



**Massachusetts Department of Public Health  
Bureau of Infectious Disease  
Division of Epidemiology and Immunization**

**CLINICAL ADVISORY  
Middle East Respiratory Syndrome Coronavirus (MERS-CoV)  
May 22, 2014**

**SUMMARY**

1. The first case of MERS-CoV infection imported into the United States was confirmed on May 2, 2014 in a traveler from Saudi Arabia. On May 11, 2014, a second imported case was confirmed in a resident of Saudi Arabia traveling in the United States. A contact of the first case was later found to have developed antibodies to the virus but had remained asymptomatic.
2. As of May 14, over 500 laboratory confirmed cases of MERS-CoV infection have been reported by the World Health Organization (WHO). This includes 145 deaths.
3. Most people with recognized MERS-CoV infection had severe acute respiratory illness with fever, cough, and shortness of breath, but some people had mild respiratory illness.
4. There is evidence of human-to-human transmission but only with close contact. Standard, contact and airborne precautions are recommended for management of hospitalized patients with known or suspected MERS-CoV infection until further investigation of transmission.
5. Diagnostic testing to detect MERS-CoV is available at the MDPH Hinton State Laboratory Institute (HSLI).
6. Clinicians should consider MERS-CoV infection in patients with fever and an acute respiratory infection and history of travel to the Arabian Peninsula or neighboring countries\* in the 14 days prior to onset of symptoms.
7. Healthcare providers can call the Massachusetts Department of Public Health at (617) 983-6800 for further guidance.

**Background**

Middle East Respiratory Syndrome, or MERS, is a viral respiratory illness caused by Middle East Respiratory Syndrome Coronavirus—MERS-CoV. It was first reported in Saudi Arabia in 2012. As of May 12, 2014, 536 laboratory-confirmed cases of MERS-CoV infection, with 145 deaths, have been reported by WHO. All reported cases have been directly or indirectly linked to travel to or residence in seven countries: Saudi Arabia, UAE, Qatar, Oman, Jordan, Kuwait, and Yemen. The first case of MERS in the U.S. was identified in a resident of Saudi Arabia and was confirmed by the CDC on May 2, 2014. On May 11, 2014, a second case of MERS in the U.S. was confirmed by the CDC. This patient was also a resident of Saudi Arabia. The first and second U.S. cases of MERS are not linked. Subsequently, a close contact of the first case was found to have anti-MERS-CoV antibody in serum collected after exposure, but had had no illness.

For more detailed and up-to-date information go to the Centers for Disease Control and Prevention (CDC) MERS-CoV web page at: <http://www.cdc.gov/coronavirus/mers/>

Similar to the SARS-CoV, the MERS-CoV is capable of causing severe lower respiratory tract infection. Milder illness has also been described, and evidence of asymptomatic infection has been described in the U.S. (see above) and elsewhere. The exact nature of exposure causing infection is not known, but human-to-human transmission has occurred, including in healthcare facilities. The MERS-CoV is most similar to a coronavirus found in bats, but as in the case of the SARS-CoV, exposure to other intermediate animals (such as camels) may be a source of MERS-CoV infection.

### **Reporting**

We ask that clinicians report the following to their local health departments and MDPH:

Fever and pneumonia or acute respiratory distress syndrome (based on clinical or radiologic evidence)

AND ANY of the following:

- history of travel from countries in or near the Arabian Peninsula\* within 14 days before symptom onset
- close contact with a symptomatic traveler who developed fever and acute respiratory illness (not necessarily pneumonia) within 14 days after traveling from countries in or near the Arabian Peninsula)
- close contact of a confirmed or probable case of MERS

\* Bahrain, Iran, Iraq, Israel, Jordan, Kuwait, Lebanon, Palestinian territories, Oman, Qatar, Saudi Arabia, Syria, the United Arab Emirates (UAE), and Yemen

### **Infection control**

Standard, contact, and airborne precautions are recommended for management of hospitalized patients with known or suspected MERS-CoV infection. For CDC guidance on MERS-CoV infection control in healthcare settings, see [Interim Infection Prevention and Control Recommendations for Hospitalized Patients with MERS-CoV](#). For CDC interim guidance to prevent MERS-CoV from spreading in homes and communities in the U.S., see [Interim Home Care and Isolation Guidance for MERS-CoV](#).

### **Testing**

The MDPH HSLI is certified to perform FDA-approved emergency use testing with the CDC Novel Coronavirus 2012 rRT-PCR Assay for the presumptive detection of MERS-CoV. Testing will only be performed on patients meeting specific travel and symptom criteria, and only after consultation with MDPH

### **Specimen Type and Priority Laboratory Testing**

- Lower respiratory specimens appear to work best on the rRT-PCR assay. These include sputum, tracheal aspirate, pleural fluid and bronchoalveolar lavage (BAL).
- Upper respiratory specimens can also be collected. These include nasopharyngeal/oropharyngeal (NP/OP) swabs, nasopharyngeal wash/aspirates, or nasal aspirates.
- Serum is an acceptable specimen for MERS CoV rRT-PCR if collected < 7 days post symptom onset.

Additional specimen types that may be sent for testing include: stool and plasma (collected in an EDTA tube).

**Lower respiratory specimens** such as BAL, tracheal aspirate, sputum or pleural fluid should be sent in a sterile, leak-proof, screw-cap collection cup or sterile dry container. Refrigerate specimen at 2-8° C up to 72 hours; if exceeding 72 hours, specimens should be frozen at -70°C.

For **upper respiratory tract specimens** such as nasopharyngeal (NP) AND oropharyngeal (OP), use only synthetic fiber swabs with plastic shafts. Do not use calcium alginate swabs or swabs with wooden shafts, as they may contain substances that inactivate some viruses and inhibit PCR testing. Place swabs immediately into sterile tubes containing 2-3 ml of viral transport media (VTM) or universal transport media (UTM). NP/OP specimens can be combined, placing both swabs in the same vial. Refrigerate specimen at 2-8°C up to 72 hours; if exceeding 72 hours, freeze at -70°C and ship on dry ice.

For nasopharyngeal wash/aspirate or nasal aspirates, collect 2-3 mL undiluted into a sterile, leak-proof, screw-cap sputum collection cup or sterile dry container. Refrigerate specimen at 2-8°C up to 72 hours; if exceeding 72 hours, freeze at -70°C and ship on dry ice.

**Serum:** For serologic testing, it is recommended that serum specimens be collected during the acute stage of the disease, preferably during the first week after onset of illness, and again during convalescence, ≥ 3 weeks after the acute sample was collected.

*Children and adults* Collect 1 tube (5-10 mL) of whole blood in a serum separator tube. Allow the blood to clot, centrifuge briefly, and separate sera into sterile tube container. The minimum amount of serum required for testing is 200 µL. Refrigerate the specimen at 2-8°C and ship on ice-pack; freezing and shipment on dry ice is permissible.

*Infants* A minimum of 1 mL of whole blood is needed for testing of pediatric patients. If possible, collect 1 mL in an EDTA tube and in a serum separator tube. If only 1 mL can be obtained, use a serum separator tube. EDTA blood (plasma): Collect 1 tube (10 mL) of heparinized (green-top) or EDTA (purple-top) blood. Refrigerate specimen at 2-8°C and ship on ice-pack; do not freeze.

**Stool:** Collect 2-5 grams of stool specimen (formed or liquid) in a sterile, leak-proof, screw-cap sputum collection cup or sterile dry container. Refrigerate specimen at 2-8°C up to 72 hours; if exceeding 72 hours, freeze at -70°C and ship on dry ice

All specimens must be pre-packed to prevent breakage and spillage. Complete one general submission form per specimen (SS-SLI-1-13) <http://www.mass.gov/eohhs/docs/dph/laboratory-sciences/general-submission-form.pdf> **including:** submitting facility, ordering clinician, and patient name, ID (or medical record number), address, travel history (including dates, locations, and mode(s) of travel), signs and symptoms, onset date and current patient status.

**Ship to:**           **Attention:** Virus Isolation Laboratory  
Hinton State Laboratory Institute  
305 South Street  
Jamaica Plain, MA 02130

For assistance with specimen submission call The Division of Epidemiology and Immunization at (617) 983-6800 or the HSLI at (617) 983-6688. **Suspect cases in Boston must be reported to the Boston Public Health Commission at 617-534-5611.**