

MERS

Reference Guide

Updated 5/29/2014

See www.cdc.gov for most current info

MERS Case Definitions

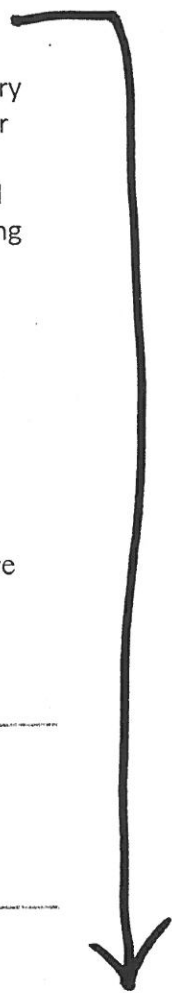
Patient Under Investigation (PUI)

A patient under investigation (PUI) is a person with the following characteristics:

- A. Fever ($\geq 38^{\circ}\text{C}$, 100.4°F) and pneumonia or acute respiratory distress syndrome (based on clinical or radiological evidence) AND EITHER:
 - o a history of travel from countries in or near the Arabian Peninsula¹ within 14 days before symptom onset, OR
 - o close contact² 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 Peninsula¹ OR
 - o a member of a cluster of patients with severe acute respiratory illness (e.g. fever and pneumonia requiring hospitalization) of unknown etiology in which MERS-CoV is being evaluated, in consultation with state and local health departments.

OR

- B. Close contact² with a confirmed or probable case of MERS while the case was ill AND
 - o fever ($>100^{\circ}\text{F}$) or symptoms of respiratory illness within 14 days following the close contact. (This is a lower threshold than category A.)



PUIs should be evaluated in consultation with the state and local health departments. For more information, see CDC's Interim Guidance for Health Professionals.

Confirmed Case

A confirmed case is a person with laboratory confirmation³ of MERS-CoV infection.

Probable Case

A probable case is a PUI with absent or inconclusive⁴ laboratory results for MERS-CoV infection who is a close contact² of a laboratory-confirmed MERS-CoV case.

Footnotes

History of travel to these countries, consider MERS	
Bahrain	Lebanon
Iraq	Oman
Iran	Qatar
Israel, the West Bank, and Gaza	Saudi Arabia
Jordan	Syria
Kuwait	Yemen
	United Arab Emirates (UAE)

1. Countries considered in the Arabian Peninsula and neighboring 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.
2. Close contact is defined as a) any person who provided care for the patient, including a healthcare worker or family member, or had similarly close physical contact; or b) any person who stayed at the same place (e.g. lived with, visited) as the patient while the patient was ill.
3. Confirmatory laboratory testing requires a positive PCR on at least two specific genomic targets or a single positive target with sequencing on a second.
4. Examples of laboratory results that may be considered inconclusive include a positive test on a single PCR target, a positive test with an assay that has limited performance data available, or a negative test on an inadequate specimen.

SPECIMEN COLLECTION FOR MERS TESTING

ODH Lab can test specimens for MERS virus by PCR. Before collecting specimens, please contact:

The Bureau of Infectious Diseases, Outbreak Response and Bioterrorism Investigation Team 24/7 at (614)722-7221

What to collect: (listed in order of priority)

A. Lower respiratory tract

Bronchoalveolar lavage, tracheal aspirate, pleural fluid

Collect 2-3 mL 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.

Sputum

Have the patient rinse the mouth with water and then expectorate deep cough sputum directly 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.

B. Upper respiratory tract

Nasopharyngeal AND oropharyngeal swabs (NP/OP swabs)

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. 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.

Nasopharyngeal swabs -- Insert a swab into the nostril parallel to the palate. Leave the swab in place for a few seconds to absorb secretions. Swab both nasopharyngeal areas.

Oropharyngeal swabs -- Swab the posterior pharynx, avoiding the tongue.

Nasopharyngeal wash/aspirate or nasal aspirates

Collect 2-3 mL 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.

Note: Swabs need to be in viral transport medium in order to be tested.

C. Serum for virus detection

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.

D. Stool

Collect 2-5 grams of stool specimen (formed or liquid) in 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.

Submission form:

Complete the ODH Microbiology form and enclose with the specimen:
<http://www.odh.ohio.gov/pdf/IDCM/frm2530.pdf> Under Virology, request MERS-PCR and the respiratory virus panel.

How to Ship:

Specimens from suspected MERS cases must be packaged, shipped, and transported according to the current edition of the International Air Transport Association (IATA) Dangerous Goods Regulations at [https://www.iata.org/whatwedo/cargo/dgr/Documents/DGR52_InfectiousSubstances\(DGR362\).pdf](https://www.iata.org/whatwedo/cargo/dgr/Documents/DGR52_InfectiousSubstances(DGR362).pdf) . Specimens for MERS testing are Category B.

Specimens should be stored and shipped at the temperatures indicated above. *Where refrigerator temperature is indicated, ship on frozen freeze packs.* If samples are unable to be shipped within 72 hours of collection, they should be stored at -70°C and shipped on dry ice.

All specimens must be pre-packed to prevent breakage and spillage. Specimen containers should be sealed with Parafilm® and placed in ziplock bags. Place enough absorbent material to absorb the entire contents of the Secondary Container (containing Primary Container) and separate the Primary Containers (containing specimen) to prevent breakage. Send specimens with cold packs or other refrigerant blocks that are self-contained, not actual wet ice.

Please Note:

- Do not place any dry ice in the "Primary Container" or "Secondary Container", foam envelopes, ziplock bags, cryovial boxes, or hermetically sealed containers.
- Do not place Primary Containers sideways or upside down in ziplock bags.
- Do not place any paperwork in the Secondary Containers or ziplock bags, so as not to damage the paperwork.
- Do not use biohazard/autoclave bags to prepack your materials due to the inadequate seal of these bags.

Where to ship:

Ship for next day delivery to:

Attention: Specimen Receiving
Ohio Dept of Health Laboratory, Building 22
8995 E. Main Street
Reynoldsburg OH 43068

For more details on specimen collecting and shipping, see:
<http://www.cdc.gov/coronavirus/mers/guidelines-clinical-specimens.html>

For questions about MERS antibody testing, isolation procedures, or other questions relating to MERS, please contact ORBIT at (614)995-5599.

Jamison, Linda

From: ophcs@ophcs.odh.ohio.gov
Sent: Friday, May 23, 2014 11:47 AM
To: Jamison, Linda
Subject: ODH Advisory: MERS-CoV. [id: 2343943]
Attachments: SPECIMEN COLLECTION FOR MERS TESTING KQ 05-21-2014 (2).pdf

Importance: Low

Two MERS-CoV cases have been documented in the United States. The Director's Journal Entry making MERS-CoV a Class A reportable disease in Ohio and a MERS IDCM chapter can be found in the Alert Details section of the OPHCS home page. Please share with reporting colleagues. ODH Lab can perform MERS testing on respiratory specimens and serum using a PCR test. To submit specimens, please first call ODH 24/7 at (614) 722-7221 to discuss the case. The ideal specimens for PCR testing are lower respiratory tract (BAL, tracheal aspirate, sputum), then upper respiratory tract (NP, OP swabs, etc), then serum. Note that swabs need to be in viral transport medium, and specimens should be shipped overnight on frozen freeze packs. Please share this information with infectious disease physicians, microbiologists and pathologists in your facility. For further details, please see the attached memo, which is also in the Alert Details section of the OPHCS home page. Questions can be directed to the ODH Outbreak Response & Bioterrorism Investigation Team at (614)995-5599 or ORBIT@odh.ohio.gov.

This email included one or more attachments. If there are no attachments, your email system may have removed them. You can download them from the Alert Details page at the following location:

https://home.ophcs.odh.ohio.gov/_layouts/rm/AlertStatus.aspx?AlertId=12414

Alert Id: 12414
Acknowledge: Yes
Alert Program: HAN
Delivery Time: 72 hours
Event Status: Actual
Jurisdictional Level: State, Local
MessageType: Alert
Sensitive: No
Severity: Minor

Time Sent: 5/23/2014 11:45:53 AM

[Click to Confirm Receipt of this Message](#)

Please use the link above to confirm this alert message directly from a PC by providing your OPHCS User ID and Password.

To confirm this alert by email accessed through a Smartphone (BB, Iphone, etc):

Health Department Phone Numbers

REPORT POTENTIAL CASE IMMEDIATELY

Butler County Health Department:

513-887-5253

Jenny Bailor, DON

513-887-5251

Southwest Ohio Region Public Health Infections Disease Call Center:

877-774-4636

Middle East Respiratory Syndrome (MERS) Patient Under Investigation (PUI) Short Form

For Patients Under Investigation (PUIs), complete and send this form to eocreport@cdc.gov (subject line: MERS Patient Form) or fax to 770-488-7107. If you have questions, contact the CDC Emergency Operations Center (EOC) at 770-488-7100.

STATE ID:		Today's Date: MM/DD/YY		County:		City:		State:											
Interviewer's name:				Phone:		Email:													
Physician's name:				Phone/Pager:															
PUI Definition—Does the patient have:		(Please consult CDC website at http://www.cdc.gov/coronavirus/mers/case-def.html)																	
1. Acute respiratory infection with fever ($\geq 38^{\circ}\text{C}$, 100.4°F) and cough?		<input type="checkbox"/> Yes		<input type="checkbox"/> No		<input type="checkbox"/> Unknown													
2. Clinical or radiographic evidence of pneumonia or acute respiratory distress syndrome (ARDS)?		<input type="checkbox"/> Yes		<input type="checkbox"/> No		<input type="checkbox"/> Unknown													
3. Travel from the Arabian Peninsula or neighboring countries [†] 14 days before illness onset?		<input type="checkbox"/> Yes		<input type="checkbox"/> No		<input type="checkbox"/> Unknown													
If yes, which countries? _____		Date of travel to/from the Middle East:		MM/DD/YY		MM/DD/YY													
Patient Demographic Information																			
1. Sex: <input type="checkbox"/> M <input type="checkbox"/> F		2. Age: _____ yr <input type="checkbox"/> mo		3. Residency: <input type="checkbox"/> US resident <input type="checkbox"/> non US resident, country: _____															
Clinical Presentation, History and Risk Factors																			
4. Date of symptom onset: MM/DD/YY																			
5. Symptoms (Check all that apply): <input type="checkbox"/> Fever <input type="checkbox"/> Dry cough <input type="checkbox"/> Productive cough <input type="checkbox"/> Chills <input type="checkbox"/> Sore throat <input type="checkbox"/> Headache <input type="checkbox"/> Muscle aches <input type="checkbox"/> Shortness of breath <input type="checkbox"/> Vomiting <input type="checkbox"/> Abdominal pain <input type="checkbox"/> Diarrhea <input type="checkbox"/> Other _____																			
6. In the 14 days before symptom onset did the patient have close contact with a recent ill traveler from the Arabian Peninsula or neighboring countries [†] ? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown If yes, which countries? _____																			
7. Is the patient (Check all that apply): <input type="checkbox"/> Health care worker (HCW) <input type="checkbox"/> US military <input type="checkbox"/> Flight crew <input type="checkbox"/> Other _____																			
8. Concurrent risk factors (Check all that apply): <input type="checkbox"/> Immunocompromised <input type="checkbox"/> Pregnant <input type="checkbox"/> Unknown <input type="checkbox"/> Other _____																			
Clinical Outcomes																			
9. Is/Was the patient:					10. Is/Has patient receiving/received a diagnosis of:														
a. Hospitalized?		<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown		If yes, date: MM/YY/DD		Pneumonia?		<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown											
b. Admitted to ICU?		<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown				ARDS?		<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown											
c. Intubated?		<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown				Renal failure?		<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown											
11. Does the patient have a non-MERS etiology for their respiratory illness but has not responded to appropriate therapy? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown					12. Has the patient died? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown														
Infection Control																			
13. When hospitalized, is/was the patient in a:					14. Are/Were surgical masks being used by the patient during transport?														
a. Negative pressure room?		<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown				Yes		<input type="checkbox"/> No <input type="checkbox"/> Unknown											
b. Private room?		<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown				Yes		<input type="checkbox"/> No <input type="checkbox"/> Unknown											
15. What personal protective equipment are/were being used by HCW when entering the patient's room (Check all that apply): <input type="checkbox"/> Gloves <input type="checkbox"/> Gowns <input type="checkbox"/> Eye protection (goggles or face shield) <input type="checkbox"/> N95/other form of respiratory protection (e.g., PAPR) <input type="checkbox"/> Facemask <input type="checkbox"/> Unknown																			
Laboratory Testing																			
Tests Performed		Results				Tests Performed		Results											
		+		-		Pending (Pe)		Not done				+		-		Pending (Pe)		Not done	
Influenza <input type="checkbox"/> A <input type="checkbox"/> B						<input type="checkbox"/>		<input type="checkbox"/>		Streptococcus pneumoniae						<input type="checkbox"/>		<input type="checkbox"/>	
RSV						<input type="checkbox"/>		<input type="checkbox"/>		Legionella pneumophila						<input type="checkbox"/>		<input type="checkbox"/>	
Human metapneumovirus						<input type="checkbox"/>		<input type="checkbox"/>		Blood culture						<input type="checkbox"/>		<input type="checkbox"/>	
Parainfluenza 1-4						<input type="checkbox"/>		<input type="checkbox"/>		If positive _____						<input type="checkbox"/>		<input type="checkbox"/>	
Adenovirus						<input type="checkbox"/>		<input type="checkbox"/>		Other: _____						<input type="checkbox"/>		<input type="checkbox"/>	
MERS Testing																			
Specimen [‡]	ID #	Date collected	State			Sent to CDC?	Specimen [‡]	ID #	Date collected	State			Sent to CDC?						
		MM/DD/YY	+	-	Pe				MM/DD/YY	+	-	Pe							
NP/OP					<input type="checkbox"/>	<input type="checkbox"/>	PF					<input type="checkbox"/>	<input type="checkbox"/>						
Sputum					<input type="checkbox"/>	<input type="checkbox"/>	Stool					<input type="checkbox"/>	<input type="checkbox"/>						
BAL					<input type="checkbox"/>	<input type="checkbox"/>	Serum					<input type="checkbox"/>	<input type="checkbox"/>						
TA					<input type="checkbox"/>	<input type="checkbox"/>						<input type="checkbox"/>	<input type="checkbox"/>						

[†]Countries considered in the Arabian Peninsula and neighboring include: Bahrain, Iraq, Iran, Israel, Jordan, Kuwait, Lebanon, Oman, Palestinian territories, Qatar, Saudi Arabia, Syria, the United Arab Emirates (UAE), and Yemen.

[‡]NP/OP, Nasopharyngeal/Oropharyngeal swab; BAL, Bronchoalveolar lavage; TA, Tracheal aspirate; PF, Pleural fluid

Isolation Precautions

Quick start

DO ALL OF THE FOLLOWING:

1. Put a regular mask on the patient while transporting
2. Airborne isolation room (negative air pressure)
3. N95 or PAPR
4. Gown and gloves
5. Eye protection

Health care worker exposure

1. Since this is an emerging illness, the final recommendation will be per infectious disease physician or the health department. In general, the current thought is:
 - a. Health care workers are considered exposed if they have been within 10 feet of the suspected case (without respiratory protection).
 - b. Exposed workers should not work for 14 days and should monitor for fever and respiratory illness.

Interim Infection Prevention and Control Recommendations for Hospitalized Patients with Middle East Respiratory Syndrome Coronavirus (MERS-CoV)

Standard, contact, and airborne precautions are recommended for management of hospitalized patients with known or suspected MERS-CoV infection, based on CDC's case definition for a patient under investigation: www.cdc.gov/coronavirus/mers/case-def.html#pui. Note that additional infection prevention precautions or considerations may be needed if a MERS-CoV patient has other conditions or illnesses that warrant specific measures (e.g., tuberculosis, *Clostridium difficile*, multi-drug resistant organisms).

Though these recommendations focus on the hospital setting, the recommendations for personal protective equipment (PPE), source control (i.e., placing a facemask on potentially infected patients when outside of an airborne infection isolation room), and environmental infection control measures are applicable to any healthcare setting.

In this guidance healthcare personnel (HCP) refers all persons, paid and unpaid, working in healthcare settings who have the potential for exposure to patients and/or to infectious materials, including body substances, contaminated medical supplies and equipment, contaminated environmental surfaces, or contaminated air. HCP include, but are not limited to, physicians, nurses, nursing assistants, therapists, technicians, emergency medical service personnel, dental personnel, pharmacists, laboratory personnel, autopsy personnel, students and trainees, contractual personnel, home healthcare personnel, and persons not directly involved in patient care (e.g., clerical, dietary, house-keeping, laundry, security, maintenance, billing, chaplains, and volunteers) but potentially exposed to infectious agents that can be transmitted to and from HCP and patients. **This guidance is not intended to apply to persons outside of healthcare settings.**

As information becomes available, these recommendations will be re-evaluated and updated as needed. These recommendations are based upon available information (as of May 14, 2014) and the following considerations:

- Suspected high rate of morbidity and mortality among infected patients
- Evidence of limited human-to-human transmission
- Poorly characterized clinical signs and symptoms
- Unknown modes of transmission of MERS-CoV
- Lack of a vaccine and chemoprophylaxis

Key Components of Standard, Contact, and Airborne Precautions Recommended for Prevention of MERS-CoV Transmission in U.S. Hospitals

For full details of these precautions, see 2007 Guideline for Isolation Precautions: Preventing Transmission of Infectious Agents in Healthcare Setting: www.cdc.gov/hicpac/2007IP/2007isolationPrecautions.html.

Component	Recommendation(s)	Comments
Patient placement	<ul style="list-style-type: none"> • Airborne Infection Isolation Room (AIIR) 	<ul style="list-style-type: none"> • If an AIIR is not available, the patient should be transferred as soon as is feasible to a facility where an AIIR is available. Pending transfer, place a facemask on the patient and isolate him/her in a single-patient room with the door closed. The patient should not be placed in any room

Component	Recommendation(s)	Comments
		<p>where room exhaust is recirculated without high-efficiency particulate air (HEPA) filtration.</p> <ul style="list-style-type: none"> • Once in an AIIR, the patient’s facemask may be removed. • When outside of the AIIR, patients should wear a facemask to contain secretions. • Limit transport and movement of the patient outside of the AIIR to medically-essential purposes. • Implement staffing policies to minimize the number of personnel that must enter the patient’s room. • After a potentially infectious patient leaves a room, unprotected individuals, including HCP, should not be allowed in the room until sufficient time has elapsed for enough air changes to remove potentially infectious particles. More information on clearance rates under differing ventilation conditions is available www.cdc.gov/mmwr/preview/mmwrhtml/rr5417a1.htm?s_cid=rr5417a1_e#tab1.
<p>Aerosol Generating Procedure</p>	<ul style="list-style-type: none"> • Use a combination of measures to reduce exposures from aerosol-generating procedures when performed on MERS-CoV patients. • Limiting the number of HCP present during the procedure to only those essential for patient care and support. • Conduct the procedures in a private room and ideally in an AIIR when feasible. Room doors should be kept closed except when entering or leaving the room, and entry and exit should be minimized during and shortly after the procedure. • HCP should adhere to PPE precautions in this interim guidance (i.e., gloves, a gown, and either a face shield that fully covers the front and sides of the face or goggles, and respiratory protection that is at least as protective as a fit-tested N95 filtering facepiece respirator [e.g., powered air purifying or elastomeric respirator during aerosol-generating procedures]). • Conduct environmental surface cleaning 	<ul style="list-style-type: none"> • Although there are limited data available to definitively define a list of aerosol generating procedures, procedures that are usually included are those planned ahead of time, such as bronchoscopy, sputum induction, elective intubation and extubation; and some procedures that often occur in unplanned, emergent settings and can be life-saving, such as cardiopulmonary resuscitation, emergent intubation, and open suctioning of airways. • Once the patient vacates a room where aerosol generating procedures were conducted, unprotected individuals, including HCP, should not be allowed in that room until sufficient time has elapsed for enough air changes to remove potentially infectious

Component	Recommendation(s)	Comments
	<p>following procedures (see section below on environmental infection control).</p>	<p>particles. More information on clearance rates under differing ventilation conditions is available www.cdc.gov/mmwr/preview/mmwrhtml/rr5417a1.htm?s_cid=rr5417a1_e#tab1.</p>
<p>Personal Protective Equipment (PPE) for Healthcare personnel (HCP)</p>	<ul style="list-style-type: none"> • Gloves • Gowns • Eye protection (goggles or face shield) • Respiratory protection that is at least as protective as a fit-tested NIOSH-certified disposable N95 filtering facepiece respirator or greater. <ul style="list-style-type: none"> ○ If a respirator is unavailable, a facemask should be worn. In this situation respirators should be made available as quickly as possible. 	<ul style="list-style-type: none"> • Recommended PPE should be worn by HCP upon entry into patient rooms or care areas for any reason (e.g., clinical care, specimen collection, environmental cleaning, etc.). • Upon exit from the patient room or care area, PPE should be removed and either <ul style="list-style-type: none"> ○ Discarded, or ○ For re-useable PPE, cleaned and disinfected according to the manufacturer’s reprocessing instructions ○ Hand hygiene should be performed after removal of PPE.
<p>Hand Hygiene</p>	<ul style="list-style-type: none"> • HCP should perform hand hygiene frequently, including before and after all patient contact, contact with potentially infectious material, and before putting on and upon removal of PPE, including gloves. • Healthcare facilities should ensure that supplies for performing hand hygiene are available. 	<ul style="list-style-type: none"> • Hand hygiene in healthcare settings can be performed by washing with soap and water or using alcohol-based hand rubs. If hands are visibly soiled, use soap and water, not alcohol-based hand rubs.
<p>Environmental Infection Control</p>	<ul style="list-style-type: none"> • Follow standard procedures, per hospital policy and manufacturers’ instructions, for cleaning and/or disinfection of: <ul style="list-style-type: none"> ○ Environmental surfaces and equipment ○ Textiles and laundry ○ Food utensils and dishware 	<ul style="list-style-type: none"> • Use EPA-registered hospital disinfectants to disinfect hard non-porous surfaces. <ul style="list-style-type: none"> ○ Follow label instructions for use. • Searchable EPA website of registered products: http://iaspub.epa.gov/apex/pesticides/f?p=PPLS:1.
<p>Duration of Infection Control Precautions</p>	<ul style="list-style-type: none"> • At this time, information is lacking to definitively determine a recommended duration for keeping patients in isolation precautions. • Duration of precautions should be determined on a case-by-case basis, in conjunction with local, state, and federal health authorities. 	<ul style="list-style-type: none"> • Factors that should be considered include: presence of symptoms related to MERS-CoV, date symptoms resolved, other conditions that would require specific precautions (e.g., tuberculosis, <i>Clostridium difficile</i>) and available laboratory information.

Component	Recommendation(s)	Comments
Monitoring and Management of Potentially Exposed Personnel	<ul style="list-style-type: none"> • HCP who care for patients with MERS-CoV should be advised to monitor and immediately report any signs or symptoms of acute illness to their supervisor or a facility designated person (e.g., occupational health services) for a period of 14 days after the last known contact with the sick patient. • HCP who develop respiratory symptoms or fever after an unprotected exposure (i.e. not wearing recommended PPE at the time of contact) to a patient with MERS-CoV should <ul style="list-style-type: none"> ○ not report to work or immediately stop working ○ notify their supervisor ○ implement respiratory hygiene and cough etiquette ○ seek prompt medical evaluation ○ comply with work exclusion until they are deemed no longer infectious to others. • For asymptomatic HCP who had an unprotected exposure (i.e. not wearing recommended PPE at the time of contact) to a patient with MERS-CoV <ul style="list-style-type: none"> ○ Consider exclusion from work for 14 days to monitor for signs and symptoms of respiratory illness and fever ○ If necessary to ensure adequate staffing of the facility the asymptomatic provider could be considered for continuing work if they wear a facemask for source control (i.e., limiting transmission from exposed HCP to other HCP or patients), <ul style="list-style-type: none"> ▪ The facemask should be worn at all times while in the healthcare facility for 14 days from the last unprotected exposure ▪ HCP continuing to work while wearing a facemask should be reminded that if caring for patients under airborne precautions, to change the facemask to respiratory protection that is at least as protective as a fit-tested NIOSH-certified disposable N95 filtering facepiece respirator (without an exhalation valve) (i.e., the HCP should not wear both a 	

Component	Recommendation(s)	Comments
	<p>facemask and respirator at the same time.) When respirator use is no longer needed, the HCP should put a facemask back on for source control.</p>	
<p>Monitoring, Management, and Training of Visitors</p>	<ul style="list-style-type: none"> • Establish procedures for monitoring managing and training visitors. • Limit visitors to those who are essential for the patient’s wellbeing and care. • Visits should be scheduled and controlled to allow for: <ul style="list-style-type: none"> ○ Screening of symptoms for acute respiratory illness before entering the hospital and upon arrival to hospital ○ Facilities to evaluate risk to the health of the visitor (e.g., visitor might have underlying illness putting them at higher risk for MERS-CoV) and ability to comply with precautions ○ Facilities to provide instruction, before entry into the patient care area on hand hygiene, limiting surfaces touched, and use of PPE according to the current facility policy while in the patients room ○ Facilities should consider tracking (e.g., logbook) of all visitors who enter patient rooms ○ Visitors should not be present during aerosol-generating procedures ○ Visitors should be instructed to limit their movement within the facility. 	<ul style="list-style-type: none"> • Visitors who have been in contact with the MERS-CoV patient before and during hospitalization are a possible source of MERS-CoV for other patients, visitors, and staff.

Preparedness

To aid providers and facilities, CDC has developed two checklists that identify key actions that can be taken now to enhance preparedness for MERS-CoV infection control.

- Healthcare Providers Preparedness Checklist: <http://www.cdc.gov/coronavirus/mers/preparedness/checklist-provider-preparedness.html>
- Healthcare Facility Preparedness Checklist: <http://www.cdc.gov/coronavirus/mers/preparedness/checklist-facility-preparedness.html>

Interim Home Care and Isolation Guidance

CDC has developed interim guidance for local and state health departments, infection prevention and control professionals, healthcare providers, and healthcare workers who are coordinating the home care and isolation of ill people who are being evaluated for MERS-CoV infection.

- Interim Home Care and Isolation Guidance for MERS-CoV:
<http://www.cdc.gov/coronavirus/mers/hcp/home-care.html>

Important Links

- Respirator Trusted-Source Information:
http://www.cdc.gov/niosh/npptl/topics/respirators/disp_part/RespSource.html
- Respirator Fact Sheet:
<http://www.cdc.gov/niosh/npptl/topics/respirators/factsheets/respsars.html>



Frequently Asked Questions and Answers

Q: What is MERS?

A: Middle East Respiratory Syndrome (MERS) is a viral respiratory illness. MERS is caused by a [coronavirus \(/coronavirus/about/index.html\)](/coronavirus/about/index.html) called “Middle East Respiratory Syndrome Coronavirus” (MERS-CoV).

Q: What is MERS-CoV?

A: MERS-CoV is a beta [coronavirus \(/coronavirus/about/index.html\)](/coronavirus/about/index.html). It was first reported in 2012 in Saudi Arabia. MERS-CoV used to be called “novel coronavirus,” or “nCoV”. It is different from other coronaviruses that have been found in people before.

Q: How was the name selected?

A: The Coronavirus Study Group (CSG) of the International Committee on Taxonomy of Viruses (ICTV) decided in May 2013 to call the novel coronavirus “[Middle East Respiratory Syndrome Coronavirus](#)” (MERS-CoV) [\[5 pages\]](#)
(<http://jvi.asm.org/content/early/2013/05/08/JVI.01244-13.full.pdf>) [↗](#)
(<http://www.cdc.gov/Other/disclaimer.html>).

Countries with Lab-Confirmed MERS Cases

Countries in the Arabian Peninsula with Cases

- Saudi Arabia
- United Arab Emirates (UAE)
- Qatar
- Oman
- Jordan
- Kuwait
- Yemen
- Lebanon

Countries with Travel-associated Cases

- United Kingdom (UK)
- France
- Tunisia
- Italy
- Malaysia
- Philippines
- Greece
- Egypt
- United States of America (USA)
- Netherlands

Two patients were transferred to Germany for care.

Q: Is MERS-CoV the same as the SARS virus?

A: No. MERS-CoV is not the same coronavirus that caused severe acute respiratory syndrome (SARS) in 2003. However, like the SARS virus, MERS-CoV is most similar to coronaviruses found in bats. CDC is still learning about MERS.

Q: What are the symptoms of MERS?

A: Most people who got infected with MERS-CoV developed severe acute respiratory illness with symptoms of fever, cough, and shortness of breath. About 30% of them died. Some people were reported as having a mild respiratory illness. More about [Symptoms & Complications \(/coronavirus/MERS/about/symptoms.html\)](/coronavirus/MERS/about/symptoms.html).

Q: Does MERS-CoV spread from person to person?

A: MERS-CoV has been shown to spread between people who are in close contact.^[1 (#foot1)] Transmission from infected patients to healthcare personnel has also been observed. Clusters of cases in several countries are being investigated. More about [Transmission \(/coronavirus/MERS/about/transmission.html\)](/coronavirus/MERS/about/transmission.html).

Q: What is the source of MERS-CoV?

A: We don't know for certain where the virus came from. However, it likely came from an animal source. In addition to humans, MERS-CoV has been found in camels in Qatar, Egypt and Saudi Arabia, and a bat in Saudi Arabia. Camels in a few other countries have also tested positive for antibodies to MERS-CoV, indicating they were previously infected with MERS-CoV or a closely related virus. However, we don't know whether camels are the source of the virus. More information is needed to identify the possible role that camels, bats, and other animals may play in the [transmission \(/coronavirus/MERS/about/transmission.html\)](/coronavirus/MERS/about/transmission.html) of MERS-CoV.

Q: Is CDC concerned?

A: Yes, CDC is concerned about MERS-CoV. Most people who have been confirmed to have MERS-CoV infection developed severe acute respiratory illness. They had fever, cough, and shortness of breath. About 30% of these people died. Also, in other countries, the virus has spread from person to person through close contact, such as caring for or living with an infected person. CDC recognizes the potential for the virus to spread further and cause more cases globally, including in the United States.

Q: Has anyone in the United States gotten infected?

A: Yes, on May 2, 2014, the first U.S. imported case of MERS was confirmed in a traveler from Saudi Arabia to the U.S. On May 11, 2014, a second U.S. imported case of MERS was confirmed in a traveler who also came from Saudi Arabia. The two U.S. cases are not linked. On May 16, 2014, an Illinois resident who had contact with the first case of MERS in the U.S. tested positive for MERS-CoV. More about [MERS in the U.S. \(/coronavirus/mers/US.html\)](/coronavirus/mers/US.html)

Q: What is CDC doing about MERS?

A: CDC works 24/7 to protect people's health. It is the job of CDC to be concerned and move quickly whenever there is a potential public health problem.

CDC continues to closely monitor the MERS situation globally. We are working with the World Health Organization and other partners to better understand the virus, how it spreads, the source, and risks to the public's health.

We recognize the potential for MERS-CoV to spread further and cause more cases globally and in the United States. In preparation for this, we have

- Enhanced surveillance and laboratory testing capacity in states to detect cases
- Developed guidance and tools for health departments to conduct public health investigations

- Provided recommendations for healthcare infection control and other measures to prevent disease spread
- Provided guidance for flight crews, Emergency Medical Service (EMS) units at airports, and U.S. Customs and Border Protection (CPB) officers about reporting ill travelers to CDC
- Disseminated up-to-date information to the general public, international travelers, and public health partners

Q: Am I at risk for MERS-CoV infection in the United States?

A: The MERS situation in the U.S. represents a very low risk to the general public in this country.

Q: Can I still travel to countries in the Arabian Peninsula or neighboring countries where MERS cases have occurred?

A: Yes. CDC does not recommend that anyone change their travel plans because of MERS. The current CDC travel notice is an Alert (Level 2), which provides special precautions for travelers. Because spread of MERS has occurred in healthcare settings, the alert advises travelers going to countries in or near the Arabian Peninsula to provide health care services to practice CDC's recommendations for infection control of confirmed or suspected cases and to monitor their health closely. Travelers who are going to the area for other reasons are advised to follow standard precautions, such as hand washing and avoiding contact with people who are ill.

For more information, see CDC's travel notice on [MERS in the Arabian Peninsula](http://wwwnc.cdc.gov/travel/notices/alert/coronavirus-arabian-peninsula-uk) (<http://wwwnc.cdc.gov/travel/notices/alert/coronavirus-arabian-peninsula-uk>).

Q: What if I recently traveled to countries in the Arabian Peninsula or neighboring countries and got sick?

A: If you develop a fever and symptoms of respiratory illness, such as cough or shortness of breath, within 14 days after traveling from countries in the Arabian Peninsula or neighboring countries^[2 (#foot1)], you should see your healthcare provider and mention your recent travel.

Q: How can I help protect myself?

A: CDC routinely advises that people help protect themselves from respiratory illnesses by taking everyday preventive actions:

- Wash your hands often with soap and water for 20 seconds, and help young children do the same. If soap and water are not available, use an alcohol-based hand sanitizer.
- Cover your nose and mouth with a tissue when you cough or sneeze then throw the tissue in the trash.
- Avoid touching your eyes, nose, and mouth with unwashed hands.
- Avoid close contact, such as kissing, sharing cups, or sharing eating utensils, with sick people.
- Clean and disinfect frequently touched surfaces, such as toys and doorknobs.

Q: Is there a vaccine?

A: No, but CDC is discussing with partners the possibility of developing one.

Q: What are the treatments?

A: There are no specific treatments recommended for illnesses caused by MERS-CoV. Medical care is supportive and to help relieve symptoms.

Q: Is there a lab test?

A: Yes, there are two main ways to determine if a person is or has been infected with MERS-CoV. We can collect a respiratory sample and use a test called PCR to determine if a person has active infection with the virus. We can also do a blood test that looks for antibodies to MERS-CoV that would indicate a person had previously been infected with MERS-CoV.

Q: What should healthcare providers and health departments do?

A: For recommendations and guidance on the case definitions; infection control, including personal protective equipment guidance; home care and isolation; case investigation; and specimen collection and shipment, see [Interim Guidance for Health Professionals \(/coronavirus/mers/interim-guidance.html\)](http://www.cdc.gov/coronavirus/mers/interim-guidance.html).

Footnotes

1. Close contact is defined as a) any person who provided care for the patient, including a healthcare worker or family member, or had similarly close physical contact; or b) any person who stayed at the same place (e.g. lived with, visited) as the patient while the patient was ill.
2. Countries considered in the Arabian Peninsula and neighboring 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.

Page last reviewed: May 17, 2014

Page last updated: May 17, 2014

Content source: [National Center for Immunization and Respiratory Diseases, Division of Viral Diseases](http://www.cdc.gov/coronavirus/mers/interim-guidance.html)

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