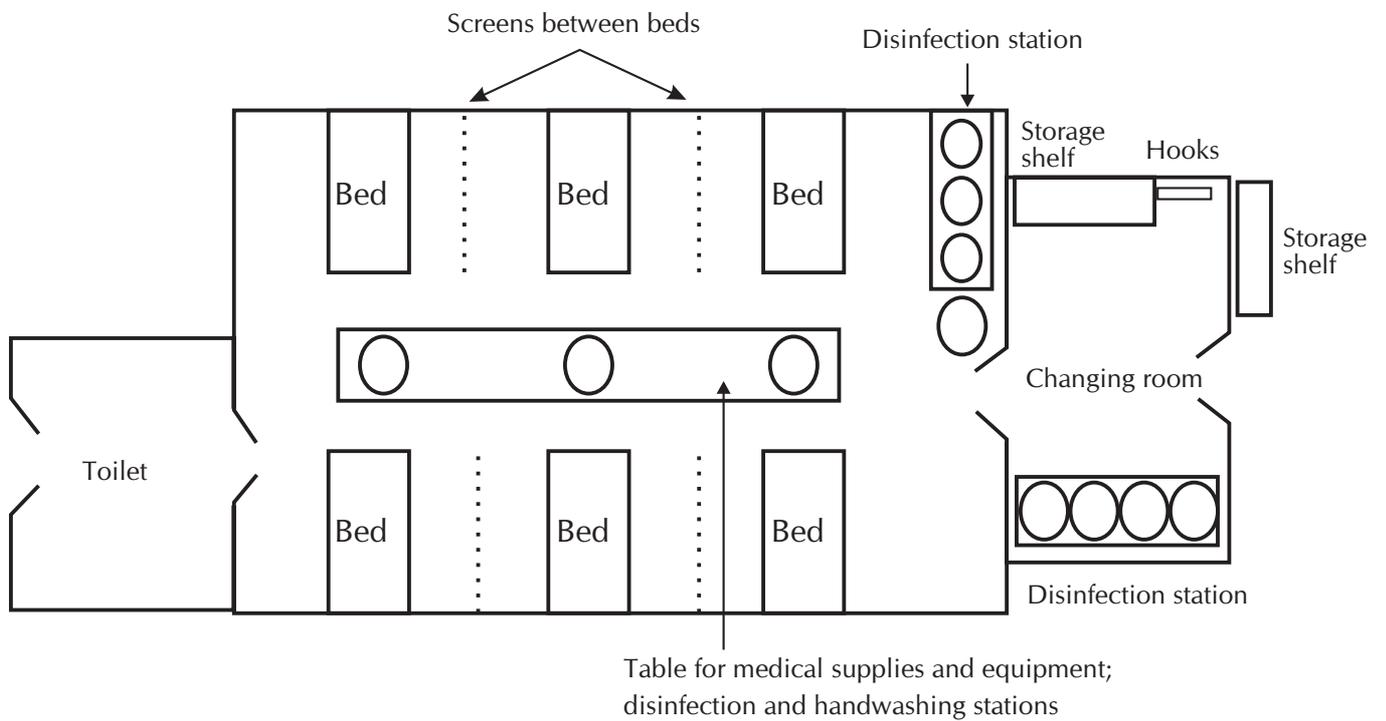


Fig. 10. A sample layout for several patients



3.3 Gather Recommended Supplies

Ideally, supplies should be available to begin VHF Isolation Precautions. If a separate emergency supply is **not** available when a VHF case is suspected, use supplies from other services in the health facility.

If a recommended item is not available, or if the quantity is limited, make a substitute item from available materials. For example, the manual recommends using plastic sheeting to cover mattresses. If plastic sheeting is not available, use plastic cloth normally used to cover kitchen tables. This is usually available in the local market.

3.3.1 Plan Disinfection for VHF-Contaminated Items

Ordinary household bleach, soap and water are useful disinfectants against viruses causing VHF.⁶ They are low in cost and commonly available.

Ordinary Household Bleach: The viruses causing VHF are very sensitive to bleach solution. This manual describes a low-cost disinfection system using two bleach solutions: a solution of 1:10 and a solution of 1:100. Detailed instructions for preparing the solutions are in Section 5.1.

Soap and Clean Water: Scrubbing with soap and water before disinfection removes infectious body fluids and other foreign matter from contaminated items. This makes bleach solutions more effective. Detailed instructions for preparing solutions of soapy water are in Section 5.2.

Sterilization: Heat sterilization requires special equipment, such as an autoclave or steam sterilizer. When this equipment is not working or is not available, boiling heat-resilient items in water for 20 minutes will kill VHF viruses.

6 VHF viruses are lipid enveloped, and this feature makes them sensitive to destruction by detergent solutions.

3.3.2 Gather Supplies for the Patient Area

Obtain the following items for use in the patient's room:

Bed and mattress or sleeping mat for each patient.

Plastic sheeting to cover the mattress or sleeping mat. This is strongly recommended. Plastic sheeting will protect the mattress from contamination. It can be easily cleaned and disinfected if it becomes contaminated with infectious body fluids.

Bedding for each bed – at least 1 blanket and a bottom sheet. If necessary, the patient or the patient's family can bring the bedding from home.

One thermometer, one stethoscope, and one blood-pressure cuff per patient. Keep them in the isolation area for reuse with the same patient.

If there is not enough equipment to supply one each of these items per patient, assign one piece of equipment for use only with the patients in the isolation area.

Covered container for alcohol or bleach solution used to disinfect thermometer and stethoscope after use with each patient.

Puncture-resistant container for collecting used disposable needles, syringes and other sharp instruments.

Puncture-resistant tray with soapy water for collecting reusable needles, syringes and instruments.

Bedside table or shelf on which to place medical instruments, puncture-resistant container, and so on.

Large wall clock with a second hand for measuring respiration rates and pulse.

Bedpan for each patient.

Screens or other barriers to place around the VHF patients' beds. This will prevent patient-to-patient transmission through spills or splashes of infectious body fluids or from aerosol routes.

If screens are not available, stretch ropes or lines from one end of the patient area to the other. Hang sheets from the ropes.

Disinfection station with buckets, sprayer, bleach solutions, soap and water, mop, and a supply of one-use towels. It is preferable to dispose of gloves after each use. However, the reuse of gloves in many health facilities is a common practice. Disinfect gloved hands between patients if there are not enough gloves for health care workers to dispose of after each patient.

Container with soapy water for collecting discarded outer gloves.

Boot sprayer for disinfecting the boots before leaving the patient's room.

Extra supply of gowns and gloves.

3.3.3 Gather Supplies for the Changing Room

Hooks, nails, or hangers for hanging reusable protective clothing.

Roll of plastic tape for taping cuffs and trousers of protective clothing.

Disinfection station with bleach solution for disinfecting gloved hands.

Handwashing station with bucket, soap, soap dish, clean water, and supply of one-use towels.

Containers with soapy water for collecting:

- Discarded gloves
- Used instruments to be sterilized.

Containers for collecting:

- Reusable protective clothing to be laundered
- Infectious waste to be burned.

3.3.4 Arrange for Storing of Supplies Outside the Changing Room

Shelf or box with a lock for storing clean protective clothing.

Supply of clean protective clothing.

Container for collecting non-infectious waste.

Covered shelf (or plastic bags which can be closed) to store disinfected boots and keep them dry.

The checklists at the end of this section can be used to gather supplies for the isolation area.

3.4 Set Up Changing Rooms

For patient-care staff:

One changing room is needed outside the patient isolation area. This area is where health care workers will put on protective clothing to protect them from spills or splashes of infectious body fluids while they are in the patient's room. After leaving the patient's room, they will reenter the changing room and remove the protective clothing. They will hang it for reuse or dispose of it appropriately.

Contaminated clothing and supplies remain in the changing room until cleaning staff trained to use VHF Isolation Precautions take the VHF-contaminated items to the laundry or disposal site.

For laboratory, cleaning, laundry, and waste disposal staff:

Set up changing rooms near the work areas for other health facility staff who will handle laboratory specimens and who will clean laundry, or dispose of contaminated items. They will also need to wear protective clothing during any contact they have with body fluids or VHF-contaminated items.

The stations in the changing room should be set up so that traffic flow is from the *least to most contaminated* area.

3.5 Place Security Barrier Around Isolation Area

Restrict access to the isolation area: Place signs around the isolation area clearly stating that access is restricted. Or tie lines or ropes around the isolation area and hang plastic sheets from them.



Fig. 11. A security barrier and sign



Section 3

Prepare a list of health facility staff and family members authorized to enter the isolation area: List the medical, nursing, laboratory, cleaning staff, and, if appropriate, those family members who are trained in the use of VHF Isolation Precautions. If an accidental exposure or incident occurs, the list can help in the prompt identification of possible contacts.

When there is a large number of patients, station a guard at the entry to the isolation area: In a large scale outbreak, station a security guard at the door of the patient isolation area outside the changing room. The guard will limit access to authorized health facility staff and family members only. This is critical for maintaining strict isolation and protecting the community.

Provide the guard with the list of authorized persons and a sign-in sheet. The guard can record who comes into the isolation area and note the time of entry and departure.

Date	Name	Service	Time In	Time Out
13.6.98	Dr. Nsango	Infectious Diseases	10:15	11:30
13.6.98	Nurse Bandari	Intensive Care	10:00	11:30
13.6.98	Nurse Ninakazi	Intensive Care	11:00	13:30
13.6.98	Masika	Cleaning	11:10	11:45
13.6.98	Madunda	Family member	11:15	

Fig. 12. An example of a sign-in sheet

3.6 Consult Family Members about Patient Care

Talk with family members and explain why the patient is being isolated. Tell them about the risk of transmission for VHF and why protective clothing is needed. Answer any questions they have.

When there is a large outbreak (more than one or two cases), identify a person to serve as a liaison between health facility staff and the patients' families. Select a health staff member, an experienced community member, or a convalescent patient.

If it is the custom for family members to provide cleaning and washing of the patient while the patient is in the health facility, help the family to select a caregiver. Select as caregiver the family member who has already had the most contact with the patient. Also select a second person who can do the patient care activities when the other caregiver is resting.

In areas where family members participate in patient care, they are likely to help the patient with:

- Feeding and giving water
- Washing the hospital gown or pyjama with soap and water
- Getting up or moving around.

When a VHF is suspected, it is likely that health care workers trained in VHF Isolation Precautions will do most of the direct patient care tasks. However, if there are family members who will assist with direct patient care, give them information and training about:

- The risk of VHF transmission and the reason for protective clothing
- How to wear gloves, gowns, and a mask
- How to take off gloves, gowns, and mask and store or dispose of them safely.

Make sure there is a changing room for family members to use that is separate from the changing room for health care workers. Provide a set of protective clothing for the family members to wear in the isolation room. At a minimum, make sure that the family members wear at least a pair of gloves.



Section 3

Provide in the family members' changing room:

- A shelf or table to store a supply of clean gloves to be worn by the family member
- Hooks to hang a set of protective clothing
- A bucket with soapy water for collecting discarded gloves after leaving the isolation area
- A handwashing station.

Arrange to monitor family members for signs of illness.

Assist family members with:

- Coordination of other family members who bring food for the patient and for the family member providing care
- Location of an area for family members to stay in while providing care that includes cooking, washing and sleeping facilities.

Note: When a breast-feeding mother has a suspected case of VHF, the child's breast-feeding should not be interrupted. Help the family to decide how to continue the child's breast-feeding when the mother is too ill to do so.

Checklist: Supplies for a Changing Room

Storage Outside the Changing Room:

1. Shelf or cabinet with lock _____
2. Supply of clean scrub suits, gowns, aprons, gloves, masks, headcovering, and eyewear _____
3. Covered shelf for storing disinfected boots _____
4. Bucket for collecting non-infectious waste _____

Inside the Changing Room:

1. Hooks, nails, or hangers for hanging reusable gowns, scrub suits _____
2. Roll of plastic tape _____
3. Handwashing supplies: bucket or pan, clean water, soap, one-use towels _____
4. Bucket or pan, 1:100 bleach solution for disinfecting gloved hands _____
5. Container with soapy water for collecting discarded gloves _____
6. Container with soapy water for collecting used instruments to be sterilized* _____
7. Container with soapy water for collecting reusable gowns, masks, sheets to launder* _____

*Place outside the changing room if the changing room is too small

If large amounts of waste on floor:

Sprayer, bucket or shallow pan with 1:100 bleach solution for disinfecting boots _____



Checklist: Supplies for Patient Area

1. 1 bed with clean mattress or sleeping mat and at least a bottom sheet and blanket for each bed _____
2. Plastic sheeting to cover mattress or sleeping mat _____
3. 1 thermometer, 1 stethoscope, and 1 blood pressure cuff for each patient or for each patient area _____
4. 1 puncture-resistant container for collecting non-reusable needles, syringes, and discarded sharp instruments _____
5. 1 bedside table or shelf _____
6. 1 large wall clock with a second hand _____
7. Pan with 1:100 bleach solution or alcohol and one-use towels for disinfecting the thermometer and stethoscope between use with each patient _____
8. Bucket or pan, 1:100 bleach solution, one-use towels for disinfecting gloved hands between patients _____
9. Supplies for disinfecting patient excreta (bedpan, urinal, 1:10 bleach solution) _____
10. Sprayer, 1:100 bleach solution, clear water, and mop for disinfecting spills on floor and walls _____
11. Container with soapy water for collecting discarded gloves _____
12. Screens (or sheets hung from ropes or lines) placed between VHF patients' beds _____
13. Extra supply of gowns and gloves _____
14. Container for collecting infectious waste to be burned _____

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)



Section 4

- 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.



Section 4

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.

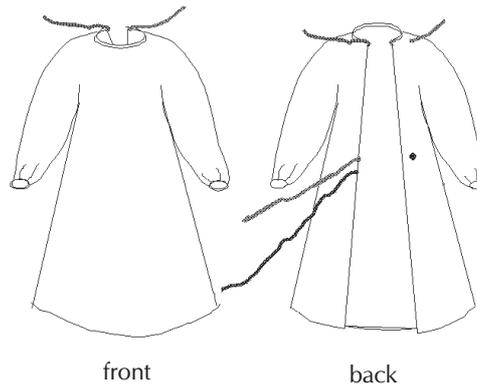


Fig. 17. Illustration of gown with ties

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



Section 4

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



Section 4

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.

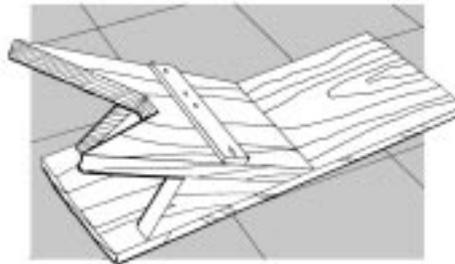


Fig. 43. A boot remover

- 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.

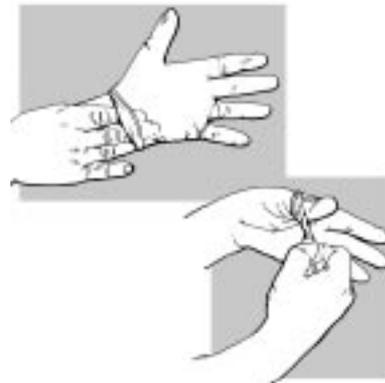


Fig. 44. Removing the inner gloves

- 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.



Section 4

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.