Interim Guidance for Managing Patients with Suspected Viral Hemorrhagic Fever in U.S. Hospitals

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This document updates recommendations (MMWR 1995; 44 (25) ;475-9 www.cdc.gov/mmwr/preview/mmwrhtml/00038033.htm) for managing patients with suspected viral hemorrhagic fever (VHF) who are admitted to U.S. hospitals. This document provides additional epidemiologic data on the transmission of VHF and updated recommendations on infection control precautions during patient care, environmental infection control procedures, case reporting, specimen handling and testing, handling of human remains, and post-exposure management. The terms and categories of isolation in this document are based on those outlined in the Guideline for Isolation Precautions in Hospitals (www.cdc.gov /ncidod/hip/ISOLAT/Isolat.htm l). These interim recommendations will be updated as additional information becomes available.

Transmission Risk

In Africa, transmission of VHF in healthcare settings has been associated with reuse of contaminated needles and syringes and with provision of patient care without appropriate barrier precautions to prevent exposure to virus-containing blood and other body fluids (including vomitus, urine, and stool) (1-3). The transmission risks associated with various body fluids have not been well defined because most caregivers who have acquired infection had contacts with multiple fluids.

The risk for person-to-person transmission of hemorrhagic fever viruses is greatest during the latter stages of illness when virus loads are highest; latter stages of illness are characterized by vomiting, diarrhea, shock, and, in less than half of infected patients, hemorrhage. No VHF infection has been reported in persons whose contact with an infected person occurred only during the incubation period (i.e., before onset of fever). The incubation period for VHF ranges from 2 days to 3 weeks, depending on the viral agent (1). There are reports of Ebola virus transmission occurring within a few days after onset of fever; however, the presence of other symptoms in the source patients and the level of exposure to body fluids among secondary cases are unknown in these instances (CDC, unpublished data, 1995). In studies involving three monkeys experimentally infected with Ebola virus (Reston strain), fever and other systemic signs of illness preceded detection of infectious virus in the animals' pharynx by 2-4 days, in the conjunctivae and on anal swabs by 5-6 days, and in the nares by 5-10 days (8).

In studies involving nonhuman primates, monkeys could be infected by mechanically generated small-particle aerosols (4-7), but epidemiologic studies in humans do not indicate that VHF is readily transmitted from person to person by the airborne route (1,2). Airborne transmission was considered as a possible explanation for a hospital-associated cluster of Lassa fever infections in which the index patient had severe pulmonary involvement, but the mode of transmission for that outbreak was not determined (3). Although unproven, airborne transmission of VHF is a hypothetical possibility during procedures that may generate aerosols.

Case Reporting and Specimen Testing

All suspected cases of VHF should be reported immediately to local and state health departments and to CDC (Special Pathogens Branch, 404 639-1115). Consult the Special Pathogens Branch before obtaining or sending specimens to CDC for confirmatory testing. State health departments should also be notified before sending specimens to CDC. For links to state health departments visit the "Information Networks and Other Information Sources" page on the CDC Web site www.cdc.gov/doc.do/id/0900f3ec80226c7a.

Risk Categories

VHF should be suspected in febrile persons who, within 3 weeks before onset of fever, have either 1) traveled in the specific local area of a country where VHF has recently occurred; 2) had direct unprotected contact with blood, other body fluids, secretions, or excretions of a person or animal with VHF; or 3) had a possible exposure when working in a laboratory that handles hemorrhagic fever viruses. The likelihood of acquiring VHF is considered low in persons who do not meet any of these criteria. Even following travel to areas where VHF has occurred, persons with fever are more likely to have infectious diseases other than VHF (e.g., common respiratory viruses, endemic infections such as malaria or typhoid fever). Clinicians should promptly evaluate and treat patients for these more common infections while awaiting confirmation of a VHF diagnosis.

Infection Control Precautions

The following recommendations should be followed when caring for persons with suspected VHF.

- Patients who are hospitalized or treated in an outpatient healthcare setting should be placed in a private room and Standard, Contact, and Droplet Precautions should be initiated (www.cdc.gov/ncidod/hip/isolat/Isolat.htm). Patients with respiratory symptoms also should wear a face mask to contain respiratory droplets prior to placement in their hospital or examination room and during transport (www.cdc.gov/flu/professionals/infectioncontrol/resphygiene.htm).
- Caretakers should use barrier precautions to prevent skin or mucous membrane exposure of the eyes, nose, and mouth with patient blood, other body fluids, secretions (including respiratory droplets), or excretions. All persons entering the patient's room should wear gloves and gowns to prevent contact with items or environmental surfaces that may be soiled. In addition, face shields or surgical masks and eye protection (e.g., goggles or eyeglasses with side shields) should be worn by persons coming within approximately 3 feet of the patient.
- Additional barriers may be needed depending on the likelihood and magnitude of contact with body fluids. For example, if copious amounts of blood, other body fluids, vomit, or feces are present in the environment, plastic apron, leg, and shoe coverings also may be needed.
- Nonessential staff and visitors should be restricted from entering the room of patients with suspected VHF. Maintain a log of persons entering the patient’s room.
- Before exiting the room of a patient with suspected VHF, safely remove and dispose of all protective gear, and clean and disinfect shoes that are soiled with body fluids as described in the section on environmental infection control below.
- To prevent percutaneous injuries, needles and other sharps should be used and disposed of in accordance with recommendations for Standard Precautions (www.cdc.gov/ncidod/hip/ISOLAT/std_prec_excerpt.htm).
- If the patient requires a surgical or obstetric procedure, consult your state health department and CDC regarding appropriate precautions for these invasive procedures.

- Although transmission by the airborne route has not been established, hospitals may choose to use Airborne Precautions (www.cdc.gov/ncidod/hip/ISOLAT/airborne_prec_excerpt.htm) for patients with suspected VHF who have severe pulmonary involvement or who undergo procedures that stimulate coughing and promote the generation of aerosols (e.g. aerosolized or nebulized medication administration, diagnostic sputum induction, bronchoscopy, airway suctioning, endotracheal intubation, positive pressure ventilation via face mask [e.g., biphasic intermittent positive airway pressure ventilation, continuous positive airway pressure ventilation], and high-frequency oscillatory ventilation) to prevent possible exposure to airborne particles that may contain virus.

Specimen Handling

- Alert laboratory staff to the nature of the specimens prior to sending them to the clinical laboratory. Specimens should remain in the custody of designated laboratory personnel until testing is completed. Due to the potential risks associated with handling infectious materials, laboratory testing should be limited to the minimum necessary for essential diagnostic evaluation and patient care.
- While obtaining clinical laboratory specimens from the patient, use infection control precautions for patient care outlined in this document. Place specimens in sealed plastic bags, then transport them in a clearly labeled, durable, leak-proof container directly to the specimen handling area of the laboratory. Care should be taken not to contaminate the external surfaces of containers.
- Process clinical specimens in a class II biological safety cabinet following biosafety level 3 practices. If possible, pretreat serum used in laboratory tests with the combination of heat-inactivation at 56° C and polyethylene glycol p-tert-octylphenyl ether (Triton(®) X-100)*; treatment with 10 uL of 10% Triton(®) X-100 per 1 mL of serum for 1 hour reduces the titer of hemorrhagic fever viruses in serum, although 100% efficacy in inactivating these viruses should not be assumed. For tests in which the validity is affected by the presence of a detergent in the serum, heat inactivation alone may be of some benefit in reducing infectivity (9).
- Blood smears (e.g., for malaria) are not infectious for VHF after fixation in solvents.
- Attempts to isolate or cultivate the virus should not be part of routine clinical laboratory diagnosis when VHF is suspected. If such procedures are done on specimens where VHF is suspected, biosafety level 4 facilities and procedures are required (www.cdc.gov/od/ohs/biosfty/bmbl4/bmbl4toc.htm).
- Routine cleaning and disinfecting procedures can be used for automated analyzers; analyzers should be disinfected after use as recommended by the manufacturer or with a 500 parts per million solution (1:100 dilution) of sodium hypochlorite (1/4 cup of household bleach to 1 gallon water).

Environmental Infection Control Procedures

- Environmental surfaces or inanimate objects contaminated with blood, other body fluids, secretions, or excretions should be cleaned and disinfected using standard procedures (www.cdc.gov/ncidod/hip/enviro/guide.htm)
- Disinfection can be accomplished using a U.S. Environmental Protection Agency (EPA)-registered hospital disinfectant or a 1:100 dilution of household bleach (1/4 cup bleach to 1 gallon water). For grossly soiled surfaces, (e.g., vomitus or stool), use a 1:10 dilution of household bleach.
- Soiled linens should be placed in clearly labeled leak-proof bags at the site of use, transported directly to the laundry area, and laundered following routine healthcare laundry procedures. (www.cdc.gov/ncidod/hip/enviro/guide.htm)

- Liquid medical waste such as feces and vomitus can be disposed of in the sanitary sewer following local sewage disposal requirements (www.cdc.gov/ncidod/hip/enviro/guide.htm). Care should be taken to avoid splashing when disposing of these materials.
- When discarding solid medical waste (e.g., needles, syringes, and tubing) contaminated with blood or other body fluids from VHF patients, contain the waste with minimal agitation during handling. Properly contained wastes should be managed according to existing local and state regulations for ensuring health and environmental safety during medical waste treatment and disposal. On-site treatment of the waste in an incinerator or a gravity-displacement autoclave for decontamination purposes will help to minimize handling of contaminated waste. Alternatively, off-site medical waste treatment resources may be used (www.cdc.gov/ncidod/hip/enviro/guide.htm).

Handling of Human Remains

If the patient dies, handling of the body should be minimized. The remains should not be embalmed. Remains should be wrapped in sealed leak-proof material and cremated or buried promptly in a sealed casket. If an autopsy is necessary, the state health department and CDC should be consulted regarding appropriate precautions.

Management of Exposures

Persons with percutaneous or mucocutaneous exposures to blood, body fluids, secretions, or excretions from a patient with suspected VHF should immediately wash the affected skin surfaces with soap and water. Mucous membranes (e.g., conjunctiva) should be irrigated with copious amounts of water or eyewash solution. Exposed persons should receive medical evaluation and follow-up care, including fever monitoring twice daily for 21 days after exposure. Consultation with an infectious diseases expert is recommended for exposed persons who develop fever within 21 days of exposure.

*Use of trade names and commercial sources is for identification only and does not imply endorsement by the Public Health Service or the U.S. Department of Health and Human Services.

References

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