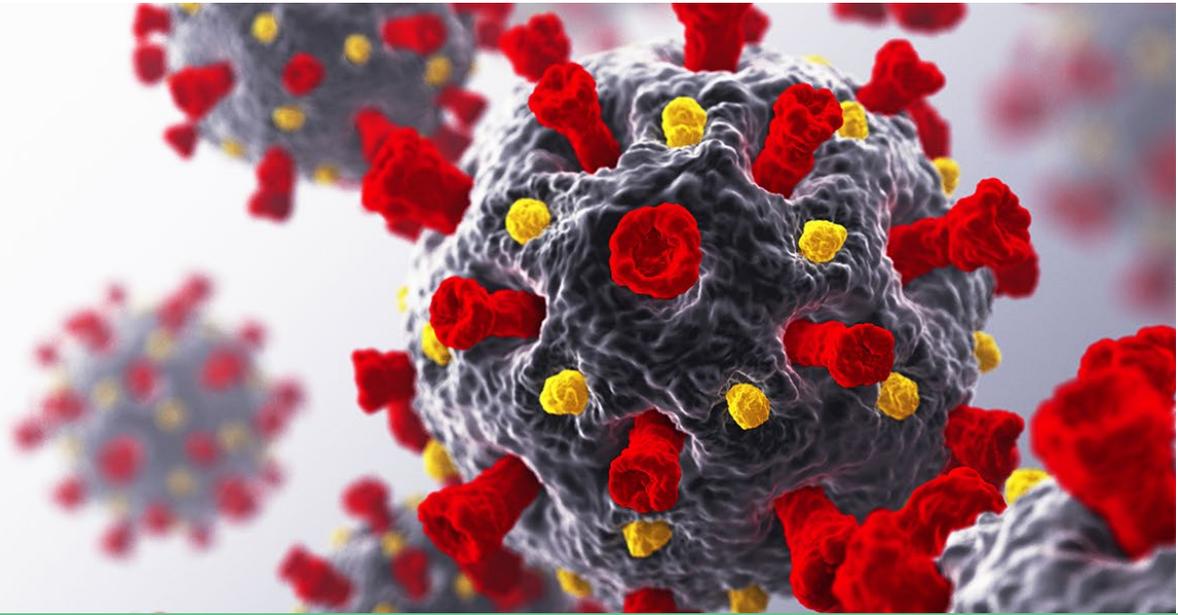


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# Best Practices for Managing COVID-19 Outbreaks in Acute Care Settings

March 2021

## Public Health Ontario

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# Abbreviations

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COVID-19	coronavirus disease 2019
ED	emergency department
HD	hemodialysis
IPAC	infection prevention and control
JHSC	joint health and safety committee
OHS	occupational health and safety
OMT	outbreak management team
PPE	personal protective equipment
PUI	patient under investigation
RT-PCR	reverse transcription polymerase chain reaction
SARS-CoV-2	Severe Acute Respiratory Syndrome coronavirus 2

# Glossary of Terms

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**Additional Precautions:** Precautions (i.e., Contact Precautions, Droplet Precautions and Airborne Precautions) that are necessary in addition to Routine Practices for certain pathogens or clinical presentations. These precautions are based on the method of transmission (e.g., contact, droplet, airborne).<sup>1</sup>

**Aerosol:** Small droplet of moisture that may carry microorganisms. Aerosols may be light enough to remain suspended in the air for short periods of time, allowing inhalation of the microorganism.

**Audit:** A systematic and independent examination to determine whether quality activities and related results comply with planned arrangements, are implemented effectively and are suitable to achieve objectives.

**Backward contact tracing:** The process of retrospectively identifying the source of infection of the case under investigation in order to identify further cases and contacts.<sup>2</sup> Backwards contact tracing involves searching for the source of the exposure to the case under investigation. Exposure of the case to any known COVID-19 case or symptomatic individual and a travel history over the previous 14 days should be sought. If a potential source case is identified, forward tracing from the newly identified source case may identify other positive cases. Backwards contact tracing for inpatients requires collaboration between infection prevention and control, occupational health and public health (to identify exposures prior to hospitalization). See also Forward contact tracing.

**Cleaning:** The physical removal of foreign material (e.g., dust, soil) and organic material (e.g., blood, secretions, excretions, microorganisms). Cleaning physically removes rather than kills microorganisms. It is accomplished with water, detergents and mechanical action.

**Contact Precautions:** Precautions used in addition to Routine Practices to reduce the risk of transmitting infectious agents via contact with an infectious person.

**Disinfection:** The inactivation of disease-producing microorganisms. Disinfection does not destroy bacterial spores. Medical equipment/devices must be cleaned thoroughly before effective disinfection can take place.

**Droplet transmission:** Transmission that occurs when the droplets that contain microorganisms are propelled a short distance (within 2 metres) through the air and are deposited on the mucous membranes of another person, leading to infection of the susceptible host. Droplets can also contaminate surfaces and contribute to Contact transmission.<sup>3</sup>

**Eye protection:** A device that covers the eyes and is used by health care providers to protect the eyes when it is anticipated that a procedure or care activity is likely to generate splashes or sprays of blood, body fluids, secretions or excretions, or within two metres of a coughing resident. Eye protection includes safety glasses, safety goggles, face shields and visors.

**Forward contact tracing:** The process of identifying and quarantining contacts who were exposed to the case under investigation, in order to stop further transmission.<sup>2</sup> Forward contact tracing involves identifying individuals with unprotected exposure to a case during the case's infectious period. See also Backward contact tracing.

**Hand hygiene:** A general term referring to any action of hand cleaning. Hand hygiene relates to the removal of visible soil and removal or killing of transient microorganisms from the hands. Hand hygiene may be accomplished using an alcohol-based hand rub or soap and running water. Hand hygiene includes surgical hand antisepsis.<sup>1</sup>

**Health care facility:** A set of physical infrastructure elements supporting the delivery of health-related services. A health care facility does not include a patient's home or physician/dentist/other health offices where health care may be provided.<sup>1</sup>

**Health care provider:** Any person delivering care to a patient. This includes, but is not limited to, the following: emergency service workers, physicians, dentists, nurses, respiratory therapists and other health professionals, personal support workers, clinical instructors, students and home health care workers. In some non-acute settings, volunteers might provide care and would be included as health care providers. See also Staff.

**High risk exposure (to a patient with COVID-19):** High risk exposures are exposures which, after an assessment of factors that may increase the risk of transmission from an infected case to a susceptible individual (e.g., duration of time in proximity, distance, use of personal protective equipment, occurrence of aerosol-generating medical procedures, direct physical contact or contact with respiratory secretions, hand hygiene), there is considered to be a significant likelihood that the exposed individual will develop COVID-19. Specific guidance on what constitutes a high risk exposure can be found in [Management of cases and contacts of COVID-19 in Ontario](#).<sup>4</sup> High risk exposures may occur from an infected patient or health care provider or support staff to a susceptible patient or health care provider or support staff.

**Low risk exposure (to a patient with COVID-19):** Low risk exposures are exposures that, after consideration of the same risk factors for transmission used to defined a high risk exposure (See High risk exposure) do not meet high risk exposure criteria, but where the exposure is still considered sufficient to impart some risk of COVID-19 acquisition. Specific guidance on what constitutes a low risk exposure can be found in [Management of cases and contacts of COVID-19 in Ontario](#).<sup>4</sup> Low risk exposures may occur from an infected patient or health care provider or support staff to a susceptible patient or health care provider or support staff.

**Nosocomial:** Arising while a patient is in a hospital or as a result of being in a hospital. Denoting a new disorder (unrelated to the patient's primary condition) associated with being in a hospital.

**Occupational Health and Safety (OHS):** Preventive and therapeutic health services in the workplace provided by trained occupational health professionals, e.g., nurses, hygienists, physicians.

**Outbreak:** An outbreak is an increase in the number of cases above the number normally occurring in a particular health care setting over a defined period of time. In Ontario, there is a specific definition for a nosocomial COVID-19 outbreak for acute care settings. This definition requires the identification of two COVID-19 cases in patients and/or staff within a defined area and over a 14-day period where acquisition of COVID-19 may reasonably have occurred within the health care facility.

**Personal protective equipment (PPE):** Clothing or equipment worn for protection against hazards.<sup>1</sup>

**Point Prevalence:** A point prevalence involves testing all patients or staff in a specific clinical area for SARS-CoV-2 on a single day, or within a defined time period, to identify all asymptomatic and symptomatic cases of COVID-19 within the area.

**Precautions:** Interventions to reduce the risk of transmission of microorganisms (e.g., resident-to-resident, resident-to-staff, staff-to-resident, contact with the environment, contact with contaminated equipment).

**Staff:** Anyone conducting activities in settings where health care is provided, including but not limited to, health care providers.<sup>1</sup> See also Health care providers.

**Suspect outbreak (COVID-19):** A suspect COVID-19 outbreak in the acute care setting is a single case of COVID-19 in a patient or staff most likely resulting from nosocomial transmission or two to three cases occurring in a defined area within a 14 day period where community transmission is likely, but where nosocomial transmission remains possible.

# Preamble

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Severe Acute Respiratory Syndrome coronavirus 2 (SARS-CoV-2) is the viral agent causing the current coronavirus disease 2019 (COVID-19) pandemic. Although the majority of transmission is occurring in community settings, outbreaks occur frequently in acute care,<sup>5-12</sup> complex continuing care/rehabilitation, and long-term care<sup>13-32</sup> settings and must be identified rapidly and controlled to minimize risks to patients and hospital staff.

Although guidance exists for the management of viral respiratory outbreaks in long-term care homes in Ontario,<sup>33</sup> and similar approaches have been taken in acute care, SARS-CoV-2 has unique epidemiological features that require a distinct approach to outbreak recognition and management.

This document provides guidance on the recognition and management of COVID-19 outbreaks in acute care facilities, including high-risk outpatient areas in these facilities (e.g., hemodialysis units, infusion clinics, emergency departments). Recommendations in this document are based on evidence to date on the mode of transmission of SARS-CoV-2, reports on outbreak investigations for COVID-19, interim professional guidance for infection prevention and control for SARS-CoV-2, and expert opinion. As new information becomes available, the recommendations in this document will be revised as necessary.

This document is intended for those who have a role in infection prevention and control, patient safety, quality improvement, risk management, or occupational health and safety in Ontario acute care hospitals. Although developed from an acute care perspective, the outbreak management framework presented here may also be useful in complex continuing care and rehabilitation settings. In addition, microbiologists, administrators and clinicians will also find the information in this document useful.

As our understanding of SARS-CoV-2 and COVID-19 is changing rapidly, these guidelines need to be interpreted in light of the local context, changing evidence, and in consultation with public health, infection prevention and control (IPAC) and occupational health and safety (OHS) teams.

# 1. Epidemiology of SARS-CoV-2 and COVID-19

SARS-CoV-2 transmission requires prolonged close contact in most cases, with secondary attack rates in households of 10% to 50%<sup>34,35</sup> and evidence of limited transmission to those with either transient exposure, or contact at distances greater than 2 m.<sup>36,37</sup> Transmission occurs by the respiratory droplet route, although both direct and indirect contact transmission, and possibly “opportunistic” aerosol transmission in crowded and poorly ventilated indoor settings may also play a role.<sup>38,39</sup>

The median incubation period of SARS-CoV-2 is 5 days but symptoms can develop anytime from 1 day to 14 days post exposure.<sup>40</sup> Both the median and maximum incubation period are considerably longer than those seen with influenza and other respiratory viruses. This long incubation period means that outbreak-related cases may be identified more than a week after their initial exposure delaying outbreak recognition. When managing outbreaks, the long incubation period also means that it can take 1-2 weeks to know whether viral transmission has been successfully interrupted. Additionally, the wide range of the incubation period can make it difficult to determine if a case is health care- or community-acquired.

A second unique aspect of SARS-CoV-2 epidemiology is the occurrence of viral transmission over the 48 hours prior to symptom onset, during the presymptomatic period.<sup>40</sup> Additionally, some cases of SARS-CoV-2 infection never develop symptoms and these asymptomatic cases may also be infectious, although the degree of infectiousness in this group is less than that of presymptomatic and symptomatic cases.<sup>41,42</sup>

Finally, the lack of population immunity to SARS-CoV-2 increases the risk of large and explosive outbreaks, particularly in closed settings, and may contribute to the high mortality associated with these outbreaks. Serological data continue to indicate that the vast majority of Canadians do not have immunity to SARS-CoV-2.<sup>43-45</sup>

## 2. Definition of a COVID-19 Outbreak

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COVID-19 is not endemic in Canadian health care facilities, and any nosocomial acquisition of COVID-19 requires immediate investigation and the implementation of control measures. However, because of the long incubation period, it can be difficult to determine conclusively if a specific COVID-19–positive patient acquired the infection prior to or during the hospital admission. Health care-related transmission is even harder to recognize in health care staff and in outpatient populations, such as dialysis patients, who move continuously between health care and community settings.

**A hospital COVID-19 outbreak has been defined in Ontario as:**

**Two or more laboratory-confirmed COVID-19 cases (patients and/or staff) within a specified area (unit/floor/service) within a 14-day period where both cases could have reasonably acquired their infection in the hospital.<sup>46</sup>**

This definition leaves room for clinical judgement with respect to what is reasonable evidence of nosocomial acquisition. Key factors to consider when determining this include:

- the total number of confirmed patient and staff cases
- whether cases are symptomatic or asymptomatic
- the duration of admission prior to symptom onset or test positivity
- prior test results
- any known exposures in the community or in the health care setting

For example, a patient who develops symptomatic COVID-19 15 days after hospital admission is clearly nosocomial; conversely the case of an asymptomatic patient who tests positive <1 day after admission would be considered community acquired. For patients admitted 1 to 14 days at the time of the positive test, judgement and integration of all of these factors are required.

A particular challenge is asymptomatic patients or staff, as a positive test result in an individual without symptoms can represent:

- A presymptomatic case that will go on to develop symptoms and may be highly infectious.
- A new asymptomatic case that may be infectious.
- A previous positive case that is still shedding viral RNA and is not infectious.\*
- A false-positive case that is not infectious (rare).\*

\* Review of the cycle threshold values of RT-PCR test results can be useful as high cycle threshold values suggest lower levels of virus and may be more consistent with status as a previous positive with prolonged shedding or a false positive.<sup>4,47,48</sup> Consultation with a microbiologist can help with result interpretation and to determine whether repeat testing is indicated.

In addition, it can be difficult to determine if an outbreak is occurring based solely on a small number of staff cases, and clusters of staff cases not associated with patient cases can occur via several scenarios:

- A ward-based outbreak of COVID-19 where patient cases have not yet been identified.
- A ward-based outbreak where transmission is occurring exclusively from staff to staff (e.g., transmission in break rooms).
- A staff outbreak related to staff-to-staff transmission in common areas of the facility not linked to a specific ward (e.g., transmission in shared offices associated with a specific professional group).
- A staff outbreak related to staff-to-staff transmission outside the facility (e.g., staff car-pooling without masks, staff who live together\*).
- Increased community COVID-19 incidence, with coincidental identification of two staff cases working in a single clinical area.

Staff outbreaks have been frequently recognized even in staff with roles that do not involve patient contact. These outbreaks are often associated with incomplete masking and physical distancing by staff in a variety of shared environments both within and outside the facility. Subsequent transmission to patients can occur. Staff outbreaks should be suspected not only when several staff from a single area are diagnosed with COVID-19, but also when clusters of staff cases occur within a single professional group (e.g., pharmacists, respiratory therapists, security personnel) as they may congregate together even if they do not work in the same clinical areas. If such an outbreak is recognized, contact tracing is essential to identify epidemiological links between cases as well as patient and staff exposures that may have occurred in multiple areas of the facility. Additionally, all staff with the shared risk factor should be tested (e.g., all radiology technicians, all staff who share a specific office or take breaks in a specific room) as part of the outbreak investigation.

If preliminary evidence suggests that the staff cases are all community-acquired (e.g., known community contacts where the direction of transmission is clear\*) or there is no evidence of health care transmission (e.g., no clear unprotected contacts between involved staff, no patient cases), it may not be necessary to declare an outbreak based on two positive staff in a single clinical area, particularly if the area has a large number of staff and/or a high incidence of community transmission is occurring. Careful consideration of each case with respect to the risk factors for nosocomial and community-acquisition is important. Regardless of whether the cluster is declared an outbreak, a full investigation should proceed that includes the testing of all patients and staff within the area, contact tracing of all staff cases to identify other potentially exposed staff and patients, and implementation of measures to reduce the risk of transmission. Identification of additional cases within a 14-day period would then require declaration of an outbreak in most instances.

\* Note: When COVID-19 is identified in a health care provider and a community or household contact, the direction of transmission should not be assumed to be from the community contact to the health care provider as transmission can occur in either direction and household contacts of health care providers are at increased risk of COVID-19, presumably related to transmission from the health care provider to the household member.<sup>49</sup> Careful consideration of the timing of symptoms and positive test results in both cases can help establish the probable direction of transmission.

A framework for classifying patient and staff cases is presented in [Table 1](#) and Table 2 although judgement is always required when applying this framework and in interpreting the COVID-19 outbreak definition.

**Table 1. Framework for Classifying Inpatient Cases**

Admission Duration prior to Symptom Onset**	Community Exposure	Hospital Exposure	No Known Exposure
<1 day and no prior admission	Community-acquired	n/a	Community-acquired
1 to 14 days	More likely community-acquired	More likely hospital-acquired	Consider hospital-acquired if >5 days <sup>†</sup> ; clinical judgement if 1-5 days
>14 days	Hospital-acquired	Hospital-acquired	Hospital-acquired
Asymptomatic	More likely community-acquired	More likely hospital-acquired	Unknown*

\*\* Patients who present to hospital with COVID-19 but have been hospitalized within the previous 14 days should also be considered as having possible hospital-acquired COVID-19.

<sup>†</sup> Based on the 5 day median incubation period of SARS-CoV-2.

\* If asymptomatic patients are tested due to a defined exposure or outbreak investigation, and test positive, the source of COVID-19 would be assumed to be the exposure; if tested for other reasons, it may be difficult to determine when exposure occurred as test results can remain positive for >90 days.

Note: This classification does not apply to outpatients (such as patients on dialysis) who have frequent health care exposures.

**Table 2. Framework for Classifying Staff Cases**

Symptoms	Community Exposure	Unprotected Hospital Exposure	No Known Exposure
Symptomatic Staff	Community-acquired	Hospital-acquired	Consider staff risk of community and health care exposures and risk factors
Asymptomatic staff	Community-acquired	Hospital-acquired	Consider staff risk of community and healthcare exposures and risk factors—and whether the positive result may be the result of remote infection or may be a false positive—COVID-19 tests can remain positive for >90 days

## 3. Outbreak Recognition

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Early recognition of COVID-19 outbreaks is critical as it allows control measures to be implemented prior to prolonged and widespread exposure of patients and staff and before the outbreak can spread to additional wards or facilities. All facilities should have surveillance programs in place to identify and track patient and staff cases and to integrate this data to recognize outbreaks.

### 3.1 Patient Surveillance

Patients should be screened for COVID-19 symptoms upon admission and should undergo surveillance for COVID-19 symptoms at least twice daily while admitted (see [Appendix A. Symptoms of COVID-19](#)). Symptomatic patients should be placed in Droplet and Contact Precautions and tested for SARS-CoV-2. IPAC should be notified of all new patients with symptoms consistent with COVID-19. Recognition and isolation of patients with symptoms suggestive of COVID-19 is critical for outbreak prevention and recognition.

When clusters of symptomatic patients are recognized within a given unit or with another epidemiological association (e.g., all were in the diagnostic imaging department at the same time) test results should be expedited. IPAC must notify the leadership of the affected area, OHS, and public health if an outbreak is suspected. **Immediate action is required based on a single COVID-19 case where nosocomial transmission is possible** (see [5.2 Immediate Actions](#)). Even when nosocomial transmission has been excluded, immediate case management and contact tracing are still required.

### 3.2 Staff Surveillance

All staff members with symptoms consistent with COVID-19 should notify OHS immediately and must not come to work. Staff who have had an unprotected exposure to a case of COVID-19 in either the community or the health care setting should also notify OHS immediately. OHS should track ill staff members based on the areas where they work (e.g., dialysis unit, intensive care unit) and by the work role (e.g., phlebotomist, radiology technician, social worker). Staff members with symptoms consistent with COVID-19 should be strongly recommended to be tested for SARS-CoV-2 and should provide their test results to OHS.

If OHS identifies clusters of ill staff members working in a common area (e.g., several sick staff members in the intensive care unit) or in a common discipline (e.g., several sick phlebotomists) they must notify the leadership of the affected area, IPAC, and public health if an outbreak is suspected. In addition to the above, immediate action is required based on a single positive COVID-19 test in a staff member where nosocomial transmission is possible (see [5.2 Immediate Actions](#)). Even when nosocomial transmission has been excluded, immediate case management and contact tracing are still required.

## 4. Initial Investigation of a Single Nosocomial Patient or Staff Case of COVID-19

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### 4.1 Patient Case

The diagnosis of COVID-19 in any patient should lead to the immediate notification of key stakeholders (see [3.1 Patient Surveillance](#)) and an immediate investigation should proceed. The purpose of the investigation is to:

1. Ensure that the patient is aware of the diagnosis and that measures to prevent further disease transmission are in place (e.g., for hospitalized patients, isolation in a single room in Droplet and Contact Precautions; for discharged patients, home self-isolation).
2. Conduct contact tracing<sup>‡</sup> to identify patients, staff or visitors exposed to the patient and initiate appropriate management of patient or staff who had a significant exposure<sup>§</sup> to the patient. Public health should be notified of exposed visitors, and exposed visitors should not continue to visit the facility except in specific circumstances aligned with the facility's visitor policy and following review by IPAC.
3. Determine if there is a reasonable likelihood that COVID-19 was acquired within the health care facility.
4. Determine if there are other symptomatic patients or staff members in the clinical area who require investigation.

<sup>‡</sup> Public health shall be notified and will conduct contract tracing (i.e., public health will assess for exposures that occurred in the community prior to admission, and follow-up with exposed patients that have already been discharged).<sup>50</sup>

<sup>§</sup> Exposures can be classified as high risk or low risk using the framework presented in [Management of Cases and Contacts of COVID-19 in Ontario](#).<sup>4</sup>

### 4.2 Staff Case

The diagnosis of COVID-19 in any staff member should lead to the immediate notification of key stakeholders (see [3.2 Staff Surveillance](#)) and an immediate investigation should proceed. The purpose of the investigation is to:

1. Ensure that the staff member is aware of the diagnosis, is not continuing to work, and receives appropriate instruction on home self-isolation and how to seek medical care if required.
2. Conduct contact tracing<sup>‡</sup> to identify all patients or staff members who may have been exposed to the positive staff and initiate appropriate management of patient and staff members who had high or low risk exposures.<sup>§</sup>
3. Determine if there is a reasonable likelihood that COVID-19 was acquired within the health care facility.<sup>¶</sup>
4. Determine if there are other symptomatic staff members or patients in the clinical area or department in which the staff member worked who require investigation.

<sup>‡</sup> Public health shall be notified and will conduct contact tracing (i.e., public health will assess for exposures that occurred in the community) and to follow up with exposed patients who have already been discharged.<sup>50</sup>

<sup>§</sup> Exposures can be classified as high risk or low risk using the framework presented in [\*Management of Cases and Contacts of COVID-19 in Ontario\*](#).<sup>4</sup>

<sup>¶</sup> If an employer is advised by or on behalf of a worker that the worker has an occupational illness or that a claim in respect of an occupational illness has been filed with the Workplace Safety Insurance Board by or on behalf of the worker, the employer shall give notice in writing, within four days of being so advised, to the Ministry of Labour, Trade and Skills Development, to the joint health and safety committee, and to the trade union, if any.<sup>51</sup>

# 5. Outbreak Management for Outbreaks on Inpatient Units

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## 5.1 Notification

If a potential COVID-19 outbreak is identified within a health care facility, key stakeholders must be notified immediately—including hospital and unit leadership, IPAC, OHS, joint health and safety committee (JHSC), public health and microbiology.

## 5.2 Immediate Actions

As soon as a suspect outbreak is identified, the following actions should proceed immediately:

- Place all positive patients in Droplet and Contact Precautions in single rooms or cohort with other confirmed positive cases.
- Ensure all positive staff are in home self-isolation.
- Assess all patients in the outbreak area for symptoms of COVID-19—symptomatic patients should be placed in Droplet and Contact Precautions in a single room where possible and tested for COVID-19; symptomatic patients should not be cohorted. IPAC should be notified of all symptomatic patients.
- Assess all staff in the outbreak area for symptoms of COVID-19—symptomatic staff should not remain at work, should be placed on home self-isolation and should be tested for COVID-19; OHS should be notified of all symptomatic staff.
- IPAC should notify OHS about new patient cases and OHS should notify IPAC about new staff cases to ensure early outbreak recognition and allow prompt contact tracing of patients and staff
- Consider placing the entire unit in Droplet and Contact Precautions pending review at an initial outbreak management team (OMT) meeting.
- If Droplet and Contact Precautions for all patients are not initiated, at a minimum patients should be confined to their rooms except for medically essential tests and procedures and group activities should be cancelled.
- Pause admissions and transfers until the situation is reviewed by the OMT.
- Restrict visitors and essential care partners as per the facilities outbreak policy.
- Initiate contact tracing related to all positive patient and staff cases.
- Place all exposed patients (e.g., roommates of positive cases) in Droplet and Contact Precautions in single rooms. Exposed patients must not be cohorted because of the risk that if one develops COVID-19 as a result of the initial exposure, they may transmit to other exposed patients in the room prior to symptom onset.
- OHS should assess all exposed staff; staff with high risk exposures should be placed on home-self-isolation.
- Schedule an OMT meeting within 24 hours of recognition of a suspected outbreak. (See [5.3 Outbreak Management Team Meeting](#)).
- Identify patients who have recently been transferred off the unit to other wards or facilities; notify other wards or facilities of the suspected outbreak and ensure all transferred patients are in Droplet and Contact Precautions—testing of these patients may be indicated and the timing of such testing can be determined by the OMT.

## 5.3 Outbreak Management Team Meeting

The OMT should meet shortly after recognition of a possible outbreak. All key stakeholders should be included. Facilities may differ in the composition of an OMT but in general the OMT meeting should include medical and administrative leadership from the affected areas including nursing leadership, IPAC, OHS, public health, microbiology, communications, and environmental services. Consideration should also be given to engineering, risk management, physician leadership from affected areas and others as required. Facilities associated with a COVID-19 assessment centre should also consider including a representative from the assessment centre in OMT meetings.

The role of the OMT is to review the epidemiological, clinical and microbiological data, determine if an outbreak is occurring and declare the outbreak, determine what additional investigations are required, recommend control measures, review the outbreak situation as it evolves, modify control measures as required based on their effectiveness in preventing transmission, declare the outbreak over and conduct a debrief and root cause analysis to identify key learnings. Key steps in the initial OMT meeting are detailed in [Appendix C](#). Meetings should continue to occur at a frequency dictated by the course of the outbreak, with frequent meetings (e.g., daily, every other day) over the initial phase of the outbreak and until the outbreak comes under control.

At each OMT meeting the following should be reviewed:

- The epidemic curve and other epidemiological investigations and tools that may be relevant (e.g., bed maps, results on contact tracing that show links between cases).
- New patient and staff cases.
- New symptomatic patients and staff.
- New patient and staff exposures.
- The clinical status of patient and staff cases including deaths.
- Planned patient discharged and transfers
- PPE supplies and availability
- Review unit staffing and how the outbreak is impacting clinical care
- Status of action items from previous meetings.
- Integration of the above data and consideration of evidence regarding how, where and why transmission is occurring and the effectiveness of measures implemented.
- Additional proposed actions relating to investigation or control of the outbreak.
- The communications plan.
- The anticipated end date of the outbreak.

## 5.4 Outbreak Investigation and Management

Investigation and management for a COVID-19 outbreak should proceed simultaneously. Timely testing of all patients and staff is a cornerstone of both investigation (i.e., to determine the extent of the outbreak) and control (i.e., to ensure positive patients are isolated and positive staff members are not working).

The key goals of the outbreak response are to:

- Interrupt transmission in the involved areas.
- Prevent transmission to new areas.
- Ensure continued provision of clinical care.
- Identify and correct causes that contributed to the outbreak.

## 5.4.1 RAPID CASE IDENTIFICATION AND CONTACT TRACING

Rapid identification of the scope of the outbreak is critical to outbreak control. After the initial recognized cases of COVID-19 in patients and staff are placed in Droplet and Contact Precautions (see [5.2 Immediate Actions](#)), broad testing of all patients and staff in the affected area is essential to quickly understand the scope of the outbreak (i.e., patient and staff point prevalence testing). Although this initial testing should not be delayed, because of the 1-to-14 day incubation period, negative results on initial point prevalence tests are only partially reassuring and for most outbreaks prevalence testing should be repeated 5-7 days after the initial point prevalence testing in patients and staff.

Contact tracing related to positive patient and staff cases should be conducted quickly by IPAC and OHS in collaboration. Although all patients and staff on an outbreak unit can be considered to have an increased risk of COVID-19, high risk patient contacts (e.g., roommate contacts of a confirmed case) and staff contacts (e.g., staff with unprotected exposure to a patient or staff case) are important to identify quickly as they are at the highest risk of developing COVID-19, may already have symptomatic or asymptomatic COVID-19 (“forward contact tracing”), and may already have been transferred to other units or facilities. Additionally, contact tracing should also seek to identify, where possible, the index case or chain of transmission that introduced COVID-19 onto the ward (“backward contact tracing”) to best understand that period of risk, identify other possible cases and exposures, and to address deficiencies in policy or practice that may have contributed to the outbreak.

### 5.4.1.1 Key Actions

- Test all patients on the affected units as soon as possible.
- Test all staff working on the affected units as soon as possible.
- Strongly consider repeat testing of patients and staff 5 to 7 days after the initial point prevalence testing.
- IPAC in collaboration with OHS should conduct forward and backward contract tracing of all positive patient cases to allow rapid identification and management of exposed patients and staff and to identify the source of the outbreak.
- OHS, in collaboration with IPAC, should conduct forward and backward contact tracing of all positive staff cases, to allow rapid identification and management of exposed patients and staff and to identify the source of the outbreak.

## 5.4.2 OUTBREAK CONTAINMENT

COVID-19 outbreaks can easily spread from one clinical area to another, or from one facility to another. To minimize this risk, staff working on the outbreak unit should be restricted to the outbreak unit and should not work on other units. Operationally, this usually means that staff members who work primarily on the outbreak unit (e.g., nurses, clinical assistants, physicians and other staff members who spent the majority of their time on the outbreak unit) should not work on other units within the facility. Conversely, staff members who work all across the facility, but spend minimal amounts of time on any particular unit (e.g., radiology technicians, phlebotomists, consultant physicians) can continue to work on both the outbreak unit and other inpatient units. Judgement is required in applying these principles to other staff members who work on several units but potentially spend larger amounts of time on the outbreak unit. Examples might include a respiratory therapist who provides significant services in an ICU but also covers other units; a physiotherapist who works on a small number of units including the outbreak unit. Where possible, these staff members should be restricted to the outbreak unit (e.g., the respiratory therapist would be dedicated to the ICU, while other respiratory therapists would cover the other units). However, in some cases where this would not allow essential services to be provided, it may be necessary to allow these staff members to work on multiple units. Decisions about dedicating this group of staff should be made on a case-by-case basis by the OMT based on the severity of the outbreak and the feasibility of dedicating these staff members to the outbreak unit.

Staff members who work in other facilities, in addition to the outbreak facility, must notify OHS at all facilities where they work about their exposure to the outbreak unit. In most situations, staff members should not be working on the outbreak unit and at other facilities.

The unit should be closed to admissions except in exceptional circumstances where both the OMT and the public health unit agree that unit closure will outweigh the harms that may occur as a result of continuing to admit patients to an outbreak unit. Transfers to the unit should also be stopped and transfers from the unit limited to medically necessary transfers (e.g., to the intensive care unit for a deteriorating patient). Visitors should be restricted as per the hospital's outbreak policy. Patients who are transferred should remain in Droplet and Contact Precautions, be tested, and should remain quarantined on the new unit for 14 days from their last exposure to the outbreak unit, even if initial testing was negative. Because of the long incubation period of COVID-19, a review of transfers that occurred prior to declaration of the outbreak is also important and other units and facilities should be notified of patients who were on the unit during the period where suspected transmission may have been occurring but prior to declaration of the outbreak.

### 5.4.2.1 Key Actions

- The unit should be closed to admissions and non-urgent transfers.
- Visitors to the unit should be restricted as per facility's outbreak policy.
- Patients who require urgent transfer to another unit for medical reasons should be transferred in Droplet and Contact Precautions and remain in quarantine for 14 days from their last day on the outbreak unit and be retested at the end of the quarantine period.

- If patients were transferred during the period of transmission on the unit but prior to recognition of the outbreak, the receiving unit or facility should be notified and the patient should be placed in Droplet and Contact Precautions and tested.
- Staff members working on an outbreak unit should not work in other areas of the facility where feasible.
- Staff members working on an outbreak unit who work at other facilities must notify OHS at those facilities about their exposure to the outbreak unit.

### 5.4.3 INTERRUPTING TRANSMISSION ON THE OUTBREAK UNIT

As already noted, rapid identification of positive and exposed patient and staff cases through point prevalence studies and contact tracing is critical to interrupting COVID-19 transmission. Because it takes time to perform testing and contact tracing, placing all patients in Droplet and Contact Precautions for at least the initial phase of the outbreak is an important strategy to reduce transmission risk from as yet unrecognized patients. In addition, a careful review of IPAC and OHS practices on the unit is important to determine deficiencies in policies or practices that may have contributed to transmission. Although contact transmission may not be the primary mode of COVID-19 transmission, ensuring adequate disinfection of shared equipment (and dedicating equipment to COVID-19–positive patients) and enhancing environmental cleaning are important.

As the IPAC approach to COVID-19 has evolved over the course of the pandemic and as a result of changes in the supply of PPE, it is critical to ensure that both policies and practices are aligned and up to date in the outbreak area. Additionally, during times of lower COVID-19 activity, practices may be relaxed and it is important to ensure that frontline staff are aware of, and applying, appropriate IPAC measures once an outbreak is recognized.

#### 5.4.3.1 Key Actions

- Place all patients on [Droplet and Contact Precautions](#).<sup>1</sup>
- Ensure PPE supplies are sufficient and accessible by staff.
- Review IPAC and OHS policies.
- Review IPAC and OHS practices on the unit through discussion with unit leadership, unit educators, and front-line staff from all professional groups (e.g., nursing, allied health, environmental services, etc.)
- Audit unit practices including IPAC and OHS practices.
- Provide education on key elements of the COVID-19 IPAC and OHS response.
- Provide education on symptom surveillance and reporting.
- Consider the use of “safety coaches” on the unit to [monitor and provide feedback on hand hygiene and PPE practices](#).<sup>52</sup>
- Enhance environmental service staffing, if required, and ensure [appropriate environmental cleaning and disinfection](#) are ongoing, including cleaning of common areas and staff only spaces (e.g., staff lounges, eating areas or locker rooms).<sup>53</sup>

## 5.5 Communication

Effective communications are a core element of the outbreak response. Clear and transparent internal communications are essential to maintaining staff trust, reducing anxiety related to the outbreak and ensuring the outbreak measures are understood and implemented by staff. Regular and detailed communications to staff on the affected area and JHSC is important to ensure they are aware of the outbreak and the outbreak control measures implemented. A more general communication to all facility staff is also important to ensure they are aware of the outbreak, and how it may be affected their areas.

COVID-19 outbreaks also cause anxiety in patients and families and may attract media attention. Clear communication to patients, families and the media are also important. A media plan should be developed. Proactive communications to the media for significant outbreaks should be considered. The development of FAQ for patients and families is also important.

Signage should be placed on the outbreak unit to ensure all visitors and off service staff are aware of the outbreak and the measures in place on the unit.

### 5.5.1 KEY ACTIONS

- Regular communications about the outbreak and outbreak control measures should go to unit staff with separate communications sent more broadly, as required.
- Communications for patients, visitors and families should be developed.
- A media plan should be prepared with consideration to release a statement about the outbreak, if appropriate.
- Signage should be present on the unit to notify visitors and off-unit staff about the outbreak.

## 5.6 Monitoring Transmission

Monitoring for new cases through ongoing surveillance for symptomatic patients and symptomatic staff is essential. Ideally all patients should be reviewed for COVID-19 symptoms twice daily, and if symptoms develop patients should be promptly placed in Droplet and Contact Precautions (if not already implemented as an outbreak strategy). Additionally, after the initial and repeat point prevalence testing, if ongoing transmission is continuing to occur, consider additional point prevalence testing of patients and staff with the frequency of testing determined by the course of the outbreak (i.e., if multiple positive cases are identified on point prevalence testing, earlier repeat testing may be indicated).

## 5.7 Declaring the Outbreak Over

A COVID-19 outbreak can be declared over by the OMT in consultation with public health when transmission has been interrupted and no further staff or patient cases have occurred for 14 days since the onset of symptoms of the last positive case (or the test positive date of the last positive case if the last case remained asymptomatic). If the last case was a patient discharged from the unit prior to the

diagnosis of COVID-19, their last day on the unit case be used instead of the date of symptom onset or test positivity. If the last case was staff and their last date worked was prior to diagnosis, their last day worked can be used. After the outbreak is over, a debrief should be conducted to review the outbreak and its management and to conduct a root cause analysis. Where one or more factors contributed to the outbreak, measures should be put in place to prevent similar future outbreaks.

### 5.7.1 KEY ACTIONS

- All patients should be assessed twice daily for COVID-19 symptoms.
- When patients are recognized as having new COVID-19 symptoms, testing should be repeated, Droplet and Contact Precautions initiated, and IPAC informed immediately.
- Symptomatic staff should notify OHS, be tested, and should not be working until cleared by OHS.
- Conduct additional point prevalence studies if ongoing transmission is occurring at a frequency determined by the extent of ongoing transmission.
- The OMT can declare the outbreak over, in consultation with public health, when no new patient or staff case has occurred for 14 days.

## 6. Management of Outbreaks in High Risk Outpatient Areas

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COVID-19 outbreaks can occur in outpatient settings and there are multiple reports of outbreaks in hemodialysis (HD) settings in particular.<sup>54-60</sup> Although the general principles of outbreak management provided for inpatient outbreaks are applicable to outpatient COVID-19 outbreaks, there are some critical differences related to patient populations, patient flow and infrastructure that require consideration. Although it is beyond the scope of this document to review outbreaks in all outpatient settings, we provide some considerations for outbreak management in high-risk settings including hemodialysis units, infusion clinics/medical day units, and the emergency department.

### 6.1 Hemodialysis Units

HD units are at high risk for COVID-19 outbreaks and the HD population is at risk for severe COVID-19. COVID-19 can be introduced into these facilities more easily than inpatient units as both patients and staff move back and forth between the community and HD setting multiple times per week. Additionally, HD patients often move back and forth between different health care settings (e.g., from long-term care homes or rehabilitation facilities to dialysis; or internally from medical and surgical wards to a HD unit), creating the potential for introducing COVID-19 from a long-term care home outbreak to the HD facility.

Once COVID-19 is introduced into HD units, the physical infrastructure and patient flow provide ample opportunities for transmission and rapid amplification of cases. Dialysis settings typically involve large numbers of patients located at HD stations in open concept areas, often less than 6 feet apart and without physical barriers between patients. This creates the risk for rapid patient-to-patient transmission of diseases that spread via the droplet route. As staff move back and forth between many patients, omission of hand hygiene, failure to change gloves or other PPE, and the use of shared medical equipment that has not been properly disinfected can also result in transmission. HD patients often use health care transport services to get to and from HD, with multiple patients in the same vehicle and there are often waiting areas and bathrooms used by many HD patients prior to, during or after, HD. These situations provide opportunity for transmission of COVID-19 between HD patients, including those not located near each other within the HD setting or even between patients on different shifts if mixing occurs between patients at the end of one session and the beginning of another in waiting areas. Finally, there is limited time for environmental cleaning between dialysis shifts, creating a risk for transmission related to ineffective disinfection of the HD station itself.

All of these factors should be considered in developing a program to prevent COVID-19 in HD facilities and as for inpatient areas, screening of patients upon arrival to the facility, and ongoing monitoring for symptoms of COVID-19 during HD sessions are critical to identify potential outbreaks early. All symptomatic HD patients should be tested for COVID-19 and clusters of cases in patients or staff should

be reported immediately to the dialysis unit leadership and to IPAC and OHS. Screening of HD patients for COVID-19 symptoms can be challenging as both cognitive and language barriers are common in this population and involving families in this process is important. It is also important to ensure that patients understand the purpose of screening, and that access to HD will not be denied regardless of symptoms or COVID-19 status.

The definition of a COVID-19 outbreak in HD is not different than for a ward outbreak:

**Two or more laboratory-confirmed COVID-19 cases (patients and/or staff) within a HD setting and within a 14 day period where both cases could have reasonably acquired their infection in the HD setting.**

A challenge with this definition, however, is in the interpretation of whether the infection could have “reasonably” been acquired in the HD unit. The challenge of determining whether staff members who develop COVID-19 secondary to transmission in the health care or the community setting was discussed in [2. Definition of a COVID-19 Outbreak](#); the same problem exists in HD units for both staff and patients, given patients’ ongoing exposure in the community. Factors similar to those discussed in [2. Definition of a COVID-19 Outbreak](#) must be considered to determine the likelihood of an outbreak:

- The total number of confirmed patient and staff cases.
- Whether cases are symptomatic or asymptomatic.
- Whether cases are clustered temporally and spatially within the HD unit (e.g., 2 cases on the Mon/Wed/Fri noon dialysis shift in the same pod is likely an outbreak; 1 case on the evening shift M/W/F and 1 case on the noon shift Tues/Thu/Sat could be sporadic community transmission).
- Prior test results.
- Any known exposures in the community or in the health care setting.

As a result of this uncertainty, and in a manner similar to the identification of staff outbreaks, it may be necessary to hold off on calling an outbreak in HD until there are more than two cases. While that is a reasonable approach, the potential for explosive outbreaks in this setting means that aggressive attempts to identify additional cases are required even when a single unexplained and potentially health care-acquired case is identified and in most cases control measures should be implemented even if an outbreak has not been declared.

When a single patient COVID-19 case is identified in a HD patient, unless clearly linked to a community transmission event or transmission in another facility, it is prudent to test all the other patients in that patient’s shift and pod and to consider testing the entire shift if feasible. Similarly, health care providers providing care to the patient should be tested. If two cases have been identified, testing all patients on the shift and all HD staff is essential. If any additional cases\* are identified that cannot be clearly attributed to another setting all outbreak measures should be implemented even if an outbreak is not declared; if multiple additional cases\* are identified an outbreak must be declared and appropriate measures implemented, as described in [5. Outbreak Management for Outbreaks on Inpatient Units](#).

\* When the incidence of COVID-19 is high or has been high in a specific community, broad testing of asymptomatic patients may identify some individuals with resolved rather than active COVID-19 (See considerations related to the classification of asymptomatic cases in [Chapter 2](#)).

## 6.2 Infusion Clinics and Medical Day Units

Infusion clinics are outpatient areas that are structured in a similar manner to hemodialysis units but provide care to a patient population that require frequent infusions, including oncology patients and other patient populations. Most of the considerations described for the hemodialysis population also apply in this setting, including the need for patient screening and monitoring for symptoms, although there is significantly more heterogeneity in the frequency with which patients come for treatment, with some patients coming daily for a defined period, and others coming weekly, monthly, or on other schedules.

The definition of an outbreak and the challenges and considerations required to determine if an outbreak is occurring are similar to HD. When a single case is identified, testing can reasonably be focused on patients and staff present on the same day(s) that the case was in the unit within the previous 14 days. If multiple cases are identified, testing of all staff and a broader group of patients, identified based on their risk of exposure, is indicated.

## 6.3 Emergency Departments

Emergency departments (ED) are complex environments with a high throughput of patients, some of whom are admitted to hospital but many of whom are briefly assessed and discharged. Waiting areas are often crowded and as volumes cannot be easily controlled, maintaining physical distance in waiting areas during peak periods is challenging. Furthermore, patients with moderate to severe COVID-19 will come to the ED for assessment, increasing the burden of disease within this environment. It is easy to see how patient-to-patient transmission of COVID-19 can occur. Transmission in the ED environment is not only a risk to ED staff, but is also a risk to the entire facility as patients are admitted from the ED to all areas of the hospital, creating the potential for multiple, hospital-wide outbreaks if widespread ED transmission is occurring. The rapid flow of patients through the ED also makes ED outbreaks hard to recognize as cases will most likely have been discharged or admitted to other units by the time symptoms start and these symptoms will most likely be attributed to community transmission.

Screening for COVID-19 symptoms and ensuring symptomatic patients are masked and placed 2 metres from other patients in waiting areas, or brought promptly into individual exam rooms is critical to minimize risk to other patients and staff. In fact, all patients in ED waiting areas should be masked at all times when COVID-19 is circulating in the community, unless the mask is not recommended (i.e., those less than 2 years of age, anyone unable to remove the mask without assistance) or cannot be tolerated (i.e., breathing difficulties).

The definition of an ED outbreak is the same as for ward outbreaks, although they are most likely to be recognized based only on staff cases due to the difficulty of recognizing patient cases in this setting. For

this reason, the possibility of an ED outbreak should be considered when a cluster of COVID-19 cases are recognized in patients recently admitted to different clinical areas or when several simultaneous outbreaks are recognized on different clinical units.

Management of ED outbreaks is similar to ward based outbreaks although closure of the ED is not feasible for most hospitals and would be harmful to the population served and the overall health care system.

In most suspected or confirmed ED outbreaks, patient testing can be guided by contact tracing (i.e., test patients cared for by known positive ED staff). Point prevalence testing is not a useful strategy for all ED patients during outbreaks, as most of the exposed patients will already have been discharged or admitted to a unit and patients currently in the ED are unlikely to test positive. However, for large ED outbreaks consideration should be given to testing all patients admitted through the ED over a predefined period of risk or for the prior 14 days. Such testing should be guided by a risk assessment—if multiple patient cases related to the ED have already been recognized, it may be necessary to test all patients who came through the ED and to use Droplet and Contact Precautions for these patients. Where no patient cases have been recognized but there have been significant exposures, the approach to testing and isolation can focus on direct contact tracing with or without inclusion of a subset of high risk admissions (e.g., patients who spent a prolonged period in the ED; patients who spent a prolonged time period in the area of the ED where the positive staff cases were working or have other risk factors that may place them at increased risk). In very large ED outbreaks, especially if the outbreak has already spread to additional units, testing all hospitalized patients may be necessary.

## 7. Management of Staff Outbreaks

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Most COVID-19 outbreaks involve a combination of patient and staff cases within a given clinical area, unit or ward. Outbreaks where all initial cases are staff cases, especially when not all of the staff members work on the same unit, should raise the possibility of a staff outbreak. Staff outbreaks may involve staff from a single discipline (e.g., respiratory therapists) and can occur when staff are exposed via:

- shared office spaces, eating spaces and break rooms
- social activities at the hospital
- contact outside the hospital (e.g., shared transportation to and from work, after work social activities, staff that live together)

When staff cases increase in the facility, even if in different areas, the investigation should consider whether a staff outbreak is occurring. If a staff outbreak is suspected, test all staff with the same risk factor (e.g., all respiratory therapists, all staff using the same break room). Contact tracing with identification of high risk exposed patients is critical to ensure that the staff outbreak has not resulted in a patient outbreak.

In addition to contact tracing and the identification of additional symptomatic, positive or exposed patients or staff members, interventions should focus on staff education, and ensuring that staff members are following appropriate IPAC and OHS practices including masking at all times in public and shared spaces except when eating and physically distanced from other staff and the need to report symptoms to OHS and not to work even with mild COVID-19 symptoms.

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# Appendix A. Symptoms of COVID-19

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The most common symptoms of COVID-19 include:<sup>61</sup>

- fever (feeling hot to the touch, a temperature of 37.8°C or higher)
- chills
- cough that's new or worsening (continuous, more than usual)
- barking cough, making a whistling noise when breathing (croup)
- shortness of breath (out of breath, unable to breathe deeply)
- sore throat
- difficulty swallowing
- runny, stuffy or congested nose (not related to seasonal allergies or other known causes or conditions)
- lost sense of taste or smell
- pink eye (conjunctivitis)
- headache that's unusual or long lasting
- digestive issues (nausea/vomiting, diarrhea, stomach pain)
- muscle aches
- extreme tiredness that is unusual (fatigue, lack of energy)
- falling down often
- for young children and infants: sluggishness or lack of appetite

Source: Government of Ontario. [COVID-19: stop the spread.](#)<sup>61</sup>

# Appendix B. Case Definition for COVID-19

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These case definitions are for surveillance purposes and they are current as of November 20 2020. They are not intended to replace clinical or public health practitioner judgment in individual patient assessment and management.<sup>62</sup>

## Probable Case

- A person (who has not had a laboratory test) with symptoms compatible with COVID-19<sup>#</sup> AND:
  - Travelled to an affected area (including inside of Canada<sup>\*\*</sup>) in the 14 days prior to symptom onset; OR
  - Close contact<sup>††</sup> with a confirmed case of COVID-19; OR
  - Lived in or worked in a facility known to be experiencing an outbreak of COVID-19 (e.g., long-term care, prison)

OR

- A person with symptoms compatible with COVID-19<sup>§</sup> AND in whom laboratory diagnosis of COVID-19 is inconclusive.<sup>§§,¶¶</sup>

OR

- A person with a preliminary positive result<sup>###</sup> from a Health Canada approved point-of-care assay.

## Confirmed Case

- A person with laboratory confirmation of SARS-CoV-2 infection using a validated assay, consisting of positive nucleic acid amplification test (NAAT; e.g. real-time PCR or nucleic acid sequencing) on at least one specific genome target. Laboratory confirmation is performed at reference laboratories (e.g., The National Microbiology Laboratory or Public Health Ontario Laboratory) or non-reference laboratories (e.g., hospital or community laboratories).<sup>\*\*\*,#</sup>

OR

- A person with a positive detection of serum/plasma antibodies to SARS-CoV-2 from a laboratory in Ontario that is licensed to conduct serology testing AND the testing is done for clinical purposes.<sup>†††</sup>

## Confirmed Case of Reinfection

- A person with a primary and secondary laboratory-confirmed infection with SARS-CoV-2, with time-based or test-based clearance in between the two infections, where genome sequencing indicates that the two SARS-CoV-2 infections either (i) belong to different genetic clades or lineages, OR (ii) sufficient single nucleotide variations to correlate with the probability that the two episodes are caused by different viral lineages.

# Information on [symptoms compatible with COVID-19 illness](#)<sup>63</sup> and [provincial testing guidance](#)<sup>64</sup> are available on the Ministry of Health's website.

\*\* [Affected areas](#)<sup>65</sup> are updated regularly in the [World Health Organization's Situation Reports](#).<sup>66</sup> Current epidemiology in Canada is available through the [Public Health Agency of Canada](#).<sup>67</sup>

- <sup>††</sup> A **close contact** is defined as a person who had a high-risk exposure to a confirmed or probable case during their period of communicability. This includes household, community and health care exposures as outlined in [Ministry guidance on cases and contacts of COVID-19](#).<sup>4</sup>
- <sup>§§</sup> Inconclusive is defined as an indeterminate result on a single or multiple real-time PCR target(s) and is not detected or remains indeterminate by an alternative real-time PCR assay or without sequencing confirmation, or a positive test with an assay that has limited performance data available.
- <sup>¶¶</sup> An indeterminate result on a real-time PCR assay is defined as a late amplification signal in a real-time PCR reaction at a predetermined high cycle threshold (Ct) value range (note: Ct values of an indeterminate range vary by assay and not all assays have an indeterminate range). This may be due to low viral target quantity in the clinical specimen approaching the limit of detection of the assay, or alternatively in rare cases may represent nonspecific reactivity (false signal) in the specimen. When clinically relevant, repeat testing is recommended.
- <sup>###</sup> Positive results issued from point-of-care assays are reportable to public health, but require confirmation. Parallel specimens for confirmation through standard laboratory-based testing should be obtained for all point-of-care testing until further evaluation of their test performance. Final case status (Confirmed or Does Not Meet Case Definition) should be based on the parallel confirmatory laboratory-based test result. If no parallel specimen is collected, the case status should remain as probable.
- <sup>\*\*\*</sup> Some hospital and community laboratories have implemented COVID-19 testing in-house and report final positive results, which is sufficient for case confirmation. Other hospital and community laboratories will report positives as preliminary positive during the early phases of implementation and will require confirmatory testing at a reference laboratory (e.g. Public Health Ontario Laboratory or the National Microbiology Laboratory).
- <sup>†††</sup> At this time, COVID-19 antibody testing is licensed and available in Ontario for limited [clinical purposes](#) only.<sup>64</sup> COVID-19 antibody testing should not be used as an acute screening or diagnostic tool or used to determine a patient’s immune status or infectivity. Results should be interpreted in the context of the clinical and exposure history.

Source: Ontario. Ministry of Health. [Case definition – coronavirus disease \(COVID-19\)](#).<sup>62</sup>

# Appendix C. Key Actions for an Initial Outbreak Management Team Meeting

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- The OMT should develop a case definition for the outbreak (see [Appendix B. Case Definition for COVID-19](#)).
- IPAC, OHS and JHSC should present:
  - A review of all suspected or confirmed patient cases.
  - A review of all suspected or confirmed staff cases (anonymously).
  - A line list and epidemic curve for all suspected and confirmed patient cases and (anonymized) staff cases.
  - A review of contact tracing results including:
    - All exposed patients and staff and how they have been managed.
    - How positive patient and staff cases may be epidemiologically linked with each other.
  - A review of the clinical status of all confirmed patient cases and (anonymously) staff cases.
  - An initial assessment of specific practices or events that may have caused or contributed to the outbreak, if known. These may include:
    - Poor adherence to IPAC practices (e.g., hand hygiene, equipment disinfection, environmental cleaning).
    - Poor adherence to or barriers to following COVID protocols (e.g., physical distancing, masking, avoidance of shared food, lack of PPE or hand hygiene product).
    - Diagnostic or surveillance errors (e.g., failure to recognize typical or atypical COVID-19 symptoms, failure to report symptoms, laboratory error, misinterpretation of laboratory tests, etc.)
    - Patient-specific factors (e.g., non-compliant patient, ill visitors on unit, wandering symptomatic patient).
    - Environmental factors (e.g., multi-bed rooms with beds <2 m apart, poor ventilation, crowded and cluttered environments).
  - An initial assessment of IPAC practices in the affected areas to identify deficiencies in general IPAC practices (e.g., hand hygiene, disinfection of shared equipment, environmental cleaning) and IPAC practices specific to COVID-19.
- Representatives from the affected areas should:
  - Provide input on IPAC practices on the unit and any identified deficiencies.
  - Provide their own assessment of factors that may have contributed to SARS-CoV-2 transmission.
  - Report on staffing levels and how the outbreak and/or outbreak control measures are impacting clinical care.
- The OMT should determine if additional investigations are required which may included:
  - review of all IPAC and OHS policies and protocols
  - audits of IPAC and OHS practices
- The OMT should determine, in consultation with IPAC and microbiology, whether whole genome sequencing should be performed.

- The OMT should then discuss and determine the outbreak control measures that should be instituted, if not already in place. (The following list are items that should be discussed but may not be appropriate in all situations):
  - Declare the outbreak (if appropriate).
  - Close the unit to admissions (if appropriate).
  - Restrict staff to the unit.
  - Implement enhanced PPE (e.g., face shields at all times in the outbreak unit, Droplet and Contact Precautions for all patients).
  - Enhanced patient surveillance for symptoms and testing of symptomatic patients.
  - Implement practice audits of IPAC and OHS practices and/or education to ensure best practices are in place.
  - Implement patient and staff point prevalence testing.
  - Identify internal transfers off the unit during the transmission period and implement Droplet and Contact Precautions and testing.
  - Identify discharged patients and external transfers during the transmission period followed by communication with public health and receiving facilities to ensure appropriate management of these cases.
  - Transfer required PPE supplies to the unit.
  - Consider enhanced environmental cleaning.
  - Consider additional specific interventions based on the apparent epidemiology of the outbreak.
  - Implement a communications plan considering the need to communicate with:
    - staff in the affected area
    - staff across the organization
    - patient and families
    - the broader public (e.g., on the hospitals website)
    - the media
  - Determine date of next meeting.

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