



Marburg Virus in Rwanda and High Consequence Pathogen Preparedness

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What is Marburg Virus?

- Causes a rare, severe viral hemorrhagic disease called Marburg Virus Disease
 - Symptoms being 2-21 days after infection
 - Initial symptoms may be non-specific
 - Case fatality has ranged from 20-90% depending on timely access to supportive care
 - Travel and exposure history is key to assess risk
- Naturally found in Egyptian rousette bats living in Sub-Saharan Africa
 - First described in 1967 (Marburg, Germany) associated with imported African green monkeys
 - No natural reservoir in the United States or Pacific region
- Human-to-human transmission drives outbreaks and is caused by:
 - Direct contact with the body fluids of a sick or deceased person with Marburg virus infection, OR
 - Objects contaminated with their fluids like clothes, bedding, needles and equipment, OR
 - Semen from a man who has recovered from infection with Marburg
- Unlike Ebola virus, there are currently no FDA-approved vaccines or therapeutics



OUTBREAKS OF MARBURG VIRUS DISEASE

● Outbreak Location and Year

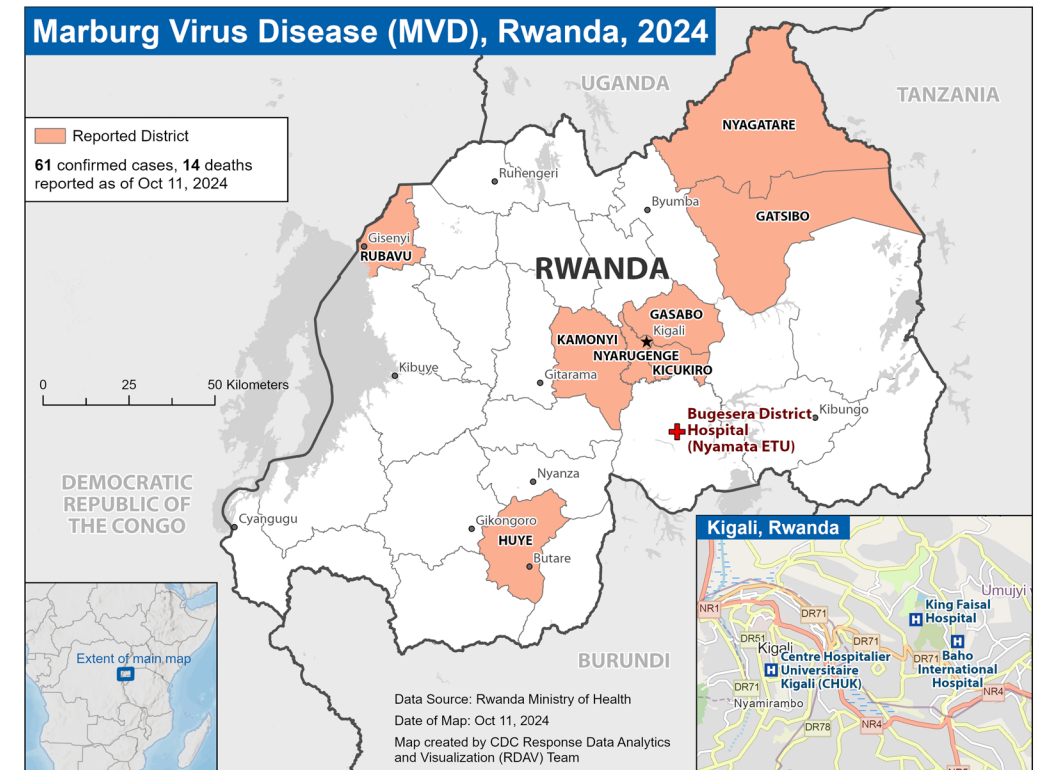
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Source: [About Marburg](#) | [Marburg](#) | [CDC](#)

2024 Marburg Outbreak in Rwanda

- On 9/27, Rwanda Ministry of Health reported multiple confirmed MVD cases, majority healthcare workers
 - First Marburg outbreak ever in Rwanda
- As of October 15th:
 - 62 confirmed cases
 - 15 deaths
 - 4,010 tests conducted
- Initial U.S. public health response
 - Goal: Identify potentially exposed travelers early & prevent local transmission
 - CDC has been in Rwanda since 2002 and is supporting local authorities
 - Reinforce domestic response capabilities





Risk Assessment

- CDC and Hawaii DOH assesses the current risk level as **LOW** for the general public
- The main risk for Marburg virus importation into the U.S. is via an infected traveler
 - Travel history is key to detect and investigate persons at increased exposure risk
 - However, this is currently low due to the limited size of the outbreak and travel patterns
- Travelers at increased risk for Marburg virus infections are typically healthcare workers recently in an outbreak area with an unprotected exposure
- Understanding the actual evidence-based risk vs. uncertainty is key to balancing safety and appropriate patient care

Key Areas for Preparedness

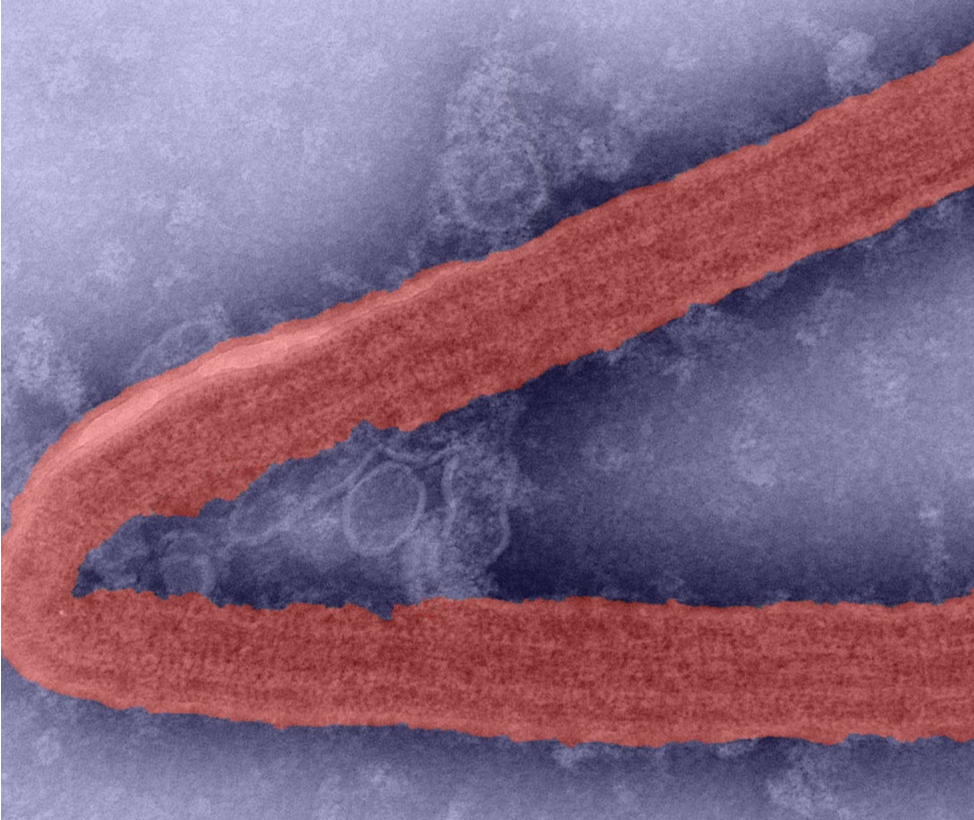
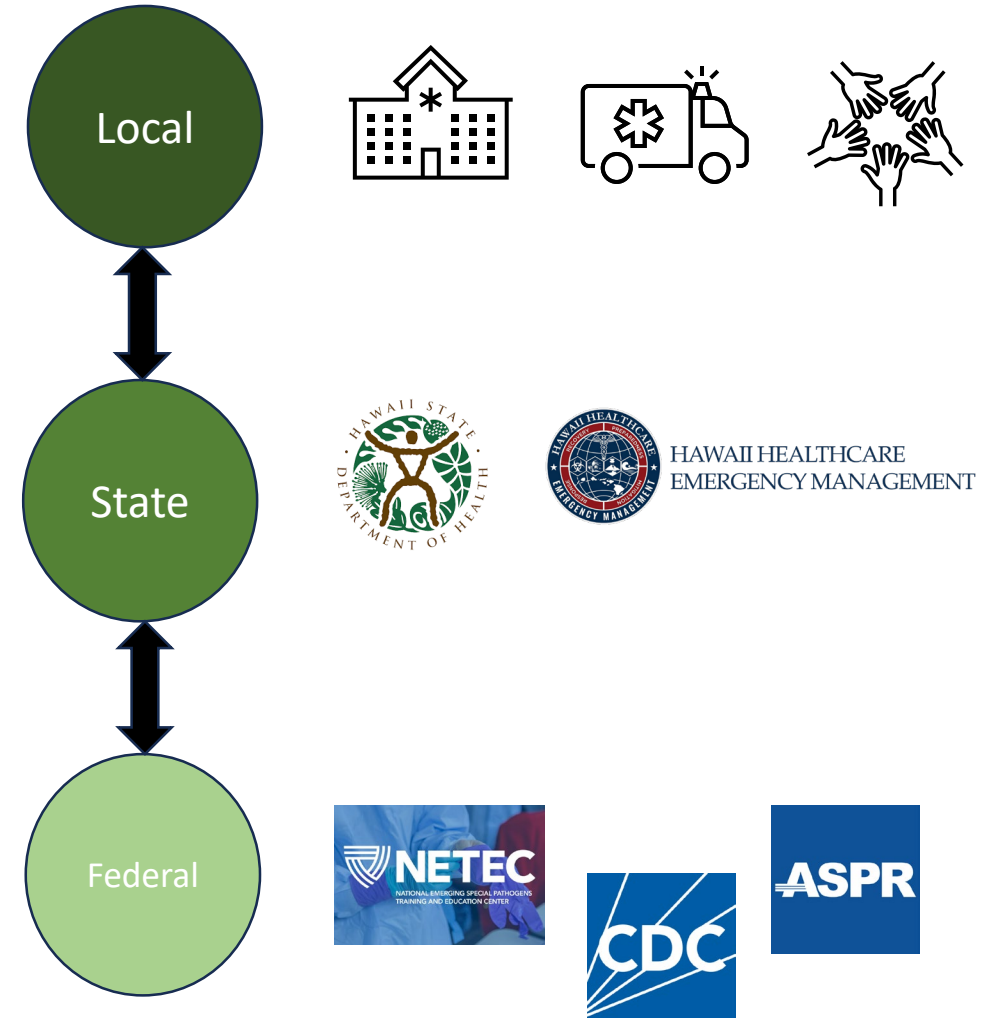


Photo: Marburg virus, CDC

- Traveler health screening and education (CDC)
 - On 10/7, CDC elevated a Travel Advisory from Level 2 to Level 3, recommending reconsideration of non-essential travel to Rwanda
 - This week CDC and DHS are re-directing all travelers from Rwanda through 3 U.S. locations to conduct traveler health screening and education
- Traveler health monitoring and precautions (CDC, DOH)
- Public health case investigation and laboratory diagnostic capacity (DOH)
- Acute care hospital maintenance of Joint Commission accreditation standard on infection control for high consequence pathogens (Hospitals)
- Acute care hospital ability to assess suspected patients and render early care (Hospitals)
- Patient ground and air transport to definitive care (EMS, Hospitals, DOH, HHS/ASPR)
- Responder safety (EMS, Hospitals, DOH)
- Trusted and factual risk communication for timely public engagement to support response and combat misinformation

Preparedness Resources and Partnerships

- High consequence pathogen preparedness requires involvement and partnership across all levels
- Maintenance of hospital and EMS operational plans
 - [10/3 CDC HAN on current Marburg outbreak](#)
 - [Interim Guidance for EMS Systems and 9-1-1 Answering Points | Viral Hemorrhagic Fevers \(VHFs\) | CDC](#)
 - Joint Commission infection control standards
- HI DOH and CDC public health and infection control guidance
 - DOH reporting line or after-hours Physician's Exchange
 - [Interim Guidance for Preparing Frontline Healthcare Facilities for Patients Suspected to Have Ebola Virus Disease \(EVD\) | Ebola | CDC](#)
- Hawaii Healthcare Emergency Management
 - Operational resource support & coordination augmentation
- National Emerging Special Pathogens Training and Education Center (NETEC)
 - Free CE courses, including [EMS Biosafety Transport for Operators](#)
 - 1:1 consultation service for hospitals



CDC Interim Guidance for Emergency Services



Viral Hemorrhagic Fevers (VHFs)

EXPLORE TOPICS ▾

Q SEARCH

MAY 15, 2024

Interim Guidance for Emergency Services

WHAT TO KNOW

- Who this is for: EMS clinicians, EMR, emergency medical technicians, advanced EMTs, paramedics, and other medical first responders who could be providing patient care in the field, such as law enforcement and fire service personnel), managers of 9-1-1 ECC/PSAPS, EMS agencies, EMS systems, and agencies with medical first responders.

Overview

This guidance refers only to the following viral hemorrhagic fevers: [Ebola](#), [Marburg](#), [Lassa](#), [Crimean Congo Hemorrhagic Fever \(CCHF\)](#) and the [South American Hemorrhagic Fevers](#) (i.e., those caused by Junin, Machupo, Chapare, Guanarito and Sabia viruses). Refer to the pathogen-specific pages for further information about the individual pathogens (e.g., signs and symptoms, incubation periods, routes of transmission, diagnosis, treatments).

Guidance for Emergency Services

RELATED PAGES

- [Guidance for EMS Systems and 9-1-1 Answering Points](#)
- [Air Medical Transport](#)
- [Clinical Testing and Screening](#)
- [VHF Clinical Care](#)
- [Infection Control Guidance](#)

CDC Interim Guidance for EMS Systems and 9-1-1 Answering Points



Recommendations for 9-1-1
ECC/PSAPs

Modified Caller Queries



Recommendations for EMS
and Medical First
Responders

Patient Assessment
Safety and PPE
Patient Management and Infection
Control



Prehospital Care Considerations



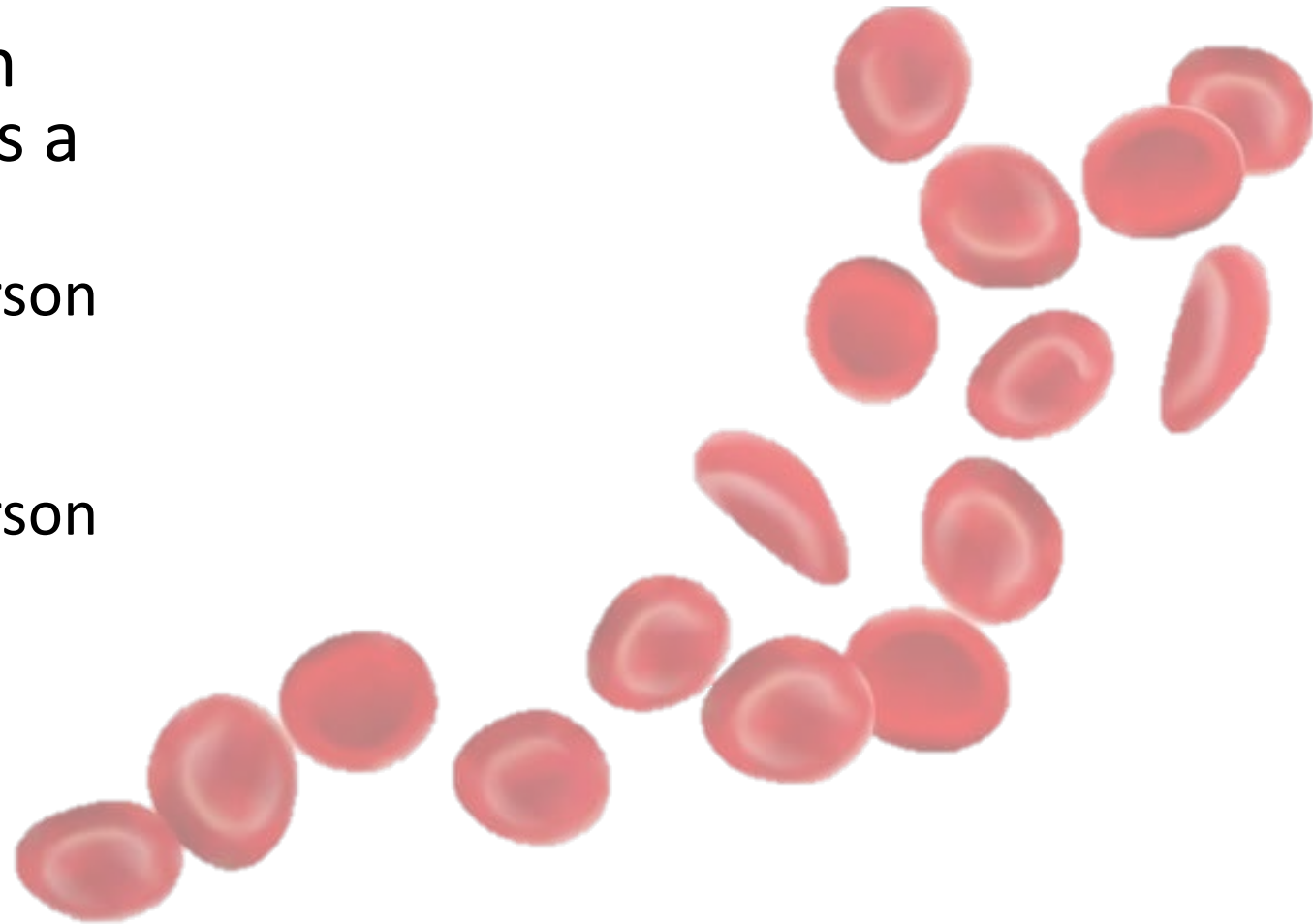
EMS Transport of Patient to a Healthcare Facility



Cleaning EMS Transport Vehicles after Transporting a
Patient Suspected to Have VHF

CDC Interim Guidance for EMS Systems and 9-1-1 Answering Points - Overview

- Likelihood of contracting VHF in the U.S. is extremely low unless a person has direct contact with:
 - The blood or body fluids of a person with VHF who has symptoms
 - OR
 - The blood or body fluids of a person who has died of VHF
- Important for ECC/PSAPs to question callers about:
 - Risk factors for exposure to VHF
 - Signs and symptoms of VHF





MAY 2, 2024

Guidance for Personal Protective Equipment (PPE)

Donning and Doffing PPE During Management of Patients with Selected VHF in U.S. Hospitals

Additional PPE Guidance Documents

[PPE: Confirmed Patients and Clinically Unstable Patients Suspected to have VHF](#)

[PPE: Clinically Stable Patients Suspected to have VHF](#)

PPE Training Videos

Select Your PPE Combination

EXPAND ALL +

Trained Observer



N95 Respirator and Coverall



Powered Air-Purifying Respirator and Coverall



N95 Respirator and Gown



Powered Air-Purifying Respirator and gown





PPE FAQs

AT A GLANCE

Frequently asked questions for Guidance on Personal Protective Equipment (PPE) for Patients Confirmed to have Selected Viral Hemorrhagic Fevers (VHFs) Who are Clinically Unstable or have Bleeding.

PPE Training

Where are the instructional videos for donning and doffing PPE found?

YouTube site: https://www.youtube.com/playlist?list=PLvvp9iOILTQZQMSoMMXnfvUc_n98Txft

Continuous videos landing page: [Guidance for Personal Protective Equipment \(PPE\) | Viral Hemorrhagic Fevers \(VHFs\) | CDC](#)

Additional training resources are also available:

Online course: [Healthcare Provider Trainings on Ebola Disease | Ebola | CDC](#)

[CDC TRAIN](#) [↗](#)

CDC TRAIN is a gateway into [TRAIN National](#) [↗](#), the most comprehensive catalog of public health learning products. TRAIN is one of the most widely used learning management systems and is a free service of the Public Health Foundation.



PPE and Precautions for Marburg virus



Full body coverage: coverall or gown, shoe or boot covers, and a head cover, hood, or shroud. This ensemble is used for VHF patients who are 'wet' - a term used to indicate patients who are diaphoretic, vomiting, bleeding, or having diarrhea. Blood and viral penetration resistance: gown = ANSI/AAMI PB70 Level 4 or coverall = ASTM F1671 or EN14126.



Isolation gown: choose the level of gown based on risk. AAMI PB70 Level 1 – 3 have increasing levels of resistance to fluids, and Level 4 is tested for viral penetration.



Eye protection: full face shield or goggles with circumferential protection.



Respiratory protection: N95 or higher filtering face piece respirator or PAPR (powered air purifying respirator).



Medical or surgical mask: for droplet or source protection only. They do not provide respiratory protection.



Gloves: non-sterile medical exam gloves. Double gloving and the use of extended cuff gloves may be advised.

Standard precautions: include hand hygiene, the use of gloves and other articles of PPE to prevent exposure to blood and other potentially infectious materials, respiratory etiquette, and safe sharps, injection, and lab practices.

Contact precautions: For known or suspected infections that can be transmitted by touch or contamination of surfaces and equipment. PPE = gloves and isolation gown.

Droplet precautions: For known or suspected infections with pathogens that are transmitted when coughing, sneezing, or speaking. Use source control mask on the patient when able and when the patient is outside of the private room or care area. PPE = medical face mask and eye protection. Eyes, nose, and mouth should remain fully covered while in close proximity to patient.

Airborne precautions: For patients with or suspected of having a pathogen that can be transmitted by fine mist, aerosol particles, and droplet nuclei, such as measles, chicken pox, disseminated zoster (shingles), and tuberculosis (TB). Use Airborne Infection Isolation Room (AIIR) and source control mask on the patient when able. PPE = fit-tested N95 respirator or higher.

Eye protection: Goggles or safety glasses that provide a barrier from all sides; or a full-face shield that extends past the sides of the face and to the chin.

Virus Family	Illness Caused	Common Geography	Vector or Source	Person-to-person spread	Precautions	PPE	Comments
Filoviridae	Ebola Virus Disease	Central, sub-Saharan Africa	? Presumed bat	YES	Contact, Droplet/Airborne, Eye		Dry phase = impermeable gown to mid-calf
	Marburg virus		Fruit bat				Wet phase = Full body coverage

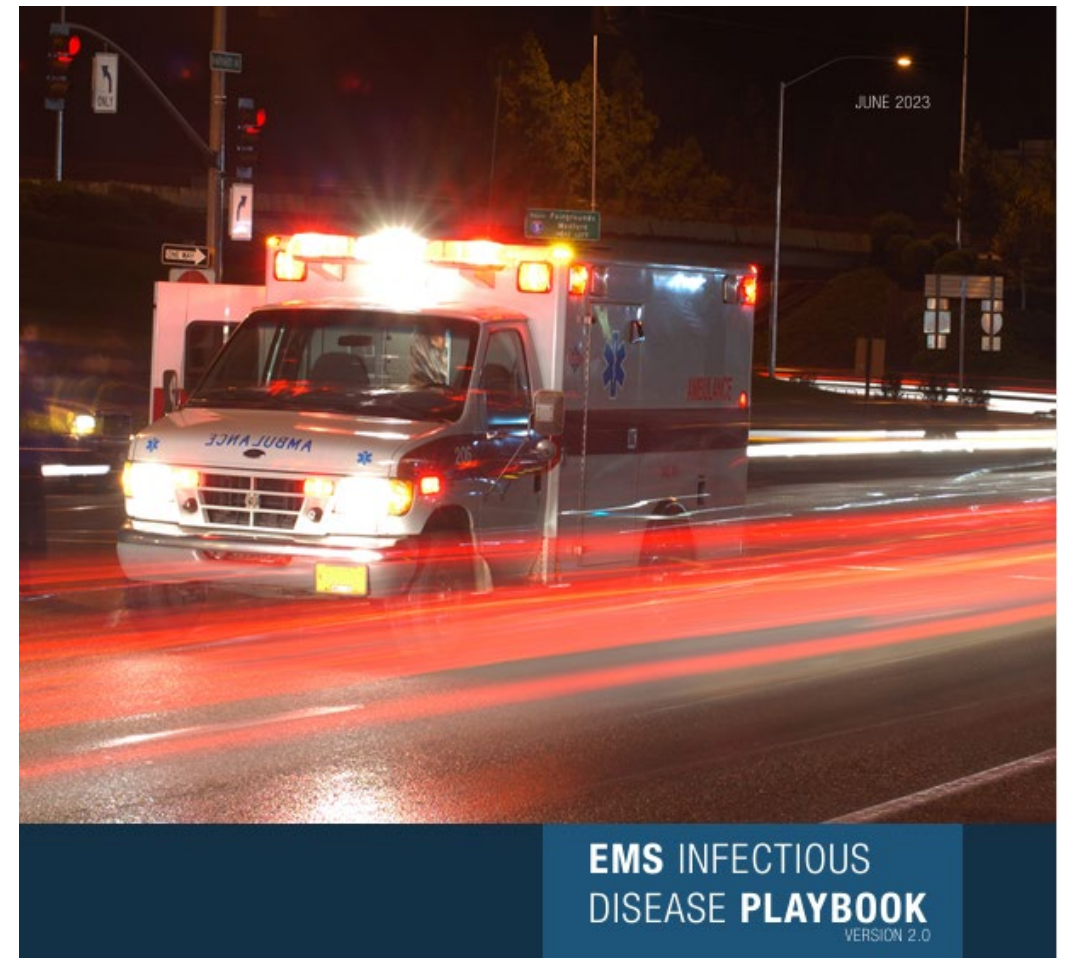
Legend

- Full body coverage
- Gown
- Respiratory protection by N95 or higher
- Medical or surgical mask
- Gloves
- Eye protection

ASPR TRACIE. (2024). EMS Infectious Disease Playbook.

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Remember These Three Action Items:



Viral Hemorrhagic Fevers (VHFs)

Remember: As soon as a VHF is suspected, initiate precautions

Identify ➔ Early suspicion (symptoms, exposure, travel) and recognition help protect everyone.

Isolate ➔ Choose PPE in conjunction with engineering and administrative controls; consider the potential infectious agent, patient condition, your level of interaction, and tasks to be performed. <https://www.cdc.gov/niosh/topics/hierarchy/default.html>.

Inform ➔ Promptly notify appropriate internal and external stakeholders, including your infection prevention and public health professionals.

Hawai'i State
**DEPARTMENT
OF HEALTH**



Mahalo for Listening!
Questions?

health.hawaii.gov