



NC DEPARTMENT OF
**HEALTH AND
HUMAN SERVICES**

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To: All North Carolina Health Care Providers

From: Emma Doran, MD, MPH, Medical Epidemiologist

Subject: **Middle-East Respiratory Syndrome Coronavirus (MERS-CoV)** (4 pages)

Date: May 29, 2024

Summary

Middle East Respiratory Syndrome (MERS) is an illness caused by a coronavirus (MERS-CoV) that was first identified in 2012 and has been associated with severe respiratory infections among persons who live in or have traveled to the Middle East and persons (including health care providers) exposed to MERS cases outside of the Middle East. The first travel-associated cases in the United States were confirmed in May 2014. There has been clear evidence of person-to-person transmission both in household and healthcare settings, but no evidence of sustained person-to-person transmission in the community.

Healthcare providers should maintain an increased suspicion for MERS-CoV in anyone presenting with respiratory symptoms after recent travel to countries in and near the Arabian Peninsula including travel to the Kingdom of Saudi Arabia (KSA) for Hajj, an annual Islamic pilgrimage.

Case Investigation

A person meeting both the clinical features and epidemiological criteria listed below should be considered a Patient Under Investigation (PUI).

Clinical Criteria		Epidemiologic Criteria
<p>Severe illness Patient has fever and pneumonia OR fever and acute respiratory distress syndrome with no other more likely alternative diagnosis</p>	<p>and ≥1 of the following epidemiologic risk factors</p>	<p>Within 14 days before symptom onset, a history of travel from countries in or near the Arabian Peninsula¹ -or- Within 14 days before symptom onset, history of close contact with a person who themselves developed fever and acute respiratory illness within 14 days of residing in or travel to countries in or near the Arabian Peninsula -or- Within 14 days before symptom onset, a history of direct physical contact with camels² in North, West, or East Africa³ -or- Is a member of a cluster of patients with severe acute respiratory illness of unknown etiology -or- High risk occupational exposure to MERS-CoV, such as laboratory or research personnel⁴</p>

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Clinical Criteria		Epidemiologic Criteria
<p>Milder illness Patient has fever or symptoms of respiratory illness (e.g., cough and/or shortness of breath) with no other more likely alternative diagnosis</p>	<p>and ≥1 of the following epidemiologic risk factors</p>	<p>Within 14 days of symptom onset, a history of being in a health care facility (as a patient, worker, or visitor) in a country or territory in or near the Arabian Peninsula where recent health care–associated cases of MERS have been identified -or- Within 14 days of symptom onset, a history of direct physical camel contact² in or near the Arabian Peninsula -or- Within 14 days of symptom onset, a history of close contact⁵ with a person with confirmed MERS-CoV infection while that person was ill -or- High risk occupational exposure to MERS-CoV, such as laboratory or research personnel⁴</p>

¹Countries considered in or near the Arabian Peninsula include: Bahrain; Iraq; Iran; Israel, the West Bank and Gaza; Jordan; Kuwait; Lebanon; Oman; Qatar; Saudi Arabia; Syria; the United Arab Emirates (UAE); and Yemen.

²Direct physical contact could include touching, riding, hugging, kissing, grooming, or exposure to respiratory secretions but does not include consumption of cooked camel meat.

³Because the risk for MERS-CoV transmission from camels in North, West, and East Africa is not yet fully understood, consider MERS evaluation for travelers coming from these regions who develop severe respiratory illness within 14 days of direct physical camel contact.

⁴Diagnostic and research facilities that handle MERS-CoV should have established procedures instructing their staff in how to prevent and respond to occupational exposures. Laboratory exposure can occur through contact with infected animals and viral specimens without proper precautions and personal protective equipment (PPE).

⁵Close contact is defined as a) being within approximately 6 feet (2 meters), or within the room or care area, of a confirmed MERS patient for a prolonged period of time (such as caring for, living with, visiting, or sharing a healthcare waiting area or room with, a confirmed MERS patient) while not wearing recommended personal protective equipment or PPE (e.g., gowns, gloves, NIOSH-certified disposable N95 respirator, eye protection); or b) having direct contact with infectious secretions of a confirmed MERS patient (e.g., being coughed on) while not wearing recommended personal protective equipment.

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

Persons who meet criteria should also be evaluated for common causes of community-acquired pneumonia, if not already done. (*Note: Viral culture should not be attempted in cases with a high index of suspicion.*) MERS-CoV infection should still be considered even if another pathogen is identified, since co-infections have been reported.

Any cluster of severe acute respiratory illness in healthcare workers in the United States should be thoroughly investigated. The occurrence of a severe acute respiratory illness cluster of unknown etiology should prompt immediate notification of local public health for further investigation and testing.

Specimen Collection and Testing

Specimens obtained from individuals meeting the current definition of a PUI for MERS-CoV should be submitted to the NCSLPH for diagnostic testing using a real-time reverse-transcription polymerase chain reaction (rRT-PCR assay) at the CDC. Acceptable specimen types include:

- Lower respiratory tract specimens **preferred** (bronchoalveolar lavage, sputum and tracheal aspirates)
- Upper respiratory tract (nasopharyngeal (NP) and oropharyngeal (OP) swabs) After collection, NP and OP swabs can be combined in the same vial of 2-3 ml viral transport media)

CDC recommends the collection of two respiratory specimen types, with at least one being a lower respiratory tract specimen, as soon as possible after symptom onset and within 7 days of onset. However, if patients remain symptomatic for > 7 days, respiratory specimens should still be collected, with a preference for lower respiratory tract specimens. NP/OP specimens, in addition to a lower respiratory tract specimen is strongly recommended depending upon the length of time between symptom onset and specimen collection. All specimen containers must be labeled with two primary patient identifiers (e.g. full name and DOB), specimen type, and the date of collection.

Specimen storage:

- 2-8°C for up to 72 hours after collection.
- If extraction cannot be completed within 72 hours, specimens should be stored at -70°C or lower as soon as possible after collection.

Specimen packaging and shipping: Specimens should be packaged and transported using [Category B guidelines](#) to the NCSLPH for submission to the CDC. Specimens less than 72 hours old can be received at 2-8°C. Specimens > 72 hours old must be received frozen on dry ice at -70°C or lower. All specimens must be submitted with a completed [CDC Form 50.34](#) and a completed [MERS PUI Short Form](#).

Contact the BTEP unit (919-807-8600) to schedule expedited specimen transport to the NCSLPH or if you have submission questions.

See CDC's [Collecting, Handling, and Testing Clinical Specimens from PUIs for MERS-CoV Infection](#) guidance and [Biosafety Guidelines for Handling and Processing Specimens Associated with MERS-CoV](#).

Infection Control

Transmission of MERS-CoV has been documented in healthcare settings. See CDC's updated Interim Guidance for Healthcare Professionals at <https://www.cdc.gov/coronavirus/mers/infection-prevention-control.html>

Standard, contact, and airborne precautions are recommended for management of patients in healthcare settings with known or suspected MERS-CoV infection. These include:

- Use of fit-tested NIOSH-approved N95 or higher respirators
- Use of gowns, gloves and eye protection
- Use of negative-pressure airborne infection isolation rooms (AIIR) if available

A facemask should be placed on the patient if an AIIR is not available or if the patient must be moved from his/her room.

Treatment

No antivirals are currently available for treatment of MERS-CoV. Individuals with MERS often receive medical care to help relieve symptoms. For severe cases, current treatment includes care to support vital organ functions.

Reporting

MERS-CoV infections are reportable in North Carolina. Physicians are required to contact their local health department or the state Communicable Disease Branch (919-733-3419) as soon as MERS-CoV infection is reasonably suspected.

Additional Resources

[CDC MERS](#)

[CDC MERS Information for Healthcare Professionals](#)