What is Lassa Fever?

Lassa Fever is a viral hemorrhagic fever (VHF) caused by the Lassa virus. Lassa virus belongs to the virus family *Arenavirdae*. It was first discovered in 1969 in Lassa, Nigeria and is now endemic to West Africa with high prevalence in Sierra Leone, Liberia, Guinea, and Nigeria. Neighboring countries Mali, Cote d'Ivoire, Ghana, Togo, Benin, and Burkina Faso also report periodic cases. Lassa fever is a zoonotic disease, meaning that humans become infected from contact with infected animals. The animal reservoir, or host, of the virus is the "multimammate rat", rodents of the genus *Mastomys,* located in west Africa. Once infected, the rodent does not become ill and is able to excrete virus in urine and feces for an extended time period. Person-to-person transmission can occur, especially in health care settings lacking adequate infection prevention and control measures. Cases occur year-round, with a peak in March during the transition from dry to wet season. About 8 in 10 people who are infected have mild symptoms and are not diagnosed. One in 5 infections result in severe disease that can impact the liver, spleen, and kidneys. The case fatality rate overall is 1% but among patients hospitalized with severe disease the case fatality rate is 15% and higher. There are an estimated 100,000 -300,000 cases in West Africa each year, with rare cases reported in travelers to the US from endemic regions.

Clinical Presentation & Disease Summary

Transmission:

- Contact with the urine or droppings of an infected rat
- catching and preparing infected rats as food or eating contaminated food
- inhaling tiny particles in the air contaminated with infected rat urine or droppings (e.g. when cleaning or sweeping)
- contact with blood or body fluids from an infected individual sick through mucous membranes, like eyes, nose, or mouth (rare)
- Getting the virus in open cuts or sores
- Lassa virus may persist in the semen of some males recovering from disease for up to a few months. However, to date no transmission via exposure to infected semen has been documented.

Incubation Period:

- 2-21 days
- Individuals are not contagious prior to symptom onset

Symptoms:

- In about 80% of cases, the disease is asymptomatic or mild
- Onset is usually gradual
- Mild symptoms include:
  - Fever, myalgia, malaise and headache
- After a few days, may progress to include:
  - sore throat, muscle pain, chest pain, nausea, vomiting, diarrhea, cough, and abdominal pain
- Severe cases:
  - facial swelling, pulmonary edema (fluid in lung cavity), bleeding from mouth, nose, vagina, or gastrointestinal tract, low blood pressure may develop
- Later stages:
  - Shock, seizures, tremor, disorientation, and coma

Complications:

- Miscarriage in pregnant women
- Fetal and maternal death
- Hearing loss
- Neurological signs

- Visual impairments
- Joint pain
- Transient hair loss
- Psychological disorders
- Death

Note: Other infections can mimic Lassa Fever, including other viral hemorrhagic fevers, malaria, typhoid fever, shigellosis, yellow fever, influenza, and leptospirosis.

When to Suspect a Patient has Lassa Fever

Suspect Lassa fever in any individual who has one or more symptoms of Lassa fever (listed above) **AND** one or more of the following exposure risk factors within 3 weeks of symptom onset:

- Travel to / residence in a country known to have circulating Lassa fever. Outbreak map located here
- Known/suspected exposure to ill or dead person with suspected/confirmed Lassa fever, including by:
  - Contact with bodily fluids (e.g., blood, sweat, saliva, urine, vomit, feces, semen) 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 recovered from Lassa fever
- Work in a laboratory that handles viral hemorrhagic fever specimens
- Handling wild animals or carcasses that may be infected with Lassa virus (e.g., rats)
- Exposure to *Mastomys* rat's urine and/or feces through contaminated food or household items or direct contact with infected rats.

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
- Provide a mask to the patient and initiate prompt isolation. Follow **Infection Prevention Guidance**.

Inform
- Notify dept/facility leadership, Infection Prevention & Control, on-call hospital epidemiologist.
- Notify jurisdictional health department immediately (via the 24-hour Epi-On-Call contact list) and follow jurisdictional protocols for patient assessment.

Infection Prevention and Control

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 Placement

- Place patient in a single patient **Airborne Infection Isolation Room (AIIR)**. If an AIIR is not available, isolate the patient in a private examination room. Keep the door closed, minimize entry and exit, and avoid entry without appropriate PPE.
  - Keep a **log** of all persons who care for or enter the room or care area of the patient.

- Limit movement of the patient outside of the room. When outside the room, **patient should wear a facemask**.

Transmission-Based Precautions & Personal Protective Equipment

- Adhere to **Standard + Airborne + Contact Precautions**. At minimum for those who do not have bleeding, vomiting, or diarrhea use a respirator, 2 pairs of extended cuff gloves (at minimum, outer gloves should have extended cuffs), fluid-resistant gown that extends to at least mid-calf OR fluid-resistant coveralls without integrated hood, face shield, hood, knee high boot covers. Additionally, an impermeable apron is recommended over gown or coveralls anytime the patient is vomiting or has diarrhea.
    - CDC VHF PPE: Clinically Stable Patients Suspected to have VHF
    - CDC VHF PPE: Confirmed Patients and Clinically Unstable Patients Suspected to have VHF
- Follow Donning and Doffing Checklist
    - Example: NYC Health + Hospitals **SP Level 2 VHF PPE Donning and Doffing Checklist**.
- Ensure a trained observer is present and donned in appropriate PPE (respirator, 2 pairs of extended cuff gloves (at minimum, outer gloves should have extended cuffs), fluid-resistant gown that extends to at least mid-calf OR fluid-resistant coveralls without integrated hood, face shield, hood, knee high boot covers).

Environmental Infection Control

- Lassa virus is classified as a **Category A infectious substance**: capable of causing permanent disability or life-threatening/fatal disease in humans if exposure occurs. Notify facility EVS. Keep all waste, supplies, or medical equipment in patient room until Lassa virus is ruled out.
- If Lassa fever infection 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 Lassa fever infection is **RULED IN**, all cleaning, disinfection, and transport of waste must be **managed as 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 (if applicable) or staff.
- Further information regarding waste and transport can be found here: https://www.cdc.gov/viral-hemorrhagic-fevers/hcp/infection-control/handling-vhf-associated-waste.html

Diagnostic Testing

- **Consultation and approval from jurisdictional health department is required for disease-specific diagnostic testing.** Call jurisdictional health department 24-hour Epi-On-Call contact.
- Further information regarding specimen collection can be found here: https://www.cdc.gov/viral-hemorrhagic-fevers/php/laboratories/specimen-collection.html

Treatment and Immunization

- Ribavirin, an antiviral drug, has been shown to be most effective when given early in the course of the illness.
- Patients should also receive supportive care, including, rest, hydration, and treatment of symptoms.
- There are no licensed vaccines available for Lassa Fever.

Contact: SystemBiopreparedness@nychhc.org

References:

- CDC Lassa Fever
- WHO Lassa Fever
- United Kingdom Guidance on Lassa Fever