Tools for Preparedness: Triage, screening and patient management for Middle East Respiratory Syndrome Coronavirus (MERS-CoV) infections in acute care settings

5th Revision: May 2016
Public Health Ontario

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This document was developed by the Provincial Infectious Diseases Advisory Committee on Infection Prevention and Control (PIDAC-IPC). PIDAC-IPC is a multidisciplinary scientific advisory body that provides evidence-based advice to Public Health Ontario (PHO) regarding multiple aspects of infectious disease identification, prevention and control. PIDAC-IPC’s work is guided by the best available evidence and updated as required. Best practice documents and tools produced by PIDAC-IPC reflect consensus on what the committee deems prudent practice and are made available as a resource to public health and health care providers. PHO assumes no responsibility for the results of the use of this document by anyone.

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NOTES: This document is intended to provide best practices only. Health care settings are encouraged to work towards these best practices in an effort to improve quality of care.

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The evidence in this document is current to June, 2013. New material in this revision is summarized in the table below. Revisions in the body of the text are highlighted.

Summary of amendments in 5th revision:

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<td>May-16</td>
<td>Countries affected by MERS-CoV</td>
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# Abbreviations

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<th>Abbreviation</th>
<th>Description</th>
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<tbody>
<tr>
<td>AIIR</td>
<td>airborne infection isolation room</td>
</tr>
<tr>
<td>ARDS</td>
<td>acute respiratory distress syndrome</td>
</tr>
<tr>
<td>ARI</td>
<td>acute respiratory infection</td>
</tr>
<tr>
<td>ED</td>
<td>emergency department</td>
</tr>
<tr>
<td>EDTA</td>
<td>ethylenediaminetetraacetic acid</td>
</tr>
<tr>
<td>ICU</td>
<td>intensive care unit</td>
</tr>
<tr>
<td>MERS-CoV</td>
<td>Middle East respiratory syndrome coronavirus</td>
</tr>
<tr>
<td>MOHLTC</td>
<td>Ministry of Health and Long-Term Care</td>
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<tr>
<td>PCR</td>
<td>polymerase chain reaction</td>
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<td>PHO</td>
<td>Public Health Ontario</td>
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<tr>
<td>PIDAC</td>
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Tools for Preparedness: Triage, Screening and Patient Management for Middle East Respiratory Syndrome Coronavirus (MERS-CoV) Infections in Acute Care Settings, 5th revision.

This tool is intended to assist frontline health care workers (primarily in emergency departments, although the principles are applicable in other urgent care settings) in the identification and immediate management of patients who present with severe acute respiratory infection that may be due to Middle East Respiratory Syndrome coronavirus (MERS-CoV). This tool should be used in conjunction with guidance from the Ministry of Health and Long-Term Care (MOHLTC), available at: www.ontario.ca/novelcoronavirus.

This tool is provided to supplement existing PIDAC documents, including Routine Practices and Additional Precautions in all Health Care Settings and Annex B: Prevention of Transmission of Acute Respiratory Infection in all Health Care Settings. All hospitals are expected to have infection prevention and control programs in place that address Routine Practices (risk assessment, hand hygiene, personal protective equipment, control of the environment, administrative controls), Additional Precautions (specific signage, accommodation and personal protective equipment, dedicated medical equipment, limited transport as well as communication with other departments/agencies) and other interventions for the prevention of transmission of acute respiratory infections.
Background

As of April 15, 2016, 1,714 human cases of illness (including at least 618 deaths) due to MERS-CoV have been described in twenty-six countries.¹ The illness usually presents as a severe acute respiratory infection. Pneumonia is common and gastrointestinal symptoms, including diarrhea, have been reported. Severe MERS-CoV can cause respiratory failure that requires mechanical ventilation and support in an intensive care unit. Some patients have had organ failure, especially of the kidneys, or septic shock. People with chronic diseases such as diabetes, cancer, and chronic lung disease, as well as the immunocompromised, are vulnerable to more severe disease.² Information on the current incidence of MERS-CoV, including an international travel update, may be obtained from the World Health Organization at: www.who.int/csr/disease/coronavirus_infections/en/index.html.

MERS-CoV infection is a zoonotic infection with reservoir in camels. Person-to-person transmission occurs via the droplet-contact route when there is close contact, such as providing clinical care to an infected person without following proper infection prevention and control measures.² Transmission has occurred in health care settings to health care workers and other patients, and in households. The majority of MERS-CoV cases are reported from the Middle East, mainly from Saudi Arabia.³ A large outbreak in the Republic of Korea (182 cases and 32 deaths as of June 27, 2015) resulted from introduction by a returning traveller. There is neither evidence of sustained human-to-human transmission in the community⁷ nor evidence of airborne transmission.⁴

Health care providers and acute care facilities around the world should be conducting surveillance to identify cases of MERS-CoV that may present to their facilities, and to prevent transmission from such cases if they occur.⁴
# Checklist for Preparedness Before the First MERS-CoV Patient Arrives

<table>
<thead>
<tr>
<th>DOMAIN</th>
<th>ELEMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surveillance</td>
<td>□ Establish institutional responsibility for tracking information about MERS-CoV (and other emerging pathogens).</td>
</tr>
</tbody>
</table>
| Education       | □ Ensure that emergency department (ED) staff is aware of clinical and exposure screening criteria and is updated as needed regarding case definition and screening for travel history.  
□ Consider audits of ED triage screening.  
□ Provide information to health care providers [particularly nurses, physicians, respiratory therapists; focus on ED and intensive care unit (ICU)] on precautions to be taken for patients with suspect/confirmed MERS-CoV infection.                                                                                                                                                                                                                                                                                                                                                     |
| Laboratory Readiness | Establish:  
□ A notification system for laboratory regarding suspect patients.  
□ A mechanism for notification and prompt delivery of specimens from suspected patients to your public health laboratory.  
□ A system for communicating results to relevant staff and departments; a MERS-CoV result should be treated as a critical result.  
□ Safety protocols for laboratory staff who will be handling specimens.                                                                                                                                                                                                                                                                                                                                                                                               |
| Communication   | □ Draft an outline of a communication plan associated with admission of a suspect/confirmed case.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Planning        | □ Develop a patient management plan.  
□ Review/update plan semi-annually.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Case Treatment  | □ Consider participation in investigations to describe clinical features and epidemiology and investigate new therapy (e.g., [http://isaric.tghn.org](http://isaric.tghn.org)).                                                                                                                                                                                                                                                                                                                                                                                                                                      |
## Checklist for Components of a Patient Management Plan

<table>
<thead>
<tr>
<th>DOMAIN</th>
<th>ELEMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Accommodation</strong></td>
<td>☐ Identify appropriate room in ED for patients being investigated for disease.</td>
</tr>
<tr>
<td></td>
<td>☐ Establish timeline for movement of patient out of ED if admission is required.</td>
</tr>
<tr>
<td><strong>Additional Precautions</strong></td>
<td>☐ Patients should be accommodated in an airborne infection isolation room (AIIR) when possible.</td>
</tr>
<tr>
<td></td>
<td>☐ Health care workers should use both Droplet/Contact and Airborne Precautions (i.e., use of gown, gloves, eye protection, N95 respirator1).</td>
</tr>
<tr>
<td></td>
<td>☐ Patients should wear a surgical mask during transportation, if tolerated.</td>
</tr>
<tr>
<td></td>
<td>☐ Ensure that precautions are initiated whenever a case is suspected; precautions to be discontinued by infection prevention and control staff or their designate when case is cleared.</td>
</tr>
<tr>
<td><strong>Diagnosis</strong></td>
<td>☐ Document the process for confirming that patient meets the case definition and requires testing.</td>
</tr>
<tr>
<td></td>
<td>☐ Consider availability of materials to remind staff how to obtain specimens using appropriate precautions.</td>
</tr>
<tr>
<td></td>
<td>☐ Document the process and communications required for rapid transport and testing of relevant specimens.</td>
</tr>
<tr>
<td><strong>Communication</strong></td>
<td>☐ Notify local public health unit and public health laboratory.</td>
</tr>
<tr>
<td></td>
<td>☐ Notify pre-designated internal stakeholders as per plan (e.g., senior management team, occupational health, infection prevention and control, communications, microbiology laboratory).</td>
</tr>
</tbody>
</table>

1 In Ontario, the Ministry of Health and Long-Term Care recommends the use of a fit-tested, seal-checked N95 respirator and AIIR for MERS-CoV. This advice differs from guidance from the Public Health Agency of Canada.
<table>
<thead>
<tr>
<th>DOMAIN</th>
<th>ELEMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Education/Training</strong></td>
<td>□ Establish mechanism for updating institution’s knowledge regarding status of MERS-CoV (e.g., MOHLTC guidance).</td>
</tr>
<tr>
<td></td>
<td>□ Define what materials will be needed (e.g., Q&amp;A for ED/ICU staff; email to senior management; reassurance to laboratory staff who will be handling specimens) and who will be responsible for drafting and review.</td>
</tr>
<tr>
<td></td>
<td>□ Define which hospital departments may be providing care and/or provide diagnostic services for the patient and require information (e.g., nursing areas, respiratory therapy, physiotherapy, occupational therapy, nutrition, diagnostic imaging, pastoral care, laboratories, pharmacy, volunteers, security).</td>
</tr>
<tr>
<td></td>
<td>□ Define contractors and external agencies whose employees may have been exposed (e.g., emergency medical services, other first responders, home care services).</td>
</tr>
<tr>
<td></td>
<td>□ Draft messages/information needed for family and visitors in collaboration with local public health unit.</td>
</tr>
<tr>
<td></td>
<td>□ Limit visitors to family and household contacts and provide education on PPE requirements and use.</td>
</tr>
<tr>
<td><strong>Follow-up for</strong></td>
<td>□ Consult with public health authorities regarding risk assessment, and develop a plan for follow-up of exposed staff and visitors.</td>
</tr>
<tr>
<td>Identification of Transmission</td>
<td>□ Report to local public health unit to identify and manage relevant out of hospital exposures.</td>
</tr>
<tr>
<td></td>
<td>□ Confirm guidelines for follow-up for staff and patients (e.g., World Health Organization, Public Health Agency of Canada).</td>
</tr>
<tr>
<td></td>
<td>□ Identify staff/patients/visitors who require follow-up.</td>
</tr>
<tr>
<td></td>
<td>□ Report any occupational illness to the Ministry of Labour, the joint health and safety committee (or health and safety representative), and the trade union, if any.</td>
</tr>
</tbody>
</table>
Guidance for Exposure Follow-up in Acute Care Settings

Laboratory testing


Who requires follow-up?

Health care workers are expected to use Routine Practices and Contact, Droplet and Airborne Precautions when at risk of exposure to a confirmed case, a probable case, or persons under investigation and/or the patient’s environment. Following unprotected exposure to a confirmed or probable case, a risk assessment will be conducted by an appropriate infection prevention and control, occupational health or public health professional to determine the need for, and degree of, follow-up and surveillance of a worker. The following health care workers are a high priority for follow-up:

- A worker who provided direct clinical or personal care to, or examined, a symptomatic confirmed or probable case involving direct face-to-face contact within two metres of the case OR
  - A worker in the same room at the time an aerosol-generating procedure was performed on a confirmed or probable case

AND

- who was not wearing gown/gloves/eye protection/N95 respirator

Visitors who require follow-up (by local public health unit):

- Visitors at the bedside of a confirmed case for more than 15 minutes without wearing gown/gloves/surgical mask/eye protection (i.e., not adhering to Droplet/Contact Precautions)
What follow-up is required?

For those who require follow-up:

- Assess daily for respiratory symptoms for 14 days (may be active or passive for persons not present in the hospital; those working should be screened at the beginning of each work shift).
- If fever or any respiratory symptoms develop, exclude the individual from work and restrict to home.
- Collect appropriate laboratory specimen for persons under investigation for possible MERS-CoV infection.
- Collect acute (as soon as convenient after exposure is identified) and convalescent (day 21 after last exposure) serology for MERS-CoV antibody testing.

Screening and Patient Management Algorithm for Middle East Respiratory Syndrome Coronavirus (MERS-CoV)¹

1. Initiate Airborne + Droplet/Contact Precautions.
2. Notify local public health unit.
3. Test for viral/bacterial respiratory pathogens and send the following specimens to Public Health Ontario Laboratory (PHOL)⁴:
   - Nasopharyngeal swab (NPS) AND viral throat swab.
   - Sputum, pleural fluid, lung tissue; bronchoalveolar lavage (BAL), if done.
   - Blood for serology, acute and convalescent.
   - Stool, if diarrhea, in dry sterile container.

Notes:
1. This algorithm is intended to be applied to individual cases presenting to Emergency Departments (and urgent care centres) and should not be used to identify clusters. For a complete list of exposure criteria, visit: [www.health.gov.on.ca/en/pro/programs/publichealth/coronavirus/guidance.aspx](http://www.health.gov.on.ca/en/pro/programs/publichealth/coronavirus/guidance.aspx).
2. Acute Respiratory Infection (ARI): Any new onset acute respiratory infection that could potentially be spread by the droplet route (either upper or lower respiratory tract), which presents with symptoms of a new or worsening cough or shortness of breath and often fever (also known as febrile respiratory illness, or FRI). Note that elderly people who are immunocompromised may not have a febrile response to a respiratory infection.
4. PHOL may test patients for MERS-CoV beyond the criteria in the person-under-investigation definition if requested and discussed with the medical microbiologist at PHOL. See PHOL MERS-CoV Test Information Sheet prior to submission of specimens: [www.publichealthontario.ca/en/ServicesAndTools/LaboratoryServices/Pages/Middle-Eastern-Respiratory-Syndrome-Coronavirus-(MERS-CoV).aspx](http://www.publichealthontario.ca/en/ServicesAndTools/LaboratoryServices/Pages/Middle-Eastern-Respiratory-Syndrome-Coronavirus-(MERS-CoV).aspx).

1. Airborne + Droplet/Contact Precautions or pathogen-specific precautions.
2. Discontinue Airborne Precautions.
3. Continue Airborne + Droplet/Contact Precautions.
4. Report to local public health unit.
5. Report occupational illness to Ministry of Labour, joint health and safety committee (or health and safety representative), WSIB and trade union, if any.
6. Initiate investigation and exposure follow-up.

Tools for Preparedness: MERS-CoV Infections in Acute Care | May 2016
References


Bibliography/Further Reading


3. Middle East Respiratory Syndrome Coronavirus (MERS-CoV) Test Information Sheet: http://www.publichealthontario.ca/en/ServicesAndTools/LaboratoryServices/Pages/Middle-Eastern-Respiratory-Syndrome-Coronavirus-(MERS-CoV).aspx


   No special handling required for diagnostic specimens in hospital laboratories