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To: North Carolina Health Care Providers and Laboratories
From: Megan Davies, MD, State Epidemiologist
Scott Zimmerman, DrPH, MPH, HCLD (ABB), State Laboratory of Public Health
Re: **Ebola Hemorrhagic Fever (3 pages)**

This memo is intended to provide updated information to all North Carolina health care providers and laboratories regarding Ebola hemorrhagic fever (Ebola HF) and management of suspected cases.

This version has been updated to include new definitions of high-risk and low-risk exposures, updated laboratory guidance, and a link to updated infection prevention guidance from CDC.

Summary

National and international health authorities are currently working to control a large, ongoing outbreak of Ebola involving areas in West Africa. A map of affected areas is available at http://www.cdc.gov/vhf/ebola/resources/distribution-map-guinea-outbreak.html. All cases of human illness or death have occurred in Africa; no case has been reported in the United States.

Clinical and Epidemiologic Features

Ebola hemorrhagic fever is a rare and deadly disease. The disease is native to several African countries and is caused by infection with one of the ebolaviruses (Ebola, Sudan, Bundibugyo, or Taï Forest virus). It is spread by direct contact with a sick person's blood or body fluids. It is also spread by contact with contaminated objects or infected animals.

The incubation period for Ebola HF is usually 8–10 days, but could potentially range from 2–21 days. The risk for person-to-person transmission of hemorrhagic fever viruses is greatest during the latter stages of illness when viral loads are highest. Ebola is not transmissible during the incubation period (i.e., before onset of fever).

Symptoms include fever, headache, joint and muscle aches, sore throat, and weakness, followed by diarrhea, vomiting, and stomach pain. Skin rash, red eyes, and internal and external bleeding may be seen in some patients.

Case Investigation and Testing

- Ebola hemorrhagic fever (HF) should be suspected and testing is recommended for febrile patients with clinically compatible illness who, within 3 weeks before onset of fever, have had a high-risk exposure, defined as follows:
    - Direct, unprotected contact with blood or other body fluids of a patient known to have or suspected to have Ebola HF;
    - Had a possible exposure when working in a laboratory that processes body fluids of confirmed or

suspect Ebola HF cases;
    - Participated in funeral rites or other direct unprotected exposure to human remains in the geographic area where the outbreak is occurring.

- Ebola hemorrhagic fever (HF) and testing should be considered for febrile patients with clinically compatible illness who, within 3 weeks before onset of fever, have had a low-risk exposure, defined as follows:
    - Persons who spent time in a healthcare facility where Ebola HF patients are being treated;
    - Household members of an Ebola HF patient without high-risk exposures as defined above;
    - Persons who had direct unprotected contact with bats or primates from a geographic area where the outbreak is occurring.

- **Clinicians caring for patients meeting these criteria should immediately implement isolation precautions (see below) and contact their local health department or the state Communicable Disease Branch (919-733-3419; available 24/7) to discuss laboratory testing and control measures.**

- Decisions about testing for Ebola in cases meeting these criteria will be made on a case-by-case basis.

- Even following travel to areas where Ebola HF has occurred, persons with fever are more likely to have infectious diseases other than Ebola HF (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 even if Ebola is being considered. Testing for malaria and Lassa fever should also be considered if Ebola HF is suspected, since there is overlap in terms of clinical features and geographic areas where exposures could occur.

- Testing for Ebola is currently available through the CDC's Viral Special Pathogens Branch. Specimens **will not** be accepted without prior consultation.

- Appropriate specimen types, quantity of material, tests utilized and transport conditions are listed below.

Specimen Type	**Quantity**	**Testing**	**Transport**
Serum (preferred)	➢ 4ml	Culture, PCR, Serology	Refrigerated (4°C), placed on cold packs if shipment is to be received within 72 hrs.
Uncoagulated whole blood (purple, yellow, or blue top)	➢ 4ml	Culture, PCR	
Formaline-fixed or paraffin-embedded tissues	NA	Immunohistochemistry	Ship at room temperature. Note: An autopsy or surgical report must accompany the specimen.
Fresh frozen tissue	1 cm^3 (except for biopsies)	Culture, PCR	Ship specimen frozen on dry ice in a plastic container.

- For consultation on specimen collection and packaging, contact the North Carolina State Laboratory of Public Health (NCSLPH) Bioterrorism and Emerging Pathogens (BTEP) Unit at 919-807-8600.

- All specimen submissions must be accompanied by a completed **CDC 50.34 DASH Form** (http://slph.state.nc.us/Forms/CDC-Dash-NCSLPH-013114.pdf) **and** a **Viral Special Pathogens Branch Diagnostic Specimen Submission Form** (http://www.cdc.gov/ncezid/dhcpp/vspb/pdf/specimen-submission.pdf).

- To date CDC has recommended shipment in accordance with IATA guidelines as a Category B diagnostic specimen. *CDC Laboratory guidance is under revision.* The NCSLPH **highly recommends** that individuals packaging and shipping these diagnostic specimens use their professional judgment and consider packing instruction 620, IATA guidelines for Category A. Comprehensive guidance on packing and shipping these types of potentially infectious substances can be found at the following website: https://clinmicro.asm.org/index.php/bench-work-resources/conducting-daily-operations/packaging-and-shipping. *We anticipate active discussion with all entities requesting diagnostic testing for Ebola, and we will provide guidance on a case-by-case basis.*

Infection Control

- The following recommendations should be followed when caring for persons with suspected Ebola HF:
    - Patient placement: Patients should be placed in a private room containing a private bathroom.
    - Healthcare provider protection: Standard, Contact, and Droplet Precautions should be initiated. Patients with respiratory symptoms should wear a face mask to contain respiratory droplets prior to placement in their hospital or examination room and during transport.
    - Aerosol-generating procedures: Aerosol-generating procedures should be avoided. If such procedures are necessary, Airborne Precautions (use of N95 respirator or higher and airborne isolation room) should be implemented for the duration of the procedure.
    - Environmental infection control: Appropriate agents for cleaning and disinfection include 10% sodium hypochlorite (bleach) solution, or quarternary ammonium or phenolic product. Personnel performing environmental cleaning should wear PPE as described above.
- Additional recommendations are available at http://www.cdc.gov/vhf/ebola/hcp/infection-prevention-and-control-recommendations.html.

Treatment

- Supportive care only; no antivirals are currently available for treatment of Ebola HF.

Reporting

- Physicians are required to contact their local health department or the state Communicable Disease Branch (919-733-3419) as soon as Ebola or any other hemorrhagic fever virus infection is reasonably suspected.

This is an evolving situation and recommendations are likely to change as new information becomes available. Updated information and guidance are available from the CDC at http://www.cdc.gov/vhf/ebola.