

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

Public Health Ontario is a Crown corporation dedicated to protecting and promoting the health of all Ontarians and reducing inequities in health. Public Health Ontario links public health practitioners, frontline health workers and researchers to the best scientific intelligence and knowledge from around the world.

Public Health Ontario provides expert scientific and technical support to government, local public health units and health care providers relating to the following:

- Communicable and infectious diseases
- infection prevention and control
- environmental and occupational health
- emergency preparedness
- health promotion, chronic disease and injury prevention
- public health laboratory services

Public Health Ontario's work also includes surveillance, epidemiology, research, professional development and knowledge services. For more information, visit www.publichealthontario.ca

How to cite this document:

Ontario Agency for Health Protection and Promotion (Public Health Ontario), Provincial Infectious Diseases Advisory Committee. 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. Toronto, ON: Queen's Printer for Ontario; 2016.

Public Health Ontario acknowledges the financial support of the Ontario Government.

©Queen's Printer for Ontario, 2016

Publication history:

1st Revision: October 2013

2nd Revision: May 2014

3rd Revision: June 2014

4th Revision: July 2015

5th Revision: May 2016

Disclaimer

Disclaimer for Best Practice Documents:

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.

This document may be reproduced without permission for non-commercial purposes only and provided that appropriate credit is given to Public Health Ontario. No changes and/or modifications can be made to this document without explicit written permission from Public Health Ontario.

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.

Provincial Infectious Diseases Advisory Committee (PIDAC)

Tel: 647-260-7100 Email: pidac@oahpp.ca

Tools for Preparedness: Triage, screening and patient management for Middle East Respiratory Syndrome Coronavirus (MERS-CoV) infections in acute care settings, 5th revision.

First published: June 2013

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:

| Date of Implementation | Description of Major Changes | Page |
|------------------------|---|------|
| May-16 | Countries affected by MERS-CoV, morbidity and mortality, and mode of transmission | 4 |
| May-16 | Countries affected by MERS-CoV | 10 |

Authors/Contributors

PIDAC-IPC MEMBERS:

Dr. Matthew Muller, chair

Medical Director, IPC

St. Michael's Hospital, Toronto

Chingiz Amirov

Director, IPAC

Baycrest Health Sciences

Dr. Irene Armstrong

Associate Medical Officer of Health

Toronto Public Health, Toronto

Anne Bialachowski

Manager, IPAC

St. Joseph's Health Centre, Hamilton

Sandra Callery

Director, IPAC

Sunnybrook Health Sciences Centre, Toronto

Dr. William Ciccotelli

Infectious Disease and Medical Microbiology

Grand River Hospital, Kitchener

Judy Dennis

Manager, IPAC

Children's Hospital of Eastern Ontario, Ottawa

Dr. Susy Hota

IPAC Medical Specialist

University Health Network, Toronto General

Hospital, Toronto

Dr. Allison McGeer

Director, Infection Control

Mount Sinai Hospital, Toronto

Vydia Nankoosingh

Manager, IPAC

The Scarborough Hospital, Toronto

Catherine Richard

Manager, Occupational Health & Safety Program

Champlain Community Care Access Centre

EX-OFFICIO MEMBERS:

Erika Bontovics

Manager, Infectious Diseases Policy and Programs

Ministry of Health and Long-Term Care, Toronto

Dr. Gary Garber

Chief, IPAC

Public Health Ontario, Ottawa

Dr. Leon Genesove

Chief Physician, Health Care Unit

Occupational Health and Safety Branch

Ministry of Labour, Toronto

PUBLIC HEALTH ONTARIO STAFF:

Dr. Maureen Cividino

IPAC Physician

Tim Cronsberry

Director (Acting), IPAC

Dr. Jennie Johnstone

IPAC Physician

Dr. Kevin Katz

IPAC Physician

Mabel Lim

IPAC Specialist/Technical Writer

Eva Truong

Administrative Assistant

Dr. Mary Vearncombe

IPAC Physician

Acknowledgements

PIDAC-IPC would like to acknowledge the contribution and expertise of the following individuals who participated in developing the first published edition of this document:

PIDAC-IPC MEMBERS:

Dr. Mary Vearncombe, chair

Medical Director
IPAC, Microbiology
Sunnybrook Health Sciences Centre, Toronto

Dr. Irene Armstrong

Associate Medical Officer of Health
Toronto Public Health, Toronto

Wendy Beauparlant

LTC Consultant
Extendicare (Canada) Inc., Sudbury

Anne Bialachowski

Manager, IPAC
St. Joseph's Healthcare, Hamilton

Rena Burkholder

IPAC Professional
Guelph General Hospital, Guelph

Sandra Callery

Director, IPAC
Sunnybrook Health Sciences Centre, Toronto

Judy Dennis

Manager, IPAC
Children's Hospital of Eastern Ontario, Ottawa

Dr. Susy Hota

IPAC Medical Specialist
Toronto General Hospital, Toronto

Dr. Kevin Katz

Infectious Diseases Specialist and Medical
Microbiologist
Medical Director, Infection Prevention and Control
North York General Hospital, Toronto

Dr. Allison McGeer

Director, Infection Control
Mount Sinai Hospital, Toronto

Shirley McLaren

Director of Client Services
CBI Home Health, Kingston

Dr. Matthew Muller

Medical Director, IPC
St. Michael's Hospital, Toronto

EX-OFFICIO MEMBERS:

Erika Bontovics

Manager, Infectious Diseases Policy and Programs
Ministry of Health and Long-Term Care, Toronto

Dr. Gary Garber

Scientific Lead
Medical Director, IPAC
Public Health Ontario, Toronto

Dr. Leon Genesove

Chief Physician, Health Care Unit
Occupational Health and Safety Branch
Ministry of Labour, Toronto

PUBLIC HEALTH ONTARIO STAFF:

Dr. Maureen Cividino

IPAC Physician

Tim Cronsberry

Manager, Regional Infection Control Network

Shirley McDonald

IPAC Resource Expert/Technical Writer

Dr. Samir Patel

Clinical Microbiologist, PHOL

Table of Contents

| | |
|---|------------------------------|
| Abbreviations | 2 |
| Background | 4 |
| Checklist for Preparedness Before the First MERS-CoV Patient Arrives | 5 |
| Checklist for Components of a Patient Management Plan | 6 |
| Guidance for Exposure Follow-up in Acute Care Settings | 8 |
| Laboratory testing | 8 |
| Who requires follow-up?..... | 8 |
| What follow-up is required?..... | 9 |
| Screening and Patient Management Algorithm for Middle East Respiratory Syndrome Coronavirus (MERS-CoV) | 10 |
| References | Error! Bookmark not defined. |
| Bibliography/Further Reading | 12 |

Abbreviations

| | |
|-----------------|---|
| AIIR | airborne infection isolation room |
| ARDS | acute respiratory distress syndrome |
| ARI | acute respiratory infection |
| ED | emergency department |
| EDTA | ethylenediaminetetraacetic acid |
| ICU | intensive care unit |
| MERS-CoV | Middle East respiratory syndrome coronavirus |
| MOHLTC | Ministry of Health and Long-Term Care |
| PCR | polymerase chain reaction |
| PHO | Public Health Ontario |
| PIDAC | Provincial Infectious Diseases Advisory Committee |

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, 1714 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 community² 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

| DOMANI | ELEMENTS |
|-----------------------------|---|
| Surveillance | <input type="checkbox"/> Establish institutional responsibility for tracking information about MERS-CoV (and other emerging pathogens). |
| Education | <input type="checkbox"/> 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. <input type="checkbox"/> Consider audits of ED triage screening. <input type="checkbox"/> 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: <ul style="list-style-type: none"> <input type="checkbox"/> A notification system for laboratory regarding suspect patients. <input type="checkbox"/> A mechanism for notification and prompt delivery of specimens from suspected patients to your public health laboratory. <input type="checkbox"/> A system for communicating results to relevant staff and departments; a MERS-CoV result should be treated as a critical result. <input type="checkbox"/> Safety protocols for laboratory staff who will be handling specimens. |
| Communication | <input type="checkbox"/> Draft an outline of a communication plan associated with admission of a suspect/confirmed case. |
| Planning | <input type="checkbox"/> Develop a patient management plan. <input type="checkbox"/> Review/update plan semi-annually. |
| Case Treatment | <input type="checkbox"/> Consider participation in investigations to describe clinical features and epidemiology and investigate new therapy (e.g., http://isaric.tghn.org). |

Checklist for Components of a Patient Management Plan

| DOMAIN | ELEMENTS |
|-------------------------------|--|
| Accommodation | <ul style="list-style-type: none"> <input type="checkbox"/> Identify appropriate room in ED for patients being investigated for disease. <input type="checkbox"/> Establish timeline for movement of patient out of ED if admission is required. |
| Additional Precautions | <ul style="list-style-type: none"> <input type="checkbox"/> Patients should be accommodated in an airborne infection isolation room (AIIR) when possible. <input type="checkbox"/> Health care workers should use both Droplet/Contact and Airborne Precautions (i.e., use of gown, gloves, eye protection, N95 respirator¹). <input type="checkbox"/> Patients should wear a surgical mask during transportation, if tolerated. <input type="checkbox"/> 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. |
| Diagnosis | <ul style="list-style-type: none"> <input type="checkbox"/> Document the process for confirming that patient meets the case definition and requires testing. <input type="checkbox"/> Consider availability of materials to remind staff how to obtain specimens using appropriate precautions. <input type="checkbox"/> Document the process and communications required for rapid transport and testing of relevant specimens. |
| Communication | <ul style="list-style-type: none"> <input type="checkbox"/> Notify local public health unit and public health laboratory. <input type="checkbox"/> Notify pre-designated internal stakeholders as per plan (e.g., senior management team, occupational health, infection prevention and control, communications, microbiology laboratory). |

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.

| DOMAIN | ELEMENTS |
|---|--|
| Education/ Training | <ul style="list-style-type: none"> <input type="checkbox"/> Establish mechanism for updating institution’s knowledge regarding status of MERS-CoV (e.g., MOHLTC guidance). <input type="checkbox"/> Define what materials will be needed (e.g., Q&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. <input type="checkbox"/> 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). <input type="checkbox"/> Define contractors and external agencies whose employees may have been exposed (e.g., emergency medical services, other first responders, home care services). <input type="checkbox"/> Draft messages/information needed for family and visitors in collaboration with local public health unit. <input type="checkbox"/> Limit visitors to family and household contacts and provide education on PPE requirements and use. |
| Follow-up for Identification of Transmission | <ul style="list-style-type: none"> <input type="checkbox"/> Consult with public health authorities regarding risk assessment, and develop a plan for follow-up of exposed staff and visitors. <input type="checkbox"/> Report to local public health unit to identify and manage relevant out of hospital exposures. <input type="checkbox"/> Confirm guidelines for follow-up for staff and patients (e.g., World Health Organization, Public Health Agency of Canada). <input type="checkbox"/> Identify staff/patients/visitors who require follow-up. <input type="checkbox"/> 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. |

Guidance for Exposure Follow-up in Acute Care Settings

Laboratory testing

The Public Health Ontario Laboratory provides testing for MERS-CoV. For more details and information on laboratory testing procedures, see MOHLTC Guidance for Health Workers and Health Sector Employees, available at: www.health.gov.on.ca/en/pro/programs/publichealth/coronavirus/guidance.aspx, and Public Health Ontario Laboratory MERS-CoV Test Information Sheet, available at: [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).

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)

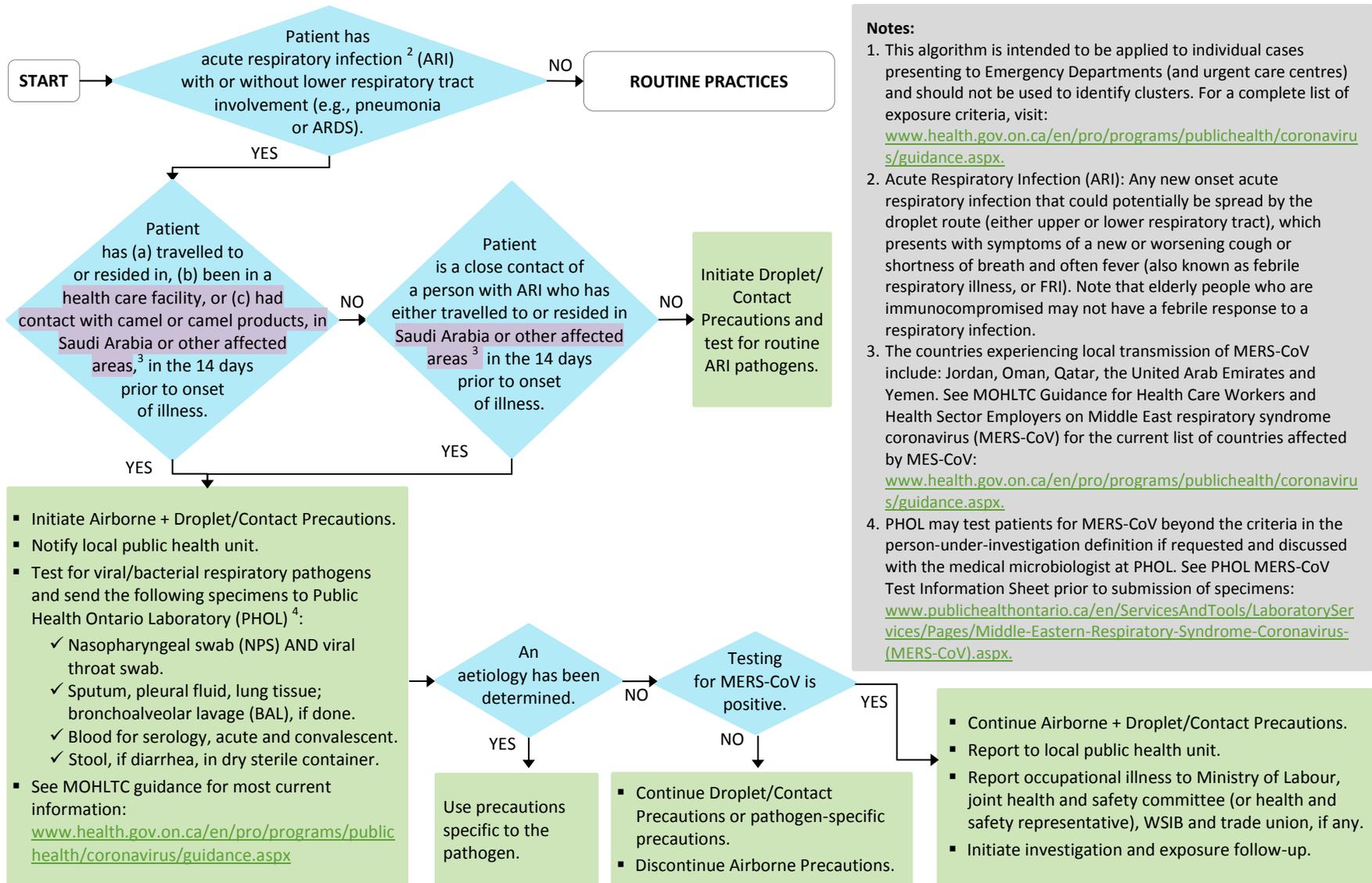
What follow-up is required?

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.

For the most current information, see MOHLTC Guidance for Health Workers and Health Sector Employees, available at: www.health.gov.on.ca/en/pro/programs/publichealth/coronavirus/guidance.aspx

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



References

1. Middle East respiratory syndrome coronavirus (MERS-CoV) [Internet]. Geneva: World Health Organization; 2016 [cited 2016 Apr 15]. Available from: www.who.int/emergencies/mers-cov/en/
2. Emergencies preparedness, response. Frequently asked questions on Middle East respiratory syndrome coronavirus (MERS-CoV) [Internet]. Geneva: World Health Organization; 2015 [cited 2016 Feb 24]. Available from: www.who.int/csr/disease/coronavirus_infections/faq/en/#
3. European Centre for Disease Prevention and Control. Rapid risk assessment: severe respiratory disease associated with Middle East respiratory syndrome coronavirus (MERS-CoV) [Internet]. 15th update ed. Stockholm: European Centre for Disease Prevention and Control; 2015 [cited 2015 Apr 15]. Available from: http://ecdc.europa.eu/en/publications/Publications/MERS_update_08-Mar2014.pdf
4. World Health Organization. Summary and risk assessment of current situation in Republic of Korea and China [Internet]. 2015 June 3 ed. Geneva: World Health Organization; 2015 [cited 2015 Jun 11]. Available from: www.who.int/csr/disease/coronavirus_infections/risk-assessment-3june2015/en/

Bibliography/Further Reading

1. Information for Health Workers and Health Sector Employers regarding MERS-CoV: www.health.gov.on.ca/en/pro/programs/publichealth/coronavirus/guidance.aspx
2. Ontario Ministry of Health and Long-Term Care website on MERS-CoV: www.health.gov.on.ca/en/pro/programs/publichealth/coronavirus/Default.aspx
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](http://www.publichealthontario.ca/en/ServicesAndTools/LaboratoryServices/Pages/Middle-Eastern-Respiratory-Syndrome-Coronavirus-(MERS-CoV).aspx)
4. World Health Organization guidance on MERS-CoV: www.who.int/csr/disease/coronavirus_infections/en/
5. Public Health Agency of Canada (PHAC) Interim Guidance – MERS-CoV: www.phac-aspc.gc.ca/erie/coronavirus/guidance-directives/nCoV-ig-dp-eng.php
6. U.S. Centers for Disease Control and Prevention Guidance: www.cdc.gov/coronavirus/mers/index.html
7. Public Health England Guidance – MERS-CoV: www.hpa.org.uk/Topics/InfectiousDiseases/InfectionsAZ/MERSCoV/
8. PHAC Biosafety guidance for specimens: www.phac-aspc.gc.ca/lab-bio/res/advi-avis/hce-che-2013-01-22-eng.php
No special handling required for diagnostic specimens in hospital laboratories

Public Health Ontario

480 University Avenue, Suite 300

Toronto, Ontario

M5G 1V2

647.260.7100

communications@oahpp.ca

www.publichealthontario.ca

