

# **Respiratory Infection Outbreak Guidelines for Healthcare Facilities**

**Reference Document for use by Health Care Organizations  
for Internal Policy/Protocol Development**

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Revised from Provincial Infection Control Network  
Reference for Respiratory Outbreak Prevention and Control Guidelines  
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**British Columbia Provincial Infection Control Network**

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### Acronyms

**ABHR** Alcohol based hand rub  
**AGMP** Aerosol generating medical procedure  
**BAL** Broncho-alveolar Lavage  
**BCWCH** British Columbia Women's and Children's Hospital  
**BCCDC** British Columbia Centre for Disease Control  
**DFA** Direct Fluorescent Antibody Assay  
**ET** Endotracheal  
**GRG** Guidelines review group  
**HCP** Health Care provider  
**HMPV** Human Metapneumo virus  
**HPIV** Human Parainfluenza Virus  
**ICP** Infection Control Practitioner/Professional  
**IFA** Indirect Fluorescent Antibody Assay  
**ILI** Influenza-like Illness  
**ICO** Infection Control Officer  
**MHO** Medical Health Officer  
**NP** Nasopharyngeal  
**OHN** Occupational Health Nurse  
**OPMT** Outbreak Prevention and Management Team  
**PHAC** Public Health Agency of Canada  
**PHN** Public Health Nurse  
**PICNet** Provincial Infection Control Network of British Columbia  
**POC** Point of care  
**PPE** Personal Protective Equipment  
**RI** Respiratory Infection  
**RSV** Respiratory Syncytial Virus  
**RT-PCR** Reverse Transcription Polymerase Chain Reaction  
**SARS** Severe Acute Respiratory Syndrome  
**TB** Tuberculosis  
**VIRAP** Viral Rapid Testing  
**WH&S** Workplace Health and Safety

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## 1. Introduction

Respiratory infections (RI) are often spread when droplets, generated from coughing and sneezing by infected people, come into contact with the mucous membranes of the eyes, mouth, nose, or airway of another person. Because microorganisms in droplets can often survive on surfaces, infections can also be spread indirectly when people touch contaminated hands, surfaces and objects and inoculate themselves by touching their mucous membranes.

Outbreaks of respiratory infection in BC predominantly occur between October and March each year. Influenza is a major cause of respiratory outbreaks, but outbreaks can also be caused by other viruses such as parainfluenza virus, respiratory syncytial virus (RSV), coronavirus, rhinovirus, human metapneumovirus and adenovirus, and less commonly by bacterial pathogens such as *Mycoplasma pneumoniae*, *Legionella sp.*, *Chlamydia pneumoniae*, and *Streptococcus pneumoniae* (1). The dominant causal organisms are highly variable from season to season and across geographic areas or specific locales or settings. For example, in a Canadian study by Loeb et al. (2000) the most common organism identified was parainfluenza virus, followed by Influenza A, although in just over 1/3 of the outbreaks studied multiple causal organisms were identified(2). Another study by Falsey et al. (2008) found the most common organism involved in RI outbreaks in Boston residential care facilities to be human metapneumovirus followed by coronavirus 228E (3).

Of the etiologic agents, influenza A and B viruses are of greatest concern because of their epidemic seasonal behaviour and their relatively high levels of morbidity and mortality, especially amongst the population at the extremes of life (4). For both Influenza A and B there are effective interventions that can prevent infections and mitigate outbreaks such that early identification of their possible contribution to respiratory illness is important.

## 2. Purpose

These guidelines describe the infection prevention and control practices for respiratory infections that are primarily droplet spread. Implementing these guidelines will enable the healthcare system to detect and contain clusters and outbreaks of common respiratory infections and assist in the detection of novel pathogens.

## 3. Scope

These guidelines are not intended to replace local or regional processes, but rather to serve as a reference for all healthcare settings when developing or updating their own policies. The recommendations described in this document exemplify best practices in the prevention and control of seasonal droplet-spread respiratory outbreaks.

These guidelines are designed to address seasonal respiratory infections (RI) that are primarily spread by large droplets. Although the basic control measures described in these guidelines are to be used for outbreak prevention and control of all respiratory infections, specific respiratory infections such as SARS, tuberculosis or an emerging pathogen with unknown characteristics require special consideration and additional control measures.

While evidence has shown that some seasonal respiratory infections have a component of aerosol spread the burden of transmission by the airborne route remains controversial(5). For known airborne spread infections (e.g. measles, TB), specific guidelines should be followed as laid out by your regional health authority, the BC Center for Disease Control (6), and the Public Health Agency of Canada (7). These illnesses are beyond the scope of this document. Pandemic Influenza events also fall beyond the scope of this document.

## 4. Literature Search Strategy

Electronic searches of Medline, Science Direct, PubMed, Google Scholar and Cinahl (2006 -November 2010) were carried out to identify new findings to update this document. References cited in eligible papers, that were considered to be relevant were also obtained. Of those titles identified approximately 300 abstracts were reviewed and approximately 100 full articles were read.

## 5. Methods

The recommendations made within this guideline are graded based on the level of supporting evidence available, using the Public Health Agency of Canada rating scale for strength and quality of evidence (**Appendix 1**). The grading level assigned does not relate to the importance of the recommendation, but to the strength of the supporting evidence. Evidence tables were created by the writer where strong evidence to support the recommendations was available. These tables were reviewed by the PICNet Guideline Review Group (GRG). For recommendations based on the expert opinion of the GRG members, any differences in opinion were resolved through discussion and consensus. This process was reviewed and approved by the PICNet Guidelines Steering Committee.

## 6. Outbreak Prevention and Management Team

Organizational leadership is critical in all healthcare settings to ensure effective outbreak prevention and control. Ideally, all facilities should have a designated Outbreak Prevention and Management Team (OPMT). This group is responsible for ensuring that measures for preventing outbreaks are in place and for directing and overseeing the management of all aspects of any outbreak. OPMT members should have decision making authority for their discipline within the facility or unit. A lead person from this group should be appointed to coordinate the meeting(s) during an outbreak. The membership of an OPMT will depend upon the facility's location, size and contractual status.

Membership may include:

- A medical advisor (if available)
- Infection control physician (if available)
- Medical Health Officer (MHO) or delegate
- An administrator or Director of Care
- An Infection Control Professional (ICP) or person responsible for infection prevention and control (IPAC) at that site
- An Occupational Health Nurse or person responsible for Workplace Health and Safety (WH&S)
- A Public Health Communicable Disease representative or Public Health Nurse (PHN)
- A laboratory manager or representative
- A person responsible for support services such as housekeeping and laundry
- A foods services supervisor
- Communications coordinator
- Front line healthcare providers (HCP) representative (e.g. charge nurse)

A written process for RI Outbreak Management which includes current membership of the OPMT with contact information should be available to all HCPs. This should be reviewed yearly and updates made. See **Appendix 2** for a quick check list to prepare for RI outbreaks. *Category BIII*

## **6.1 Roles and Responsibilities During a Respiratory Infection Outbreak**

The BC Public Health Act and Community Care and Assisted Living Act define the roles and responsibilities of the MHO and Public Health in outbreak control. The remaining roles and responsibilities have been recommended by consensus of the RI Outbreak Management Guidelines Working Group with the understanding that in some Health Authorities or facilities responsibilities may be delegated or shared differently depending upon the type of care provided, resources or physical setting. There is therefore some overlap in the description of roles.

### **British Columbia Centre for Disease Control (BCCDC) Public Health Microbiology & Reference Laboratory**

Provides advice on sample collection and testing and undertakes timely processing of samples and reporting back of results to a designated contact person.

### **Facility Administrator/Manager or Director of Care**

Ensures that patients/residents/clients receive care in a safe environment by working collaboratively with ICP/PHN/MHO to ensure that HCPs are familiar with outbreak prevention and control processes and ensures timely implementation of control strategies which may include providing additional resources. Works collaboratively with WH&S to monitor and report HCPs illness.

### **Healthcare Provider (HCP: includes all disciplines who provide services to or around patients)**

Work collaboratively with MHO/PHN/ICP, Facility Managers to ensure best practices are used for the prevention and control of RI Outbreaks. This includes early recognition of clusters of RI infections, diligent use and promotion of hand hygiene, early recognition of possible outbreaks and timely implementation of control strategies.

### **Infection Control Officer (ICO)**

Usually a physician but may be a senior ICP that is responsible for leading the IPAC program in a facility. Provides primary direction in outbreak pre-planning and control.

### **Infection Control Professional (ICP)**

Works with the MHO and/or PHN and in conjunction with the facility manager and HCPs to ensure that appropriate outbreak mitigation measures are in place in preparation for an outbreak occurrence. Acts as a consultant and provides support/resources prior to and during an outbreak to ensure control strategies are initiated promptly; communicates/liases promptly with Public Health and/or the MHO when outbreaks are suspected and/or have been declared.

### **Local Laboratory/ Medical Microbiologist**

Provides advice on appropriate laboratory specimens to facilitate diagnostics (in conjunction with BCCDC) and assists in timely transportation of specimens to BCCDC where appropriate. In some cases may perform initial specimen testing.

### **Media/Public Relations**

With guidance from the MHO and Outbreak Prevention and Management Team develops appropriate public announcements.

### **Medical Director or Facility Individual Physicians**

Works collaboratively with the Facility Manager and PHN/ICP/MHO to ensure that patients/residents/clients receive appropriate care in a safe environment.

### **Medical Health Officer (MHO)**

Consults with IPAC, Public Health Nurse, Occupational Health, Medical Director, Administrators and Nursing HCPs, concerning outbreak declaration, control measures and declaration of end of outbreak. The Medical Health Officer has legislative authority and responsibility, according to the Public Health Act, to control the outbreak. The MHO may delegate this responsibility. In many situations, jointly developed protocols are in place to guide outbreak detection and management and the Medical Health Officer may not be directly involved with each outbreak. Even if such protocols are in place, the authority of the Medical Health Officer to direct the local response remains in place.

### **Public Health Nurse (PHN)**

Consults with IPAC, MHO, Occupational Health, Medical Director, Administrators and Nursing HCPs, concerning outbreak declaration, control measures and declaration of end of outbreak.

### **Support Services**

Assists in outbreak management by ensuring additional resources such as personnel, supplies, enhanced cleaning etc. are available.

### **Occupational Health/Workplace Health and Safety (WH&S)**

In collaboration with IPAC or the Facility Manager, monitors and tracks HCPs illness; provides support and education related to sick time and compensation of healthcare providers.

## **6.2 Outbreak Prevention and Management Team Meetings**

Depending on their location, ownership or contractual status, each healthcare facility may have a very different RI Outbreak Management Team. The team may include a hospital-based Infection Control Practitioner, an Occupational Health Nurse, a Public Health Nurse, an Environmental Health Officer, a Medical Microbiologist, or a Medical Health Officer. It is very important for each facility to determine who will serve as resources in case of an outbreak, and to maintain a current list of contact names and numbers. Current contact names and numbers are needed for the following services:

- The outbreak management resource person for your facility
- The facility Infection Control Practitioner (if applicable)
- The facility Medical Microbiologist (if applicable)
- The Medical Health Officer on-call or the Medical Microbiologist on-call
- The laboratory where the facility will be sending specimens for testing and where testing materials can be obtained.

### **6.2.1 Responsibilities of the OPMT in the Non-Outbreak Period**

#### **Plan implementation of control measures:**

- Ensure that posters, educational material and control measures are in place and available and discussed with staff.
- Discuss the use of additional control measures, such as antiviral prophylaxis, and plan for their implementation.
- Assure appropriate and sufficient quantities of personal protective equipment (PPE) and supplies are accessible (i.e. alcohol hand sanitizer, cleaner/disinfectants, masks, gowns etc).
- Discuss the implementation of the staff exclusion policy for a confirmed influenza outbreak, and review the staffing contingency plan. If staff exclusions critically compromise staffing levels, delegate an OPMT member to contact the Medical Health Officer to discuss options.



- Determine if additional influenza immunizations are required for non-immunized staff members or patients/residents, and if so, plan how they will be implemented.
- Confirm the plan for the collection and submission of specimens for laboratory testing.

**Plan communication strategy:**

- Identify any additional persons/institutions that require notification of the outbreak, and person responsible for doing so. This may include the Director of Care, any OPMT members not present at the meeting, the Licensing Program (for settings licensed under the Community Care and Assisted Living Act), facility laboratory services, BC Ambulance, Handidart, Medigas, etc.
- Identify facilities or institutions that have admitted a resident/patient from the facility up to two days before symptoms started in the first case of the outbreak.
- Determine if additional communication or education is required for residents/patients, family and staff groups.
- Identify the individual who will be responsible for the ongoing monitoring of the outbreak in both residents and staff members, and the most efficient and effective method for doing this.
- Identify the individual who will be receiving the laboratory results and how this information will be communicated within the facility.
- Identify the individual who will be communicating with the Public Health on a daily basis, and to ensure that contact numbers are readily available.
- Identify who will be the media spokesperson (this may be a designated person from the Health Authority)
- Decide how frequently the OPMT will meet, and to set the next meeting date and time.

The Outbreak Prevention and Management Team members for the facility and the Public Health representative should meet as soon as possible after an outbreak is suspected or confirmed to take the following actions:

- Review the line listing information to ensure that all members of the team have a common understanding of the situation
- Develop a working case definition for this particular outbreak. The signs and symptoms noted in a particular outbreak may be somewhat different from the generic case definition for RI. Furthermore, the case definition for residents/patients may be different from that developed for staff members. Residents or patients who meet the working case definition will be considered ‘cases’ regardless of the results of laboratory testing unless another diagnosis is confirmed.

## 7. Identifying an Outbreak

### 7.1 Case Definition for Respiratory Infection

Prior to laboratory confirmation of infection by a particular organism, the following case definition should be used to identify possible cases of respiratory infection (RI):

- New or worsening cough and
- Fever  $>38^{\circ}\text{C}$ , or a temperature that is abnormal for that individual
- Additional symptoms including myalgia/arthralgia, prostration, nasal discharge, sore throat, headache

**Note:** There may be groups within the population that would not meet this definition, yet are infected with an organism that can cause respiratory outbreaks. For example, young children, the elderly, the immuno-compromised, or those taking medications such as steroids, NSAIDS, or ASA, **may not develop a fever** or may have a lowered temperature as a result of the infection.

- A temperature  $<35.6^{\circ}\text{C}$  or  $> 37.4^{\circ}\text{C}$  in the elderly may be an indication of infection

### 7.2 Suspected and Declared outbreaks

Early detection of respiratory outbreaks and implementation of control measures will reduce the impact on the health of both staff members and residents/patients. Use a definition for a ‘suspected outbreak’ to investigate cases for the presence of a causative RI organism and to facilitate the efficient implementation of control measures should this be considered likely.

The local Medical Health Officer or delegate determines whether illness in a healthcare setting constitutes an outbreak of RI and assists with recommendations to contain and minimize the health consequences. At the discretion of the local Medical Health Officer and/or delegates, some control measures may be implemented at the “suspected outbreak” stage while other more invasive measures await confirmation.

#### **Definition of a ‘suspected RI outbreak’**

- One laboratory confirmed case of an RI-causing organism and no other cases of RI.
- or**
- Two cases of RI occurring within 7 days in a geographic area (i.e. unit or floor). One of the two cases may be in a staff member epidemiologically linked to the resident/patient/client.
- or**
- More than one unit having a case of RI within 7 days.

When these occur in an acute care facility, staff should be on the alert for more cases and be ready to implement full unit wide control measures (contact/droplet precautions).

#### **Definition of a ‘declared RI outbreak’**

When there are additional cases identified beyond those recognized within the “suspect outbreak” definition.

## 7.3 Identifying the Source

A variety of respiratory pathogens are capable of causing outbreaks in healthcare facilities. Very specific control measures are applied when an outbreak is caused by Influenza A or B, but facilities may be unclear about control measures needed to control outbreaks that are known or suspected to be due to other pathogens. For instance, there may be a laboratory diagnosis of other viral pathogens (e.g. RSV, parainfluenza), or when a laboratory is unable to identify an organism, there may be a general consensus that the outbreak is likely caused by undefined organisms capable of causing 'common cold-like' illness.

Respiratory viral infections are transmitted among the general population either as sporadic episodes or as institutional and community outbreaks. Since many respiratory virus infections present with relatively common symptoms, a definitive laboratory diagnosis is important for the appropriate management of the patients, implementation of IPAC measures and in the case of influenza, the therapeutic and prophylactic use of antiviral drugs for both the patients and staff (4). In general, influenza infections are known to spread rapidly through institutions and in older adults are associated with more complications than other respiratory viruses (8). Accordingly, in institutional outbreaks, it is particularly desirable to rule in or rule out influenza when testing for the etiological agent of the respiratory infection.

**Appendix 3** provides a table of the common viral and bacterial pathogens that cause RI outbreaks.

## 8. Collection of specimens

### 8.1 Selecting the Appropriate Diagnostic Testing Methodology

Laboratory testing for respiratory viruses is performed using a number of different technologies. These range from isolation of the virus in cell culture to immuno-specific detection of the virus by immunofluorescence microscopy or enzyme immunoassays (point-of-care tests) to nucleic acid based tests such as reverse transcriptase-polymer chain reaction (RT-PCR). In addition, influenza infections in particular can be diagnosed retrospectively by serological tests such as the hemagglutination-inhibition assay. Each approach has its advantages and disadvantages for both sporadic and epidemic virus testing.

Turn-around-time is an important issue for specific testing approaches. Laboratories recognize that this should be kept to a minimum since test results obtained after several days are of limited value for the management of these infections (9). Immuno-specific and nucleic-acid based tests now allow laboratories to make a diagnosis within a matter of hours of the specimen being received. However, the overall time for obtaining a laboratory diagnosis by the physician also includes specimen collection, transport to the laboratory, and communication of the findings to the submitting physician in addition to the laboratory testing itself, which includes the pre-analytical documentation. Depending on the access to the laboratory, the overall turn-around time may be prolonged; hence the healthcare provider should be aware of the particulars of each available testing methodology, the appropriateness of its use in a specific clinical context and the expected time that is likely to be required to obtain a laboratory diagnosis. Please see **Appendix 4** for a table showing the facilities that provide viral testing for respiratory specimens.

In general, point-of-care tests (POC), which have been developed for the diagnosis of influenza, are appropriate for use in institutional outbreak investigations. They can readily be performed on site or at a nearby laboratory thereby minimizing transportation times. These tests can readily be performed by appropriately trained laboratory personnel or nursing staff. However, it is recommended that local testing centers perform routine quality control on their tests in conjunction with an established virology laboratory (10). Point-of-care tests are generally limited for the diagnosis of influenza A and B viruses and respiratory syncytial virus (RSV). While they are relatively insensitive for establishing a diagnosis on a single patient,

they are nevertheless acceptable if specimens from several patients are tested. These results are useful in establishing the presence of an outbreak if the tests from several patients are positive.

## 8.2 General Recommendations for Specimen Collection and Transport

When an institutional outbreak of a respiratory infection is suspected, specimens are collected for virus testing. The type of respiratory specimen collected and the method will depend on the patient/resident's condition and the resources available. Examples of specimens include: nasopharyngeal washings (using suction or with a syringe), nasopharyngeal swabs, nasal swabs and Baylor nasal washes. For institutional outbreaks, specimens from up to 6 symptomatic individuals should be initially submitted. If no etiological agent can be identified, further specimens may be sent.

- Throat swabs are usually contraindicated for respiratory virus diagnosis. They are generally unacceptable for direct fluorescent antibody (DFA) and may have limited acceptance for RT-PCR tests.
- Respiratory specimens should be collected as per the instructions of the laboratory processing the specimen or as outlined below. Detailed procedures for specimen collection are provided in **Appendix 5**
- Specimens should be collected only from symptomatic individuals within 48 to 72 hours of onset of symptoms, including HCP if available. From acutely ill patients, specimens collected after 72 hours may be acceptable for testing by RT-PCR and virus isolation in cell culture.
- Always label the specimen with the patient/resident's full name, date of birth and Provincial Health Number. Complete the laboratory specific requisition form for each specimen. These must be sent with the specimens to the laboratory.
- Wear PPE when collecting the specimens as required (i.e. gloves, mask, eye protection and gowns). This is to protect from a splash or a spray with a body fluid, substance, excretion or secretion (i.e. if the patient/resident coughs or sneezes during the procedure).
- Keep specimens at refrigerator temperature (2°C to 8°C) as much as possible after collection and during transport to the laboratory; this may be achieved by using an ice pack. Do not freeze the specimens.
- Complete the laboratory specific respiratory outbreak lab form and fax to the lab as instructed on the form. See **Appendix 6** for the BCCDC Respiratory Illness Outbreak Laboratory Form (check BCCDC website for most up to date version: [www.phsa.ca/labforms](http://www.phsa.ca/labforms)) and the VIRAP Influenza-like Illness Specimen Contact Sheet for BC Women's and Children's Hospital (BCWCH); other forms can be obtained from your selected laboratory. Please ensure that you provide the name and telephone number to which test results are to be communicated.
- Transport to the laboratory according to established processes.

## 9. Reporting and Notification

According to the British Columbia Public Health Act all RI outbreaks in healthcare facilities must be reported to the MHO and/or designated Public Health contact (i.e. PHN, Communicable Disease team). The facility Manager/Director of Care or Infection Control Professional should also notify the Infection Control Officer and mobilize the Outbreak Prevention and Management Team. An example of an initial Outbreak Report Form is found in **Appendix 7**

Ancillary services used by the facility also should be alerted in the event of an outbreak. These may include:

- HandiDart
- Lab service provider
- Medigas
- BC Ambulance Service
- Cleaning service provider
- Other service providers: physiotherapy, podiatry, hairdressing, music therapist, etc.

*Category BIII*

## 10. General Principles of Control

### 10.1 Immunizations

#### 10.1.1 Influenza vaccine (11)

Influenza is a respiratory infection that causes substantial illness and death in BC health settings as well as illness among healthcare providers every year. Influenza immunization of health-care personnel and long-term care facility residents can help prevent outbreaks (12). Influenza outbreaks may still occur with sub-optimal immunization coverage among healthcare personnel or in the event of substantial virus drift away from the selected vaccine components. Although influenza immunization may not always prevent infection, it can prevent serious complications (13). Even with some drift of the circulating virus away from the vaccine component, cross-protection against the drift variant can be provided by vaccination.

Influenza immunization of people capable of transmitting influenza to patients or residents is considered a part of the duty of care for patients/residents/clients. This includes all persons carrying on activities within the facility, i.e., employees, students, attending physicians, and both healthcare and non-healthcare contract workers and volunteers (12, 14-19).

*Category AI*

The National Advisory Committee on Immunization (NACI) publishes an Advisory Statement on Influenza vaccine each June.(11) It can be viewed using the following link:

<http://www.phac-aspc.gc.ca/im/index-eng.php>

#### 10.1.2 Pneumococcal polysaccharide vaccine (20)

*Streptococcus pneumoniae* is a bacterium and an important contributor to deaths associated with influenza every winter. A vaccine against *S. pneumoniae* exists and, unlike influenza vaccine, does not have to be repeated every year. Therefore, ensuring that eligible high-risk people receive their free pneumococcal vaccine will protect them each winter.

The pneumococcal polysaccharide vaccine is recommended for and provided free to people who are at high risk of getting serious infections including elderly or immunocompromised patients or residential care

residents. Healthcare settings are encouraged to develop processes for obtaining pre-printed orders for pneumococcal immunization for residents on admission to complex care settings.

Assessment of eligibility for pneumococcal immunization should be part of yearly immunization clinics for all healthcare settings. Certain individuals with specific health concerns will be eligible for a booster of pneumococcal vaccine five years after the initial dosing. For a complete listing of eligibility criteria please see Section 7 of Chapter II of BCCDC Communicable Disease Manual: BC Immunization Program (21).

### 10.1.3 Immunization of Visitors

Visitors should be provided with information regarding the need for influenza and pneumococcal immunization and locations where they can receive immunization.

*Category BIII*

## 10.2 Routine Practices (22)

Routine Practices is the term used by the Public Health Agency of Canada to describe the system of infection prevention and control practices used to prevent the transmission of infections in all healthcare settings. Routine Practices should be used with all patients/residents/clients at all times. A full description of these may be obtained from: <http://www.phac-aspc.gc.ca/dpg-eng.php>

Close attention to Routine Practices is fundamental to preventing transmission of microorganisms among patients/residents/clients and HCP in all healthcare settings. The basic elements of Routine Practice that are especially important for control of respiratory infections are:

### 10.2.1 Hand Hygiene

Hand hygiene is everybody's responsibility: HCPs, clients, visitors and volunteers. Hand hygiene is an effective way to prevent the transmission of microorganisms. Compliance with hand hygiene recommendations requires continuous reinforcement.

- Either alcohol based hand rub (ABHR) or soap and warm water are accepted methods of hand hygiene.
  - soap and water is required if hands are visibly soiled
  - ABHR is recommended at “point of care” places in patient care areas
- Patients/residents/clients who are able to participate in self-care should be taught, encouraged and reminded of the importance of hand hygiene before eating or preparing food, after using the toilet or other personal hygiene activities, before leaving their homes for common/public areas and when returning home from public places.
- Ensure that hand hygiene facilities are available to patients/residents/clients prior to meals etc.
- Patients/residents/clients who are unable to participate in hand hygiene due to physical or mental impairments should be assisted with hand hygiene prior to meals etc.

### 10.2.2 Respiratory Hygiene

All patients/residents/clients and visitors should be encouraged to practice good respiratory hygiene. This includes (22):

1. Performing hand hygiene after coughing, sneezing or using tissues
2. Using disposable, single use tissues for wiping noses
3. Covering the nose and mouth when sneezing and coughing (even when this is due to allergies or chronic illness).
4. Keeping hands away from the mucous membranes of the eyes and nose

### 10.2.3 Point of Care Risk Assessment (22)

A Point of Care Risk Assessment is the evaluation of the interaction between the Healthcare Provider (HCP), the patient/resident/client and the environment to determine the potential for exposure to pathogens. Prior to any patient/resident/client interaction all HCP have a responsibility to always assess the infectious risk posed to themselves and to others (e.g. other patients/residents/clients, visitors, other HCP).

Risk Assessments for any interaction includes:

- The patient/resident's/client/s symptoms and whether they may be consistent with an infectious process (cough, fever, nausea/vomiting)
- The type of interaction that will occur (e.g. direct care vs. bringing something into the room for them vs. performing an aerosol generating medical procedure)
- The potential for contamination of themselves or any equipment used
- Identification of barriers (e.g. PPE) required to prevent transmission (e.g. gloves, mask)
- Whether all secretion/excretions are contained (e.g. compliance with respiratory hygiene, wounds well covered)
- Whether the person is able to follow instructions (e.g. cognitive abilities, mental health condition)
- The setting in which the interaction will take place (e.g. single room vs. multi-bed room, vs. outpatient or common area)

In reality, HCP do Risk Assessments many times a day for their safety and the safety of others in the healthcare environment. During a RI outbreak HCPs should be especially vigilant in identifying risk of exposure to RI pathogens, especially when assisting those who are acutely ill (e.g. fever, cough).

*Category BIII*

**Risk stratification table for RI**

<b><u>Risk level</u></b>	<b><u>Organism-related risk</u></b>	<b><u>Infectious person-related risk</u></b>	<b><u>Procedure-related risk</u></b>	<b><u>Host-related risk</u></b>
<b>Higher</b>	Unknown organism in person with possible high risk contacts (i.e. recent travel and contact with poultry)	Acute illness (i.e. fever with frequent productive coughing)	Use of aerosol generating medical procedures (AGMP)	Caregiver is immune-compromised (e.g. transplant recipient) or Roommate is immune-compromised (e.g. transplant recipient) or No vaccine or antiviral prophylaxis taken
<b>Lower</b>	Unknown organism in person with <u>known history of no high risk contacts</u> (e.g. resident of long-term care facility with no current outbreak)	Low severity illness (i.e. infrequent non-productive coughing, mild symptoms)	No use of AGMP	Caregiver and roommate not immune compromised <u>or</u> Vaccine and/or prophylaxis taken

#### **10.2.4 Patient/Resident Placement**

In acute care facilities, a single room with a toilet and hand hygiene facilities is preferable.

If large numbers of patients/residents/clients require Contact and Droplet Precautions simultaneously, single room accommodation may not be possible. In this case, it is advisable to cohort patients/residents with similar symptoms. When single rooms are scarce and/or cohorting is not feasible:

- Avoid placing a patient/resident with RI symptoms in the same room as a patient who is at high risk for complications (e.g. immunocompromised, recent surgery etc.).
- In a shared room, patient/resident's beds should be 2 meters apart with a curtain drawn between them.
- In shared rooms, roommates and all visitors must be aware of the precautions to follow. Select roommates who are able to comply with precautions *Category BIII*

#### **10.2.5 Risk Reduction Strategies (22)**

Risk reduction strategies include: engineering measures (e.g. negative pressure rooms) client screening, use of personal protective equipment (PPE), environmental cleaning, proper disinfection and sterilization of reusable equipment or use of "single use" only equipment, appropriate waste management and safe sharps handling, appropriate client placement and using preventative workplace practices such as HCPs immunization policies.

#### **10.2.6 Education of Healthcare Providers, Clients and Families/Visitors/Volunteers (22)**

All healthcare providers should receive general education on agency policies, which includes information regarding the principles of infection prevention and control. Review of hand hygiene; Routine Practices and Additional Precautions; and chain of infection should be included and refreshed periodically. Specific information should be emphasized, as it relates to the work environment.

Education for patients/residents should include information about hand and respiratory hygiene. If the patient/resident has an infection, this information should include practices necessary to reduce the risk of spread.

Families/Visitors/Volunteers should be educated on respiratory and hand hygiene and any other situation appropriate practices.

#### **10.3 Additional Precautions (22)**

Additional Precautions are used in addition to Routine Practices when an infection with a specific mode of transmission is suspected or confirmed. These are required when Routine Practices are not sufficient to prevent transmission. Many respiratory infections require Contact and Droplet Precautions.

Patients/residents/clients should be assisted to understand the nature of their infection and the precautions being used, as well as the prevention of transmission of disease to others during their stay in the facility and upon their return to the community. *Category BII*

Healthcare settings should ensure that staff members have quick and easy access to the PPE and cleaning products required when providing care. *Category BIII*

In outbreak situations, Additional Practices may differ for different organisms and illness severity, and they may need to be modified in consultation with the MHO or delegate on an ongoing basis as the outbreak progresses.



### 10.3.1 Isolation/Spatial/Barrier Separation

Residents or patients who meet the case definition for a respiratory infection should be encouraged to remain in their room until they are no longer symptomatic or in the case of an outbreak, the date determined by the Medical Health Officer or their delegate.

It should be noted that confinement of residents and patients, even for a few days, could have adverse effects on the individual's emotional well-being, especially those with mental illness or dementia (23-25). Staff members need to make efforts not to socially isolate these individuals. Implement strategies designed to diminish the negative impact and protect the patient/residents such as:

- one to one supervision of meals for those who have difficulty swallowing
- monitoring of patients/residents to ensure adequate nutritional and fluid intake
- increasing frequency of rounds to provide oral fluids for patients/residents
- planned one to one (or room to room) interactions with priority given to those who have cognitive issues
- physiotherapy or other rehabilitative therapy should continue if the individual is well enough

*Category AII*

Ideally, healthcare settings should accommodate all patients in single rooms to provide privacy for patient and family; this would also facilitate IPAC activities. In reality, the number of single rooms in existing health care settings is limited, and most patient rooms and bathrooms must be shared. Critical care areas are frequently large open units or are divided into cubicles without doors, and waiting areas may force ill people to be in close proximity for long periods of time.

A patient, resident or client who meets the definition for a respiratory infection and needs to remain in a common area, should be asked to don a surgical mask to reduce the likelihood of transmission of the infection to others (26). If unable to tolerate a mask (i.e. children, people who have difficulties breathing under the mask even with the administration of oxygen, people with dementia or other mental health conditions), the person should be asked to remain in a separate area or at least two meters away from others (26).

*Category BII*

When a patient, resident or client with a respiratory infection must remain in a common area or must share a room with others, the room-mate(s) and all visitors should be made aware of precautions to follow.

*Category BIII*

In **acute care facilities**, consideration could be given to ensuring that room-mate(s) are not at high risk of serious disease if transmission occurs, and are able to comply with precautions. This is not generally possible in residential care facilities where residents' rooms are their homes.

*Category BIII*

## 11. Personal Protective Equipment for Contact/Droplet Precautions

While conducting personal risk assessments staff members should assess their likelihood of being exposed to any body fluids by direct or indirect contact, by splashes, or by fine mist sprays. They should then choose and don the appropriate personal protective equipment (i.e. gloves, surgical mask, eye protection) prior to entering the space (within 2 meters) where the exposure may occur (22). *Category BII*

### 11.1 Facial Protection (22)

According to Routine Practices, facial protection (mask and face shield, or mask and other eye protection such as goggles) should be worn by healthcare workers to protect the mucous membranes of the eyes, nose and mouth during procedures and patient care activities likely to generate splashes or sprays of blood, body fluids, secretions or excretions (22). Personal prescription eyeglasses are not effective PPE.

In addition to activities identified under Routine Practices, masks with eye protection should be worn when within two meters of a coughing patient to help prevent acquisition of respiratory infections transmitted primarily by large droplets. For the purpose of this document the term mask refers to fluid resistant surgical masks, not to special masks or respirators (27-35). *Category AII*

Surgical masks are effective against large droplets, but have a broad variability of effectiveness against small airborne particles. In Canada, there are no standardized requirements for surgical masks.(36, 37). While masks are highly effective in containing respiratory viruses when properly worn by patients/residents, it is advisable and prudent for HCPs to also wear a mask when within two meters of the patient/resident with RI regardless of whether they are also wearing a mask (35). *Category BII*

#### Key recommendations for the use of surgical masks:

- Should be used only once and changed if wet ( mask efficiency decreases when wet)
- Should cover both the nose and the mouth
- Should not be allowed to dangle around the neck
- Avoid touching while being worn
- Touch only the ties or elastics when removing and discard in an appropriate receptacle
- Perform hand hygiene before and after removing the mask

#### Key recommendations for the use of eye protection:

- Should cover the eyes well enough so that droplets are prevented from entering the eyes from any direction (prescription eyeglasses are not suitable)
- Note that the outside of the eye protection is contaminated after use
- To remove, don clean gloves, handle by head band on ear pieces, decontaminate with disinfectant, remove gloves, and perform hand hygiene
- Reusable eye protection (e.g. goggles) may be labeled with the healthcare worker's name, decontaminated, and re-used by the same person unless damaged

Healthcare providers should also avoid touching their eyes or nose with their hands to prevent self-inoculation with pathogens. Facial protection may be a helpful barrier in minimizing this mode of transmission. Whenever possible, healthcare providers should use examination procedures that minimize exposure to droplets (e.g. sitting next to rather than in front of a coughing patient when providing care, or performing auscultations from behind)(38-40). *Category BII*

## 11.2 Gloves

Use clean, non-sterile gloves for contact with blood, body fluids, secretions and excretions, mucous membranes, draining wounds or non-intact skin (open skin lesions or exudative rash), for handling items visibly soiled with blood, body fluids, secretions or excretions and when the healthcare provider has open skin lesions on the hands (41-43). *Category BII*

The use of gloves does not preclude the need for hand hygiene. In view of the difficulties in compliance with hand hygiene, healthcare providers may see the use of gloves as an alternative method of preventing hand contamination. Unfortunately, hands can become contaminated through glove holes, tears or defects or during glove removal, therefore it is recommended that hand hygiene be performed after removal of gloves (44). Contamination of HCP hands despite glove use has been demonstrated after experimental inoculation of gloved hands (45) and 13% of the time after contact with patients' mucous membranes (46).

### Key recommendations for the use of gloves:

- Should be used as a supplement and not as a substitute for hand hygiene
- Should not be reused or washed
- Should be changed between care activities and procedures with the same patient after contact with materials that may contain high concentrations of microorganisms
- Should be removed immediately after completion of care or a specific task, at point of use and hand hygiene performed before touching a clean environmental surface, or surfaces/equipment associated with a different patient.

## 11.3 Gowns

Long sleeved gowns that cover the wrists should be used to protect uncovered skin and prevent soiling of clothing during procedures and patient care activities likely to generate splashes or sprays of blood, body fluids, secretions or excretions(22). *Category BII*

Healthcare providers should ensure any open skin areas and lesions on forearms or exposed skin is covered with an occlusive dressing at all times. Intact skin that has been contaminated with blood, body fluids, secretions or excretions should be thoroughly washed, as soon as possible, with soap and warm running water for at least 15 seconds (47).

When Contact Precautions have been initiated, a gown should be worn if clothing or forearms will have direct contact with the patient/resident, or environmental surfaces or objects associated with that patient/resident. Gloves should be applied in such a way as to cover the cuffs of the gown sleeves.

Remove gloves and gown and perform hand hygiene before leaving the patients/residents room.

## **12. Aerosol Generating Medical Procedures** (30, 31, 35, 48-51)

An aerosol generating medical procedure (AGMP) is a medical or surgical procedure that involves manipulation of a patient's airway in a manner that may stimulate coughing and/or promote the generation of aerosols.

Some examples include:

- Elective intubation and extubation
- Bronchoscopy
- Sputum Induction
- Autopsies

- Some procedures that occur in unplanned, emergent settings and can be life-saving such as cardiopulmonary resuscitation, emergent intubation and open suctioning of airways

It is prudent to avoid performing aerosol generating procedures on a patient with known or suspected respiratory infection unless medically necessary. Until the infectious disease is resolved, either delay the procedure (if clinically appropriate) or make procedural changes to the care performed to reduce the risk (e.g. choose to use an aero chamber instead of a compressor to deliver aerosolized medications).

When performing or assisting with a planned or urgent AGMP on a patient with known or suspected RI, only those healthcare workers essential to performing the procedure should be in the room. All HCPs should wear a surgical mask and facial protection. **If SARS, TB or an emerging pathogen is suspected then an N95 respirator should be worn while performing an AGMP until the mode of transmission and pathogenicity has been defined.**

*Category BII*

### **12.1 Patients Requiring Mechanical Ventilation (49):**

Personnel caring for patients with RI on mechanical ventilators operating in a closed system may use Routine Precautions alone unless there is a concern that the care provided may cause a breach in the circuit. If the integrity of the system is breached (e.g., open suctioning, filter changes), staff members in the room should use droplet/contact precautions. Ventilators with built in hydrophobic submicron filters in the expiratory circuit should be used. If this is not possible, a disposable filter should be placed in the expiratory circuit of the ventilator. Disposable filters and ventilator circuits should be bagged and sealed for disposal.

*Category BIII*

## **13. Transfers to Other Facility/Department**

If a need for Additional Precautions has been established, any receiving unit, diagnostic service, or transport personnel should be informed so they are aware of the precautions to follow.

The ill person should be out of their room for essential purposes only. Precautions should be maintained during transport to minimize risk of transmission to others and contamination of environmental surfaces or objects. Those responsible for transporting the patient should apply Additional Precautions as required.

*Category BIII*

## **14. Cohorting of Patients/Residents**

“Cohorting” refers to the grouping together of individuals suspected or confirmed to have an infection with the same pathogen within a specific area to limit the direct or indirect contact between infected individuals and non-infected individuals, in order to decrease opportunities for transmission of infectious agents.

If possible, staff members should be assigned to work in either affected or unaffected areas of a facility but not both, or either with ill or with well patients but not both. If this is not possible, staff members should begin working in unaffected areas or with well patients first, with strict hand hygiene between. Attempts should be made to minimize movement of staff members, students, or volunteers between floors, especially if some areas are unaffected.

*Category BIII*

Patients/residents known to be infected with the same organism (identified by diagnostic testing) may be grouped together if possible.

*Category BIII*

## 15. Activity Restrictions

### 15.1 Group Activity Restrictions

In addition to restricting ill patients/residents to their room, if cases are confined to one unit, all residents or patients from that unit should avoid contact with those from the remainder of the facility. Previously scheduled events, (i.e. holiday events) may need to be rescheduled. The OPMT should discuss restriction of activities with the Medical Health Officer or delegate, and this issue should be reexamined as the outbreak progresses. *Category BIII*

Social activities may require restriction within each respective unit. The OPMT should find a balance between restricting activities to control the spread of infection, and providing therapeutic opportunities for social activities. Hand hygiene should be performed by all residents/patients before and after any social activity and respiratory etiquette should be reinforced. *Category BIII*

### 15.2 Visitor Restriction

The institution should post outbreak notification signs at all entrances indicating that the facility is currently managing an outbreak of respiratory infection. Visitors should be advised of the potential risk of acquiring infections within the facility, of re-introducing infections into the facility, and of visitor restrictions currently in effect. All visitors, family members, community and professional groups who carry on activities within the healthcare setting should self-screen based on the signage posted and postpone or reschedule visits if symptomatic.

If possible, it is recommended that family members of ill residents or patients be contacted and notified of the infection of their relative. It may be helpful in some settings (e.g. residential care) to keep a telephone list of frequent visitors, who may be contacted and advised of an outbreak. *Category BIII*

Ill visitors should not be permitted to enter a facility that is managing an outbreak. In addition, visitors who have not been immunized against influenza should be encouraged to postpone visits. Visitors who choose to visit during an outbreak should be required to:

- Carry out hand hygiene on arrival and immediately prior to leaving the patient/resident room
- Visit only one resident or patient and exit the facility immediately after the visit
- Follow IPAC measures as directed by staff
- Follow respiratory etiquette

Hand-washing facilities and/or hand hygiene products should be made available throughout the healthcare setting for use by all persons entering and exiting. *Category BIII*

In general, a complete closure of the facility to all visitors/volunteers is not recommended and should only be done in consultation with the MHO and with careful consideration of the risks/benefits to all patients/residents. *Category BIII*

## 16. Admissions and Transfers

All healthcare settings should ensure they have the ability to identify cases of RI, and to detect clusters or outbreaks of RI. Individuals presenting for care in a healthcare setting who meet the case definition for RI (i.e. fever and new or worsening cough) should be asked to perform hand hygiene and wear a surgical mask. They should also be asked to either wait in a separate area or keep two meters away from other patients/residents who are not wearing facial protection. *Category BIII*

Restricting admissions to a facility experiencing an outbreak unnecessarily has the potential of creating a backlog in acute care, emergency departments or other community settings; on the other hand, admitting persons who are susceptible into an outbreak situation poses a risk to their health and has the potential to prolong the outbreak. Depending upon the infecting organism, the severity of illness, the extent of the outbreak and the physical layout of the building, the admission restriction might not be applied or may be applied to one floor, one wing or the entire facility. This decision needs to be made by the OPMT in consultation with the Medical Health Officer or delegate.

Factors to consider include:

- whether the outbreak is under control
- whether the patient/resident's attending physician is aware of the outbreak and has agreed to the admission based on a review of the patient's/resident's current health status
- whether adequate staff are available in the facility as not only may staff also become ill but outbreaks often require an increase of human resources
- whether the outbreak is due to influenza, and if so, whether the person has been immunized or is on antiviral prophylaxis
- whether the patient/resident or their substitute decision-maker has given informed consent for the admission.

Admissions of **new residents** to the affected unit during the outbreak are generally not advisable.

The **re-admission** of residents/patients who **met the case definition** prior to discharge/transfer is reasonable provided appropriate accommodations and care can be provided (i.e. it is assumed that the person is now immune to the organism causing the outbreak). *Category BIII*

The **re-admission** of residents/patients who **did not meet the case definition** for RI prior to discharge/transfer is generally not advisable during an outbreak (i.e. it is assumed that the person may not be immune to the organism causing the outbreak). *Category BIII*

**Transfers for non-urgent medical appointments** made before the outbreak should be rescheduled. *Category BIII*

When **transfers to acute care** are necessary during an outbreak, the sending facility should provide the transferring agency (BC Ambulance Service), the hospital Infection Control Practitioner and admitting unit or ward with the details of the outbreak to ensure control measures are in place when the resident arrives. *Category BIII*

**Transfers to residential care from acute care units dealing with outbreaks** are not recommended. *Category BIII*

## 17. Healthcare Provider Exposure and Illness

Healthcare providers have a responsibility to their patients and colleagues to refrain from working when ill with symptoms that are likely attributable to a communicable disease. For Registered nurses, this is enshrined in the College of Registered Nurses of BC Standards of Practice (52). In the case of a respiratory outbreak caused by influenza Please see the BCCDC Staff Influenza Immunization and Exclusion Policy in Appendix 8

All healthcare settings should establish a clear expectation that staff members do not come into work when ill with RI, and support this expectation with appropriate attendance management policies. Attendance management policies should reinforce, rather than act as a disincentive to, staff fulfilling this responsibility (49). *Category BIII*

Ensure that all staff have sound knowledge of precautions and PPE required, and how to put on and take off PPE correctly to avoid exposure.

## 18. Ongoing Surveillance of Patients/Residents and Staff

An updated report with new cases of both patient/resident/clients and HCPs should be created by the facility/unit manager or ICP and sent to the OPMT on a regular basis. *Category BIII*

**Appendix 9:** provides an example form for patient/resident/client surveillance.

**Appendix 10:** provides an example form for HCP surveillance.

**Appendix 11:** provides an example of a Daily Update Outbreak Report for OPMT

## 19. Housekeeping

### 19.1 Cleaning Processes

Dirt, organic material and debris acts to shield/protect microbes from contact with disinfectants. Thorough cleaning removes this protection and facilitates effective disinfection. Consistent, regular cleaning assists in reducing the potential for environmental transmission of microorganisms and processes should be in place to ensure regular effective cleaning (53-55). Cleaning methods which use firm contact and friction reduces the numbers of microorganisms. Use separate cloths for cleaning and for disinfection. Cleaning cloths should be changed frequently to prevent spreading microorganisms from surface to surface. Soiled/used cloths should not be re-dipped into disinfectant solution.

Increased frequency of cleaning high touch surfaces is an important contribution to the control of spread of microorganisms during an RI outbreak. Surfaces that are considered to be “high touch” include:

- Bed rails
- Call bell cords
- Institutional telephones
- Bathroom surfaces (taps, toilet handle)
- Door knobs, light switches
- Hand rails in rooms and hallways
- Elevator buttons
- Tables, counter tops
- Nourishment areas (fridges, ice machines, cupboard handles)
- Nurse’s station

Equipment that is shared between patients/residents/clients should be thoroughly cleaned and disinfected between each use. *Category BII*

Special handling of linen, food trays, or other waste contaminated with secretions from patients suspected or confirmed to have a communicable RI is not required. *Category BIII*

## 19.2 Disinfectants

Any disinfectant used in a healthcare setting is required to have a Drug Information Number (DIN) assigned by Health Canada. The manufacturer should be able to provide evaluations that demonstrate the product's effectiveness against common bacterial and viral agents (preferably from a third party). Follow the manufacturer's instructions regarding dilution and contact time required to be effective. When organic matter is present (e.g. blood, sputum, vomitus) many disinfectants require the surfaces be cleaned with a detergent prior to disinfection. If in doubt about a cleaning product please contact the Public Health representative/ICP in your area.

## 20. Problem Solving When Control Measures Appear to be Failing

The incubation period for respiratory viral illness varies, for example the incubation period for influenza is one to four days. Therefore, in an influenza outbreak, it is expected that after a few days of outbreak control measures, the number of new cases should diminish. If new cases continue to appear four to five days after outbreak control measures were implemented the following factors should be explored and reviewed with the MHO and Outbreak Management Team:

- Has anyone with a cough been moving around the facility without a mask, and/or without performing appropriate hand hygiene?
- Is any equipment being used for sick and well patients/residents without being cleaned and disinfected between uses?
- Is personal protective equipment being changed between providing care to sick residents/patients and those that are well?
- Are there any lapses in hand-washing/hand sanitizing?
- Are all hand hygiene stations well stocked with soap or alcohol-based hand sanitizer, and are new refills of products easily to locate by all staff, volunteers and visitors?
- Is the appropriate personal protective equipment available and being appropriately worn by staff members
- If influenza is involved in the outbreak and the above do not explain ongoing illness:
  - are all residents immunized against influenza and taking antiviral medication, if appropriate?
  - are all staff members, including physicians and volunteers, either immunized against influenza or have they taken an antiviral medication?
  - have residents/staff taking antiviral medication been appropriately screened for symptoms to ensure the proper treatment versus prophylactic dose of antiviral is being used; under-dosing may lead to the emergence of antiviral resistant strains?
  - have more recent outbreak specimens been screened for the possible emergence of antiviral resistance mutations in the virus?



## 21. Declaring the Outbreak Over

The Medical Health Officer (MHO) or designate is responsible for declaring an outbreak of respiratory infection within a healthcare facility and determining the duration of outbreak control measures.

The length of time from the onset of symptoms of the last case until outbreak control measures can be lifted may vary and is dependent on a number of factors, including whether the last case was a patient or staff, the adequacy of ongoing surveillance for new cases at the outbreak facility, and the epidemic curve of the outbreak. Prior to lifting outbreak control measures, the facility should not have experienced any new cases of infection (patients or staff) that meet the case definition for the period of time as defined by the MHO.

Usually, the MHO will suspend influenza outbreak control measures if no new cases have occurred within eight days from the onset of symptoms in the last patient/resident case or four days after the last staff case. The lifting of outbreak control measures sooner (or later) than eight days is at the discretion of the MHO or designate.

It is important that vigilant observation for new cases continues even after the outbreak is declared over, especially when the causative agent has not yet been identified. *Category BIII*

Once the outbreak has been declared over by the Medical Health Officer (MHO), all individuals notified of the outbreak at the beginning of the investigation are to be notified that the outbreak is over. A summary of the outbreak should be compiled and sent to the OPMT. An example of an Outbreak Summary Form is provided in **Appendix 12** *Category BIII*

## 22. Debrief of Lessons Learned

It is strongly recommended that the OPMT schedule a debriefing session as soon as feasible following the conclusion of an outbreak. *Category BIII*

The purpose of the debriefing session is to evaluate how the outbreak management process unfolded and identify interventions that worked well and opportunities for improvement. Examples of opportunities for improvement are:

- Communication within OPMT and to media
- Timeliness in recognizing and reporting outbreak
- Timeliness in implementing control measures
- Effectiveness of control measures in limiting the outbreak.

## 23. Influenza Specific Information and Interventions

### 23.1 Epidemiology

In Canada, the period of peak winter influenza activity may vary from one year to the next but usually occurs between November and April, with approximately 75% of all cases having an onset between late December and early March (56). Seasonal influenza can cause severe infection and death in any age group but most people fully recover with 90% of deaths due to seasonal influenza occurring among the elderly. The highest attack rates occur in children, the highest death rates occur in people over the age of 65 years and those with chronic cardiac, pulmonary, renal or metabolic disease, anemia or immuno-suppression. Current and specific BC surveillance data on influenza is available using the following web link:

<http://www.bccdc.ca/dis-cond/DiseaseStatsReports/influSurveillanceReports.htm>

## 23.2 Types of Influenza Viruses (56)

The family Orthomyxoviridae has three genera, namely influenza A, B and C.

- **Influenza Type A** causes mild to severe infections in all age groups. It includes numerous subtypes characterized by different combinations of surface antigens called hemagglutinin (H) and neuraminidase (N). Influenza A is capable of infecting both animals and humans, and it has been the main causative agent in influenza outbreaks and past pandemics. Two influenza A subtypes currently circulate in humans: influenza A/H1N1 and A/H3N2. Of these two subtypes, influenza A/H3N2 tends to cause the most severe outbreaks.
- **Influenza Type B** usually causes a moderate infection and with complications primarily among children. This influenza strain can only infect humans and causes outbreaks in the community.
- **Influenza Type C** is rarely diagnosed in humans and is not known to be associated with outbreaks.

## 23.3 Potential Complications of Influenza A and B Infections (57)

- **Pulmonary:** sinusitis, otitis, laryngitis, croup, laryngeal obstruction and pneumonia which can be fatal. Pneumonia typically results from secondary bacterial infection; primary viral pneumonia due to influenza is rare except in association with pandemics or novel strains (such as avian influenza infections in humans). **If primary viral pneumonia is identified in otherwise healthy individuals (particularly returning travelers) or as a cluster in a discrete geographic area then clinicians should be aware of the possibility of a novel virus and should consult with their local health authority to ensure proper management and submission of specimens to BCCDC.**
- **Cardiovascular:** myocarditis occurring either early or late in the disease process which can be fatal; pericarditis
- **Neurologic:** encephalitis; aseptic meningitis; Guillain-Barre syndrome; severe myalgia; Reyes syndrome.
- **Hematologic:** rare cases of viremia occurring during incubation or the first 48 hours of illness; disseminated intravascular coagulation (DIC).
- **Renal:** renal failure associated with rhabdomyolysis or DIC

## 24. Healthcare Provider Yearly Immunization Clinics

All healthcare providers should receive an annual influenza vaccination to protect themselves, their families and their patients/residents from influenza (12, 14-19, 58). *Category AI*

Self isolation is important when individuals have symptoms however the absence of symptoms does not indicate that an individual could not carry and shed the influenza virus. HCPs should not rely on self isolating as an option to immunization for protecting their families and patients/residents as this has been found to be unreliable(19, 58). *Category BII*

Influenza immunization of HCP can begin as soon as vaccine becomes available each fall. Health Authorities and facilities can obtain vaccine through BCCDC. Processes for ordering of influenza vaccine will vary with each facility and should be initiated each year. Vaccine should be offered to HCP at a variety of locations and at a variety of times throughout the influenza season, but HCP also have the option of being immunized through Public Health clinics or by their family physician. *Category BIII*

There is an important link between an institutional culture of safety and the receptiveness of HCPs to adopting safe workplace practices such as yearly influenza immunization. Yassi et. al. (2010) suggest that using a strategy for staff immunization as a tool that protects HCPs well being rather than identifying them as vectors of disease transmission may induce better compliance (59). This strategy is further supported by another recent study by Kaboli et al. (2010) (60). Multiple strategies should be used to increase staff influenza immunization, including the use of promotional and educational materials, mobile immunization carts, competitions, incentives, or by senior staff modeling acceptance of immunization. *Category BII*

HCP who decline influenza immunization due to medical contraindications should be asked to provide physician documentation of a valid medical contraindication. This documentation should be maintained by the facility for reference in future years. *Category BIII*

HCP should be made aware of the consequences of choosing not to be immunized. In the event of an outbreak, this includes exclusion from work and/or the requirement that they take an appropriate anti-viral medication (neuraminidase inhibitor or amantadine). Anti-viral medication is not provided free to staff by the Ministry of Health Services.

**Appendix 8** provides the British Columbia Centre for Disease Control (BCCDC) Policy for Healthcare Provider Immunization and Exclusion during an Influenza Outbreak.

## **25. Immunization for Residential Care Residents**

Settings are encouraged to have consent/pre-printed orders for the administration of influenza vaccine for all residents on admission and on an annual basis. Also encouraged is consent/pre-printed order for pneumococcal vaccine on admission and an annual review process to determine requirement for a booster dose. All persons should be screened for contraindications to the vaccine prior to receiving it (11).

Unless they have a valid medical contraindication, residents of residential care settings should receive the influenza vaccine on or around November 1<sup>st</sup> of each year (this may be changed according to the Medical Health Officer). Any new admissions during the influenza season (timing may vary and will be determined by the local MHO) should also have their immunization status assessed for influenza and pneumococcal polysaccharide vaccine, and immunization should be provided as required. A record of immunization status should be maintained so that it is readily available in the event of a respiratory outbreak. *Category BIII*

Settings should consult with local Public Health offices to determine the need to maintain a supply of pneumococcal and influenza vaccine on hand for new admissions. Issues such as cold chain and expiry of vaccine should be addressed.

## **26. Immunization for Acute Care Patients**

Between November and the end of March of each year, patients in acute care should be assessed for their risk of influenza-related complications, and offered influenza and/or pneumococcal polysaccharide immunization if they are not up to date with their immunization. It may be useful to include this as a regular component of the admission assessment or discharge plan. *Category BIII*

## 27. Antivirals

Immunization of high-risk patients and health-care personnel is the primary measure to prevent and control influenza in health-care settings. Antiviral agents can be an important adjunct in helping to quickly control outbreaks of influenza.

When administered for treatment within two days of illness onset, antivirals can reduce the duration of uncomplicated influenza illness and decrease the spread of the influenza virus (61, 62). The administration of antiviral agents to all or most patients, as early as possible when respiratory infection is identified in a facility can limit the spread of influenza in the health-care setting.

Three licensed agents are available in Canada: 1) Amantadine, Oseltamivir (Tamiflu) and Zanamivir (Relenza). All require medical prescription. Antivirals used for treatment of influenza are most effective when started within the first two days of illness. To guard against the emergence of resistant strains, antivirals should be used selectively and prudently for appropriate clinical indications, most notably for individuals with severe illness and those most likely to develop complications or die as a result of influenza infection (63).

For more information, an updated influenza antiviral guidance document entitled "The Use of Antiviral Drugs for Influenza: Guidance for Practitioners, 2010-11" has been posted on the Association of Medical Microbiology and Infectious Disease, Canada (AMMI Canada) website available at the following link: <http://www.ammi.ca/index.php>.

### 27.1 Planning for Antiviral Use

Residential Care facilities should pre-plan for antiviral medication dosage for prophylaxis and treatment of residents during an outbreak. They should be prepared to give any of the antiviral agents depending upon the strain of influenza involved. The sooner antivirals are given, the more effective they can be in controlling the outbreak.

*Category BIII*

Items to consider:

- Prior to the influenza season, each facility should establish with its medical director the protocol for administering antiviral medication in a timely manner during an outbreak. Patients/residents should have contraindications and precautions to antiviral prophylaxis and therapy reviewed. A record of antiviral orders should be maintained so that this information is readily available in the event of a respiratory outbreak.
- If Amantadine is to be used then creatinine clearance testing should be undertaken within twelve months of antiviral use (11).
- Availability of a recent result of a serum creatinine or creatinine clearance based on a 24-hour urine collection is not required before starting Oseltamivir prophylaxis, unless there is reason to suspect significant renal impairment (11).
- Pre-printed antiviral orders for both prophylaxis and treatment should be approved by a physician and available on each patient/resident chart at least one month prior to the start of the influenza season.
- The facility should be ready to give antiviral medication on a few hours notice to all residents to control an outbreak. In order to do that, each facility should establish a plan of action with the pharmacy that provides services for them, so that antivirals are obtained in a timely fashion.

*Category BIII*

## Glossary

**Acute Care Facility:** A hospital where lengths of stay average < 30 days, and where a variety of services are provided, including surgery and intensive care.

**Additional Precautions:** Interventions implemented for certain pathogens or clinical presentations in addition to routine infection control practices, to reduce the risk of transmission of microorganisms from patient to patient, patient to HCP, and HCP to patient

**Case:** In epidemiology, a person in the population or study group identified as having the particular disease, health disorder or condition under investigation. A variety of criteria may be used to identify cases: e.g. diagnosis, registries and notifications, abstracts of clinical records, reporting of defects such as a dental record. The epidemiologic definition of a case is not necessarily the same as the ordinary clinical definition.

**Case Definition:** A set of criteria that must be fulfilled in order to identify a person as a case of a particular disease. Case definition can be based on demographic, clinical, laboratory or combined criteria or a scoring system with points for each criterion that matches the features of the disease. If the diagnosis is based on a scoring system e.g. Multiple Sclerosis, it is important to abide by the system for surveillance purposes and when deciding whether to include or exclude cases in an epidemiologic study.

**Cleaning:** The physical removal of foreign material e.g. dusts, soil, organic material such as blood, secretions, excretions and microorganisms using mechanical and/or chemical means. Cleaning physically removes rather than kills microorganisms.

**Cohort:** Two or more patients/residents/clients colonized or infected with the same organism that are separated physically, in a separate room or ward, from other patients who are not colonized or infected with that organism

**Cohort HCPs:** The practice of assigning specified personnel to care only for patients/residents known to be colonized or infected with the same organism. Such personnel would not participate in the care of patients/residents/clients who are not colonized or infected with that organism

**Contact Precautions:** Interventions to reduce the risk of transmission of microorganisms through direct or indirect contact. Contact Precautions include the use of gloves and gowns when giving direct care to patients/residents/clients or when in contact with their environment.

**Diarrhea:** Stool that is of the consistency that it takes the shape of the container it is placed into.

**Drug Identification number (DIN):** In Canada, disinfectants are regulated under the Food and Drugs Act and Regulations. Disinfectants must have a drug identification number (DIN) from Health Canada prior to marketing. This ensures that labeling and supportive data have been provided and that it has been established by the Therapeutic Products Directorate (TPD) that the product is effective and safe for its intended use.

**Disinfection:** The inactivation of disease-producing microorganisms. Disinfection does not destroy bacterial spores. Disinfection usually involves chemicals, heat or ultraviolet light.

**Droplet precautions:** Interventions to reduce the risk of transmission of microorganisms via respiratory droplets. Droplet precautions include the use of a surgical mask and eye/face protection whenever one is within 2 meters of the patient/resident.

**Environmental Health Officer (EHO) (Public Health Inspectors):** Enforces the BC Public Health legislation in regard to disease control and protection of the public. Works with the MHO in conjunction with the facility ICP management and HCP to ensure that appropriate outbreak mitigation measures will be put into place in the event of an outbreak. Acts as a consultant and provides support/resources prior to and during an outbreak; communicates/liases promptly with Infection Control and/or the MHO when outbreaks are suspected and/or have been declared. Provides expertise in determining the source and means of spread of the agent, especially where food or waterborne spread may be involved.

**Hand Hygiene:** A process for the removal of soil and transient microorganisms from the hands. Hand hygiene may be accomplished using soap and running water or by the use of alcohol-based hand rubs. Optimal strength of alcohol-based hand rubs should be 60% to 90% alcohol. Hand washing is required whenever hands are visibly soiled. Alcohol based hand rubs have limited effect on non-enveloped viruses (depending upon concentration) and spore forming bacteria (e.g. *C. difficile*).

**Health Care Provider:** Individual providing or supporting health care services that will bring them into contact with patients/clients/ residents. This includes, but is not limited to: emergency service providers, physicians, dentists, chiropractors, nurses, podiatrists, respiratory therapists and other allied health professionals, students, support services (e.g. housekeeping, dietary, maintenance, hairdressers), and volunteers.

**Hospital-grade Disinfectant:** A disinfectant that has a drug identification number (DIN) from Health Canada indicating its approval for use in Canadian hospitals

**Infection Prevention and Control Professional (ICP):** Trained individual responsible for a health care setting's infection prevention and control activities.

**Isolation:** The physical separation of infected individuals from those uninfected for the period of communicability of a particular disease

**Medical Health Officer (MHO):** a medical practitioner with training, knowledge, skills and experience in community medicine who is designated to this position, for a geographical area, by the Lieutenant Governor of BC under the Public Health Act. The MHO provides advice and direction on public health issues including health promotion and health protection and their related practices, bylaws and policies. The MHO reports to the public those matters which are deemed to be in the public interest.

**Occupational Health:** the specialized practice of medicine, public health and ancillary health professions in an occupational setting. Its aims are to promote health as well as to prevent occupationally related diseases and injuries and the impairments arising there from, and when work related illness or injury occurs to treat these conditions.

**Personal Protective Equipment (PPE):** Clothing or equipment worn by individuals for protection against hazards such as blood, body fluids, and infectious secretions.

**Public Health Nurse:** Public Health nurses care for the physical and mental health needs of the community as a whole. They may work with families in the home, with community groups, in schools, in government agencies and at workplaces.

**Residential Care Facility:** Residential care facilities provide 24-hour professional nursing care and supervision in a protective, supportive environment for people who have complex care needs and can no longer be cared for in their own homes

**Routine Practices:** Routine practices is the term used by Health Canada/Public Health Agency of Canada to describe the system of infection prevention and control practices recommended in Canada to be used with all clients/patients/residents during all care to prevent and control transmission of microorganisms in health care settings.

**Surveillance:** Systematic, ongoing collection, collation, analysis, interpretation and communication of health-related information that is disseminated in a timely manner to all who need to know and for which action may be required. Surveillance is a central feature of epidemiological practice, where it is used to prevent and control disease. Information that is used for surveillance comes from many sources, including reported cases of communicable diseases, hospital admissions, laboratory reports, cancer registries, population surveys, reports of absence from school or work, and reported causes of death. Surveillance approaches may include passive reporting, enhanced reporting and active case identification and follow-up.

## Appendix 1: Public Health Agency of Canada, Rating Scale for Strength and Quality of Evidence

<i>(1) Categories for strength of each recommendation</i>	
CATEGORY	DEFINITION
A	Good evidence to support a recommendation for or against use
B	Moderate evidence to support a recommendation for or against use
C	Insufficient evidence to support a recommendation for or against use
<i>(2) Categories for quality of evidence</i>	
GRADE 1	DEFINITION
I	Evidence from at least one properly randomized controlled trial
II	Evidence from at least one well-designed clinical trial without randomization; from cohort or case-controlled analytic studies, preferably from more than one centre; from multiple time series; or from dramatic results in uncontrolled experiments
III	Evidence from opinions of respected authorities on the basis of clinical experience, descriptive studies, or reports of expert committees.



## Appendix 2: Checklist of Yearly Preparation for RI Outbreaks

Below is a checklist of strategies recommended for the prevention of respiratory outbreaks in healthcare facilities. Not all strategies are applicable to all types of facilities.

- Establish Outbreak Prevention and Management Team
- Develop policies/procedures on Outbreak Prevention and Control
- Develop policy on exclusion of non-immunized staff during an outbreak
- Acquisition or development of educational material for staff/volunteers
- Acquisition or development of educational material for patients, residents, families
- Develop documentation system for recording influenza immunization status on patients, residents
- Develop documentation system for recording influenza immunization status on staff
- Develop report format to report “Readiness Status to Local Public Health Unit”
- Develop Contact Name list for use during a Respiratory Outbreak
- Develop and maintain an equipment inventory for use during an influenza outbreak
- Develop pre-printed procedure for annual influenza immunization of residents
- Develop pre-printed procedure for pneumococcal immunization of residents
- Develop pre-printed procedure for use of antiviral medication on residents
- Develop process for ordering of annual influenza vaccine

## Appendix 3: Quick Reference Checklist

This list is an example and meant to be modified and/or re-organized to meet individual facility needs.

### Definition of a “suspected RI outbreak”

- One laboratory confirmed case of a respiratory illness causing organism and no other cases of RI  
or
- Two cases of RI occurring within 7 days in a geographic area (i.e. unit or floor). One of the two cases may be in a staff member epidemiologically linked to the patient/ resident.  
or
- More than one unit having a case of RI within 7 days.

### Definition of a Respiratory Illness Outbreak

- When there are additional cases identified beyond those recognized within the “suspect outbreak” definition

### Report

- Report outbreak to the MHO or public health delegate
- Notify appropriate Managers and Patient Care Leaders
- Outbreak Prevention and Management Team should meet as soon as possible.
- Notify service providers such as HandyDART, oxygen services, laboratory services, BC Ambulance, etc. of outbreak and control measures required
- Notify any facility that admitted a patient/resident/client from the outbreak area within the past 48 hours
- Complete line listing of ill patients/residents/clients (see page 53)
- Complete line listing of ill HCPs (discuss with person responsible for occupational health) , where this information is available (see page 54)

### Discuss with MHO or delegate the need to:

- Postpone transfers to other units or facilities, admissions or re-admissions unless medically warranted. Depending upon the physical layout of the building and the extent of the outbreak, restrictions may apply to one wing or one unit, one floor or the entire facility.
- Decrease or discontinue group activities and outings until the outbreak is resolved
- Restrictions on visitors

### Collect

- Collect and send specimens as outlined on page 12

### Establish Outbreak Control Measures

- Review spread of common viral illnesses and disease prevention recommendations with staff and volunteers.
  - Reinforce need for diligent hand hygiene and respiratory hygiene practices and use of personal protective equipment (gloves, mask with eye protection, gowns in some cases) when providing care or within 2 meters of a patient/resident/client with respiratory illness.

- Educate and reinforce the use of diligent hand hygiene and respiratory hygiene to patient/residents/clients and visitors
- Wherever possible, confine ill residents to rooms until the acute symptoms have resolved
- As much as possible, assign the same HCPs to take care of ill clients over the duration of the outbreak.
- Post outbreak signage and ABHR at each entrance to unit/facility
- Ensure everyone has easy access to hand hygiene stations (e.g. soap and water, ABHR)
- HCPs to use contact precautions when caring for ill individuals.
- Advise all visitors of outbreak, emphasize hand hygiene upon entering and exiting site
- Remind visitors not to enter the facility if they are ill (e.g. fever, cough, nausea, vomiting)
- Ensure all visitors wear personal protective equipment as recommended by the HCPs. Non-immunized visitors, including family, should be advised to consider if visits are necessary since they can spread the disease before they realize they are infectious.
- Visitors should only visit one patient/resident/client and not travel from room to room during visit
- Increase cleaning and disinfection procedures for common areas and all frequently touched surfaces.
- Whenever possible dedicate equipment to be used only on that patient/resident/client. In the event that equipment must be shared it requires thorough cleaning and disinfection in between patients/residents/clients.
- **If it is confirmed that Influenza is the causative organism by the laboratory.**
  - Exclude (*or reassign*) health care workers not protected by vaccination unless taking antiviral prophylaxis. Those who need prophylaxis can obtain a prescription from the physician.
  - Start antiviral prophylaxis administration to residents as advised by the Medical Health Officer and in consultation with your Medical Director, if applicable.
  - Exclude ill health care providers from the workplace until at least five days from onset of symptoms or until acute symptoms have resolved, whichever is longer.

### **Ongoing surveillance**

- Management and HCPs should maintain a watch for RI symptoms in patients/residents/clients and report any new onset to patient/resident/client care leaders
- HCPs should self monitor for RI symptoms and report illness to supervisor. HCPs who are ill must remain away from work until acute symptoms have resolved
- Communicate status of outbreak daily to Outbreak Prevention and Management Team please see page 55

## Appendix 4: Common Viral and Bacterial Pathogens That Cause RI Outbreaks

<u>Viral Organism</u>	<u>Epidemiology</u>	<u>Incubation period</u>	<u>Symptoms and symptom duration</u>	<u>Period of communicability</u>	<u>Prophylaxis and treatment</u>
<b>Influenza A</b>	-Typically spans November to April -Causes mild to severe symptoms -Causes infection in all age groups with highest incidence in children; highest mortality in elderly and those with comorbidity -Can infect animals and humans -Causes most outbreaks	1-4 days	-Fever*, cough (often severe and may last longer than other symptoms), headache, muscle/joint pain, sore throat, prostration and exhaustion. -Gastro-intestinal symptoms may occur in children -2-7 days	-Probably 3-5 days from clinical onset in adults; up to 7 days in young children  -Asymptomatic people may be infectious	-Yearly vaccine (for A&B) -Antivirals for prophylaxis and treatment: Neuraminidase inhibitors are <b>preferred</b> (for A&B): i.e. Oseltamivir •Amantadine (for seasonal H1N1 only) NOTE: amantadine is ineffective against the 2009 pandemic H1N1 virus and seasonal H1N1 has mostly disappeared – therefore amantadine should now only be rarely considered)
<b>Influenza B</b>	-November-April -Causes milder infection -Mostly affects children -Can cause outbreaks			-Probably 3-5 days from clinical onset in adults; up to 7 days in young children  -Asymptomatic people may be infectious	
<b>Parainfluenza virus</b>	-Entire year (little seasonal pattern) -Predominantly causes infection & outbreaks in young children and the elderly	2-6 days	-Fever, cough, wheezing -Croup	-From shortly prior to clinical onset and for duration of active disease	Symptomatic treatment only

<b>Respiratory Syncytial virus (RSV)</b>	-Usually late winter and early spring - Predominantly causes infection & outbreaks in young children and the elderly	Usually 4-6 days, range 2-8 days	-Fever, cough, wheezing -Bronchiolitis in children -Pneumonia in adults	-From a day or so before clinical onset and usually for 3-8 days. However, viral shedding may persist for several weeks or longer after symptoms have subsided, especially in children	Symptomatic treatment only. For severe pediatric cases consult a Pediatrician or an Infectious Disease physician
<b>Adenovirus</b>	-Usually fall and winter -Causes infection in all ages	Usually 4-5 days, range 2-14 days for respiratory disease	-Conjunctivitis, sore throat, fever, and other respiratory symptoms	-From up to a week prior to clinical onset and for duration of active disease -Viral shedding may persist for a long period of time	Symptomatic treatment only
<b>Common respiratory viruses such as:</b> -Rhinovirus -Coronavirus -Metapneumovirus -Echovirus -Coxsackievirus -other enteroviruses.  <i>(Currently included in multiplex panels)</i>	Throughout the year with peaks in the spring and fall	Usually 2-3 days, but may be longer	'Common cold' type illness: Sneezing, runny nose, cough, sore throat, sinus congestion malaise, headache, myalgia and/or low grade fever	-Viral shedding usually most abundant during the first 2-3 days of clinical illness. Shedding usually ceases by 7-10 days, but may continue for up to 3 weeks in young children	Symptomatic treatment only
<b>Bacterial Organism</b>	<b><u>Epidemiology</u></b>	<b><u>Incubation period</u></b>	<b><u>Symptoms and symptom duration</u></b>	<b><u>Period of communicability</u></b>	<b><u>Prophylaxis and treatment</u></b>
<i>Chlamydia pneumoniae</i>	Throughout year, no seasonality	21 days	Fever, sore throat, prolonged cough, headache, malaise	Not defined	Antibiotics based on clinical picture

<i>Bordetella pertussis</i>	Neither infection nor immunization provides lifelong immunity	7-10 days (range 5-21 days)	Mild URI with minimal or no fever, progresses to cough and then paroxysms of cough with inspiratory whoop and commonly followed by vomiting. Duration 6-10 weeks	From onset of early mild symptoms and first 2 weeks of cough	Immunization, chemoprophylaxis for all household and close contacts regardless of age and immunization status. Antibiotic therapy for treatment
<i>Legionella sp.</i>	Acquired through inhalation of aerosolized contaminated water NOT from person to person	2-10 days	Fever, cough, progressive respiratory distress. Occurs most commonly in those who are elderly, immunocompromized or have other underlying lung disease.	Person to person transmission not documented	Antibiotic therapy for treatment
<i>Mycoplasma pneumoniae</i>	World wide non seasonal more common in school age and young adults	2-3-weeks (range 1-4 weeks)	Fever, acute bronchial cough non-productive initially	Duration of symptoms	Mild illness may resolve on own, inherently resistant to beta-lactam agents.

## Appendix 5: Laboratory Services for Viral testing of Respiratory Specimens

Laboratory	Tests offered	Specimens accepted	Area served	Projected turn-around time
<p><b>BCCDC Public Health Microbiology &amp; Reference Lab</b></p> <p><b>Hours:</b> M-F: 8:30 to 20:00 S: 8:30-18:00 S-H: when required</p> <p><b>Transport specimens to:</b> Virology Laboratory BC Centre for Disease Control 655 W. 12<sup>th</sup> Avenue Vancouver, BC, V5Z 4R4 <b>Tel:</b> 604.707.2623</p>	<p>-Multiplex RT-PCR (Luminex) -RT-PCR (Influenza A/B, and subtyping) -Virus isolation -POC for Influenza</p>	<p>-All respiratory specimens -NP swab or wash <u>preferred</u> -Throat swabs sub-optimal</p>	<p>All of BC. Reference Laboratory</p>	<p><b>M-F:</b> Specimens received by 14:30 - Same day for all viruses. Specimens received after 14:30-, same day POC result for Influenza, next day for other viruses <b>S-S-H:</b> Specimens received by 12:00- Same day or next day for all viruses <b>STAT</b> requests with Microbiologist consult: 4 hrs</p>
<p><b>BC Children's Hospital Virology Lab</b></p> <p><b>Hours:</b> M-F: 8:00 to 23:00. S-S-H: 8:00 to 20:00 (16:00 in summer)</p> <p><b>Transport specimens to:</b> Virology Lab, Children's and Women's Health Centre of BC, Virology Lab. 4500 Oak Street Room 2G28 Vancouver, BC, V6H 3N1 <b>Tel:</b> 604.875.2345x7463</p>	<p><b>VIRAP</b> -DFA: Influenza A/B, RSV, Adenovirus, Parainfluenza-1, 2 &amp; 3., HMPV.</p> <p>PCR or Resplex on special request</p>	<p>-NP wash - ET aspirate -BAL</p>	<p>BCCH, BCWH, all of BC (pediatric/maternal)</p>	<p><b>M-F:</b> Specimens received by 21:30 – within 4 hrs for all viruses <b>S-S-H:</b> Specimens received by 18:30 – within hours for all viruses <b>STAT</b> requests with microbiologist consult: 4 hours</p>
<p><b>SPH Virology and Reference Laboratory</b></p> <p><b>Hours:</b> M-F: 8:00 to 17:00</p> <p><b>Transport Specimens to:</b> SPH Virology and Ref. Lab Rm. 625 Burrard Bldg. 1081 Burrard St. Vancouver, BC, V6Z 1Y6 <b>Tel:</b> 604.806.8420</p>	<p>DFA:Influenza, RSV, Adenovirus, Parainfluenza-1, 2 &amp; 3. -Isolation in cell culture -PCR for Influenza A and B note: samples for Flu PCR must be approved by the Medical Microbiologist)</p>	<p>-NP wash (<u>preferred specimen</u>) -NP swab -Baylor wash, -BAL</p>	<p>Vancouver General Hospital and all Providence Health Authority hospitals</p>	<p><b>M-F:</b> 8:00 to 17:00 – within 24 hours of receipt of specimen for DFA and Flu PCR results.</p>
<p><b>University Hospital of Northern BC (UHNBC)</b></p> <p><b>Hours:</b> M-F: 8:00-13:00</p>	<p>-DFA: Influenza, RSV, Adenovirus, Parainfluenza-1,</p>	<p>-NP wash - Other respiratory specimens are</p>	<p>-Patients hospitalized in Prince George.</p>	<p><b>M-F:</b> Specimens received by 13:00 - within 4 hrs for all viruses</p>

<p><b>Transport specimens to:</b> UHNBC 1475 Edmonton St. Prince George, BC V2M 1F2 <b>Tel:</b> 250.565.2420</p>	<p>2 &amp; 3. -POC for RSV on weekends</p>	<p>referred out</p>	<p>-All pediatric specimens. -Testing of regional specimens will depend on volume and staff.</p>	<p>-May extend hours January to March (M-F only)</p>
<p><b>Vancouver Island Health Authority (VIHA)</b> <b>Testing Locations:</b></p> <ul style="list-style-type: none"> <li>• <b>Royal Jubilee Hospital (RJH):</b> Mon-Fri.: 7:00 to 24:00. Sat., Sun., stat holidays:0700-2300</li> <li>• <b>Nanaimo Regional General Hospital (NRGH):</b> M-F: 8:00 to 21:00 S-S-H: 8:00 to 19:00</li> <li>• <b>Victoria General Hospital (VGH) Microbiology:</b> M-F: 8:00 to 16:00</li> <li>• <b>Victoria General Hospital (VGH) Molecular</b> M-F: 7:00 to 16:00 Sun: 7:00 to 14:42</li> </ul> <p><b>All other VIHA locations transport to VIHA hub testing location.</b></p> <p><b>Transport specimens to:</b></p> <ul style="list-style-type: none"> <li>• <b>Royal Jubilee Hospital (RJH):</b> 1952 Bay St. Victoria, BC. V8R 1J8 <b>Tel:</b> 250.370.8720</li> <li>• <b>Nanaimo Regional General Hospital (NRGH):</b> 1200 Dufferin Crescent Nanaimo, BC. V9S 2B7 <b>Tel:</b> 250.755.7691 x52202</li> <li>• <b>Victoria General Hospital (VGH) Microbiology:</b> 1 Hospital Way Victoria, BC. V8Z 6R5 <b>Tel:</b> 250.727.4489</li> <li>• <b>Victoria General Hospital (VGH) Molecular</b> 1 Hospital Way Victoria, BC. V8Z 6R5 <b>Tel:</b> 250.370.8111 x15332</li> </ul>	<p><b>RSV:</b> Performed at RJH, NRGH, &amp; VGH by Immuno-chromatographic test</p> <p><b>Influenza A &amp; B:</b> Performed at VGH Molecular by NAT</p>	<p>-NP swab preferred; will test any respiratory specimens if received.</p>	<p><b>RSV:</b> From all VIHA hospitals: Inpatient Pediatric (0-2 yrs) or Peds ICU or STAT request on Pediatric patient</p> <p><b>Influenza A &amp; B:</b> Inpatient Pediatric (2-16 yrs) from all VIHA hospitals; Outpatient Pediatrics (0-2 yrs); Adults and Outbreaks.</p>	<p><b>RSV:</b> Same day testing if sample received within 1-2 hours of lab closure. If sample received at VGH after routine hours, sample is sent to RJH for testing.</p> <p><b>Influenza A &amp; B:</b> Specimens received by 12:00-same day testing. If received after 12:00, testing performed on next day during regular VGH Molecular hours.</p>



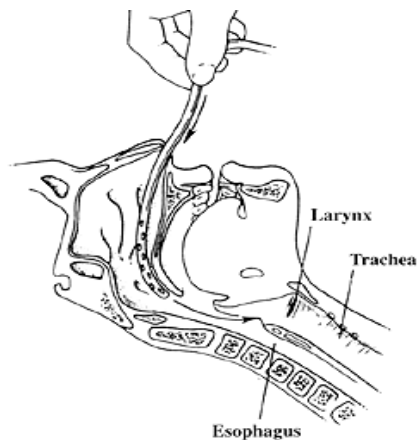
## Appendix 6: Procedures for Respiratory Specimen Collection

### Nasal swab and nasopharyngeal swab

- a) Assemble supplies:
  - I. Sterile swab with transport media
  - II. Personal protection equipment (i.e., mask, gloves, eye protection, gowns)
  - III. Requisition and label, biohazard bag
- b) Explain procedure to resident/patient.
- c) Wash hands. Put on personal protection equipment to protect yourself if the patient/resident coughs or sneezes while you are collecting the specimen.
- d) If the patient/resident has a lot of mucous in his/her nose, this can interfere with the collection of cells, ask the patient/resident to use a tissue to gently clean out visible nasal mucous before a swab is taken. Influenza viruses are located in cells that line the surface of the nasal cavity and are shed into respiratory secretions.
- e) Seat resident/patient in a comfortable bed. It is best if the patient is placed in a high-fowler's position in bed with the back of the head supported. It may be necessary to have a second person available to assist with collection.
- f) Swab Collection (use one of the following two methods):
  - Method 1: Nasopharyngeal Swab – preferred method**
    - Enter a flexible flocked swab several centimeters with a slow, steady motion along the floor of the nose (straight back, not up the nose) until the posterior nasopharynx has been reached (distance from nostrils to external opening of ear). If nasal mucosa is swollen, rotating the swab during insertion may facilitate entry.
    - Place finger on the tip of the patient/resident's nose and depress slightly
    - Once resistance is met (the swab should pass into the pharynx relatively easily), rotate the swab several times and withdraw the swab
  - Method 2: Nasal Swab**
    - With one hand behind the patient/resident's head to steady him/her, incline the head as appropriate and insert a cotton swab, from a regular Virus isolation tube, into the nostril approximately 2 cm along the nasal septum (the centre of the nose), rub the swab vigorously but gently along the lining of the septum several times to obtain cells. Vigorous swabbing is necessary to get cells onto the swab especially for testing by immunofluorescence microscopy. .
- g) Break off top of swab (it will snap off)
- h) Place in transport medium.
- i) Remove gloves, wash hands.
- j) Ensure the specimen is labeled and transport to the laboratory with completed requisition.

## Nasopharyngeal washing –syringe drawback method

1. Assemble supplies:
  - 5cc sterile syringe,
  - Sterile plastic suction catheter with standard tip
    - #8- Child or Adult
    - #10-Adult
  - Sterile saline 10 cc
  - Sterile specimen container with no preservative
  - Personal protection equipment (i.e., mask, gloves, eye protection, gowns as required)
  - Requisition, label, biohazard bag
2. Explain procedure to resident/patient/client or parent.
3. Wash hands. Put on personal protection equipment to protect yourself if the patient/resident coughs or sneezes while you are collecting the specimen.
4. Position patient/resident supine with head supported by a pillow, folded blanket or slightly elevated depending on comfort.
5. Obtain assistance from another staff member(s) as required. It may be necessary to “bundle” or restrain a child to perform this test.
6. Draw 4cc of saline into syringe.
7. Attach catheter to syringe.
8. Measure distance on catheter from person’s nose to earlobe while maintaining catheter sterility.
9. Prime catheter with saline.
10. Gently insert catheter into nasal cavity until the nasopharynx is reached (see diagram below)
11. Expel the total amount of saline (the wash) with some force against the nasopharyngeal wall and immediately draw the wash back into the syringe via the catheter. In most cases, the fluid will be cloudy with some mucus present.
12. It may be necessary to repeat procedure using other nostril, i.e. insufficient sample obtained, sample is not cloudy, does not appear to contain any cells, mucus, etc.,
13. Transfer the aspirate to a sterile container without transport medium. Use further sterile saline to flush any remaining wash out of the catheter into the container (maximum 2 cc). Label specimen, secure cap and place in transport bag.
14. Wash hands.
15. Ensure the specimen is labeled and transport to the laboratory with completed requisition.



## Nasopharyngeal washing – suction method

1. Assemble supplies:
  - 3cc sterile syringe,
  - Plastic suction catheter with vacutip  
#8- Child or Adult  
#10-Adult
  - Sterile normal saline -10 cc
  - Sterile specimen trap (mucus trap)
  - Suction tubing and apparatus
  - Personal protection equipment (i.e. mask, gloves, eye protection, gowns as required)
  - Requisition, label, biohazard bag
2. Explain procedure to patient/resident.
3. Wash hands. Put on personal protection equipment to protect yourself if the person coughs or sneezes while you are collecting the specimen
4. Position patient/resident/client supine with head supported by a pillow, folded blanket or slightly elevated depending on comfort.
5. Obtain assistance from another staff member(s) as necessary. It may be necessary to “bundle” or restrain if performing test on a child.
6. Draw up 3cc of saline into syringe.
7. Peel open package and remove specimen trap ensuring trap lid is secure.
8. Attach suction tubing to plastic connector. Turn suction regulator to low setting (<80mm/lg). Check that suction is working.
9. Apply gloves, and remove suction catheter from package, maintaining sterility. Attach catheter to tubing on trap.
10. Measure distance on catheter from nose to earlobe maintaining catheter sterility.
11. Instill saline into one nostril. Gently insert catheter into nasal cavity until the nasopharynx is reached (see diagram below). Start suctioning, while gently rotating and withdrawing the catheter. (In most cases, the fluid will be cloudy with some mucus present).
12. It may be necessary to repeat procedure using other nostril, i.e., insufficient sample obtained, sample is not cloudy, does not appear to contain any cells, mucus, etc.
13. Rinse catheter with small amount of remaining saline until specimen is rinsed through catheter into specimen trap. Ensure trap remains upright to prevent aspiration of contents into main suction container. Undo specimen container from suction equipment and attach sterile lid. Ensure lid is on securely. Label specimen and place in transport bag.
14. Dispose of waste. Ensure suction equipment is cleaned and disinfected for next use.
15. Wash hands.
16. Ensure the specimen is labeled and transport to the laboratory with completed requisition.

## Appendix 7: Laboratory Requisition Samples

### Respiratory Illness Outbreak NASOPHARYNGEAL WASHING Laboratory Form

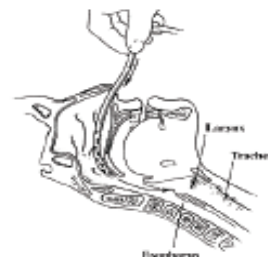
COURIER COMPANY:

ACCOUNT NUMBER:

**Before shipping, phone Children's and Women's Virology Laboratory at 604-875-2345 ext. 7463 to tell them the specimens are on their way.**

Then put this completed form and completed requisition(s) in with the NPWs and ship to:

**VIRAP (Viral Rapid Testing Program)  
Children's and Women's Health Centre of BC  
Virology Laboratory  
4500 Oak Street, Room 2G28  
Vancouver BC V6H 3N1**



**Results are to be sent to:**  
*Please write in the name or position at your facility who will be in charge of receiving the lab results.*

NAME:

POSITION:

TEL:

NAME OF FACILITY:

ADDRESS OF FACILITY:

PHONE NO. FOR PUBLIC HEALTH OR INFECTION CONTROL CONTACT:

DATE OF COLLECTION

YY

MM

DD

*Test only patients who are within 48 hours of onset of symptoms*

PATIENT NAME	SWAB SITE	C&W LAB NO.	R-MIX	TUBE CULT	NOTES
1.					
2.					
3.					
4.					
5.					
6.					

C&W Lab Use Only

**For C&W Lab Use Only:**

TEST RESULTS PHONED TO:

TIME AND DATE OF CALL:

NAME OF CALLER:

# PHSA Laboratories

Public Health Microbiology & Reference Laboratory

BC Centre for Disease Control, 655 West 12th Avenue, Vancouver, BC V5Z 4R4 [www.phsa.ca/bccdcpublichealthlab](http://www.phsa.ca/bccdcpublichealthlab)

## Virology Requisition

### Section 1 - Patient Information

<b>PERSONAL HEALTH NUMBER</b> (or out-of province Health Number and province)	<b>DOB</b> (DD/MMM/YYYY)	<b>GENDER</b> <input type="checkbox"/> M <input type="checkbox"/> F <input type="checkbox"/> UNK
<b>PATIENT SURNAME</b>	<b>PATIENT FIRST AND MIDDLE NAME</b>	
<b>ADDRESS</b>	<b>CITY</b>	<b>POSTAL CODE</b>

DATE RECEIVED
<b>PHSA LABORATORIES USE ONLY</b>
OUTBREAK ID

### Section 2 - Healthcare Provider Information

<b>ORDERING PHYSICIAN</b> (Provide MSC#) Name and address of report delivery	<b>ADDITIONAL COPIES TO:</b> (Address / MSC#)
<input type="checkbox"/> I do not require a copy of the report	1.
<b>CLINIC OR HOSPITAL</b> Name and address of report delivery	2.
<b>PHSA CLIENT NO.</b>	3.

<b>SAMPLE REF. NO.</b>
<b>DATE COLLECTED</b> (DD/MMM/YYYY)
<b>TIME COLLECTED</b> (HH:MM)

### Section 3 - Test(s) Requested

<b>PATIENT STATUS</b> <input type="checkbox"/> Hospital inpatient <input type="checkbox"/> ER patient <input type="checkbox"/> History of contact with infection <input type="checkbox"/> Travel history _____	<b>SIGNS / SYMPTOMS</b> Date of Onset: _____ (DD/MMM/YYYY) <input type="checkbox"/> Asymptomatic <input type="checkbox"/> Cough <input type="checkbox"/> Fever <input type="checkbox"/> Rash <input type="checkbox"/> Upper Respiratory Infection <input type="checkbox"/> Lower Respiratory Infection <input type="checkbox"/> Other, specify: _____	
<b>RESPIRATORY VIRUSES</b> <input type="checkbox"/> Nasopharyngeal swab <input type="checkbox"/> Nasal swab <input type="checkbox"/> Bronchoalveolar lavage <input type="checkbox"/> Nasal wash <input type="checkbox"/> Other, specify: _____ <b>Tested by</b> Influenza A <input type="radio"/> Positive <input type="radio"/> Negative <b>POC for:</b> Influenza B <input type="radio"/> Positive <input type="radio"/> Negative RSV <input type="radio"/> Positive <input type="radio"/> Negative	<b>HERPES VIRUSES</b> <input type="checkbox"/> Genital lesion for HSV <input type="checkbox"/> Non-genital lesion for HSV <input type="checkbox"/> Skin swab for Varicella-Zoster <input type="checkbox"/> Other, specify: _____ <b>Urine for:</b> <input type="checkbox"/> Cytomegalovirus	<b>GASTROINTESTINAL VIRUSES</b> <b>Feces* for:</b> <input type="checkbox"/> Rotavirus/Adenovirus <input type="checkbox"/> Norovirus <input type="checkbox"/> Other, specify: _____ <small>*Guideline for Ordering Stool Specimens <a href="http://www.bcguidelines.ca/gpac/guideline_diarrhea.html">www.bcguidelines.ca/gpac/guideline_diarrhea.html</a></small>
<b>HEPATITIS VIRUSES</b> <b>Blood for:</b> <input type="checkbox"/> Qualitative HCV RNA (diagnosis) <input type="checkbox"/> Quantitative HCV RNA (treatment only) <input type="checkbox"/> Baseline <input type="checkbox"/> Week, specify: _____ <input type="checkbox"/> HCV Genotyping	<b>ENCEPHALITIS / MENINGITIS</b> <b>Cerebrospinal Fluid for:</b> <input type="checkbox"/> Encephalitis (e.g. HSV-1, West Nile Virus) <input type="checkbox"/> Meningitis (HSV-2, Enterovirus) <input type="checkbox"/> Other, specify: _____	<b>MEASLES / RUBELLA VIRUSES</b> <input type="checkbox"/> Measles <input type="checkbox"/> Rubella <input type="checkbox"/> Urine <input type="checkbox"/> Nasal / Nasopharyngeal swab <input type="checkbox"/> Other, specify: _____
For other available tests and additional information, consult the Public Health Microbiology & Reference Laboratory's <i>Guide to Programs and Services</i> at <a href="http://www.phsa.ca/bccdcpublichealthlab">www.phsa.ca/bccdcpublichealthlab</a>	<b>MUMPS VIRUSES</b> <input type="checkbox"/> Buccal swab <input type="checkbox"/> Urine	<b>BIOPSY / AUTOPSY / OTHER TESTS</b> <input type="checkbox"/> Specify: _____

DATE INOC.		PHSA LABORATORIES USE ONLY			
DATE	DAY	A549	MK		

For information on sample collection, please call Virus Isolation Lab at (604) 707-2623

Form DCVI\_100\_1001F Version 1.0 09/2009

## Appendix 8: Initial Outbreak Report Form for OPMT (example)

### Brief Description of Outbreak

Date: \_\_\_\_\_

Location: \_\_\_\_\_ Date of index case: \_\_\_\_\_

Predominant symptoms: \_\_\_\_\_

Progression to others: \_\_\_\_\_

Number of immunized patients/residents: \_\_\_\_\_ of total number: \_\_\_\_\_

Number of immunized HCPs: \_\_\_\_\_ of total number: \_\_\_\_\_

### Actions Taken

Date and time reported to MHO: \_\_\_\_\_

Activation of Outbreak Management Team: \_\_\_\_\_

Notification of external service providers (e.g. BC Ambulance, Medigas):

\_\_\_\_\_

“Just in time” in-services to HCPs: \_\_\_\_\_

\_\_\_\_\_

Cohorting of patients/residents and/or HCPs \_\_\_\_\_

Enhanced cleaning: \_\_\_\_\_

Restriction (visitors, HCP, unit closure): \_\_\_\_\_

Extra hand hygiene stations/signage: \_\_\_\_\_

Specimens sent: \_\_\_\_\_

### Current Status:

Number of symptomatic patients/residents: \_\_\_\_\_ Number of symptomatic HCP: \_\_\_\_\_

Name of Reporting Person: \_\_\_\_\_

Adapted from forms submitted by Northern Health and Vancouver Coastal Health

## **Appendix 9: 2010-2011 British Columbia Centre for Disease Control Staff Influenza Immunization and Exclusion Policy**

Taken directly from the British Columbia Center for Disease Control  
BC FACILITY INFLUENZA IMMUNIZATION POLICY October 18, 2010

### **I. PURPOSE:**

To help ensure that those at greatest risk of complications and death from influenza are optimally protected through the appropriate use of influenza vaccine, health care facilities must develop policies for annual influenza vaccination of residents and staff, as well as policies for identifying, preventing and controlling influenza outbreaks.

Immunization policies for residents should include annual immunization in the fall as well as immunization any time during the influenza season (typically November to April) for any patient newly admitted or transferred to a health care facility who was not immunized during the season or whose immunization status is unknown. As a critical component of patient care, all facilities are required to adopt a written policy advocating staff influenza immunization. Staff who choose not to be immunized must be made aware that they can be excluded from work in the event of an influenza outbreak within their facility.

The National Advisory Committee on Immunization underscores that refusal of health care workers to be immunized implies failure in their duty of care to their patients. Non-immunized staff assist in the spread of influenza and pose an unacceptable risk to patients and co-workers during outbreaks. Their exclusion under the authority of the local Medical Health Officer is a legitimate way to protect patients and is supported by the BC Communicable Disease Policy Committee, the Health Act (Communicable Disease Regulations, Part 2; Sanitary Regulations Section 6 (e)) and Adult Care Regulations.

### **II. RATIONALE:**

Influenza is a significant cause of death in Canada, especially amongst the elderly and frail. Many of the deaths due to influenza can be prevented through immunization. Influenza immunization is safe and effective and is the single most important way to prevent influenza-related complications and deaths.

Studies show that up to 25% of non-immunized health care workers are infected with influenza during the winter months. Persons with influenza are infectious even before they become sick. In one study, 59% of health care workers with documented influenza could not recall influenza symptoms and did not know they had been infected. Persons with mild or unrecognized influenza illness still shed virus and can spread it to others. Most health care workers continue to work even when they develop symptoms. In this way, staff may introduce influenza into facilities and spread it amongst patients and co-workers. When outbreaks occur in confined settings such as long term care (LTC) facilities, they spread very quickly and as many as 50% of residents can be affected. These residents are at highest risk of developing serious and sometimes fatal complications related to influenza.

Recent meta-analysis found vaccine protection against laboratory-confirmed influenza in young adults of 80% (95%CI 56-91%) when measured during certain seasons of match and 50% (95%CI 27-65%) during certain seasons of mismatch. The vaccine is also effective in reducing absenteeism and febrile respiratory illness among health care workers and other working adults. Influenza immunization reduces not only the duration and severity of illness, but also the amount of viral shedding. Influenza vaccine is less effective in protecting older frail adults from infection. For this reason, influenza immunization of health care workers is important to protect these vulnerable persons from influenza and its complications, including death. Three cluster-randomised controlled trials and two cohort studies have now shown that immunizing health care workers protects patients from the serious outcomes of influenza. Immunizing both care providers and residents of care facilities reduces the risk of outbreaks and the disruption, illness and death these outbreaks cause.

### **III. DEFINITIONS:**

#### **Incubation Period:**

The time interval between initial contact with an infectious agent and the first appearance of symptoms associated with the infection.

#### **Influenza:**

Influenza is a viral infection of the respiratory system. Symptoms of influenza include fever, cough, sore throat, muscle ache, extreme fatigue and headache. Unlike the common cold and most other respiratory viruses commonly called “the flu”, influenza virus infection can result in severe illness, pneumonia and even death. The incubation period of influenza is 1-4 days; duration of virus shedding is usually not more than 5 days after onset of symptoms in adults.

#### **Influenza-Like Illness (ILI):**

Symptoms and signs consistent with influenza in the absence of laboratory confirmation. This is defined as: onset of respiratory illness with cough and fever/chills and one or more of sore throat, sore joints, sore muscles or prostration (generally feeling unwell and having to lie down). In the elderly or the very young, fever and/or chills may not be present.

#### **Transmission of Influenza:**

Influenza is spread from person to person by inhalation of tiny droplets produced when a person infected with influenza coughs, sneezes, laughs or even talks. It can also be spread by contact with infected respiratory secretions through articles such as bedrails, facial tissue or utensils.

#### **Influenza Outbreak:**

An influenza outbreak is a cluster of cases occurring within a short period of time in a defined area or group of people. An influenza outbreak in a facility is suspected when there are two or more cases of influenza-like illness (ILI) in a defined area (i.e. unit or floor or ward) in a seven-day period. A suspect outbreak of ILI should be reported to the Medical Health Officer or designate as soon as it is identified (within 24 hours or sooner). The Medical Health Officer (in consultation with the physician/nurse responsible for managing infection control will determine whether illness within a facility constitutes an outbreak of influenza and what control measures should be implemented.

#### **Influenza Vaccine:**

Influenza vaccine is prepared from killed influenza virus. It stimulates the formation of immunity (antibodies) against three strains of influenza virus likely to be circulating that season.

#### **Anti-viral Medication:**

Medication (drugs) capable of preventing or treating viral infection. Two classes of drugs are licensed in Canada for the prevention and/or treatment of influenza: amantadine and the neuraminidase inhibitors (zanamivir and oseltamivir) For both, treatment should be started within 48 hours of onset of symptoms to be most effective. Amantadine is only effective against influenza A. The neuraminidase inhibitors are effective against both influenza A and B. Oseltamivir is taken orally; zanamivir is inhaled. Oseltamivir has been licensed in Canada for the post-exposure prevention of influenza A and B since December 2003. It is not licensed for seasonal (pre-exposure) prophylaxis, although it has been used off-label (outside the licensed indications) for this purpose. Zanamivir was also recently approved for use for both seasonal (up to 28 day) and post-exposure prophylaxis against influenza A and B.

During the 2005-2006 influenza season in Canada, more than 90% of all influenza A/H3N2 isolates were resistant to amantadine. During the 2006-07 season, 25-30% of A/H3N2 isolates were also resistant to amantadine. During the 2007-08 season, 99.5% of A/H3N2 isolates were amantadine-resistant. During the 2009-10 season, 100% of both A/H3N2 and pandemic A/H1N1 (pH1N1) isolates were amantadine-resistant. Although seasonal A/H1N1 viruses retained sensitivity to amantadine when they were last circulating, the pH1N1 virus has replaced seasonal A/H1N1 strains since it emerged in April 2009. As such, the detection of influenza A is currently unlikely to be seasonal A/H1N1. Until this profile changes and



health authorities are officially notified, amantadine is no longer recommended for the treatment or prophylaxis of influenza.

During the 2007-08 and 2008-09 season, oseltamivir resistance was identified among circulating seasonal A/H1N1 viruses worldwide including Canada. pH1N1 after its emergence in April 2009 has replaced seasonal A/H1N1. Testing of influenza isolates in Canada has indicated that most of the pH1N1 (99%) and all A/H3N2 and influenza B isolates were sensitive to oseltamivir among those tested September 1, 2009 through May 6, 2010. Antiviral resistance testing at the WHO Collaborating Center for Surveillance, Epidemiology and Control of Influenza at CDC on isolates collected during the period 13 Jun to 25 Sep 2010 showed that all pH1N1, A/H3N2 and influenza B isolates were sensitive to oseltamivir. Recommendations described in this 2010-11 BC Facility Influenza Immunization Policy (dated October 18, 2010) will be updated based on evolving surveillance information during the season as appropriate. Health care providers using oseltamivir are advised to consult surveillance updates through public health and stay informed about influenza activity and resistance patterns during the 2010-2011 season. If oseltamivir resistance is detected or suspected in a facility outbreak setting (for example, if an outbreak is not controlled despite adequate antiviral prophylaxis), or if resistance is reported to be widespread in the community, up-to-date advice of local and provincial health authorities should be followed regarding antiviral use.

**Health Care Facility:**

Facilities providing ongoing residential care to groups of individuals, especially the frail or elderly. This includes acute care, long term care, intermediate care and extended care facilities and all other facilities that provide ongoing residential care to groups of individuals, especially the frail or elderly.

**Health Care Staff:**

Persons carrying out paid or unpaid work in a health care facility. The policy applies to **all** staff members who work, volunteer or train in the health care facility during the typical influenza season (November – April, inclusive), regardless of whether they have direct or indirect contact with patients or residents.

**Valid Medical Contraindication to Influenza Immunization:**

Influenza vaccine should not be given to persons who had an anaphylactic or shock-like reaction to a previous dose of influenza vaccine or with known anaphylactic or shock-like reaction to eggs or any other component of the vaccine. Anaphylactic reaction consists of rapid onset of hives, swelling of the mouth and throat, difficulty breathing and shock. It is rare following influenza immunization.

#### **IV. STAFF INFLUENZA IMMUNIZATION AND EXCLUSION POLICY:**

**1. Health care facilities in BC are committed to protecting patients and staff from the potentially debilitating and sometimes fatal complications of influenza.**

All health care facilities (acute, long term, intermediate and extended care facilities) are required to have a written staff influenza immunization policy in place, in addition to a policy for annual immunization of residents during the fall.

Policy for residents should include annual influenza immunization in the fall as well as provision for immunizing newly admitted or transferred patients who are not immunized or whose immunization status is unknown, any time during the influenza season (typically November to April).

Policy for staff should include annual influenza immunization in the fall as well as provision for immunizing any new staff that start work during the influenza season (typically November to April). The policy must include notice that non-immunized staff can be excluded from work in the event of an influenza outbreak in the facility. At the time of hiring or placement, information about the requirement for annual influenza vaccination must be provided to all persons carrying out activities in the facility. Additionally, if the time of hiring or placement occurs during the influenza season, the person responsible for the infection control program in the facility must ask any new employee for documentation of immunization with the current year's influenza vaccine. Persons who are not newly placed or appointed to the facility should be informed about the requirement for annual immunization against influenza.

**2. All health care facilities, using their own occupational health resources, must offer influenza vaccination to their staff each year.**

Influenza immunization of staff can begin as soon as vaccine becomes locally available each fall. Vaccine should be offered to staff at a variety of sites and at a variety of times throughout the influenza season. Multiple strategies should be used to increase staff influenza vaccination, including educational opportunities, promotional materials, mobile vaccination carts, competitions, incentives, or by senior staff modeling receipt of immunization.

**3. Staff members who decline influenza immunization due to medical contraindications should provide physician documentation as valid medical contraindication.**

This documentation should be maintained by the facility for reference in future years. Those who do not provide this documentation shall not be considered to have valid medical contraindication for the purposes of enforcing this exclusion policy. Persons who decline influenza vaccination but have no medical contraindications should be offered vaccine in subsequent years.

**4. Staff must be made aware of the consequences of choosing not to be immunized.**

In the event of an outbreak, this includes exclusion from work and/or the requirement that they take an anti-viral medication (neuraminidase inhibitor). Anti-viral medication is not provided free to staff by the Ministry of Health Services. In advance of the influenza season, health care facilities should prepare a list of staff who may be excluded from work in the event of an influenza outbreak. Additionally, these persons should be assessed for eligibility for neuraminidase inhibitors prior to the influenza season and this information should be kept on hand at the facility for timely implementation of an anti-viral medication program when an outbreak occurs.

**5. All health care facilities must maintain annual records of staff influenza vaccination status.**

This includes name, date of birth, position (job), where in the facility they work and date of influenza vaccination. Staff immunized at an off-site clinic or by their family physician must provide written documentation, including the date influenza vaccine was received. Staff who report a medical contraindication to influenza vaccination should provide medical documentation. With appropriate documentation, "Contraindication" should be indicated for that staff member on the facility staff immunization record.

6. **All health care facilities must remind persons carrying on activities in the facility that if they experience symptoms of influenza-like illness, they must not work and must self-report this as soon as possible to the person responsible for occupational health or infection control in the facility.**
7. **All facilities must maintain watch for influenza-like illness and notify the Medical Health Officer or designate immediately in the event of a suspected influenza outbreak (two or more cases of ILI among staff and/or residents in a defined area within a one week period).**  
This is especially important during the typical influenza season from November to April. As influenza has been identified in North America during the summer months, facilities should remain alert for the possibility of influenza outbreaks year-round. As soon as an outbreak of influenza is suspected during the influenza season, non-immunized residents and persons carrying on activities in the facility who do not have contraindications to vaccination should be offered the vaccine.
8. **The local Medical Health Officer or his/her designate will determine whether illness in a facility constitutes an outbreak of influenza and will assist with recommendations to contain and minimize the health consequences.**
9. **All facilities must provide their local health unit with influenza vaccination coverage data for residents and staff.**

Only summary data is required, not individual records.

## **V. EXCLUSION PROCEDURES:**

### **In the event of an influenza outbreak:**

- Discuss prevention and control measures, including the exclusion of staff, with the local Medical Health Officer or his/her designate.
- Any staff with influenza-like illness (ILI) will be excluded for at least five days after the onset of symptoms OR until acute symptoms completely resolve whichever is longer.
- Health care staff who have been vaccinated more than 14 days prior to the onset of the outbreak and who do not have ILI can work in any facility without restriction.
- Non-immunized staff are subject to exclusion from work until the outbreak is declared over by the local Medical Health Officer. Anti-viral medication should be recommended. An exception to exclusion of non-immunized staff may be made if the non-immunized staff member takes anti-viral medication as prescribed and the anti-viral medication is continued until the outbreak is officially declared over and as instructed by the local Medical Health Officer (up to eight weeks). These workers must be alert to the symptoms and signs of influenza, particularly within the first 48 hours after starting antiviral prophylaxis and should be excluded from the patient care environment if these develop. Careful assessment for ILI symptoms is also important in case the antiviral schedule for treatment rather than prophylaxis of influenza infection is warranted and in order to reduce the likelihood of resistance emerging due to suboptimal dosing in persons already infected.
- Staff who were not immunized prior to an outbreak of influenza, but who are immunized during the outbreak, may return to work in the outbreak setting after 14 days have elapsed since vaccination or when the outbreak is declared over by the local Medical Health Officer. Staff can return to work if anti-viral medication is taken for 14 days after the date of their influenza immunization or until the outbreak has been officially declared over, whichever is sooner. These workers must be alert to the symptoms and signs of influenza, particularly within the first 48 hours after starting antiviral prophylaxis and should be excluded from the patient care environment if these develop. Careful assessment for symptoms of influenza-like illness is also important in case the antiviral schedule for treatment rather than prophylaxis of influenza infection is warranted and in order to reduce the likelihood of resistance emerging due to suboptimal dosing in persons already infected.
- Non-immunized, excluded staff must not have developed ILI symptoms and must wait one incubation period (up to 4 days) from the last day they worked at the outbreak facility prior to working in a non-outbreak facility. This is because they may be incubating influenza. If ILI symptoms develop in that period, staff must be excluded for at least 5 days after ILI onset OR until acute symptoms completely resolve whichever is longer.
- Exclusion of non-immunized staff should be considered as a control measure to prevent transmission of influenza in the facility, and as an adjunct to other outbreak control measures. Where staff exclusions would compromise staffing levels severely and place residents at risk, the local Medical Health Officer may issue alternate recommendations.

## Appendix 10: Outbreak Surveillance Form - Patients/Residents/Clients (example)

Patient Demographics					Clinical Presentation					Specimen(s) sent	
Name	Date of birth y/m/d	Unit	Room #	Room type	Date of last vaccine	Name and date of prophylaxis	Date of onset of symptoms	Symptoms	Date symptoms resolved	Collection Date/ Date Submitted	Result

**SYMPTOMS:** C=cough F=Fever H=Headache ST=sore throat M=Myalgia N=Nausea V=Vomiting D=Diarrhea  
**ROOM TYPE:** P=Private S=Semi-private M=Multi-bed

Adapted from forms submitted by Northern Health and Vancouver Island Health Authority



## Appendix 12: Daily Update Outbreak Report for OPMT (example)

Location: \_\_\_\_\_

Date: \_\_\_\_\_ Day \_\_\_\_\_ of Outbreak

Number of new cases today - Patients/Residents/Clients: \_\_\_\_\_

Number of new cases today – HCPs: \_\_\_\_\_

Date of symptom onset of last case: \_\_\_\_\_

Number of patients/residents currently symptomatic: \_\_\_\_\_  
(include new cases)

Number of patients/residents recovered: \_\_\_\_\_

New developments/concerns:

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Further actions required:

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*Adapted from forms submitted by Northern Health, Fraser Health and Vancouver Coastal Health*

## Appendix 13: Outbreak Summary Report for OPMT (example)

Date of onset of outbreak: \_\_\_\_\_ Date outbreak declared over: \_\_\_\_\_

Microorganism identified: \_\_\_\_\_ Laboratory Confirmed? Yes \_\_\_ No \_\_\_

Number of specimens identified in: \_\_\_\_\_ Suspected source: \_\_\_\_\_

Number of patients/residents exposed: \_\_\_\_\_ Total number of cases (patients/residents): \_\_\_\_\_

Attack rate for patients/residents (# of exposed divided by # of cases, multiply by 100): \_\_\_\_\_

Number of HCPs exposed: \_\_\_\_\_ Total number of cases (HCPs): \_\_\_\_\_

Attack rate for HCPs (# of exposed divided by # of cases, multiply by 100): \_\_\_\_\_

Number of cases requiring higher level of care: \_\_\_\_\_  
(e.g. transfer to hospital, transfer to ICU)

Number of deaths: \_\_\_\_\_

Unusual situations: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

*Adapted from forms submitted by Northern Health and Vancouver Coastal Health*



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