

What is Marburg Virus Disease?

Marburg virus disease (MVD) is a rare but severe and often fatal viral hemorrhagic fever (VHF) caused by Marburg virus, which belongs to the filovirus-family. The reservoir host of Marburg virus is the African fruit bat, *Rousettus aegyptiacus*. Marburg virus was first recognized in 1967, when outbreaks of hemorrhagic fever occurred simultaneously in laboratories in Marburg and Frankfurt, Germany and in Belgrade, Yugoslavia (now Serbia). Since then, outbreaks and sporadic cases have been reported in Angola, Democratic Republic of the Congo, Kenya, South Africa, Uganda, Guinea, Ghana, and most recently in Rwanda.

Clinical Presentation & Disease Summary

How is it transmitted?

- Person to person through direct contact (through broken skin or mucous membranes) with blood or body fluids of infected person OR person who has died of MVD
- Objects contaminated with body fluids of infected person (e.g. bedsheets, clothing, medical equipment)
- Semen from men who have recovered from MVD
- Unprotected contact with infected bat feces or aerosols

MVD is known to persist in immune-privileged sites in some people who have recovered (e.g., testicles, eyes). Persistence of Marburg virus in other immune privileged sites (placenta, central nervous system) is possible.

When do symptoms begin?

2-21 days after infection.

What are the symptoms?

Symptom onset is sudden and marked by fever, chills, headache, and myalgia. As disease progresses, additional symptoms may include:

- Nausea, vomiting, chest pain, sore throat, abdominal pain, and diarrhea
- Jaundice, inflammation of pancreas, severe weight loss, delirium, shock, liver failure, massive hemorrhaging, and multi-organ dysfunction
- Maculopapular rash that is most prominent on the trunk (chest, back, stomach)

Clinical diagnosis of Marburg virus disease (MVD) can be difficult. Many of the signs and symptoms of MVD are similar to other infectious diseases (such as malaria or typhoid fever) or viral hemorrhagic fevers that may be endemic in the area (such as Lassa fever or Ebola).

When to Suspect a Patient has Marburg Virus Disease

Suspected Case: Meets the clinical criteria AND the epidemiologic criteria

- One or more symptoms of Marburg (listed above) AND one or more of the following exposures within the 3 weeks before onset of symptoms:
 - Travel to / residence in country known to have circulating Marburg virus
 - Known/suspected exposure to ill or dead person with suspected/confirmed Marburg, including by:
 - Contact with bodily fluids (e.g., blood, sweat, saliva, urine, vomit, feces, semen) without appropriate PPE
 - Contact with objects contaminated by bodily fluids (e.g., clothing, bedding, equipment) without appropriate PPE
 - Contact with bodily fluids or contaminated objects with appropriate PPE if there is concern for a breach in PPE
 - Known/suspected exposure to semen of male acutely ill from or recovered from Marburg
 - Work in a laboratory that handles viral hemorrhagic fever specimens
 - Handling wild animals or carcasses that may be infected with Marburg virus (e.g. bats)

Key Steps for Frontline Clinical Staff

Identify

- Assess the patient for signs and symptoms, travel history, and epidemiological criteria.
- For assistance, contact facility Infection Prevention and Control or on-call hospital epidemiologist

Isolate

- Give the patient a mask and promptly isolate.

Inform

- Notify dept/facility leadership, Infection Prevention & Control, on-call hospital epidemiologist.
- Call NYC DOHMH Provider Access Line to report/ascertain risk (866-692-3641)
- If determined by NYC DOHMH to be a suspected MVD patient, call Central Office Special Pathogens Program/ Emergency Management at 646-864-5442.

Infection Prevention for MVD

Hand Hygiene

Perform hand hygiene before and after all patient contact, contact with potentially infectious material, and before putting on and upon removal of PPE, including gloves. Use soap and water for at least 20 seconds or use alcohol-based hand rubs. If hands are visibly soiled, use soap and water.

Patient Isolation

- Place patient in a single patient **Airborne Infection Isolation Room (AIIR)**. If an AIIR is not available, isolate patient in a private examination room. Keep door closed, minimize entry and exit, and avoid entry without appropriate PPE.
- Limit transport and movement of the patient outside of the room. When outside of the isolation room, patients should wear a facemask to contain secretions.
- Keep a log of all persons who care for or enter the room or care area of the patient.

Transmission-Based Precautions & Personal Protective Equipment

- Adhere to [Special Pathogens Level 2 isolation](#). Use a respirator, 2 pairs of extended cuff gloves, impermeable gown, apron, face shield, hood, knee high boot covers.
- Follow the [SP Level 2 VHF PPE Donning and Doffing Checklist](#).
- Ensure a trained observer is present and donned in appropriate PPE (gown, respirator, face shield, 2 pairs of extended cuff gloves, shoe covers).

Environmental Infection Control

- Marburg virus is considered a **Category A** infectious substance: capable of causing permanent disability or life-threatening/fatal disease in healthy humans if exposure occurs. Notify facility EVS. Keep all waste, supplies, or medical equipment in the patient room until Marburg is ruled out.
- If MVD is ruled out, clean and disinfect the patient's care area using an EPA registered disinfectant for appropriate contact times. Management of laundry, food service utensils, and medical waste should also be performed in accordance with routine procedures.
- If MVD is ruled in, all cleaning, disinfection, and transport of waste will be **escalated to facility EVS and managed by vendors with expertise in handling Category A waste**. Once the patient vacates a room, all unprotected individuals, including HCP, should not be allowed in that room until sufficient time has elapsed for enough air changes to remove potentially infectious particles and the room has been cleaned and disinfected by designated vendor.

Diagnostic Testing

Consultation and approval from NYC DOHMH is required if specimen collection is warranted. Call NYC DOHMH Provider Access Line: 866-692-3641.

Treatment and Immunization

There is no specific or licensed treatment. Treatment is limited to supportive care with rehydration; symptomatic treatment improves survival. A range of blood products, immune therapies and drug therapies are currently under development. There is no approved vaccine for MVD. Multiple trials and efforts are underway to develop an effective filovirus vaccine.

Additional Information

- CDC: <https://www.cdc.gov/vhf/marburg/symptoms/index.html>, <https://www.cdc.gov/vhf/marburg/pdf/factsheet.pdf>
- WHO: <https://www.who.int/news-room/fact-sheets/detail/marburg-virus-disease>
- CDC: About Marburg virus disease | Marburg (Marburg Virus Disease) | CDC