

Infection prevention and control guidelines for patients with Middle East Respiratory Syndrome Coronavirus (MERS-CoV) infection

Tariq A. Madani, FRCPC, FACP, Abdulbakeem O. Althaqafi, ArBIM, SCCIM, Basem M. Alraddadi, MD, MSc.

I. Introduction

Beginning in mid-March 2014, a sharp increase in reported cases of Middle East Respiratory Syndrome Coronavirus (MERS-CoV) in Saudi Arabia heightened international concern and raised fears of the potential for global transmission. At that point, a new Minister of Health, Engineer Adel Fakeih, was appointed on 21 April 2014. The MERS-CoV was obviously the top challenge and priority to address. He formed a Scientific Advisory Council to draw the roadmap for investigating and controlling the outbreak, and for preventing further transmission. Investigation of the outbreak by the Scientific Advisory Council confirmed that the vast majority of cases were healthcare-associated [unpublished data]. The Infectious Diseases and Control subcommittee of the Advisory Council subsequently reviewed the previous infection prevention and control guidelines, and developed the following revised guidelines to meet the urgent need for up-to-date information and evidence-based recommendations for the safe care of patients with suspected, probable, or confirmed MERS-CoV infection. The main bulk of these guidelines have been adapted from previous guidelines produced by the World Health Organization (WHO),¹ and the Centers for Disease Control and Prevention (CDC).² Council members have revised these 2 documents and made important modifications based on the current epidemiological evidence and the members' clinical experience. These guidelines were posted on the Ministry of Health (MoH) website on 24 June 2014 to replace the previous guidelines.³ In the current guidelines, a new case definition was developed based on the latest epidemiological and clinical features observed in patients reported in Jeddah, Saudi Arabia.⁴ The current guidelines have emphasized the importance of following standard, contact, and droplet precautions to prevent cross infection in the healthcare settings. It has also emphasized the importance of adhering to airborne precautions when performing procedures that may generate aerosols, or when caring for patients who are critically ill (such as, pneumonia with respiratory distress, or hypoxemia) due to the high likelihood of requiring aerosol-generating procedures, such as endotracheal intubation and/or frequent suctioning. When a negative pressure isolation room is not available, the use of portable high-efficiency particulate air (HEPA) filters for patients who should be in airborne precautions is recommended in the current guidelines. Management algorithm of patients with suspected MERS-CoV infection was added.⁴ The importance of avoiding overcrowding was also emphasized. A section on triaging in the emergency room for rapid identification of patients with acute respiratory illness was added. Guidance on indications for admission, home isolation, when to discontinue isolation and discharge patients, and collection and handling of laboratory specimens was also added. It is hoped that the current guidelines will be strictly followed by all healthcare workers and implemented in all healthcare facilities in Saudi Arabia to prevent transmission and control the current outbreak of MERS-CoV that was confirmed to be primarily healthcare-associated. As information becomes available, these guidelines will be re-evaluated and updated as needed.

From the Ministry of Health (Madani), Department of Medicine (Madani), Faculty of Medicine, King Abdulaziz University, Jeddah, King Saud Bin Abdulaziz University for Health Sciences (Althaqafi), Ministry of National Guard, and the Department of Medicine (Alraddadi), King Faisal Specialist Hospital and Research Center, Jeddah, Kingdom of Saudi Arabia.

Address correspondence and reprint request to: Prof. Tariq A. Madani, Department of Medicine, Faculty of Medicine, King Abdulaziz University, PO Box 80215, Jeddah 21589, Kingdom of Saudi Arabia. Tel. +966 (12) 6408348. Fax. +966 (12) 6408344. E-mail: tmadani@kau.edu.sa

II. Case definition and surveillance guidance

Suspect case (patients who should be tested for MERS-CoV)^a

- I. A person with fever and community-acquired pneumonia or acute respiratory distress syndrome based on clinical or radiological evidence.^b
OR
- II. A hospitalized patient with healthcare associated pneumonia based on clinical and radiological evidence.^b
OR
- III. A person with 1) acute febrile ($\geq 38^{\circ}\text{C}$) illness, AND 2) body aches, headache, diarrhea, or nausea/vomiting, with or without respiratory symptoms, AND 3) unexplained leucopenia (white blood cells $< 3.5 \times 10^9/\text{L}$) and thrombocytopenia (platelets $< 150 \times 10^9/\text{L}$).^c
OR
- IV. A person (including health care workers) who had protected or unprotected exposure^d to a confirmed or probable case of MERS-CoV infection and who presents with upper^e or lower^f respiratory illness within 2 weeks after exposure.^g

Probable case

A probable case is a patient in category I or II above with absent or inconclusive laboratory results for MERS-CoV and other possible pathogens who is a close contact^h of a laboratory-confirmed MERS-CoV case or who works in a hospital where MERS-CoV cases are cared for.

Confirmed case

A confirmed case is a suspect case with laboratory confirmationⁱ of MERS-CoV infection.

^aAll suspected cases should have nasopharyngeal swabs, and, when intubated, lower respiratory secretions samples collected for MERS-CoV testing.

^bPatients who meet the criteria for category I or II above should also be evaluated for common causes of community-acquired pneumonia (such as influenza A and B, respiratory syncytial virus, *Streptococcus pneumoniae*, *Hemophilus influenzae*, *Staphylococcus aureus*, and *Legionella pneumophila*). This evaluation should be based on clinical presentation and epidemiologic and surveillance information. Testing for MERS-CoV and other respiratory pathogens can be done simultaneously. Positive results for another respiratory pathogen (for example, H1N1 influenza) should not necessarily preclude testing for MERS-CoV because co-infection can occur.

^cLaboratory tests to exclude other causes of this clinical presentation (for example, dengue, Alkhurma hemorrhagic fever virus, *Cytomegalovirus* [CMV], *Epstein-Barr virus* [EBV], typhoid fever, and malaria) should be simultaneously performed if clinically and epidemiologically indicated.

^dProtected exposure is defined as contact within 1.5 meters with a patient with confirmed or probable MERS-CoV infection while wearing all personal protective equipment (surgical mask, gloves, and gowns, and, when indicated, goggles, or N95 mask). Unprotected exposure is defined as contact within 1.5 meters with a patient with confirmed or probable MERS-CoV infection without wearing all personal protective equipment (surgical mask, gloves, and gowns, and, when indicated, goggles, or N95 mask).

^eRhinorrhea, sore throat, and/or cough.

^fShortness of breath, hypoxemia, or pneumonic infiltration evident on chest x-ray.

^gTesting asymptomatic contacts is generally not recommended. Under certain circumstances, such testing may be considered in consultation with an Infectious Diseases/Infection Control consultant.

^hClose 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 (for example, lived with, visited) as the patient while the patient was ill.

ⁱConfirmatory laboratory testing requires a positive polymerase chain reaction (PCR) on at least 2 specific genomic targets (upE and ORF1a) OR a single positive target (upE) with sequencing of a second target (RdRpSeq or NSeq). It is strongly advised that lower respiratory specimens such as sputum, endotracheal aspirate, or bronchoalveolar lavage should be used when possible. If patients do not have signs or symptoms of lower respiratory tract infection or lower tract specimens are not possible or clinically indicated, both nasopharyngeal and oropharyngeal specimens should be collected and combined in a single collection container and tested together. If initial testing of

a nasopharyngeal swab is negative in a patient who is strongly suspected to have MERS-CoV infection, patients should be retested using a lower respiratory specimen or, if not possible, a repeat nasopharyngeal and oropharyngeal specimen. For patients in whom adequate lower respiratory samples are not possible, investigators may also want to consider other types of auxiliary testing such as nasopharyngeal wash for MERS-CoV PCR and paired acute and convalescent sera for serological tests. Collection of additional specimens such as stool, urine, and serum for MERS-CoV PCR is also recommended as the virus has also been demonstrated in these body fluids.

III. Algorithm for managing patients with suspected MERS-CoV

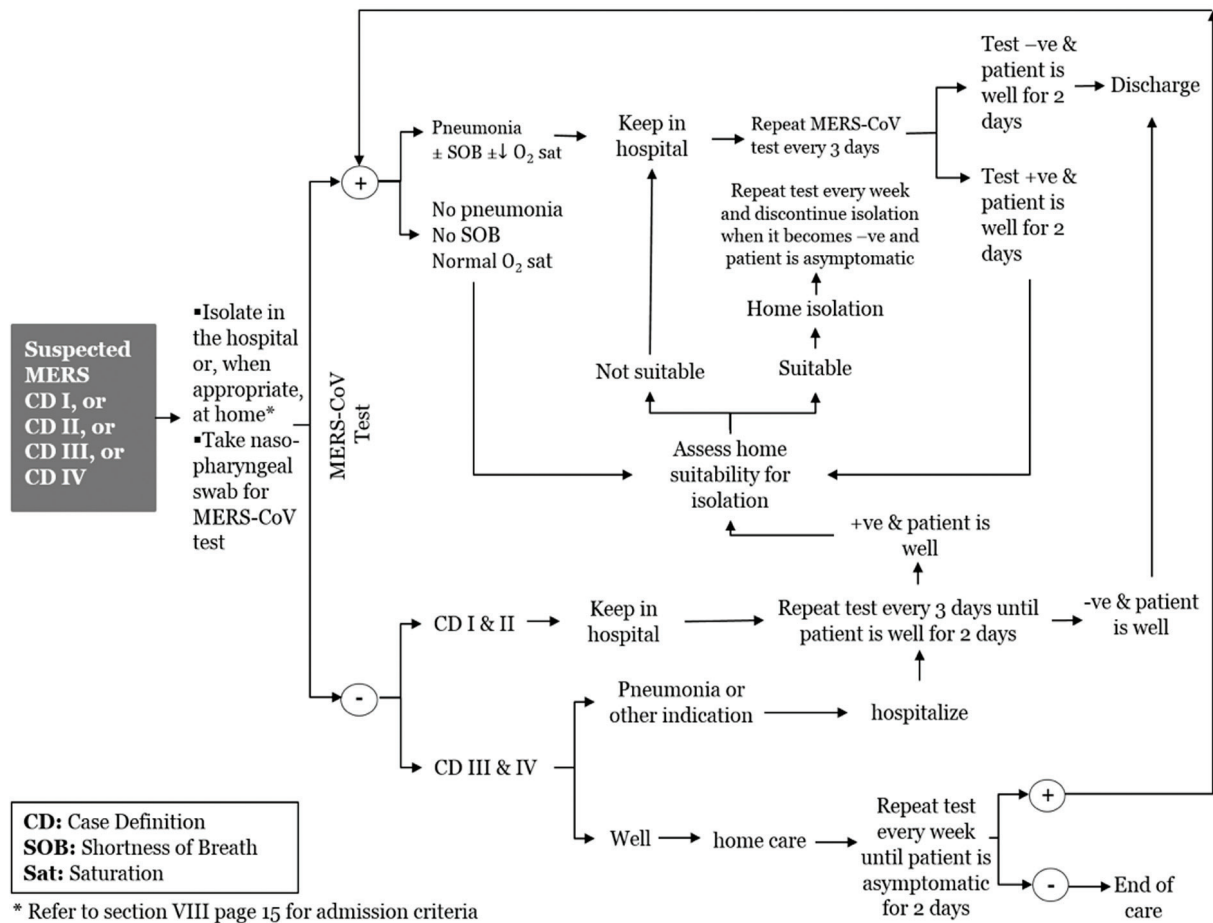


Figure 1 - Algorithm for managing patients with suspected Middle East Respiratory Syndrome Coronavirus (MERS-CoV).

IV. General infection prevention and control precautions

Standard Precautions

* Standard precautions, a cornerstone for providing safe health care and reducing the risk of further infection, should always be applied in all health-care settings for all patients.

* Standard precautions include

o Hand hygiene

- Healthcare workers (HCWs) should apply “My 5 moments for hand hygiene”: before touching a patient, before any clean or aseptic procedure, after body fluid exposure, after touching a patient, and after touching a patient’s surroundings, including contaminated items or surfaces.
- Hand hygiene includes either washing hands with antiseptic soap and water or the use of an alcohol-based waterless hand sanitizer (waterless hand rub).
- Wash hands with antiseptic soap and water when they are visibly soiled.
- The use of gloves does not eliminate the need for hand hygiene. Hand hygiene is necessary after taking off gloves and other personal protective equipment (PPE).

o Use of PPE to avoid direct contact with patients’ blood, body fluids, secretions (including respiratory secretions) and non-intact skin.

- The use of PPE should be guided by a risk assessment concerning anticipated contact with blood, body fluids, secretions, and non-intact skin for routine patient care.
- When procedures include a risk of splash to the face and/or body, PPE should include the use of facial protection by means of either a medical mask and eye-visor or goggles, or a face shield; and a gown and clean gloves.

o Respiratory hygiene and cough etiquette

To prevent the transmission of all respiratory infections in healthcare settings, including MERS-CoV and influenza, the following infection control measures should be implemented at the first point of contact with a potentially infected person. They should be incorporated into infection control practices as one component of standard precautions.

1. Visual Alerts

Post visual alerts (in appropriate languages) at the entrance to outpatient facilities (such as, emergency rooms and clinics) instructing patients and persons who accompany them (such as, family, friends) to inform healthcare personnel of symptoms of acute respiratory illness (including fever with cough, sore throat, rhinorrhea, sneezing, shortness of breath, and/or wheezing) when they first register for care and to practice the following respiratory hygiene/cough etiquette.

- Cover your mouth and nose with a tissue when coughing or sneezing.
- Dispose of the tissue in the nearest waste receptacle right after use.
- Perform hand hygiene (for example, hand washing with non-antimicrobial soap and water, alcohol-based hand sanitizer, or antiseptic handwash) after having contact with respiratory secretions and contaminated objects/materials.

2. Masking and separation of persons with respiratory symptoms

- Offer regular (medical) masks to persons who are coughing. Regular (medical) masks may be used to contain respiratory secretions (N-95 masks are not necessary for this purpose).
- When space and chair availability permit, encourage coughing persons to sit at least one meter away from others in common waiting areas.
- Healthcare facilities should ensure the availability of materials for adhering to respiratory hygiene/cough etiquette in waiting areas for patients and visitors.
- Provide tissues and no-touch receptacles for used tissue disposal.
- Provide conveniently located dispensers of alcohol-based hand sanitizer.
- Where sinks are available, ensure that supplies for hand washing (that is, antiseptic soap and disposable towels) are consistently available.

* Prevention of overcrowding in waiting and clinical areas is essential to prevent cross infection

* Environmental ventilation in all areas within a health-care facility

- * Environmental cleaning
- * Prevention of needle-stick or sharps injury
- * Safe waste management
- * Follow standard procedures, per hospital policy and manufacturers' instructions, for cleaning and/or disinfection of
 - Environmental surfaces and equipment
 - Textiles and laundry
 - Food utensils and dishware
- * Follow standard procedures for cleaning and/or disinfection of environmental surfaces and patient-care equipment, linen, stretcher (trolley), and bed. For equipment that requires sterilization, follow routine sterilization procedures.
- * Ensure that cleaning and disinfection procedures are followed consistently and correctly. Cleaning environmental surfaces with water and detergent and applying commonly used disinfectants (such as hypochlorite diluted 10 times) is an effective and sufficient procedure. Manage laundry, food service utensils and medical waste in accordance with routine procedures.
- * Policies and procedures for all facets of occupational health, with emphasis on surveillance of acute respiratory illness (ARI) among HCWs and the importance of seeking medical care
- * Monitoring of compliance, along with mechanisms for improvement as needed.

V. Triage for rapid identification of patients with acute respiratory illness (ARI).

- o Clinical triage should be used for early identification of all patients with ARI in the emergency rooms and the clinics.
- o Rapid identification of patients with ARI and patients suspected of MERS-CoV infection is key to prevent healthcare associated transmission of MERS-CoV or other respiratory viruses. Appropriate infection control precautions and respiratory etiquette (described above) for source control should be promptly applied.
- o Identified ARI patients should be asked to wear a medical mask. They should be evaluated immediately in an area separate from other patients. Infection control and prevention precautions should be promptly implemented.
- o If ARI patients can not be evaluated immediately, they should wait in a waiting area dedicated for the ARI patients with spatial separation of at least one meter between each ARI patient and others.
- o Clinical and epidemiological aspects of the cases should be evaluated as soon as possible and the investigation should be complemented by laboratory evaluation.

VI. Infection prevention, and control precautions when caring for patients with suspected, probable, or confirmed MERS-CoV infection

- o For patients with suspected, probable, or confirmed MERS-CoV infection who are not critically ill, standard, contact, and droplet precautions are recommended for management.
- o For patients who are critically ill (for example, pneumonia with respiratory distress or hypoxemia), standard, contact, and airborne precautions are recommended due to the high likelihood of requiring aerosol-generating procedures.
- o Standard, contact, and airborne precautions should be used for all (critically or non-critically ill) patients when anticipating or performing aerosol-generating procedures which may be associated with an increased risk of infection transmission (including both elective procedures such as bronchoscopy, sputum induction, elective intubation and extubation, and emergency procedures such as cardiopulmonary resuscitation, initiation of Bilevel Positive Airway Pressure (BIPAP), emergency intubation, open suctioning of airways, manual ventilation via umbo bagging through a mask before intubation).
- o Selected components of recommended precautions for prevention of MERS-CoV transmission

➤ *Placement*

- Place patients with suspected, probable, or confirmed MERS-CoV infection who are not critically ill in single patient rooms in an area that is clearly segregated from other patient-care areas.
 - ◆ Aerosol generating procedures should be performed in a negative pressure room.
- Place patients with suspected, probable, or confirmed MERS-CoV infection who are critically ill (for example, pneumonia with respiratory distress or hypoxemia) in Airborne Infection Isolation rooms (Negative Pressure Rooms) due to the high likelihood of requiring aerosol-generating procedures.
- When negative pressure rooms are not available, place the patients in adequately ventilated single rooms. When available, a portable HEPA filter, turned on to the maximum power, should be placed at the head side of the patient's bed.
- When single rooms are not available, place patients with the same diagnosis together (cohorting). If this is not possible, place patient beds at least 1 m apart.
- Avoid the movement and transport of patients out of the isolation room or area unless medically necessary. The use of designated portable X-ray, ultrasound, echocardiogram, and other important diagnostic machines is recommended when possible.
- If transport is required:
 - ◆ Patients should wear a medical mask to contain secretions
 - ◆ Use routes of transport that minimize exposures of staff, other patients, and visitors
 - ◆ Notify the receiving area of the patient's diagnosis and necessary precautions as soon as possible before the patient's arrival
 - ◆ Ensure that healthcare workers (HCWs) who are transporting patients wear appropriate PPE and perform hand hygiene afterwards

➤ *Personal protective equipment for healthcare workers*

- The following PPE should be worn by HCWs upon entry into patient rooms or care areas:
 - ◆ Gowns (clean, non-sterile, long-sleeved disposable gown)
 - ◆ Gloves
 - ◆ Eye protection (goggles or face shield)
 - ◆ A medical mask.
 - ◆ For patients under airborne precautions, all persons entering the patient's room should wear a fit-tested, seal checked N-95 mask instead of a medical mask. For those who failed the fit testing of N95 masks (for example, those with beards), an alternative respirator, such as a powered air-purifying respirator, should be used.
- Upon exit from the patient room or care area, PPE should be removed and discarded.
- Except for N95 masks, remove PPE at doorway or in anteroom. Remove N95 mask after leaving patient room and closing door.
- Remove PPE in the following sequence: 1. Gloves, 2. Goggles or face shield, 3. Gown, and 4. Mask.
- You should note and observe the following:
 1. **Gloves**
 - Outside of gloves is contaminated
 - Grasp outside of glove with opposite gloved hand; peel off
 - Hold removed glove in gloved hand
 - Slide fingers of ungloved hand under remaining glove at wrist
 - Peel glove off over first glove
 - Discard gloves in waste container
 2. **Goggles or face shield**
 - Outside of goggles or face shield is contaminated
 - To remove, handle by head band or ear pieces
 - Place in designated receptacle for reprocessing or in waste container

3. Gown

- Gown front and sleeves are contaminated
- Unfasten ties
- Pull away from neck and shoulders, touching inside of gown only
- Turn gown inside out
- Fold or roll into a bundle and discard

4. Medical or N95 masks

- Front of mask/respirator is contaminated -DO NOT TOUCH
 - Grasp bottom, then top ties or elastics and remove
 - Discard in waste container
-
- Never wear a medical mask under the N95 mask as this prevents proper fitting and sealing of the N95 mask thus decreasing its efficacy.
 - For female staff who wear veils, the medical or N95 mask should always be placed directly on the face behind the veil and not over the veil. In this instance, a face-shield should also be used along with the mask to protect the veil from droplet sprays.
 - Perform hand hygiene before and after contact with the patient or his/her surroundings and immediately after removal of PPE.
 - If possible, use either disposable equipment or dedicated equipment (for example, stethoscopes, blood pressure cuffs and thermometers).
 - If equipment needs to be shared among patients, clean and disinfect it after each patient use.
 - HCWs should refrain from touching their eyes, nose or mouth with potentially contaminated gloved or ungloved hands.

➤ *Environmental Infection Control*

- Follow standard procedures, per hospital policy and manufacturers' instructions, for cleaning and/ or disinfection of:
 - ◆ Environmental surfaces and equipment
 - ◆ Textiles and laundry
 - ◆ Food utensils and dishware
- Clean and disinfect patient-contact surfaces (for example, bed and machines) after use

➤ *Limit the number of HCWs, family members and visitors in contact with a patient with probable or confirmed MERS-CoV infection.*

➤ *To the extent possible, assign probable or confirmed cases to be cared for exclusively by a group of skilled HCWs and housekeepers both for continuity of care and to reduce opportunities for inadvertent infection control breaches that could result in unprotected exposure.*

➤ *Family members and visitors in contact with a patient should be limited to those essential for patient support and should be trained on the risk of transmission and on the use of the same infection control precautions as HCWs who are providing routine care. Further training may be needed in settings where hospitalized patients are often cared for by family members (sitters).*

VII. Infection prevention and control precautions for aerosol-generating procedures

- o An aerosol-generating procedure is defined as any medical procedure that can induce the production of aerosols of various sizes, including small (< 5 micron) particles.

- o Aerosol-generating procedures that may be associated with an increased risk of infection transmission includes both elective procedures such as bronchoscopy, sputum induction, elective intubation and extubation, as well as emergency procedures such as cardiopulmonary resuscitation, initiation of Bilevel Positive Airway Pressure (BIPAP), emergency intubation, open suctioning of airways, manual ventilation via umbo bagging through a mask before intubation.
- o Additional precautions should be observed when performing aerosol-generating procedures, which may be associated with an increased risk of infection transmission.
- o Additional precautions when performing aerosol-generating procedures:
 - Wear N95 masks - Every healthcare worker should wear a fit tested N95 mask (or an alternative respirator if fit testing failed). Additionally, when putting on N95 mask, always check the seal.
 - Wear eye protection (that is, goggles or a face shield).
 - Wear a clean, non-sterile, long-sleeved gown and gloves (some of these procedures require sterile gloves).
 - Wear an impermeable apron for some procedures with expected high fluid volumes that might penetrate the gown;
 - Perform procedures in a negative pressure room.
 - Limit the number of persons present in the room to the absolute minimum required for the patient's care and support;
 - Perform hand hygiene before and after contact with the patient and his or her surroundings and after PPE removal.

VIII. Admission criteria

- o Not all suspected MERS-CoV patients should be admitted to health-care facilities (please refer to section III. Algorithm for managing patients with suspected MERS-CoV).
- o Patients suspected to have MERS-CoV infection who have shortness of breath, hypoxemia, and/or clinical or radiological evidence of pneumonia should be hospitalized.
- o Patients with suspected MERS-CoV who have no shortness of breath, hypoxemia, or evidence of pneumonia may be cared for and isolated in their home when suitable.

IX. Home isolation

- o Isolation is defined as the separation or restriction of activities of an ill person with a contagious disease from those who are well.
- o Before the ill person is isolated at home a healthcare professional should:
 - Assess whether the home is suitable and appropriate for isolating the ill person. You can conduct this assessment by phone or direct observation.
 - ♦ The home should have a functioning bathroom. If there are multiple bathrooms, one should be designated solely for the ill person.
 - ♦ The ill person should have his or her own bed and preferably a private room for sleeping.
 - ♦ Basic amenities, such as heat, electricity, potable and hot water, sewer, and telephone access, should be available.
 - ♦ There should be a primary caregiver who can follow the healthcare provider's instructions for medications and care. The caregiver should help the ill person with basic needs in the home and help with obtaining groceries, prescriptions, and other personal needs.
- o If the home is suitable and appropriate for home care and isolation you should give the patient, the caregiver, and household members the following instructions:

For the patient

Separate yourself from other people in your home

As much as possible, you should stay in a different room from other people in your home. Also, you should use a separate bathroom, if available.

Wear a medical mask

You should wear a medical mask when you are in the same room with other people and when you visit a healthcare provider. If you cannot wear a medical mask, the people who live with you should wear one while they are in the same room with you.

Cover your coughs and sneezes

Cover your mouth and nose with a tissue when you cough or sneeze, or you can cough or sneeze into your sleeve. Throw used tissues in a lined trash can, and immediately wash your hands with soap and water or disinfect it with waterless alcohol-based hand sanitizer.

Wash your hands

Wash your hands often and thoroughly with antiseptic soap and water. You can use an alcohol-based hand sanitizer if antiseptic soap and water are not available and if your hands are not visibly dirty. Avoid touching your eyes, nose, and mouth with unwashed hands.

Avoid sharing household items

You should not share dishes, drinking glasses, cups, eating utensils, towels, bedding, or other items with other people in your home. After using these items, you should wash them thoroughly with soap and warm water.

Call ahead before visiting your doctor

Before your medical appointment, call the healthcare provider and tell him or her that you may have MERS-CoV infection. This will help the healthcare provider's office take steps to keep other people from getting infected.

For caregivers and household members

If you live with or care for someone at home who is ill and being evaluated for MERS-CoV infection, you should:

- Make sure that you understand and can help the ill person follow the healthcare provider's instructions for medication and care. You should help the ill person with basic needs in the home and provide support for getting groceries, prescriptions, and other personal needs.
- Have only people in the home who are essential for providing care for the ill person.
 - ◆ Other household members should stay in another home or place of residence. If this is not possible, they should stay in another room, or be separated from the ill person as much as possible. Use a separate bathroom, if available.
 - ◆ Restrict visitors who do not have an essential need to be in the home.
 - ◆ Keep elderly people and those who have compromised immune systems or specific health conditions away from the ill person. This includes people with chronic heart, lung or kidney diseases, and diabetes.
- Make sure that shared spaces in the home have good air flow, such as by air-conditioner or an opened window.
- Wear a disposable medical mask, gown, and gloves when you touch or have contact with the ill person's blood, body fluids and/or secretions, such as sweat, saliva, sputum, nasal mucous, vomit, urine, or diarrhea.
 - ◆ Throw out disposable medical masks, gowns, and gloves after using them. Do not reuse.

- ◆ Wash your hands immediately after removing your medical mask, gown, and gloves.
- Wash your hands often and thoroughly with soap and water. You can use an alcohol-based hand sanitizer if soap and water are not available and if your hands are not visibly dirty. Avoid touching your eyes, nose, and mouth with unwashed hands.
- Avoid sharing household items. You should not share dishes, drinking glasses, cups, eating utensils, towels, bedding, or other items with an ill person who is being evaluated for MERS-CoV infection. After the ill person uses these items, you should wash them thoroughly with soap and warm water.
- Clean all “high-touch” surfaces, such as counters, tabletops, doorknobs, bathroom fixtures, toilets, and bedside tables, every day. Also, clean any surfaces that may have blood, body fluids and/or secretions on them.
 - ◆ Wear disposable gloves and gown while cleaning surfaces.
 - ◆ Use a diluted bleach solution or a household disinfectant. To make a bleach solution at home, add 1 tablespoon of bleach to 4 cups of water. For a larger supply, add ¼ cup of bleach to 16 cups of water.
- Wash laundry thoroughly.
 - ◆ Immediately remove and wash clothes or bedding that have blood, body fluids and/or secretions on them.
 - ◆ Wear disposable gloves while handling soiled items. Wash your hands immediately after removing your gloves.
 - ◆ Wash the items with detergent and warm water at the maximum available cycle length then machine dry them.
- Place all used gloves, gowns, medical masks, and other contaminated items in a lined container before disposing them with other household waste. Wash your hands immediately after handling these items.
- Follow the guidance for close contacts below.

For close contacts including health care workers

If you have had close contact with someone who is ill and being evaluated for MERS-CoV infection, you should:

- Monitor your health for 14 days, starting from the day you were last exposed to the ill person. Watch for these symptoms:
 - ◆ Fever (38°C, or higher). Take your temperature twice a day.
 - ◆ Coughing.
 - ◆ Shortness of breath.
 - ◆ Other early symptoms to watch for are chills, body aches, sore throat, headache, diarrhea, nausea/vomiting, and runny nose.
- If you develop symptoms, follow the prevention steps described above, and call your healthcare provider as soon as possible. Before your medical appointment, call the healthcare provider and tell him or her about your possible exposure to MERS-CoV. This will help the healthcare provider’s office take steps to keep other people from getting infected. Ask your healthcare provider to call the MoH.
- If you do not have any of the symptoms, you can continue with your daily activities, such as going to work, school, or other public areas.

Provide the “Ministry of Health’s Guidance for Home Isolation of Patients Infected with MERS-Coronavirus” brochure to the ill person, the caregiver, and household members. This brochure is available in common languages (Arabic, English, Urdu, Pilipino, Indonesian, Bangladeshi, Somalian, and Ethiopian) (**Appendix 1**).

X. Management of health care workers who had contacts with patients with MERS-CoV infection.

- o Health care facilities should trace all health care workers who had protected or unprotected contacts with patients with suspected, probable, or confirmed MERS-CoV infection.
- o Contacts should not be routinely tested for MERS-CoV unless they develop upper or lower respiratory illness.
- o Contacts should continue to work in the hospital unless they develop upper or lower respiratory illness.
- o The infection control unit of the facility or equivalent thereof should proactively call by phone all contacts to assess their health on a daily basis for a total of 14 days. Contacts should also be instructed to report immediately to the Staff Health Clinic or Emergency Room if they develop upper or lower respiratory illness.
- o The Infection Control unit should be notified of all contacts who develop a respiratory illness.
- o Symptomatic contacts should be assessed clinically. Nasopharyngeal swabs should be collected and tested for MERS-CoV PCR.
- o Symptomatic contacts should be managed as suspected cases using the same protocol described in the MERS-CoV management algorithm in section III above.

XI. Management of household contacts of patients with MERS-CoV infection.

- o The Department of Public Health in the local Ministry of Health Directorate Office should trace all household or other contacts of patients with suspected, probable, or confirmed MERS-CoV infection.
- o Contacts should not be routinely tested for MERS-CoV unless they develop upper or lower respiratory illness.
- o The Department of Public Health should proactively call by phone all contacts to assess their health on a daily basis for a total of 14 days. Contacts should also be instructed to report immediately to the nearest hospital if they develop upper or lower respiratory illness.
- o Symptomatic contacts should be assessed clinically. Nasopharyngeal swabs should be collected and tested for MERS-CoV PCR.
- o Symptomatic contacts should be managed as suspected cases using the same protocol described in the MERS-CoV management algorithm in section III above.

XII. Duration of isolation precautions for MERS-CoV infection

- o Since the duration of infectivity for MERS-CoV infection is unknown, nasopharyngeal swab should be repeated every 3 days for in-patients and every week for home-isolated patients with confirmed MERS-CoV infection to test for viral shedding to assist the decision making particularly in regard to when to stop isolation in the hospital or the home setting.
- o While standard precautions should continue to be applied always, additional isolation precautions should be used during the duration of symptomatic illness and continued until 48 hours after the resolution of symptoms; AND At least one nasopharyngeal sample is negative for MERS-CoV RNA.
- o If the sample is still positive, and the patient is well enough to go home, he/she can be allowed to go home with instruction to isolate him/herself at home and come wearing a medical mask to the clinic for follow up every week to have nasopharyngeal swab repeated until it is proven to be negative.
- o 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 (for example, tuberculosis, *Clostridium difficile*, multi-drug resistant organisms).

XIII. Collection and handling of laboratory specimens

- o All specimens should be regarded as potentially infectious, and HCWs who collect or transport clinical specimens should adhere rigorously to standard precautions to minimize the possibility of exposure to pathogens.
- o Ensure that HCWs who collect specimens wear appropriate PPE.
- o Ensure that personnel who transport specimens are trained in safe handling practices and spill decontamination procedures.
- o Place specimens for transport in leak-proof specimen bags (secondary container) that have a separate sealable pocket for the specimen (that is, a plastic biohazard specimen bag), with the patient's label on the specimen container (primary container), and a clearly written request form.
- o Ensure that health-care facility laboratories adhere to appropriate biosafety practices and transport requirements according to the type of organism being handled.
- o Deliver all specimens by hand whenever possible. Do not use pneumatic-tube systems to transport specimens.
- o State the name of the suspected ARI of potential concern clearly on the accompanying request form. Notify the laboratory as soon as possible that the specimen is being transported.
- o For further information on specimen handling in the laboratory and laboratory testing for MERS-CoV, see CDC and WHO laboratory bio-risk management,^{5,6} and the laboratory testing for MERS-CoV,^{7,8} and CDC and WHO laboratory biosafety manuals.^{9,10}

XIV. Managing bodies in the mortuary

- o Deceased bodies may pose a potential risk of infections when handled by either family members or body washers.
- o Body washing must be done in the hospital
- o If family members wish to perform the body washing, they must strictly adhere to standard precautions and use PPE
- o When washing the body, wear gloves, N95 mask, a face shield (visor) or goggles, impermeable protective gown, and shoe cover. Observe hand hygiene. For transfer to the cemetery, use Ministry of Health approved body bag.

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إرشادات العزل المنزلي لحالات الإصابة بفيروس كورونا

المسبب لمتلازمة الشرق الأوسط التنفسية

٢٦ شعبان ١٤٣٥ هـ الموافق ٢٤ يونيو ٢٠١٤ م

- يُعرّف العزل بأنه فصل أنشطة الشخص المصاب بمرض معدٍ عن الأشخاص الأصحاء.
- قبل عزل الشخص المريض في المنزل يجب على متخصص الرعاية الصحية أن يقيّم مدى ملاءمة المنزل لعملية العزل ويمكن إجراء هذا التقييم عبر الهاتف أو الملاحظة المباشرة للأمور التالية:
 - يجب أن يحتوي المنزل على حمام تعمل جميع مرافقه على أكمل وجه وإذا كان هناك أكثر من حمام فيجب تخصيص أحدهم للشخص المريض فقط.
 - يجب أن يكون للشخص المريض سريره الخاص ويفضل أن يكون له غرفة النوم الخاصة به.
 - يجب توفر الخدمات الأساسية في المنزل مثل الكهرباء والمياه الساخنة والمياه الصالحة للشرب والصرف الصحي والهاتف.
 - يجب أن يتم تخصيص أحد الأشخاص كمساعد ليعتني بالمريض على أن تكون لديه القدرة على اتباع تعليمات الطبيب المعالج المتعلقة بالرعاية الطبية وتناول الأدوية. ويجب أن يساعد هذا الشخص المريض للحصول على احتياجاته الأساسية في المنزل، كما يجب أن يساعده في شراء مستلزمات المنزل والحصول على الأدوية الموصوفة في الوصفات الطبية.
- إذا كان المنزل ملائماً ومناسباً لعمليتي الرعاية والعزل فيجب إعطاء المريض ومساعدته وباقي أفراد الأسرة التعليمات التالية:

تعليمات للمريض

- امكث في المنزل
 - يجب عليك البقاء معزولاً في منزلك وعدم الخروج للعمل أو إلى الأماكن العامة أو الأسواق أو المساجد أو المدارس وعدم استعمال المواصلات العامة. يمكنك بطبيعة الحال الذهاب إلى الطبيب أو المستشفى عند الحاجة لذلك.
- اعزل نفسك عن الأشخاص الآخرين في المنزل
 - يجب أن تبقى في غرفة منفصلة عن الأشخاص الآخرين داخل المنزل قدر المستطاع، كما يجب أن تستخدم حماماً خاصاً بك إن أمكن ذلك.

- **قم بارتداء كمامة طبية**
يجب عليك ارتداء كمامة طبية عند تواجدك في غرفة واحدة مع أشخاص آخرين وأيضاً عند زيارة الطبيب المعالج. وإذا كنت لا تستطيع ارتداء كمامة طبية فيجب على من يقيمون معك ارتداء الكمامة هم أنفسهم إذا تواجدوا معك في نفس الغرفة.
- **قم بتغطية فمك وأنفك عند السعال أو العطس**
قم بتغطية فمك وأنفك بواسطة منديل عند السعال أو العطس وفي حالة عدم توفر منديل يجب تغطية فمك وأنفك باستخدام أكمام الثوب الذي ترتديه أو ذراعك وليس اليدين. قم بإلقاء المناديل المستعملة في سلة مهملات قابلة للغلق بإحكام ثم قم بغسل يديك على الفور بالماء والصابون أو تطهيرها باستعمال مطهر اليدين الكحولي الذي لا يحتاج إلى استخدام الماء.
- **اغسل يديك**
احرص على غسل يديك بشكل منتظم بواسطة الماء والصابون المطهر. إذا لم تكن يديك متسخة بشكل واضح يمكن استخدام مطهر كحولي لليدين كبديل للماء والصابون المطهر. تجنب لمس العينين والأنف والفم دون غسل اليدين.
- **تجنب مشاركة الأدوات المنزلية**
تجنب مشاركة الصحون وأكواب الشرب وأواني الطعام والمناشف وشراشف السرير وأي غرض آخر خاص بك مع الأشخاص الآخرين في المنزل. وبعد استخدامك لهذه الأغراض يجب عليك غسلها جيداً بالماء الدافئ والصابون.
- **اتصل هاتفياً بالطبيب قبل زيارته**
يجب عليك قبل موعدك الطبي الاتصال هاتفياً بطبيبك وإخباره باحتمال إصابتك بعدوى فيروس كورونا المسبب لمتلازمة الشرق الأوسط التنفسية حيث أن هذه الخطوة ستساعد العاملين في عيادة الطبيب على الاستعداد واتخاذ الإجراءات اللازمة لمنع انتقال العدوى للأشخاص الآخرين.

تعليمات لمساعد المريض ولأفراد الأسرة

إذا كنت تعيش في المنزل مع إحدى الحالات المرضية التي يشتبه في إصابتها بفيروس كورونا المسبب لمتلازمة الشرق الأوسط التنفسية أو كنت تقوم بتقديم الرعاية اللازمة لها فيجب عليك عمل الآتي:

- مساعدة المريض على صرف الأدوية الموجودة في الوصفات الطبية وتناولها بالإضافة إلى مساعدته على قضاء مستلزمات المنزل واحتياجاته الشخصية.

- يفضل أن يبقى في المنزل الأشخاص الضروريين لرعاية المريض مع خروج غيرهم إلى سكن آخر إن أمكن وإذا لم يكن ذلك متاحاً فيجب عليهم الإقامة في غرفة أخرى، أو الابتعاد عن الشخص المريض قدر الإمكان واستخدام حمام منفصل إن أمكن.
- يجب منع الزوار من الدخول على المريض.
- يجب أن يتعد كبار السن ومن لديهم مشاكل في الجهاز المناعي أو أمراض مزمنة أخرى عن المريض بما في ذلك حالات أمراض القلب المزمنة وأمراض الكلى والرتتين والسكر.
- يجب تهوية المنزل بصورة جيدة وذلك عبر تشغيل مكيفات الهواء أو فتح النوافذ.
- يجب ارتداء كمامة طبية ومريول واقى للجسد وقفازات عند التعامل مع دم المريض وسوائل الجسم الخاصة به أو إفرازاته مثل اللعاب والبلغم والمخاط الأنفي والقيء والبول والبراز.
- عند نزع أدوات الوقاية فابدأ بنزع القفاز أولاً ثم المريول ثم الكمامة.
- يجب التخلص من القفازات والمريول والكمامة الطبية بعد استخدامها مباشرة وعدم إعادة استخدامها مرة أخرى.
- اغسل يديك بالماء والصابون المطهر أو طهرهما بالكحول مباشرة بعد نزع القفازات والمريول والكمامة الطبية.
- احرص على غسل يديك بشكل منتظم بواسطة الماء والصابون المطهر. إذا لم تكن يدك متسخة بشكل واضح يمكن استخدام مطهر كحولي لليدين كبديل للماء والصابون المطهر.
- تجنب لمس العينين والأنف والفم دون غسل اليدين.
- تجنب استخدام أو لمس الأدوات الخاصة بالمريض كالأكواب والملاعق والشوك والسكاكين وأواني الطعام والمناشف وشراشف السرير ويجب عليك غسلها جيداً بالماء الدافئ والصابون بعد استخدام المريض لها.
- قم بتنظيف جميع الأسطح المكشوفة أو الأدوات الملوثة بدم المريض أو سوائل جسمه الأخرى أو إفرازاته مع مراعاة ارتداء القفازات ومريول للجسد أثناء تنظيف هذه الأسطح.
- قم يومياً بتنظيف الأسطح المكشوفة التي يتم لمسها بصورة متكررة مثل الطاولات الجانبية وهيك السرير وباقي أثاث غرفة النوم، وذلك باستخدام المنظفات المنزلية العادية أو سوائل التعقيم مع تخفيفها لدرجة كافية لمنع تلف هذه الأسطح (على سبيل المثال يستخدم مقدار واحد من الكلور المطهر مقابل ٩٩ مقداراً من الماء).
- قم بتنظيف الحمام وأسطح المراض بشكل يومي بواسطة المنظفات المنزلية العادية أو سوائل التعقيم مع تخفيفها قليلاً (يستخدم مقدار واحد من السائل مقابل ٩ مقادير من الماء).

■ غسل الملابس جيداً

- قم فوراً بنزع وغسل الملابس وأغطية الأسرة التي تحمل آثاراً للدم أو سوائل الجسم أو إفرازاته.
- قم بارتداء قفازات ومريول واقى للجسد عند حمل الأغراض الملوثة مع غسل أو تطهير اليدين فور نزعها.
- اغسل الأغراض بالماء الدافئ والمواد المنظفة لأطول وقت ممكن ثم قم بتجفيفها باستخدام مجفف الملابس.

■ ضع القفازات والكمامة ومريول الجسد المستخدمة في وعاء محكم الغلق قبل وضعها مع النفايات المنزلية الأخرى مع غسل اليدين أو تطهيرها بالكحول فوراً بعد التعامل مع هذه الأغراض.

■ اتبع الإرشادات الخاصة بالمخالطين مع المريض المذكورة أدناه.

تعليمات للمخالطين بما في ذلك العاملين في مجال الرعاية الصحية

إذا كنت خالطت عن قرب شخصاً مريضاً يشتبه بإصابته بفيروس كورونا المسبب لمتلازمة الشرق الأوسط التنفسية فيجب عليك اتباع الآتي:

■ مراقبة وضعك الصحي وقياس درجة حرارة جسمك مرتين يومياً لمدة ١٤ يوماً ابتداءً من آخر يوم خالطت فيه المريض والانتباه للأعراض التالية:

□ ارتفاع درجة الحرارة إلى ٣٨ درجة أو أكثر.

□ السعال.

□ ضيق التنفس.

□ أعراض أخرى مثل الإحساس بالبرودة وآلام الجسم والتهاب الحلق والصداع والإسهال والغثيان والقيء والرشح.

■ إذا ظهرت لديك بعض هذه الأعراض فيجب اتباع الإرشادات الوقائية المذكورة بالأعلى، بالإضافة إلى الاتصال بالطبيب في أسرع وقت ممكن. وقبل موعدك الطبي، يجب عليك الاتصال هاتفياً بطبيبك الخاص وإخباره باحتمال تعرضك لعدوى فيروس كورونا المسبب لمتلازمة الشرق الأوسط التنفسية. هذه الخطوة ستساعد العاملين في عيادة الطبيب على اتخاذ خطوات تمنع انتقال العدوى للأشخاص الآخرين. اطلب من طبيبك الاتصال بوزارة الصحة.

■ إذا لم تكن تعاني من أي أعراض فيمكنك الاستمرار في ممارسة أنشطتك اليومية مثل الذهاب إلى العمل أو المدرسة أو الأماكن العامة الأخرى.