



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

2<sup>nd</sup> edition: January 2023

## Public Health Ontario

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### **How to cite this document:**

Ontario Agency for Health Protection and Promotion (Public Health Ontario), Provincial Infectious Diseases Advisory Committee. Best practices for managing COVID-19 outbreaks in acute care settings. 2<sup>nd</sup> ed. Toronto, ON: King's Printer for Ontario; 2023.

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

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### **Publication history:**

Published: 2021

2<sup>nd</sup> Edition: January 2023

### **Cover photo:**

CDC Public Health Image Library; Eckert A, Higgins D. ID #: 23312 [Internet]. Atlanta, GA: Centers for Disease Control and Prevention; 2020 [cited 2022 Oct 21]. Available from:

<https://phil.cdc.gov/Details.aspx?pid=23312>.

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**NOTES: This document is intended to provide best practices only.**

Health care settings are encouraged to work towards these best practices in an effort to improve quality of care.

Provincial Infectious Diseases Advisory Committee (PIDAC)

Tel: 647-260-7100 Email: [pidac@oahpp.ca](mailto:pidac@oahpp.ca)

## Authors/Contributors

Public Health Ontario would like to acknowledge the contribution and expertise of the following individuals who participated in the development of this document.

### PIDAC-IPC Members:

**Dr. Dominik Mertz, Chair**

Associate Professor, Medical Director, Infection Control, Hamilton Health Sciences, Hamilton

**Maria Louise Azzara**

Infection Prevention and Control Specialist, York Region Community and Health Services, Richmond Hill

**Dr. William Ciccotelli**

Infectious Disease and Medical Microbiology, Grand River Hospital, Kitchener

**Megan Clarke**

Infection Control Practitioner, The Hospital for Sick Children, Toronto

**Zahir Hirji**

Manager, Privacy & Risk Management, Scarborough Health Network

**Dr. Susy Hota, Vice Chair** (as of November 2022)

Medical Director, Infection Prevention and Control, University Health Network, Toronto

**Dr. Jennie Johnstone**

Medical Director, Infection Prevention and Control, Sinai Health, Toronto

**Liz McCreight**

Director, Infection Prevention and Control & Risk, Sinai Health, Toronto

**Dr. Matthew Muller, Chair** (up to August 2022)

Medical Director, Infection Prevention and Control, St. Michael's Hospital, Toronto

**Francine Paquette**

Director, Infection Prevention and Control, peopleCare Communities, Waterloo

**Dr. Herveen Sachdeva**

Associate Medical Officer of Health, Toronto Public Health, Toronto

**Laurie Streitenberger**

Senior Manager, Infection Prevention and Control, The Hospital for Sick Children, Toronto

**Erika Vitale**

Director, Infection Prevention & Control, & Pandemic Planning, Windsor Regional Hospital, Windsor

### Ex-officio Members:

**Anne Augustin** (from October 2022)

Team Lead, Outbreak Response and Support, Health Protection, PHO

**Sandra Callery** (up to September 2022)

Senior Advisor, Health Protection, Science and Public Health, PHO

**Melissa Helferty**

Manager, Infectious Diseases Policy and Programs, Ontario Ministry of Health

**Dr. Samir Patel**

Clinical Microbiologist and Deputy Chief, Laboratory Research, PHO

**Dr. Nikhil Rajaram**

Provincial Physician, Occupational Health and Safety Branch, Ontario Ministry of Labour, Immigration, Training and Skills Development

**Dr. Michelle Science**

Infection Prevention and Control Physician, PHO

**Jacky Sweetnam**

Manager (Acting), Emergency Support Unit, Ontario Ministry of Long-Term Care

### Expert Advisor:

**Dr. Kevin Katz**

Medical Director, Infection Prevention and Control, North York General Hospital, Toronto

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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
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.<sup>1</sup>

**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 over the previous 7 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 in-patients 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.

**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](#) and [Quarantine](#).



**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>3</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.

**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:** The current Ministry of Health definition for a hospital COVID-19 outbreak in Ontario is: two or more patients with positive COVID-19 test results from a polymerase chain reaction test, rapid molecular test, or rapid antigen test within a specified area (unit/floor/service) within a 7-day period where both cases could have reasonably acquired their infection in the hospital.<sup>4</sup> Importantly, this definition, in isolation of other information, should not dictate whether or not an outbreak needs to be declared. Instead, consideration should be given to the likelihood of uncontrolled transmission in order to determine outbreak status, in discussion with the public health unit.

**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).

**Quarantine:** The action of separating and restricting the movement of people who were exposed to a communicable disease to see if they become sick.

**Staff:** Any employees, physicians, contract workers, volunteers and students 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.

# 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 further revised as necessary. This edition incorporates learnings from the BA.1, BA.2 and later BA.5 waves in Ontario and globally.

This document is intended for those who have a role in infection prevention and control (IPAC), patient safety, quality improvement, risk management, or occupational health and safety (OHS) 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, clinicians and local public health departments may 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, IPAC and 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 respiratory droplet and aerosol routes, particularly in crowded and poorly ventilated settings, with direct and indirect contact transmission appearing to play a smaller role.<sup>38-40</sup>

The median incubation period of SARS-CoV-2 is 5 days but symptoms can develop anytime from 1 day to 10 days post exposure.<sup>41</sup> Although the Omicron variant has a shorter incubation period, estimated at 3.4 days,<sup>42</sup> the median and maximum incubation period of SARS-CoV-2 remains 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 nosocomial or community-acquired.

A second 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>41</sup> Additionally, some cases of SARS-CoV-2 infection never develop symptoms. The proportion of asymptomatic presentations have increased with the latest Omicron wave, likely as a function of the Omicron variant itself, but probably also as a function of higher population immunity. These asymptomatic cases may be infectious, although the degree of infectiousness in this group seems to be less than that of presymptomatic and symptomatic cases.<sup>43-49</sup>

Prior to the emergence of the Omicron variant, a clear reduction in risk of outbreaks and the associated morbidity and mortality was demonstrated in long-term care homes due to the initial prioritization of COVID-19 vaccines to residents and staff in these facilities.<sup>50-53</sup> However, outbreaks in the Omicron era often involve vaccinated staff, patients or residents,<sup>54,55</sup> and as such, outbreak investigation and management has required testing of vaccinated individuals in order to stop the chain of transmission—an approach that was deemed unnecessary in the early post-vaccine era due to less immune escape.

In this latest edition of the document, the main changes are in relation to testing of vaccinated patients due to waning of immunity, and immune escape of the Omicron variant.<sup>56-60</sup> The added value of booster doses with the bivalent vaccines in terms of sterilizing immunity (immunity that completely prevents a disease-causing pathogen from establishing an infection) is yet to be determined. For this document, it is assumed that protection from the bivalent vaccines will wane in a similar fashion to the original vaccines and immunity from previous infection. A vaccine resulting in stronger and longer lasting sterilizing immunity may one day enable deviation from the recommendations made in this current edition of the document.

## 2. Definition of a COVID-19 Outbreak

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COVID-19 is establishing itself as an endemic virus in the community. Given the features of the virus and spread in the community, it is expected that nosocomial acquisition will continue to occur in health care facilities. Suspected or confirmed nosocomial COVID-19 requires immediate investigation and implementation of selected control measures. In the setting of uncontrolled transmission (i.e., unclear chain of transmission), declaration of an outbreak and implementation of all measures should be considered in discussion with the public health unit. However, because the incubation period of SARS-CoV-2 can be long, it can be difficult to determine conclusively if a specific COVID-19–positive patient acquired the infection prior to or during the hospital admission. Nosocomial 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. Judgment is required in deciding whether a COVID-19 outbreak should be declared, as there are potential harms to patient care that may result from outbreak-related disruptions.

**The current Ministry of Health definition for a hospital COVID-19 outbreak in Ontario is:**

**Two or more patients within a specified area (unit/floor/service) with positive COVID-19 test results (from a polymerase chain reaction test, rapid molecular test, or rapid antigen test) within a 7-day period where both cases could have reasonably acquired their infection in the hospital.<sup>4</sup>**

**Importantly, this definition, in isolation of other information, should not dictate whether or not an outbreak needs to be declared. Instead, consideration should be given to the likelihood of uncontrolled transmission in order to determine outbreak status, in discussion with the public health unit.**

### 2.1 Considerations for Outbreak Declarations

#### 2.1.1 DETERMINING WHETHER A CASE SHOULD BE CLASSIFIED AS NOSOCOMIAL

In determining whether an infection is reasonably nosocomial, the following key factors should be considered:

- (For patient cases) The duration of admission prior to symptom onset or test positivity. Although the incubation period of SARS-CoV-2 is between 1–10 days, the longer the patient has been admitted to hospital prior to onset of symptoms or positive test result, the more likely the case is nosocomial.
- The total number of confirmed nosocomial patient and staff cases currently on the affected unit (i.e., COVID-19 burden and associated exposure risk).
- Whether cases are symptomatic or asymptomatic. Asymptomatic cases may test persistently positively for weeks to months after their acute infection, in the presence or absence of a known previous positive PCR (not available in most individuals due to limited testing).
- Any known exposures to SARS-CoV-2.
- The level of community transmission. This is most important in determining how to attribute staff cases, but must be considered for patient cases as well (i.e., two or more positive cases among staff within short periods of time are likely to occur during major waves in the community in the absence of any nosocomial transmission).

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 within one day after admission would be considered community acquired. For patients admitted 1 to 7 days at the time of the positive test and/or onset of symptoms, judgement and integration of all of these factors are required.

## 2.1.2 INTERPRETING POSITIVE COVID-19 RESULTS IN ASYMPTOMATIC CASES

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).†

\*Infectivity is likely reduced in asymptomatic vaccinated individuals who test positive for COVID-19,<sup>61,62</sup> particularly those with “weak positive” results associated with high cycle threshold (Ct) values.<sup>63-65</sup>

†Review of the Ct 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>63-65</sup> Re-testing after at least 24 hours and consultation with a microbiologist can help with result interpretation (e.g., pre-symptomatic case Ct typically dropping, and previous positive case typically with high Ct values and increasing).

With this being said, it is important in an asymptomatic patient or staff to:

- Consider the history of previous infection of the patient or staff.
- Assess whether there are any known SARS-CoV-2 exposures.
- Monitor clinically for 48 hours to determine whether symptoms develop.
- Repeat testing if in doubt.

An outbreak based on asymptomatic cases should not be declared until the presence of at least two new active COVID-19 infections (regardless of symptoms) are determined, where the chain of transmission is unclear.

### 2.1.3 CLUSTERS OF STAFF CASES

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

- A unit-based outbreak of COVID-19 where patient cases have not yet been identified, or tests are pending.
- A unit-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 unit (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, meetings or social gatherings, staff who live together).
- Increased community COVID-19 incidence, with coincidental identification of two or more unrelated 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 inconsistent 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) or shift assignment 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.

If preliminary evidence suggests that the staff cases are all community-acquired (e.g., known community contacts where the direction of transmission is clear<sup>†</sup>) 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 or more 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 contact tracing of all high-risk contacts to identify other potentially exposed staff and patients; and implementation of measures to reduce the risk of transmission. Where testing of staff and patients is indicated, testing should occur regardless of the vaccination status. Identification of additional cases that are reasonably nosocomial and within a 7-day period may provide evidence of uncontrolled transmission and should prompt a discussion with public health on whether or not an outbreak needs to be declared.

‡Note: Careful consideration of the timing of symptoms and positive test results among household members (or other community contacts) can help to identify the direction of transmission to or from staff cases.

## 2.1.4 CLUSTERS OF COVID-19 CASES WITHIN MULTIBED ROOMS

Declaration of an outbreak may not be required with clusters limited to a single multibed room (e.g., one of the patients with delayed diagnosis of COVID-19 with transmission to roommates, or exposure to an infectious visitor or staff member). Likewise, detection of a small number of potentially nosocomial cases during high activity of COVID-19 transmission in the community may not suggest uncontrolled transmission in the facility and the declaration of an outbreak may not be required.

Patient and staff surveillance definitions are outlined in [Table 1](#) and

[Table 2](#). As outlined above, identification of two cases meeting the definition of nosocomial should not automatically trigger the declaration of an outbreak.

**Table 1. Framework for Classifying In-Patient Cases**

Admission Duration Prior to Symptom Onset or Positive Test <sup>§</sup>	Community Exposure	Hospital Exposure	No Known Exposure
<1 day and no prior admission	Community-acquired	n/a	Community-acquired
1 to 7 days	More likely community-acquired	More likely nosocomial	Consider nosocomial if >4 days <sup>¶</sup> ; clinical judgement if 1-4 days
>7 days	#	Nosocomial	Nosocomial

<sup>§</sup>Patients who present to hospital with COVID-19 but have been hospitalized within the previous 7 days should also be considered as having possible nosocomial COVID-19.

<sup>¶</sup>Based on the 3.4-day estimated median incubation period of the Omicron coronavirus.

<sup>#</sup>Best judgment should be used for patients with day passes.

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	Nosocomial	Consider staff risk of community and health care exposures and risk factors
Asymptomatic staff	Community-acquired	Nosocomial	Consider staff risk of community and health care 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 units 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 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 [Additional 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 until cleared to return to work by OHS. Staff who have had an unprotected high-risk exposure to a case of COVID-19 in either the community or the health care setting should follow facility OHS protocols. 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 having worked on the same shift[s] 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, 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 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, placement in Additional Precautions in a single room when possible; for discharged patients, self-isolation if indicated as per current public health guidance).
2. Conduct contact tracing to identify patients, staff or visitors exposed to the patient and initiate appropriate management of patient or staff who had an unprotected high-risk exposure to the patient. Exposed visitors should be notified and 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 nosocomial.
4. Determine if there are/were other symptomatic patients or staff members in the clinical area who require investigation.

### 4.2 Staff Case

The diagnosis of COVID-19 in any staff member should lead to the notification of key stakeholders (see [3.2 Staff Surveillance](#)) and an 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, how to seek medical care if required, and when he or she can return to work.
2. Conduct forward and backward contact tracing to identify all patients or staff members who may have been exposed or served as the source of transmission to the positive staff and initiate appropriate management of patient and staff members who had high-risk exposures.
3. Determine if there is a reasonable likelihood that COVID-19 was nosocomial.\*
4. Determine if there are/were other symptomatic staff members or patients in the clinical area or department in which the staff member worked who require investigation.

\*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>66</sup>

# 5. Outbreak Management for Outbreaks on In-Patient Wards

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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—including (as applicable) hospital and ward leadership, IPAC, OHS, joint health and safety committee (JHSC), public health and microbiology.

## 5.2 Immediate Actions

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

- Place all positive patients in Additional Precautions in single rooms or cohort with other confirmed positive cases, and ensure that signage indicates the type of Additional Precautions.
- 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 Additional Precautions in a single room with access to their own toileting facility where possible and tested for COVID-19; symptomatic patients with pending results should not be cohorted whenever possible. IPAC should be notified of all symptomatic patients.
- Place all exposed patients (e.g., roommates of positive cases) in Additional Precautions preferentially in single rooms. Exposed patients should not be cohorted whenever possible 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.
- Symptomatic staff should not remain at work, should be placed on self-isolation and tested for COVID-19 regardless of vaccination status; OHS should be notified of all symptomatic staff, and will advise on when staff are allowed to return to work.
- 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
- Consideration can be given to placing the entire ward in Additional Precautions pending review at an initial outbreak management team (OMT) meeting.
- If Additional Precautions for all patients are not initiated, at a minimum patients should be restricted to their rooms except for medically essential tests and procedures. Group activities should be cancelled.
- Pause admissions and transfers to the impacted area whenever possible 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.
- OHS should assess all exposed staff; staff with high-risk exposures should be tested and managed in keeping with facility policies and procedures.
- Schedule an OMT meeting ideally within 24–48 hours of recognition of a suspected outbreak. (See [5.3 Outbreak Management Team Meeting](#)).

## 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.

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 B](#). Meetings should continue to occur at a frequency dictated by the course of the outbreak, with frequent meetings (e.g., daily, every other day) as needed 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 discharges, transfers, and admission if closing ward is not possible.
- Availability of PPE and other consumable supplies (e.g., ABHR, signage).
- Review ward staffing and how the outbreak is impacting clinical care.
- Audit results of hand hygiene and PPE use, as well as cleaning practices.
- 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 (e.g., enhanced cleaning, visitors).
- The communications plan.
- The criteria to declare the outbreak over and 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 asymptomatic patients, regardless of vaccination status, is a cornerstone of the initial 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 until cleared by OHS). Caregivers who stay on the ward with patients should also be included in the outbreak investigation (e.g., pediatric wards).

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 are placed in Additional Precautions (see [5.2 Immediate Actions](#)), broad testing of (asymptomatic) patients in the affected area regardless of vaccination status is essential to quickly understand the scope of the outbreak. Asymptomatic staff testing can be offered but is no longer routinely recommended. The requirement for repeated point prevalence testing of patients should be guided by the findings in the initial point prevalence and COVID-19 activity on the ward. Note: multiplex testing for respiratory viruses is only indicated when the pathogen is unknown, or for symptomatic patients if other respiratory viruses are suspected (e.g., mixed outbreak). Point prevalence for (suspected) COVID-19 outbreaks should be a SARS-CoV-2 specific test.

Contact tracing related to positive in-patients and staff cases should be conducted quickly by IPAC and OHS in collaboration. Although all patients and staff on an outbreak ward 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 wards 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 wards as soon as possible (exceptions are currently active COVID-19 patients and those recently recovered).
- Repeat testing of asymptomatic patients can be considered depending on initial point prevalence findings and outbreak activity on the ward.
- IPAC, in collaboration with OHS, should conduct forward and backward contact tracing of all positive in-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 spread from one clinical area to another, or from one facility to another. Staff members should self-monitor for symptoms and get tested when symptoms occur. Facilities should try to dedicate staff to the outbreak ward whenever possible.

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 ward. When feasible, staff members should not be working on the outbreak ward and at other facilities.

The ward should be closed to admissions except in circumstances where both the OMT and the public health unit agree that ward closure will outweigh the harms that may occur as a result of continuing to admit patients to an outbreak ward. If keeping the ward open to admissions, new admissions should not be mixed with the outbreak cohort. Consideration should be given to create an unaffected section within the wards, optimally with dedicated staff. Transfers to the ward should also be limited, whenever feasible. Patients who were transferred to other wards or facilities should remain in Additional Precautions, be tested, and should remain quarantined on the new ward for 7 days from their last exposure to the outbreak ward, even if initial testing was negative. Because of the potentially long incubation period of COVID-19, a review of transfers that occurred prior to declaration of the outbreak is also important and other wards and facilities should be notified of patients who were on the ward during the period where suspected transmission may have been occurring but prior to declaration of the outbreak (e.g., 48 hours before onset of symptoms in first case, or when uncontrolled transmission is deemed to have started). Visitors should be restricted as per the hospital's outbreak policy. Visitors and essential care partners on an outbreak ward should not visit other patients and be instructed in appropriate PPE use, hand hygiene, and how to get tested for SARS-CoV-2 if they were to become symptomatic.

### 5.4.2.1 Key Actions

- Whenever possible, the ward should be closed to admissions and non-urgent transfers while there is evidence of ongoing transmission.
- Visitors and essential care partners to the ward should be restricted as per facility's outbreak policy.
- Patients who require urgent transfer to another ward for medical reasons should be transferred in Additional Precautions and remain in quarantine for 7 days from their last day on the outbreak ward and be tested according to the facility's policy.
- If patients were transferred during the period of transmission on the ward but prior to recognition of the outbreak (e.g., 48 hours before onset of symptoms in first case), the receiving ward or facility should be notified and the patient should be placed in Additional Precautions and tested.
- Facilities should try to dedicate staff to the outbreak ward whenever possible.
- Staff members working on an outbreak ward who work at other facilities must notify OHS at those facilities about their exposure to the outbreak ward.

## 5.4.3 INTERRUPTING TRANSMISSION ON THE OUTBREAK WARD

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 the affected ward in Additional Precautions for at least the initial phase of the outbreak to reduce transmission risk from an as yet unrecognized source could be considered. In addition, auditing and careful review of IPAC and OHS practices on the ward is important to determine deficiencies in policies or practices that may have contributed to transmission. Although contact transmission is not 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 event of an outbreak. 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

- Consider the need of placing all patients on Additional Precautions.<sup>1</sup>
- Ensure PPE and other supplies are sufficient and accessible by staff.
- Review IPAC and OHS policies.
- Review IPAC and OHS practices on the ward through discussion with ward leadership, ward educators, and front-line staff from all professional groups (e.g., nursing, allied health, environmental services, etc.)
- Audit ward practices including IPAC and OHS practices (e.g., PPE adherence, hand hygiene).
- 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 ward to [monitor and provide feedback on hand hygiene](#) and PPE practices.<sup>67</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>68</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 affect their areas.

COVID-19 outbreaks also cause anxiety in patients and families. Clear communication to patients, families, and visitors e.g., through development of a patient letter or frequently asked questions (FAQs) document, is important.

Prominent and clear signage should be placed at all entrances to the outbreak ward to ensure all visitors, essential care partners, and off service staff are aware of the outbreak and the measures in place on the ward.

### 5.5.1 KEY ACTIONS

- Regular communications about the outbreak and outbreak control measures should go to ward staff with separate communications sent more broadly, as required.
- Communications for patients, families, and visitors should be developed.
- Signage should be present upon entrance to the ward to notify anyone entering about the outbreak and the measures in place.

## 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 tested and placed in Additional Precautions (if not already implemented as an outbreak strategy), optimally in a private room with dedicated toileting facilities. Consider daily active screening of caregivers staying on the ward (e.g., pediatric wards) for symptoms. Additionally, after the initial point prevalence testing, if ongoing transmission is suspected or continuing to occur, consider additional point prevalence testing of asymptomatic patients in particular in the early phase of an outbreak, with the frequency of testing determined by the course of the outbreak. Particularly during periods of high activity of other respiratory viruses, ensure that other respiratory viruses are considered for patients with sign and symptoms of a respiratory infection with a negative SARS-CoV-2 test during a COVID-19 outbreak.

### 5.6.1 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, Additional Precautions initiated, and IPAC informed immediately.
- Symptomatic staff should notify OHS, be tested regardless of vaccination status, 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.
- Consider other respiratory viruses for symptomatic patients with negative SARS-CoV-2 tests.

## 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 patient cases deemed to be acquired on the ward have occurred for 7 days. If the last case was a patient with a known exposure and in Additional Precautions, the outbreak would only be extended 7 days from when the patient was put in appropriate Additional Precautions. If the last case was a patient discharged from the ward prior to the diagnosis of COVID-19, their last day on the ward can be used instead of the date of symptom onset or test positivity. It is likely for community-acquired cases to occur during an outbreak, in particular while COVID-19 activity in the community is high. These cases should not extend the duration of outbreaks. 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

- The OMT can declare the outbreak over, in consultation with public health, when no new nosocomial patient case has occurred for 7 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>69-75</sup> Although the general principles of outbreak management provided for in-patient 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 in-patient wards 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 an HD unit), creating the potential for introducing COVID-19 into the HD facility from another health care setting where an outbreak is occurring (e.g., a long-term care home).

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, are often crowded with limited physical distancing and without physical barriers between patients. This creates the risk for patient-to-patient transmission of diseases that spread via respiratory particles. 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 happens in in-patient 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 regardless of vaccination status and clusters of cases in patients or staff should be reported immediately to the HD unit leadership and to

IPAC and OHS. Effective screening for COVID-19 symptoms is enabled/facilitated by strong communication, including communication in the patient’s language of preference and by involving families in this process if required. 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 the HD setting is not different than for a ward outbreak:

**Two or more patients with positive COVID-19 test results from a polymerase chain reaction test, rapid molecular test, or rapid antigen test within an HD setting and within a 7 day period where both cases could have reasonably acquired their infection in the HD setting.**

**Similarly to in-patient wards, this definition in isolation should not dictate whether or not an outbreak needs to be declared. Instead, consideration should be given to the likelihood of uncontrolled transmission in order to determine outbreak status, in discussion with the public health unit.**

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 patients given their ongoing exposure in the community. Factors similar to those discussed in Chapter 2 Definition of a COVID-19 Outbreak must be considered to determine the likelihood of an outbreak. Furthermore, whether cases are clustered temporally and spatially within the HD unit must be considered, e.g., 2 cases on the Mon/Wed/Fri noon dialysis shift in the same pod is more likely an outbreak; 1 case on the evening shift M/W/F and 1 case on the noon shift Tues/Thu/Sat is more likely sporadic community transmission.

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. Although 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 nosocomial case is identified and in most cases control measures should be implemented even if an outbreak has not been declared.

During times of low community transmission, when a single patient COVID-19 case is identified in an 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<sup>76-78</sup> and to consider testing the entire shift if feasible. If two cases have been identified, testing all patients on the shift should be considered. 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 In-Patient Wards](#). When community transmission is high, a different approach may be required as positive cases are to be expected in the absence of transmission in the unit, and a thorough investigation as outlined above may not be needed or possible.

\*When the incidence of COVID-19 is high or has been high recently 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 HD units but provide care to a patient population that requires frequent infusions, including oncology patients and other patient populations. Most of the considerations described for the HD 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 units. When a single case is identified, testing can reasonably be focused on unmasked patients with prolonged exposures on the same day(s) that the case was in the unit within the previous 7 days. If multiple cases are identified, testing a broader group of patients,

identified based on their risk of exposure, may be indicated depending on level of COVID-19 activity in the community and likelihood of cases being acquired in the clinic.

## 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 wards 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 ward 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 7 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 Additional 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 wards, 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 or are not patient facing, 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, staff with high-risk exposures should be managed and tested according to facility policies and procedures. Identification of high-risk exposed patients is critical to ensure that the staff outbreak has not and will not result in uncontrolled transmission on the unit. In most cases, a unit does not require to be closed to admissions in the absence of infections among patients.

Staff should self-monitor for symptoms, and seek testing when symptoms occur. Further interventions should focus on staff education, vaccine promotion, ensuring that staff members are following appropriate IPAC and OHS practices, and are fit-tested for N95 respirators as required. This includes masking in accordance with the facility policy, the need to report symptoms to OHS and not to work even with mild COVID-19 symptoms until cleared by OHS.

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# Appendix A. Symptoms of COVID-19

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The most common symptoms of COVID-19 include:<sup>79</sup>

- fever or chills
- cough
- shortness of breath
- decreased or loss of taste or smell
- runny nose or nasal congestion
- headache
- extreme fatigue
- sore throat
- muscle aches or joint pain
- gastrointestinal symptoms (such as vomiting or diarrhea)

Source: Government of Ontario. [COVID-19: public health measures and advice](#).<sup>79</sup>



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

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The OMT should develop a case definition for the outbreak.

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 factors 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).
  - Low staff vaccination rates.
  - Poor adherence to or barriers to following COVID-19 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, low vaccination rates).
  - 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 include:

- 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, Additional Precautions for all patients).
- Enhance 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 point prevalence testing.
- Identify internal transfers off the unit during the transmission period and implement Additional 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.
- Promote staff vaccination.
- 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
  - patients and families
  - the broader public (e.g., on the hospital's website)
  - the media
- Determine date of next meeting.

**Public Health Ontario**

480 University Avenue, Suite 300  
Toronto, Ontario  
M5G 1V2

647.260.7100

[pidac@oahpp.ca](mailto:pidac@oahpp.ca)

[www.publichealthontario.ca](http://www.publichealthontario.ca)

