What is Crimean-Congo Hemorrhagic Fever?

Crimean-Congo Hemorrhagic Fever (CCHF) is a tick-borne viral hemorrhagic fever caused by the *Nairovirus* in the family *Bunyaviridae* transmitted by bites from infectious Ixodid (hard) ticks or contact with infected animal or tissues during and immediately after slaughter. The CCHF virus causes severe viral hemorrhagic fever outbreaks, with a case fatality rate of 10-40%. It is the most widespread viral hemorrhagic fever, found in Eastern and Southern Europe, the Mediterranean, northwestern China, central Asia, Africa, the Middle East, and the Indian subcontinent. The hosts of CCHF virus include a wide variety of wild and domestic animals such as cattle, sheep, and goats. While many birds are resistant to infection, ostriches are susceptible and may show a high prevalence of infection in endemic areas. The virus remains in an infected animals' bloodstream for about a week after being infected by a bite from an infected tick. While a number of tick genera are capable of becoming infected with CCHF virus, it is ticks of the genus *Hyalomma* that are the principal vector. The majority of human cases have occurred in people who work with livestock, such as agricultural workers, slaughterhouse workers, and veterinarians. These infections have occurred through either tick bites or through contact with infected animal blood or tissue during and immediately after slaughter. Human-to-human transmission can occur through close contact with blood, secretions, organs, or other bodily fluids of infected persons. Hospital-acquired infections have occurred due to contamination of medical supplies and improper sterilization of medical equipment.

Clinical Presentation & Disease Summary

Transmission:

- Bites from infected ticks (genus *Hyalomma*)
- Contact with blood from infected animals (i.e., cattle, sheep, rabbits, etc.)
- person-to-person transmission via direct contact with infectious blood or bodily fluids

Incubation Period:

- 1-14 days (the length depends on mode of acquisition of the virus)
- From a tick bite: 1-3 days, up to 9 days
- From infected blood or tissues: 5-6 days, up to 13 days

Symptoms:

- Onset of symptoms is sudden:
  - Fever
  - Myalgia (muscle ache)
  - Dizziness
  - Neck pain and stiffness
  - Backache
  - Headache
  - Sore eyes and photophobia (sensitivity to light)
  - There may be:
    - Nausea, vomiting, diarrhea, abdominal pain and sore throat early on
    - Followed by sharp mood swings and confusion.
- After two to four days:
  - Agitation may be replaced by sleepiness, depression and lassitude,
  - Abdominal pain may localize to the upper right quadrant, with detectable hepatomegaly (liver enlargement).
- Other clinical signs:
  - Tachycardia, lymphadenopathy, petechial rash on internal mucosal surfaces (e.g., mouth and throat), and on the skin.
  - Petechiae can transition to ecchymoses and severe bruising, severe nosebleeds,

and uncontrolled bleeding at injection sites can also develop and last for about two weeks.

- After the 5th day of illness patients may experience rapid kidney deterioration, sudden liver failure or pulmonary failure.
- In patients who recover, improvement generally begins on ninth or tenth day after onset of illness

Complications:

- Hepatitis
- Kidney failure
- Liver failure
- Pulmonary failure
- Death
- Recovery is slow, and long-term effects are not well-studied

When to Suspect a Patient has CCHF?

Suspect CCHF in any individual who has a sudden onset of one or more symptoms of CCHF (listed above) **AND** one or more of the following exposure risk factors within 2 weeks of symptom onset:

- Travel to / residence in a country known to have circulating CCHF. Outbreak map located here
- Known/suspected exposure to ill or dead person with suspected/confirmed CCHF, including by:
  - Contact with bodily fluids (e.g., blood, sweat, saliva, urine, vomit, feces) without appropriate PPE
  - Contact with bodily fluids or contaminated objects with appropriate PPE if there is concern for a breach in PPE
- Known/suspected tick bite
- Work in a laboratory that handles viral hemorrhagic fever specimens
- Direct contact with animal blood and/or tissues during/immediately after slaughter

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, a fluid-resistant apron is recommended over gown or coveralls anytime the patient is vomiting or has diarrhea. CDC Viral Hemorrhagic Fever PPE
- 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 (gown, respirator, face shield, 2 pairs of extended cuff gloves, shoe covers).

Environmental Infection Control

- CCHF 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 CCHF is ruled out.
- If CCHF 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 CCHF 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.

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

- There is no specific treatment or cure for CCHF.
- Treatment is supportive care, including symptom management and appropriate treatment of secondary infections.
- Ribavirin has shown some benefits in treating CCHF patients, however, more research is needed to determine the efficacy.
- There is currently no widely available or approved vaccine for human use to prevent CCHF. There is one type of vaccine used on a small scale in Eastern Europe, however, more research is needed to determine the efficacy.

Contact: SystemBiopreparedness@nychhc.org

References:

- CDC Crimean-Congo Hemorrhagic Fever
- WHO Crimean-Congo Hemorrhagic Fever
- CDC Viral Hemorrhagic Fevers (VHFs) for Health Care Providers