

# Interim U.S. Guidance for Monitoring and Movement of Persons with Potential Middle East Respiratory Syndrome Coronavirus (MERS-CoV) Exposure

**Released:** July 13, 2016

*Background.* First identified and reported in September 2012 as an agent causing severe acute respiratory illness, Middle East Respiratory Syndrome Coronavirus (MERS-CoV) has caused infections worldwide, including in the United States. To date all reported cases have been linked directly or indirectly to travel through, or residence in, countries in or near the Arabian Peninsula\*. The majority of cases have been reported from Saudi Arabia where there is evidence for ongoing, sporadic introductions from animals (e.g., camels) to humans, followed by both healthcare-related and limited community human-to-human transmission.

*Purpose of guidance.* CDC has created this interim guidance for state and local health jurisdictions to use to monitor people within the United States (U.S.) potentially exposed to MERS-CoV and evaluate their intended travel, including the application of movement restrictions when indicated ([Table 1](#)). This guidance applies to people who are within the U.S. and have been exposed to a confirmed MERS case or have been present in a setting in which MERS cases occurred (e.g., hospital), either overseas or in the U.S. The guidance does not apply to travelers entering the U.S. without known links to a confirmed MERS case. Currently CDC and state health departments are not performing enhanced risk assessment to screen travelers for MERS who are arriving in the U.S. from the Arabian Peninsula\*. This guidance provides public health authorities and other partners with a framework for determining the appropriate public health actions based on risk exposure and clinical presentation. This interim guidance is based on the current context of lack of ongoing MERS-CoV transmission in the U.S., and will be updated if the epidemiology of MERS-CoV changes.

CDC continues to recommend that healthcare providers and health departments throughout the U.S. be prepared to detect and manage cases of MERS. Healthcare providers should continue to routinely ask their patients about their travel history and healthcare facility exposure overseas and to consider a diagnosis of MERS-CoV infection in people who meet the criteria for a person under investigation (PUI). For information about the evaluation and testing of patients for MERS-CoV infection, see [CDC Guidance for Evaluating Persons Under Investigation for MERS](#).

## Definitions Used in this Guidance

For exposure-level definitions, see Table 2 titled “Epidemiologic Risk Factors to Consider when Evaluating a Person for Exposure to MERS-CoV”.

### *Active monitoring*

Active monitoring means that the state and/or local public health authority, or healthcare facility, assumes responsibility for establishing regular communication with potentially exposed individuals, including checking daily to assess them for symptoms and fever, rather than relying solely on individuals to self-monitor and report symptoms if they develop. The purpose of active monitoring is to ensure that people with epidemiologic risk factors (*high risk* and *some risk* - [see Table 2](#)) are identified, if they become symptomatic, as soon as possible after symptom onset so that they can be rapidly isolated and evaluated.

Active monitoring should consist, at minimum, of the potentially exposed individual reporting daily to the public health authority (either in person or by telephone). People being actively monitored for MERS should measure their temperature twice daily and monitor themselves for symptoms. They should immediately notify the public health authority or healthcare facility if they develop any fever (measured temperature  $\geq 100.4^{\circ}\text{F}$  or subjective fever) or respiratory symptoms consistent with MERS (e.g., cough, shortness of breath, chest pain, sore throat). Temperature should be measured using a standard thermometer (e.g., oral, tympanic, or noncontact). Fever might not be present in some patients, such as those who are very young, elderly, immunosuppressed, or taking certain medications (e.g., nonsteroidal anti-inflammatory drugs (NSAIDs)). Healthcare professionals should use clinical judgement to guide testing of patients in such situations. Other symptoms (e.g., muscle aches, nausea, vomiting, diarrhea, abdominal pain, headache, runny nose, fatigue) might also occur in MERS patients, sometimes in the absence of the more common MERS-related symptoms listed above; people under active monitoring should also report these symptoms, and healthcare professionals should consider them in decisions of public health actions based on the level of exposure risk and the judgement of public health authorities.

### *Self-Monitoring*

Self-monitoring means that potentially exposed people check their own temperature twice daily and monitor themselves for respiratory symptoms consistent with MERS (e.g., cough, shortness of breath, chest pain, sore throat). People who develop symptoms while under self-monitoring should immediately self-isolate (separate themselves from others) and notify public health authorities. If a person self-monitoring develops fever (measured temperature  $\geq 100.4^{\circ}\text{F}$  or subjective fever) or respiratory symptoms they must contact their local or state public health authority promptly so that the public health authority can coordinate consultation and referral to a healthcare provider for further

evaluation. Fever might not be present in some patients, such as those who are very young, elderly, immunosuppressed, or taking certain medications (e.g., NSAIDs). Healthcare professionals should use clinical judgement to guide testing of patients in such situations. Those who are self-monitoring are not required to report daily to the public health authority; they are required to report to the public health authority only if symptoms develop, unlike those who are being actively monitored whom are required to report daily.

### *Close contact*

Close contact, for both community and healthcare exposures, is defined as follows: a) being within approximately 6 feet (2 meters), or within the room or care area, of a confirmed MERS case 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 case) 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 case (e.g., being coughed on), while not wearing recommended personal protective equipment. See [CDC's MERS Infection Prevention and Control guidelines](#). Data to inform the definition of close contact are limited; considerations when assessing close contact include the duration of exposure (e.g., longer exposure time likely increases exposure risk) and the clinical symptoms of the person with MERS (e.g., coughing likely increases exposure risk). Special consideration should be given to those exposed in healthcare settings. For detailed information regarding healthcare personnel (HCP) please review the section [Healthcare personnel in U.S. Healthcare Facilities with active MERS cases](#) below. Transient interactions, such as walking by a person with MERS, are not thought to constitute an exposure; however, final determination should be made in consultation with public health authorities. See [Table 2](#) for more detailed information.

### *Controlled movement*

Controlled movement limits the movement of people. For individuals subject to controlled movement, travel by long-distance commercial or public transportation (e.g., aircraft, ship, bus, train) in the same conveyance as members of the general public should not be allowed. If travel is allowed, it must be in a conveyance separate from the general public, such as a private chartered flight or private vehicle in which contact with other people is appropriately limited, and must occur with arrangements for uninterrupted active monitoring.

### *Isolation*

Isolation is defined as the separation or restriction of activities of an ill person with a communicable disease from those who are well.

## *Quarantine*

Quarantine in general means the separation of a person or group of people reasonably believed, or known, to have been exposed to, but who is/are not yet symptomatic with, a communicable disease from others who have not been exposed, to prevent the possible spread of the communicable disease.

## *Use of Public Health Orders*

Public Health Orders are legally enforceable directives issued under the authority of a relevant federal, state, or local entity that, when applied to a person or group, may place restrictions on the activities undertaken by that person or group, potentially including movement restrictions, for the purposes of protecting the public's health. The list of [quarantinable communicable diseases](#) for which federal public health orders are authorized is defined by Executive Order. Equitable and ethical use of public health orders includes supporting people who sacrifice their individual liberties and freedoms for the public good. Specifically, measures must be in place to provide shelter, food, water and medical-related support to, and protect the dignity and privacy of, these people. Thoughtful planning by public health authorities is needed to implement public health orders properly.

## **Recommendations for Monitoring, Travel, and Other Public Health Actions Based on MERS-CoV Exposure Risk**

### **General considerations**

Federal communicable disease regulations, including those applicable to isolation, quarantine, movement restrictions, and other public health orders, apply principally to international travel into the United States and in the setting of interstate movement. State and local authorities have primary jurisdiction within their borders. Thus, CDC recognizes that state and local jurisdictions may make decisions about isolation, other public health orders, and active monitoring that impose a greater level of restriction than recommended by federal guidance, and that decisions and criteria to use such public health measures may differ by jurisdiction.

Active monitoring can be conducted on a voluntary basis or compelled by legal order. Active monitoring and prompt follow-up must continue and be uninterrupted if the person travels out of the jurisdiction performing active monitoring. Inter-jurisdictional transfer of monitoring oversight may be needed for people under active monitoring who travel interstate. Notification of the ministry of health in the destination country is recommended for those who travel internationally during the monitoring period. CDC requests notification prior to interstate or international transfer of travelers for whom CDC recommends controlled movement so as to ensure that travel occurs in a manner that does not place others at risk.

Public health authorities can delegate to the healthcare facility or employer (or acceptable program designated by the facility) the responsibility of actively monitoring HCP. The healthcare facility would report daily to the public health authority.

Federal public health travel restrictions (e.g., addition to the public health “[Do Not Board](#)” list for commercial air travel) may be used to enforce controlled movement. People subject to controlled movement should not use local public transportation (e.g., bus, subway, ferry) unless they have discussed it with, and received approval from, the local public health authority. People undergoing active or self-monitoring who develop fever **and/or** respiratory symptoms consistent with MERS potentially need a medical evaluation ([Table 1](#)) and must immediately contact the local public health authority who will coordinate self-isolation and medical evaluation by clinical personnel. Public health authorities may recommend medical evaluation for lower temperatures (<100.4°F) or other symptoms (e.g., muscle aches, nausea, vomiting, diarrhea, abdominal pain, headache, runny nose, or fatigue) based on clinical judgement and the level of epidemiologic risk. Fever may not be present in some patients, such as those who are very young, elderly, immunosuppressed, or taking certain medications (e.g., NSAIDs). Healthcare professionals should use clinical judgement to guide testing of patients in such situations. It is important to note that some previous MERS cases have exhibited protracted non-respiratory illness >1 week.

**Specific Guidance Based on Exposure Category**

CDC recommends the following public health actions based on risk exposure and symptom status:

**Table 1: Summary of CDC Interim Guidance for Monitoring and Movement of People Exposed to MERS-CoV**

Exposure category	Clinical criteria	Public Health Actions
<p><b>High risk</b> (see Table 2)</p>	<p>Fever OR respiratory symptoms consistent with MERS*</p>	<ul style="list-style-type: none"> <li>• Symptomatic person must immediately self-isolate and contact public health authorities, as instructed as part of monitoring protocol</li> <li>• Symptomatic HCP in this group must immediately self-isolate and should not report for work in the healthcare environment or see patients</li> <li>• Public health authorities should conduct an assessment and coordinate medical evaluation at a healthcare facility as needed               <ul style="list-style-type: none"> <li>○ Public health authorities can consult CDC to assist with evaluation of persons under investigation for MERS by calling CDC’s Emergency Operations Center at 770-488-7100</li> <li>○ If public health authorities determine that medical evaluation is needed, safe transportation must be arranged to an appropriate healthcare facility for medical evaluation for MERS and other potential causes of the person’s symptoms; see <a href="#">guidance for evaluation of a person under investigation for MERS</a></li> <li>○ Public health orders may be used to ensure compliance</li> </ul> </li> <li>• Guidance for safe ambulance transport of MERS patients can be adapted from <a href="#">Patient Transport guidance</a></li> </ul>

		<ul style="list-style-type: none"> <li>• <a href="#">developed for SARS</a></li> <li>• Air travel is permitted only by air medical transport; Federal public health travel restrictions (<a href="#">Do Not Board</a>) may be implemented as needed to enforce controlled movement. See <a href="#">guidance on Air Medical Transport</a></li> <li>• If medically evaluated and discharged with a diagnosis other than MERS, recommendations as outlined for asymptomatic people in this exposure category would apply</li> </ul>
	Asymptomatic	<ul style="list-style-type: none"> <li>• Active monitoring</li> <li>• Controlled movement consisting of, at a minimum, restrictions on long-distance travel on commercial or public transportation in the same conveyance as members of the general public <ul style="list-style-type: none"> <li>○ Federal public health travel restrictions (<a href="#">Do Not Board</a>) may be implemented to enforce controlled movement</li> <li>○ Public health orders may be considered to ensure compliance</li> </ul> </li> <li>• If long-distance travel is allowed, the conditions of travel must include: <ul style="list-style-type: none"> <li>○ Restriction to a conveyance separate from the general public in which close contact with other people can be appropriately limited</li> <li>○ Coordination with public health authorities at both origin and destination to ensure uninterrupted active monitoring</li> </ul> </li> <li>• Additional considerations and actions for HCP (e.g., work restrictions) might be indicated as outlined in <a href="#">CDC's MERS Infection Prevention and Control guidelines</a></li> <li>• Public health authorities, based on a specific assessment of the individual's situation, will determine whether additional restrictions are appropriate</li> </ul>
<b>Some risk</b> (see Table 2)	Fever OR respiratory symptoms consistent with MERS*	<ul style="list-style-type: none"> <li>• Symptomatic person must immediately self-isolate and contact public health authorities, as instructed as part of monitoring protocol</li> <li>• Symptomatic HCP in this group must immediately self-isolate and should not report for work in the healthcare environment or see patients</li> <li>• Public health authorities should conduct an assessment and coordinate medical evaluation at a healthcare facility as needed <ul style="list-style-type: none"> <li>○ Public health authorities can consult CDC to assist with evaluation of persons under investigation for MERS by calling CDC's Emergency Operations Center at 770-488-7100</li> <li>○ If public health authorities determine that medical evaluation is needed, safe transportation must be arranged to an appropriate healthcare facility for medical evaluation for MERS and other potential causes of the person's symptoms; see <a href="#">guidance for evaluation of a person under investigation for MERS</a></li> <li>○ Public health orders may be considered to ensure compliance</li> </ul> </li> <li>• Guidance for safe ambulance transport of MERS patients can be adapted from <a href="#">Patient Transport guidance developed for SARS</a></li> <li>• Air travel is permitted only by air medical transport; federal public health travel restrictions (<a href="#">Do Not Board</a>) may be implemented as needed to enforce controlled movement. See <a href="#">guidance on Air Medical Transport</a></li> <li>• Public health authorities may delay or defer medical evaluation if concern for MERS is low because symptoms are mild or transient</li> </ul>

		<ul style="list-style-type: none"> <li>• If medical evaluation is deferred, self-isolation at home or another appropriate facility should continue with, at minimum, daily close monitoring by the public health authority until symptoms resolve. See <a href="#">CDC's Home Care guidance</a></li> <li>• If medically evaluated and discharged with a diagnosis other than MERS, or if symptoms resolve, recommendations as outlined for asymptomatic people in this exposure category would apply</li> </ul>
	Asymptomatic	<ul style="list-style-type: none"> <li>• Active monitoring</li> <li>• No movement restrictions are recommended: no restrictions on travel, work, public conveyances, or congregate gatherings, except to ensure that monitoring (when needed) continues without interruption. Any travel should be coordinated with public health authorities to ensure uninterrupted active monitoring <ul style="list-style-type: none"> <li>○ Person under monitoring must ensure the public health authorities knows how to contact them every day during the monitoring period and is aware of any travel plans.</li> </ul> </li> <li>• Additional considerations and actions for HCP (e.g., work restrictions ) might be indicated as outlined in <a href="#">CDC's MERS Infection Prevention and Control guidelines</a></li> <li>• Public health authorities, based on a specific assessment of the individual's situation, will determine whether additional restrictions are appropriate</li> </ul>
<b>Low (but not zero) risk</b> (see Table 2)	Fever AND respiratory symptoms consistent with MERS*	<ul style="list-style-type: none"> <li>• Symptomatic person must immediately self-isolate and contact public health authorities or a healthcare provider, as instructed as part of monitoring protocol</li> <li>• HCP with signs or symptoms of MERS must contact public health authorities who will coordinate with the facility's occupational health program or hospital epidemiologist for medical evaluation prior to returning to work</li> <li>• Public health authorities, if contacted, should conduct an assessment to determine whether medical evaluation at a healthcare facility is needed <ul style="list-style-type: none"> <li>○ Public health authorities can consult CDC to assist with evaluation of patients under investigation for MERS by calling CDC's Emergency Operations Center at 770-488-7100</li> <li>○ If public health authorities determine that medical evaluation is needed, safe transportation must be arranged to an appropriate healthcare facility for medical evaluation for MERS and other potential causes of the person's symptoms; see <a href="#">guidance for evaluation of a person under investigation for MERS</a></li> </ul> </li> <li>• Public health orders may be considered to ensure compliance</li> <li>• Guidance for safe ambulance transport of MERS patients can be adapted from <a href="#">Patient Transport guidance developed for SARS</a></li> <li>• Air travel is permitted only by air medical transport; federal public health travel restrictions (<a href="#">Do Not Board</a>) may be implemented as needed to enforce controlled movement. See <a href="#">guidance on Air Medical Transport</a></li> <li>• Public health authorities may delay or defer medical evaluation if concern for MERS is low because symptoms are mild or transient</li> <li>• Those with mild symptoms not requiring hospitalization should follow the <a href="#">home isolation guidance</a></li> <li>• If medically evaluated and discharged with a diagnosis other than MERS, or if symptoms resolve, recommendations as outlined for asymptomatic people in this exposure category would apply</li> </ul>

	Asymptomatic	<ul style="list-style-type: none"> <li>• Self-monitoring except HCP</li> <li>• For HCP, active monitoring for symptoms <b>or</b> signs of MERS. Working in the healthcare environment or seeing patients is allowed if HCP are under active monitoring and remain asymptomatic</li> <li>• No movement restrictions are recommended. No restrictions on travel, work, public conveyances, or congregate gatherings, except to ensure that monitoring (when needed) continues without interruption</li> </ul>
<b>No identifiable risk</b> (see Table 2)	Symptomatic (any)	<ul style="list-style-type: none"> <li>• Routine medical evaluation and management of ill persons as needed</li> </ul>
	Asymptomatic	<ul style="list-style-type: none"> <li>• No actions needed</li> </ul>

\*Fever is either measured temperature >100.4°F or subjective fever. Note that fever may not be present in some patients, such as those who are very young, elderly, immunosuppressed, or taking certain medications (e.g., NSAIDs). Clinical judgement should be used to guide testing of patients in such situations. Respiratory symptoms consistent with MERS are cough, shortness of breath, chest pain, and sore throat. Medical evaluation may be recommended for lower temperatures (<100.4°F) or other symptoms (e.g., muscle aches, nausea, vomiting, diarrhea, abdominal pain headache, runny nose, fatigue) based on assessment by public health authorities.

Abbreviations: healthcare personnel=HCP

## 1. High Risk Exposure Category

**a. Symptomatic individuals in the *high-risk* category** with fever **or** respiratory symptoms consistent with MERS must be assessed by clinical personnel, either in person or by telephone, taking into account the exposure risk and clinical presentation, to determine whether the symptom criteria for the category are met (see [Table 1](#)). People in the *high-risk* category who meet the symptom criteria must immediately consult the state or local public health authorities who will coordinate medical evaluation at a healthcare facility, which may include laboratory testing for MERS-CoV infection, with appropriate infection control precautions in place.

**b. Asymptomatic people in the *high-risk* category** must undergo active monitoring until 14 days after the last potential exposure. People in this category are subject to controlled movement consisting of, at a minimum, restrictions on long-distance travel on commercial or public transportation (e.g., aircraft, ship, bus, train) in the same conveyance as members of the general public in order to avoid having these people in a situation where they could not easily separate themselves from others if they developed symptoms during travel; federal public health travel restrictions may be issued, as needed, to enforce controlled movement (see [Table 1](#)). Public health authorities might consider other restrictions based on assessment of the individual situation (e.g., excluding someone from public events or congregate gatherings if they cannot easily separate themselves from others if symptoms develop).

**c. Healthcare personnel in the *high-risk* category**, must undergo active monitoring (see [Table 1](#)). HCP in this category are subject to controlled movement consisting of, at a minimum, restrictions on long-distance travel on commercial or public transportation (e.g., aircraft, ship, bus, train) in the same conveyance as members of the general public. HCP who develop fever **or** respiratory symptoms consistent with MERS-CoV infection within 14 days after the last known contact with a MERS patient should be evaluated by a facility-designated clinician



(e.g., occupational health services, emergency department). Symptomatic HCP in this group must immediately self-isolate and should not report for work in the healthcare environment or see patients. Additional considerations and actions for asymptomatic HCP (e.g., work restrictions) might be indicated as outlined in [CDC's MERS Infection Prevention and Control guidelines](#).

## 2. *Some-risk* Exposure Category

**a. Symptomatic individuals in the *some-risk* category** with fever **or** respiratory symptoms consistent with MERS must be assessed by clinical personnel, either in person or by telephone, taking into account the exposure risk and clinical presentation, to determine whether the symptom criteria for the category are met (see [Table 1](#)). People in the *some-risk* category who meet the symptom criteria must immediately consult the state or local public health authorities. Public health authorities should conduct a detailed exposure assessment to determine if medical evaluation at a healthcare facility is needed; medical evaluation may be delayed or deferred if suspicion for MERS is low because symptoms are mild or transient. If it is determined that further medical evaluation is not needed immediately, the person should self-isolate at home or in a location approved by the public health authority, with close monitoring by the public health authority, until symptoms resolve. For more guidance please refer to [CDC's MERS Home Care guidance](#).

**b. Asymptomatic people in the *some-risk* category** must undergo active monitoring until 14 days after the last potential exposure. People in this category do not require separation from others or restriction of movement within the community (see [Table 1](#)). For these individuals, CDC recommends that travel, including by commercial or public transportation, be permitted provided that they remain asymptomatic and active monitoring continues uninterrupted. No restrictions are recommended for travel, work, public conveyances, or congregate gatherings. Public health authorities might consider other restrictions based on assessment of the individual situation (e.g., excluding someone from public events or congregate gatherings if they cannot easily separate themselves from others if symptoms develop).

**c. Healthcare personnel in the *some-risk* category** must undergo active monitoring until 14 days after the last potential exposure. HCP who develop any signs (e.g., fever or cough) **or** symptoms (e.g., shortness of breath) of MERS-CoV infection within 14 days after the last known contact with a MERS patient should be evaluated by a facility-designated clinician (e.g., occupational health services, emergency department) regardless of their use of PPE. Symptomatic HCP in this group must immediately self-isolate and should not report for work in the healthcare environment or see patients. Additional considerations and actions for asymptomatic HCP (e.g., work restrictions) might be indicated as outlined in [CDC's MERS Infection Prevention and Control guidelines](#).

## 3. *Low- (but not zero)* Exposure Category

**a. Symptomatic individuals in the *low- (but not zero) risk category*** with fever and respiratory symptoms consistent with MERS must be assessed by clinical personnel, either in person or by telephone, taking into account the exposure risk and clinical presentation, to determine whether the symptom criteria for the category are met (see [Table 1](#)). For those in the *low- (but not zero) risk* categories, public health authorities should conduct a detailed exposure assessment to determine if medical evaluation at a healthcare facility is needed; medical evaluation may be delayed or deferred if suspicion for MERS is low because symptoms are mild or transient.

**b. Asymptomatic people in the *low- (but not zero) risk category*** must self-monitor until 14 days after the last potential exposure and seek healthcare if symptoms develop. If symptoms develop, they should call ahead to their healthcare provider and mention their recent travel or exposure. No restrictions are recommended for travel, work, public conveyances or congregate gatherings.

**c. For healthcare personnel in the *low- (but not zero) risk category*** who will continue to engage in direct patient care, active monitoring is recommended (see [Table 1](#)); while HCP do not have an increased risk of developing disease themselves, the increased level of monitoring is justified because of the risk of transmission to patients in the work setting who are more likely to develop severe disease due to underlying medical conditions or advanced age. There are no travel restrictions for this group. If symptoms of illness develop, any healthcare personal in the *low-(but not zero) risk category* under active monitoring must immediately stop working and contact their local or state public health authorities so that so that immediate isolation and clinical assessment can be coordinated.

**4. People in the *no identifiable risk category*** do not need monitoring or restrictions unless these are indicated because of a diagnosis of, or exposure to, a communicable disease other than MERS (see [Table 1](#)).

#### **For All Risk Categories**

Public health orders may be considered if necessary to ensure compliance with isolation and medical evaluation. Federal public health travel restrictions may be issued if there is reasonable belief that the person poses a public health threat during travel. If medical evaluation results in a person being discharged with a diagnosis other than MERS, monitoring and/or movement restrictions will continue as outlined for asymptomatic people based on the person's exposure risk category until 14 days after the last potential exposure.

## Recommendations for Specific Groups and Settings

### Healthcare personnel in U.S. healthcare facilities with active MERS cases

For the purposes of risk exposure to MERS-CoV, HCP refers to all people, paid and unpaid, working in healthcare settings whose activities potentially place them at risk for exposures to a patient with MERS. Examples of such activities include:

- those that require direct contact with patients or their respiratory secretions
- presence in the patient's room or immediate patient-care environment, such as in a triage or examination room, or other potentially contaminated areas
- handling respiratory secretions, including soiled medical supplies and medical waste, or potentially contaminated equipment or environmental surfaces

While body fluids other than respiratory secretions have not been implicated in transmission of MERS-CoV, unprotected contact with other body fluids should also be considered as putting HCP at potential risk, until further data are available. HCP with no direct patient contact and no entry into active patient management areas are not considered to have a risk of exposure to MERS-CoV, (e.g., are considered to have *no identifiable risk*). Clinical laboratory personnel who use appropriate PPE and follow biosafety precautions (see [CDC's MERS Lab Biosafety Guidelines](#)) in a laboratory setting while handling specimens potentially containing MERS-CoV, are also considered to have no identifiable risk. However, laboratory personnel who perform any procedure with the potential to generate fine-particulate aerosols (particles with a diameter of 2.5 mm or less) outside a class II biosafety cabinet would be considered to have *low- (but not zero) risk* and should self-monitor. To date there have been no reports of laboratory-acquired MERS-CoV infections. Note that HCP who are collecting specimens directly from patients should adhere to infection control recommendation including wearing the recommended PPE during the collection period as outlined in [CDC's Infection Prevention and Control Recommendations](#).

HCP who are exposed to patients with MERS or their respiratory secretions while wearing appropriate PPE are considered to have *low-(but not zero) risk* of exposure ([Table 2](#)). However, although considered *low- (but not zero) risk*, CDC recommends that public health authorities actively monitor these HCP because of their risk of transmission to patients in the work setting who are more likely to develop severe disease due to underlying medical conditions or advanced age. As long as those HCP, who will continue to engage in direct patient care, undergo active monitoring and remain asymptomatic, they may continue to perform their normal job duties. Active monitoring can be conducted by the hospital institution in coordination with the public health authorities, or solely by the public health authority. There are no recommended travel restrictions for this group. Review and approval of work, travel, or use of commercial or public transportation is not indicated or recommended for such HCP, except to ensure that active monitoring continues without interruption. However, if people under active monitoring wish to travel out of their state of jurisdiction, they must notify the appropriate public health authorities so active monitoring can

be transferred to the appropriate public health jurisdiction or continue to be conducted by the original jurisdiction following notification to the receiving jurisdiction.

HCP who have unprotected exposures to patients with MERS or their respiratory secretions (*high or some* risk) might be subject to additional restrictions by the local public health authorities or their employer, including consideration of a furlough from work in a healthcare facility or other healthcare setting, telework, and/or the potential use of public health orders, until 14 days after the last potential exposure.

### **Modifications to guidance if there is MERS-CoV transmission to healthcare personnel or patients in a U.S. healthcare facility**

If MERS-CoV transmission to HCP or patients is identified in a U.S. facility, exposure levels for other HCP and patients in the facility should be reassessed. If transmission is the result of a known exposure (e.g., HCP not wearing PPE when having patient contact), the HCP involved in the event would be elevated immediately to the *some* risk category; the other HCP in the facility who wore PPE correctly and are determined to be uninvolved would remain in the *low-(but not zero)* risk category ([Table 2](#)).

However, if no known exposure and no systematic infection control problems (e.g., breach in PPE use by an individual) are identified as the cause of transmission among the infected staff or patients, special actions need to be taken. First, all HCP involved in MERS patient care would be elevated immediately to the *some* risk category regardless of whether they wore PPE correctly, as this indicates an elevated risk for other HCP caring for MERS patients in that facility ([Table 2](#)). In certain circumstances these individuals might be subject to additional restrictions, including consideration of a furlough from work in a healthcare facility or other healthcare setting, and/or the potential use of public health orders, until 14 days after the last potential exposure. Second, the following procedures should be conducted: (1) review the infection control practices to identify potential deficiencies, (2) correct any identified deficiencies which might include re-training HCP in job- and/or task-specific procedures including appropriate infection control practices. Following remediation, if care of MERS patients resumes, exposed HCP in the affected facility that were considered to be the *some* risk exposure category would return to the *low- (but not zero)* risk category under active monitoring. Healthcare-related personnel not engaged in direct patient care, (e.g., lab staff, housekeeping) can self-monitor. HCP are considered to be in the *low- (but not zero)* risk category if their first MERS patient-care activities occur after remediation and training. For more information see [CDC's Interim Infection Prevention and Control Recommendations for Hospitalized Patients with MERS-CoV](#).

## **Travelers on public or commercial conveyances**

### **Crew members**

If a crew member on a commercial or public conveyance, such as an airplane or ship, is under monitoring due to potential MERS-CoV exposure and is not subject to controlled movement, then the crew member is also not subject to occupational restriction and may continue to work during the monitoring period.

### **Travelers who were on an airplane with a person with symptomatic MERS**

If a confirmed case of MERS is identified in a recent airplane traveler who is determined to have been symptomatic during travel, each traveler seated within 2 rows of the person with MERS, and any others onboard who may have had extensive interaction with this person or were exposed to the person's respiratory secretions, should be assessed individually for [close contact](#). This assessment should include consideration of the clinical symptoms, and proximity and duration of exposure. For instance a travel companion or person sitting on an airplane next to a confirmed case of MERS may be considered a close contact. These travelers should be managed according to the risk level, with self-monitoring at a minimum for those seated within 2 rows of the person with MERS; public health authorities may choose to conduct daily or intermittent active monitoring of these people. Travelers (passengers and crew) seated more than 2 rows from the person with MERS who had no other potential close contact with this person are considered to have *no identifiable risk*; no monitoring or movement restrictions are recommended for these people.

### **End of Infectious Period for People with Confirmed MERS**

For people with confirmed MERS-CoV infection, isolation and movement restrictions are removed upon determination by public health authorities that the person is no longer considered to be infectious. A confirmed case of MERS is considered to no longer be infectious after two respiratory specimens (preferably lower respiratory tract) collected 24 hours apart are confirmed negative by the CDC rRT-PCR MERS-CoV assay, and the patient has clinical improvement.

### **Justification for Recommendations**

Active monitoring is justified for all people in the *high-* or *some-risk* category based on a reasonable belief that exposure may have occurred. For HCP in the *low- (but not zero) risk* category who will continue to engage in direct patient care, active monitoring for symptoms/signs of MERS is recommended; while HCP do not have an increased risk of developing disease themselves, the increased level of monitoring is

justified because of the risk of transmission to patients in the work setting who are more likely to develop severe disease due to underlying medical conditions or advanced age.

Additional restrictions, such as use of public health orders, may be warranted if a person potentially exposed to MERS-CoV fails to comply with public health recommendations or requirements. Such noncompliance could include refusal to participate in a public health assessment or failure to adhere to the terms of active monitoring, if indicated. Without such an assessment, public health authorities may be unable to determine if an individual has been exposed to, or has signs or symptoms consistent with, MERS. Medical evaluation may be required, and isolation orders may be issued, for travelers from regions with MERS-CoV transmission who refuse to cooperate with a public health assessment and appear ill.

**Table 2: Epidemiologic Risk Factors to Consider when Evaluating a Person for Exposure to MERS-CoV\*\***

Risk exposure categories apply only to individuals who provide history of a known exposure risk, such as contact with a confirmed MERS patient or presence in a setting in which MERS cases occurred (e.g., hospital) either overseas or in the U.S. Currently CDC and state health departments are not performing enhanced risk assessment to screen travelers for MERS who are arriving in the U.S. from the Arabian Peninsula\*.

Categories that pertain particularly to healthcare personnel (HCP) are highlighted in orange.

Epidemiologic risk factors <i>(Apply until 14 days after last potential exposure)</i>	Exposure category	Monitoring for MERS
Conducting or being present during a procedure likely to generate higher concentrations of respiratory aerosols (e.g., cough-generating procedures, bronchoscopy, sputum induction, intubation, extubation) on a patient with confirmed MERS without using the recommended PPE	High	Active monitoring
Close contact with a person with confirmed MERS while the person was symptomatic (see definitions of close contact) without wearing appropriate PPE	Some	Active monitoring
HCP with unprotected exposure (without PPE) to a MERS patient (not a high-risk exposure)	Some	Active monitoring
HCP without a known unprotected exposure in a facility, who are caring for a MERS patient in a facility where HCP transmission to HCP or another patient has occurred without an identified breach in infection control	Some	Active monitoring
Laboratory processing of blood, serum, or respiratory samples from a person with MERS while not wearing appropriate PPE or without using standard biosafety precautions. For example performing any procedure (e.g. vortexing, centrifuging) with the potential to	Low (but not zero)	Self-monitoring

generate fine-particulate aerosols (particles with a diameter of 2.5 mm or less) outside a class II biosafety cabinet		
Having provided healthcare while using the recommended PPE to a person with confirmed MERS while the person was symptomatic. This includes direct patient care or contact with respiratory secretions (e.g., clinical laboratory or housekeeping personnel)	Low (but not zero)	If engaged in direct patient care, active monitoring. If not engaged in direct patient care, self-monitoring.
Having traveled on an aircraft seated WITHIN 2 ROWS of a person with confirmed MERS who was symptomatic during travel, but having no exposures assessed as close contact. Examples of close contact include travel companions, assisting crew, assisting HCP.	Low (but not zero)	Self-monitoring
Having traveled on an aircraft seated MORE THAN 2 ROWS from a person with confirmed MERS who was symptomatic during travel and having no exposures assessed as close contact. Examples of close contact include, travel companions, assisting crew, assisting HCP.	No identifiable risk	None
Potential exposure that occurred more than 14 days prior	No identifiable risk	None
Contact with a person with MERS before his or her symptoms began	No identifiable risk	None
Transient interactions that do not meet the close contact definition, such as walking by a person with MERS	No identifiable risk	None
HCP with no direct patient contact and no entry into active patient management areas	No identifiable risk	None
Clinical laboratory personnel who use appropriate PPE and follow biosafety precautions in a laboratory setting while handling specimens containing MERS-CoV	No identifiable risk	None

\*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.

\*\*Criteria including exposure risks for the evaluation and testing of patients for MERS-CoV infection can be found in the [CDC Guidance for Evaluating Persons Under Investigation for MERS](#).