

PICNet

PROVINCIAL INFECTION CONTROL
NETWORK OF BRITISH COLUMBIA

A program of the Provincial Health Services Authority

Respiratory Infection Outbreak Guidelines for Health care Facilities

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

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1. Introduction

Respiratory infections (RI) are often spread when droplets, generated by coughing and sneezing of 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 then inoculate themselves by touching their mucous membranes.

Outbreaks of respiratory infection in BC predominantly occur between October and April 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]. Outbreak characteristics and corresponding control strategies of such bacterial pathogens often differ. The dominant causal organisms are highly variable from season to season and across geographic areas, 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 including the use of vaccines and anti-virals.

2. Purpose

These guidelines describe the infection prevention and control practices in health care facilities for outbreaks of respiratory infections that are primarily droplet spread. Implementing these guidelines will enable the health care system to detect and contain clusters and outbreaks of common respiratory infections and prevent associated morbidity and mortality.

3. Scope

These guidelines are intended to serve as a reference for all health care settings when developing or updating their own policies. The recommendations described in this document exemplify evidence informed 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 many of the basic control measures described in these guidelines are to be used for outbreak prevention and control of all respiratory infections, some respiratory infections, such as Legionella, 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. For known airborne spread infections (e.g., measles, TB), specific guidelines should be followed as laid out by your regional

health authority, the BC Centre for Disease Control^[5], and the Public Health Agency of Canada^[6]. Respiratory infections with known airborne spread are beyond the scope of this document.

4. Literature Search Strategy

The Canadian Agency for Drugs and Technologies in Health (CADTH) as well as PICNet staff conducted systematic literature searches for studies to address the key questions submitted by PICNet. Abstracts of selected titles were obtained and reviewed and full text articles selected were reviewed independently by three staff members of PICNet. References cited in eligible papers that were considered to be relevant were also obtained and articles reviewed. Questions used to guide the literature search included:

1. What is the evidence to support the use of N95 respirators or surgical/procedure masks while caring for a patient with a respiratory illness?
2. Antivirals for seasonal influenza in the elderly: – what are the real benefits, and what are the drawbacks; especially does widespread use of antivirals contribute to the rapid development of resistance to antivirals in the virus?
3. What is the evidence for providing antiviral prophylaxis to health care providers during outbreaks of influenza in Long Term Care/Residential Care facilities?
4. What is the evidence for requiring antiviral prophylaxis of unvaccinated but not vaccinated health care providers during outbreaks of influenza in Long Term Care/Residential Care facilities, given current understanding of influenza vaccine effectiveness?
5. What is the incremental value of antiviral prophylaxis for unvaccinated health care providers over and above prophylaxis/treatment of residents during outbreaks of influenza in Long Term Care/Residential Care facilities?
6. What is the effectiveness of antiviral prophylaxis in comparison to and in combination with other infection prevention control measures implemented during an influenza outbreak in a Residential Care Facility on the duration of the outbreak?

5. Methods

5.1 Evidence Grade

The recommendations made within this guideline are graded based on the level of supporting evidence available, using the Public Health Agency of Canada’s Critical Appraisal Toolkit rating scale for strength and quality of evidence (**Appendix 1**). The grade level assigned does not relate to the importance of the recommendation, but to the strength of the supporting evidence. Included studies were summarized onto tables with embedded articles for working group members. 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. A list of evidence graded recommendations can be found in **Appendix 2**.

5.2 Good Practice Statements

Some recommendations fall within well-known practices that are widely accepted worldwide. These have been categorized as “Good Practice Statements” (GPS). The criteria for this category has been compiled from several academic discussions and reviews^[7-11]. This change has been reviewed and approved of by the PICNet Guidelines Steering Committee. The criteria for using a Good Practice Statement designation are:

- Is the statement clear and actionable? (clear and specific, including specification of the population of interest and actionable)
- Is the message really necessary in regard to actual health care practice? (without the guidance, clinicians might fail to take the appropriate action)
- After consideration of all relevant outcomes and potential downstream consequences, will implementing the good practice statement result in large net positive consequences? (benefits are large and harm very small; certainty of benefits and harms are great; the values and preferences are clear; the intervention is cost saving; and the intervention is clearly acceptable, feasible, and promotes equity)
- Is collecting and summarizing the evidence a poor use of a guideline panel’s limited time and energy? (it is a poor use of a guideline panel’s time and resources to collect and link the indirect evidence; the guideline panel’s limited time and energy is better spent on other efforts to maximize the guideline’s methodologic quality and overall trustworthiness)
- Does stating the opposite of the recommendation sound obviously illogical?

A summary list of the good practice statements can be found in **Appendix 2**.

6. Outbreak Prevention and Management Team

Organizational leadership is critical in all health care 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 are in place for preventing outbreaks 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 pharmacy manager or representative
- A person responsible for support services such as housekeeping and laundry
- A food services supervisor

- A communications coordinator
- A point-of-care health care providers (HCP) representative (e.g., charge nurse)

A written process for RI Outbreak Management that 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 3** for a quick checklist to prepare for RI outbreaks.

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 Medical Health Officer (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 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 all preparations for an outbreak are complete (e.g., testing supplies are on hand), 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. Ensures that outbreaks are reported to local Public Health and any further required communication (e.g., daily reports) to local Public Health occurs.

Health care Provider (HCP: includes all disciplines that provide services to or around patients)

Works collaboratively with MHO/PHN/ICP and 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.

Most Responsible Provider (MRP)

Communicates with receiving facility HCPs and staff regarding transfers between facilities that are experiencing an RI outbreak. Also communicates to patients and families.

Infection Control Officer (ICO)

Usually a physician but may be a senior ICP who is responsible for leading the IPAC program in a facility. Provides operational leadership 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/liaises 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 BCCDCPHL) and assists in timely transportation of specimens to BCCDCPHL where appropriate. In some cases may perform initial specimen testing.

Media/Public Relations

Develops appropriate public announcements with guidance from the MHO and Outbreak Prevention and Management Team.

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. Ensures medical interventions are implemented to prevent and control outbreaks (e.g. vaccination and standing orders for anti-virals).

Medical Health Officer (MHO)

Provides direction and consultation to 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)

Collaborates with Infection Control and others to facilitate outbreak management.

6.2 Outbreak Prevention and Management Team Meetings

Depending on their location, ownership or contractual status, each health care 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 and 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 Preplanning for Respiratory Illness Outbreaks

Each year, prior to the season in which respiratory outbreaks tend to occur (typically October – April) every facility should prepare for the possibility of a respiratory illness outbreak and ensure all mechanisms are in place for early detection, timely reporting and timely and appropriate response to contain the outbreak. *GPS*

Preparations include: vaccination of staff, patients and residents; obtaining pre-written orders for antiviral use; ensuring adequate supplies of testing kits have been ordered from BCCDCPHL; ensuring adequate supplies of PPE are available; and emphasizing with staff, patients/residents and visitors the importance of hand hygiene and respiratory hygiene.

See **Appendix 3** for a quick checklist to prepare for RI outbreaks

6.2.2 Responsibilities of the OPMT in Preparing for Respiratory Illness Outbreak

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 (i.e. pre-written orders for antiviral medication).
- Assure appropriate and sufficient quantities of personal protective equipment (PPE) and supplies are accessible (i.e. testing swabs, 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/patients 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 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 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 cases of respiratory infection (RI):

- New or worsening cough and
- Fever $>38^{\circ}\text{C}$, or a temperature that is abnormal for that individual and
- At least one of the following symptoms: myalgia/arthritis, prostration, sore throat

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°C or > 37.4°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 timely, efficient implementation of control measures, should this be considered likely.

The local Medical Health Officer or delegate determines whether illness in a health care 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.

RI Outbreak may be suspected in the following circumstances:

One laboratory confirmed case of health care acquired RI-causing organism and no other cases of RI within 7 days and within a geographic area.

or

More than one geographic area having a health care facility acquired case of RI within 7 days.

In these circumstances, staff should isolate cases of RI, be on the alert for more cases, and be ready to implement full unit-wide control measures.

Definition of a ‘RI outbreak’:

Two or more epidemiologically linked cases of RI occurring within 7 days in a geographic area (e.g., unit or floor – may vary depending on facility layout and movement of staff/residents). One of these cases must be a resident/patient/client.

7.3 Identifying the Source

A variety of respiratory pathogens are capable of causing outbreaks in health care 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.

Since many respiratory virus infections present with relatively similar symptoms, a definitive laboratory diagnosis is important for the appropriate management of the patients, and implementation of IPAC measures. In the case of influenza, laboratory confirmation enables the therapeutic and prophylactic use of antiviral drugs for both the residents/patients and staff and knowing whether vaccinated and unvaccinated staff need to be treated differently (i.e. deciding on exclusion of unvaccinated staff). 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 5 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. 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^[12]. Real time 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 health care 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 6** for a table showing the facilities that provide viral testing for respiratory specimens.

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 7**.

- 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, N95/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 7** for the PHSA Laboratories Influenza-like illness (ILI) Outbreak Laboratory Form (check BCCDC website for most up to date version: <http://www.elabhandbook.info/PHSA/Default.aspx>). 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 health care 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 8**.

Alert all ancillary services used by the facility in the event of an outbreak. These may include:

- Nearest acute care hospital
- HandiDart
- Lab service provider
- Medigas
- BC Ambulance Service
- Cleaning service provider
- Other service providers: physiotherapy, podiatry, hairdressing, music therapist, volunteers, clergy, students, paid companions etc.

10. General Principles of Control

10.1 Immunizations

10.1.1 Influenza Vaccine

Influenza is a respiratory infection that causes substantial illness and death in BC health settings as well as illness among health care providers every year. Influenza immunization of both health care personnel and long-term care facility residents can help prevent outbreaks^[13]. Influenza outbreaks may still occur with sub-optimal immunization coverage among health care personnel and/or in the event of low vaccine effectiveness for selected vaccine components. Although influenza immunization may not always prevent infection, it can prevent serious complications. Even during seasons of suboptimal vaccine effectiveness, some cross-protection may be provided by vaccination depending on multiple agent host-factors^[14].

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 health care and non-health care contract workers and volunteers^[15]. Currently in BC, the province wide Influenza Prevention Policy requires all health care workers to either be vaccinated against influenza or wear a mask in patient care areas throughout the influenza season^[15].

The National Advisory Committee on Immunization (NACI) publishes an Advisory Statement on Influenza vaccine each June^[16].

10.1.2 Pneumococcal Polysaccharide Vaccine

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. Health care settings are encouraged to develop processes for obtaining pre-printed orders for pneumococcal immunization for residents on admission to complex care settings^[17, 18].

NACI recommends pneumococcal vaccine for^[16]:

- Routine immunization for infants and children
- People at high risk for invasive pneumococcal disease due to underlying medical conditions
- Residents of residential care facilities
- Adults at high risk of invasive pneumococcal disease due to lifestyle factors: smokers, persons with alcoholism, persons who are homeless, persons who use illicit drugs
- All adults 65 years of age and older

Assessment of eligibility for pneumococcal immunization should be part of yearly immunization clinics for all health care 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^[19].

10.1.3 Immunization of Visitors

Provide family and visitors with information regarding the need for influenza and pneumococcal immunization and locations where they can receive immunization. *GPS*

10.2 Routine Practices

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 health care settings^[20].

Close attention to all Routine Practices is fundamental to preventing transmission of microorganisms among patients/residents/clients and HCP in all health care settings. The basic elements of Routine Practice that are especially important for control of respiratory infections are: point of care risk assessment, appropriate use of personal protective equipment, hand hygiene, respiratory hygiene, risk reduction strategies, and education of health care providers, client/patient/residents, family and visitors.

10.2.1 Point of Care Risk Assessment (PCRA)

Prior to every patient interaction, health care providers have a responsibility to assess the infectious risk posed to themselves, colleagues, other patients, and visitors by a patient, situation or procedure^[20]. PCRA includes an assessment of the task/care to be performed, the patient's clinical presentation, physical state of the environment and the health care setting. This information is used to assess and analyze the potential for exposure to infectious agents and identify risks for transmission. Appropriate measures to control the exposure such as use of PPE are then selected.

Risk Assessments for any interaction includes:

- The patient's/resident's/client's symptoms and whether they may be consistent with an infectious illness (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, HCPs do risk assessments many times a day for their safety and the safety of others in the health care environment. During a RI outbreak it is especially important that HCPs be vigilant in identifying risk of exposure to RI pathogens when assisting those who are acutely ill (e.g. fever, cough).

All health care 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 health care 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^[20, 28, 36]. *Category C1*

10.2.2 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^[21]. A component of routine practice is encouraging, teaching, and assisting patients/residents/clients to perform HH before eating, after toileting, and on leaving their room. For more detailed hand hygiene information please go to:

<https://www.picnet.ca/guidelines/hand-hygiene>

10.2.3 Respiratory Hygiene

Encourage all patients/residents/clients and visitors to practice good respiratory hygiene. This includes^[20]:

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

10.2.5 Risk Reduction Strategies

Risk reduction strategies include: 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, preventative workplace practices such as HCPs immunization policies and engineering measure (e.g. negative pressure rooms)^[20].

10.2.6 Education of Health care Providers, Clients and Families/Visitors/Volunteers

All employees and volunteers need general education on agency policies, which includes information regarding the principles of infection prevention and control such as Routine Practices and Additional Precautions. Yearly review of all infection control principles enhances good practices^[20]. *GPS*

Educate patients/residents/clients about hand and respiratory hygiene. If the patient/resident/client has an infection, include practices necessary to reduce the risk of spread. *GPS*

Educate families, visitors and volunteers on respiratory and hand hygiene and any other situationally appropriate practices. *GPS*

10.3 Additional Precautions

Additional Precautions are used in addition to Routine Practices when an infection with a specific mode of transmission is suspected or confirmed^[20]. These are required when Routine Practices are not sufficient to prevent transmission. Many common respiratory infections require Droplet and Contact Precautions.

Patients/residents/clients need 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.

Ensure that staff members have quick and easy access to the PPE and cleaning products required when providing care. *GPS*

In outbreak situations, Additional Precautions may differ based on causative organism and severity of illness. 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

Encourage residents or patients who meet the case definition for a respiratory infection, 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. Meal tray service can be arranged for symptomatic residents.

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^[22-25]. 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

Single rooms can facilitate IPAC activities and increase privacy. However the number of single rooms in some 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. Waiting areas may force ill people to be in close proximity with one another 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/procedural mask to reduce the likelihood of transmission of the infection to others^[26-28]. *Category BII*

If unable to tolerate a mask (e.g. children, people who have difficulties breathing under the mask even with the administration of oxygen, people with dementia or other mental health conditions), ask them to remain in a separate area or at least two meters away from others^[20, 29]. When a patient, resident or client with a respiratory infection must remain in a common area or must share a room with others, ensure that roommate(s) and visitors are aware of precautions to follow.

In **acute care facilities**, consideration should be given to ensuring that roommate(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. *GPS*

11. Personal Protective Equipment for Droplet & Contact Precautions

11.1 Facial Protection

In addition to activities identified under Routine Practices, wear a mask with eye protection (e.g. visor, face shield) 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/procedural masks, not to special masks or respirators^[20, 30-32]. *Category A11*

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^[33-35]. N95 respirators are approved by NIOSH (National Institute for Occupational Safety and Health).

While masks are effective in containing respiratory viruses (source control) when properly worn by coughing patients/residents^[27, 30], it is prudent for HCPs to also wear a mask and eye protection when providing care that will bring them close to the face of the patient/resident with RI regardless of whether the patient/resident is also wearing a mask. *GPS*

Also, according to BC's Influenza Prevention Policy, HCPs who have not received an influenza vaccination must wear a mask whenever they are in patient care areas during the influenza season. *Policy*

Health care providers need to 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. 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). *GPS*

11.2 Gloves

Since many respiratory viruses are transmitted via droplets and direct or indirect contact, use clean, non-sterile gloves for contact with the patient/resident and their bed space^[36-38].

11.3 Gowns

In addition to activities identified under Routine Practices, 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.

See **Appendix 9:** Additional Precautions for acute respiratory infection across the continuum of care.

12. Aerosol Generating Medical Procedures

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^[20].

Some examples include:

- Intubation and extubation
- Bronchoscopy
- Sputum Induction
- Autopsies
- Open suctioning of airways
- Nebulized therapy for symptoms of respiratory infection

When performing or assisting with a planned or urgent AGMP on a patient with known or suspected RI, only those health care workers essential to performing the procedure should be in the room. All HCPs should wear, at minimum, surgical mask and eye protection,^[20, 39, 40] although using the precautionary principle, an N95 respirator would be preferred. Consult your health authorities internal policies for respiratory protection requirements for AGMPs.

If MERS, TB or a novel or emerging pathogen is suspected, then an N95 respirator and eye protection should be worn while performing an AGMP until the mode of transmission etiological agent and pathogenicity has been defined.^[6, 20, 26, 39, 41-43] *Category B11*

12.1 Patients Requiring Mechanical Ventilation

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 a minimum of droplet/contact precautions. Depending on a case-by-case evaluation, airborne precautions may be considered. Use ventilators with built in hydrophobic submicron filters in the expiratory circuits. If this is not possible, place a disposable filter in the expiratory circuit of the ventilator^[44, 45].

13. Transport to Other Facility/Department

If an RI outbreak is suspected or confirmed, any receiving unit, diagnostic service, or transport personnel should be informed so they are aware of the precautions to follow during temporary movement to another facility or department.

The ill person should be out of their room for essential purposes only and wear a procedure mask as tolerated. 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.

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, assign staff members 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. Minimize movement of staff members, students, or volunteers between floors, especially if some areas are unaffected. *GPS*

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

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 (e.g. 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 re-examined as the outbreak progresses. *Category C11*

Social activities may require restriction within each respective affected 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 C11*

15.2 Visitor Restriction

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 health care setting should self-screen based on the signage posted and postpone or reschedule visits if symptomatic. *GPS*

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.

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 health care setting for use by all persons entering and exiting. *GPS*

In general, a complete closure of the facility to all visitors/volunteers should only be done in consultation with the MHO and with careful consideration of the risks/benefits to all patients/residents. *Category C11*

16. Admissions and Transfers

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. Therefore, it is always valuable to carefully evaluate the breadth and length of any admission restrictions. 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.

16.1 Admission and/or Transfers Between Acute and Residential Care During an Outbreak

New admissions from the community, and transfers from acute care facilities to a residential care facility dealing with an RI outbreak **can pose a** risk to the individual resident as well as **pose a** risk of prolonging the outbreak. In limited circumstances, new admissions or transfers may be considered on a case-by-case basis in consultation with the MHO. Considerations include:

- The current status of the outbreak and its management (e.g. attack rate, severity of illness, length of time since the last case)
- Whether the resident would return to an area of the facility that is currently experiencing an outbreak
- The degree of protection for the resident offered by immunization and/or prophylactic antivirals for influenza
- Whether the resident/substitute decision maker and sending/receiving physician are aware of the outbreak and are agreeable to the move.
- The overall benefit vs. risk to the health of the transferring client of immediate vs. delayed placement in the residential facility

Re-admission of a resident who had been assessed as a clinical case of the outbreak illness prior to their transfer/discharge may be considered and discussed with the MHO, provided appropriate accommodations and care can be provided (it is assumed that the person is now immune to the pathogen causing the outbreak).

Transfers for non-urgent medical appointments from a residential care unit experiencing an outbreak should be re-scheduled.

When transfers to acute care from a residential care facility dealing with an RI outbreak are necessary, the sending facility should provide the transferring agency (e.g. BC Ambulance Service), the hospital

Infection Control Practitioner and admitting unit or ward with details of the outbreak to ensure that control measures are in place when the resident arrives

17. Health care Provider Exposure and Illness

Health care 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 British Columbia College of Nursing Professionals (BCCBP) Standards of Practice^[46].

Symptomatic staff should be excluded from work until five days after symptom onset or the resolution of acute systemic symptoms (e.g. fever, fatigue, general aches), whichever is sooner.^[47] Longer exclusions may be considered for staff caring for highly immunocompromised patients (e.g. transplant patients).

All health care settings should establish a clear expectation that staff members do not come into work, throughout the year, when ill, 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^[48-50].

Category C1

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. *GPS*

Until the outbreak is declared over, staff exposed to the outbreak area should not work in non-outbreak areas within the facility or in another facility until three days have passed without further exposure.^[51] Where this may jeopardize staffing levels, the MHO may provide alternative recommendations.

Category C11

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.

Appendix 10: provides an example form for patient/resident/client surveillance.

Appendix 11: provides an example form for HCP surveillance.

Appendix 12: 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^[37, 38, 52-54]. Cleaning methods that use firm contact and friction reduce the numbers of microorganisms. Use separate cloths for cleaning and for disinfection. Change cleaning cloths frequently to prevent spreading microorganisms from surface to surface. Do not re-dip soiled/used cloths into disinfectant solution. Use of disposable disinfectant wipes is also appropriate^[53].

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 “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^[37, 52-55]. *Category BII*

19.2 Disinfectants

Any disinfectant used in a health care setting is required to have a Drug Information Number (DIN) assigned by Health Canada and have demonstrated effectiveness against common bacterial and viral agents. 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.

20. Problem Solving When Control Measures Appear to be Failing

The incubation period for respiratory viral illness varies, as does the timeline for assessing when outbreak measures are successful or not. 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 are implemented, explore the following items:

- 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 easy 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?
 - Has there been additional testing to see if there is another respiratory virus contributing to the outbreak?

21. Declaring the Outbreak Over

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

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 the incubation period of the causative agent, 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 will 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.

In an influenza outbreak the MHO will typically suspend influenza outbreak control measures if no new cases have occurred within six to 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. 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 13**

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. *GPS*

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

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 most cases having an onset between late December and early March. Seasonal influenza can cause severe infection and death in any age group but most people fully recover, with the majority 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/Health-Professionals-Site/Pages/Data-Reports/Influenza-Surveillance-Reports.aspx>

23.2 Types of Influenza Viruses ^[56]

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.

Influenza Type B usually causes a moderate infection with complications primarily among children but also adults. This influenza strain can only infect humans and causes outbreaks in the community and within care facility settings.

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 ^[56]

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 MHO and Medical Microbiologist to ensure proper management and submission of specimens to BCCDCPHL .

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

23.4 Health care Provider Yearly Immunization

According to the BC Influenza Prevention Policy all health care providers are required to acquire an annual influenza vaccination or wear a face mask whenever they are in a patient care area^[57]. Health care providers are also required to self-report their choice of vaccination or mask use to their health authority, using the online Influenza Self-reporting System to do so.

Influenza immunization of HCP can begin as soon as vaccine becomes available each fall. Health Authorities and facilities can obtain vaccine through BCCDC distribution processes. 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 Pharmacists, Public Health clinics or by their family physician.

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) suggests using a strategy for staff immunization as a tool that protects HCPs as well^[58]. This strategy is further supported by another recent study by Kaboli et al. (2010)^[59]. 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 C11*

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 alternative to immunization for protecting their families and patients/residents as this has been found to be unreliable^[60].

23.5 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. Screen residents for contraindications to the vaccine prior to receiving it^[16, 56]. *GPS*

Unless they have a valid medical contraindication, offer residents of residential care settings influenza vaccine as soon as it is available. 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. *GPS*

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. Address issues such as cold chain and expiry of vaccine.

23.6 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.

23.7 Antivirals

Immunization of high-risk patients and health care personnel is the primary measure to prevent and control seasonal influenza in health care settings. Antiviral agents can be an important adjunct in helping to quickly control outbreaks of influenza. 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^[56, 61]. Antivirals may also be recommended for staff prophylaxis or treatment of seasonal influenza. Unless otherwise directed by the Medical Health Officer, unvaccinated staff who decline prophylaxis need not be excluded from work during the outbreak. *Category C11*

For more information, an influenza antiviral guidance document entitled “*The Use of Antiviral Drugs for Influenza: A Foundation Document for Practitioners*”^[61] can be found at:

<https://www.ammi.ca/Content/Guidelines/Flu%20%28published%20version%29%20FINAL.pdf>

In the event of a pandemic influenza, specific guidelines for antiviral use would supersede the recommendations for seasonal influenza.

23.7.1 Planning for Antiviral Use

Pre-printed antiviral orders for both prophylaxis and treatment should be signed by a physician and available on each patient/resident chart at least one month prior to the start of the influenza season (early October). Recent serum creatinine levels on all patients/residents should be documented. 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. *GPS*

Appendix 1: Rating Scale for Strength and Quality of Evidence

Grade of Evidence		
Strength of Evidence	Grades	
Strong	A1	Direct evidence from meta-analysis or multiple strong design studies of high quality, with consistency of results
	A11	Direct evidence from multiple strong design studies of medium quality with consistency of results OR At least one strong design study with support from multiple moderate design studies of high quality, with consistency of results OR At least one strong design study of medium quality with support from extrapolation from multiple strong-design studies of high quality, with consistency of results
Moderate	B1	Direct evidence from multiple moderate design studies of high quality with consistency of results OR Extrapolation from multiple strong design studies of high quality, with consistency of results
	B11	Direct evidence from any combination of strong or moderate design studies of high/medium quality, with a clear trend but some inconsistency of results OR Extrapolation from multiple strong design studies of medium quality or moderate design studies of high/medium quality, with consistency of results OR One strong design study with support from multiple weak design studies of high/medium quality with consistency of results
Weak	C1	Direct evidence from multiple weak design studies of high/medium quality, with consistency of results OR Extrapolation from any combination of strong/moderate design studies of high/medium quality, with inconsistency of results
	C11	Studies of low quality regardless of study design OR Contradictory results regardless of study design OR Case series/case reports OR Expert opinion

Appendix 2: List of Weighted Recommendations Good Practice Statements

Weighted Recommendations

A patient, resident or client who meets the definition for a respiratory infection and needs to remain in a common area, and should be asked to don a surgical/procedural mask to reduce the likelihood of transmission of the infection to others[26-28]. *Category BII (page 15)*

In addition to activities identified under Routine Practices, wear a mask with eye protection 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/procedural masks, not to special masks or respirators [20, 30-32]. *Category A11 (page 16)*

If MERS, TB or an emerging pathogen is suspected then an N95 respirator and eye protection should be worn while performing an AGMP until the mode of transmission and pathogenicity has been defined.[6, 20, 26, 39, 41-43] *Category B11 (page 17)*

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 re-examined as the outbreak progresses. *Category C11 (page 18)*

Social activities may require restriction within each respective affected 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 C11 (page 17)*

In general, a complete closure of the facility to all visitors/volunteers should only be done in consultation with the MHO and with careful consideration of the risks/benefits to all patients/residents. *Category C11 (page 18)*

Individuals presenting for care in a health care 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 C1 (page 18)*

All health care settings should establish a clear expectation that staff members do not come into work when ill with RI symptoms, 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 [47-49]. *Category C1 (page 20)*

Health care workers should avoid or minimize working between facilities while exposed to an outbreak, particularly if they are unvaccinated. If unavoidable, the health care worker, regardless of whether they are vaccinated, should notify the patient care managers of each facility. *Category C11 (page 20)*

Equipment that is shared between patients/residents/clients should be thoroughly cleaned and disinfected between each use. ^[37, 51, 52, 54] *Category BII (page 21)*

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 C11 (page 24)*

Unless otherwise directed by the Medical Health Officer, unvaccinated staff who decline prophylaxis need not be excluded from work during the outbreak. *Category C11 (page 26)*

Good Practice Statements

Each year, prior to the season in which respiratory outbreaks tend to occur (typically November – March) every facility should prepare for the possibility of a respiratory illness outbreak and ensure all mechanisms are in place for early detection, timely reporting and timely and appropriate response to contain the outbreak. *Page 7*

Provide family and visitors with information regarding the need for influenza and pneumococcal immunization and locations where they can receive immunization. *Page 13*

All employees and volunteers need general education on agency policies, which includes information regarding the principles of infection prevention and control such as Routine Practices and Additional Precautions. Yearly review of all infection control principles enhances good practices[20]. *Page 14*

Educate families, visitors and volunteers on respiratory and hand hygiene and other routine practices and additional precautions practices. *Page 14*

Patients/residents/clients will need education 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. *Page 14*

Ensure that staff members have quick and easy access to the PPE and cleaning products required when providing care. *Page 15*

In **acute care facilities**, consideration should be given to ensuring that roommate(s) are not at high risk of serious disease if transmission occurs, and are able to comply with precautions *Page 15*

While masks are effective in containing respiratory viruses (source control) when properly worn by coughing patients/residents [27, 30], it is prudent for HCPs to also wear a mask when providing care that will bring them close to the face of the patient/resident with RI regardless of whether the patient/resident is wearing a mask. *page 16*

Health care providers need to 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. 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). *Page 16*

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/residents but not both. If this is not possible, staff members should begin working in unaffected areas or with well patients/residents 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. *Page 17*

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 health care setting should self-screen based on the signage posted and postpone or reschedule visits if symptomatic. *Page 18*

Hand-washing facilities and/or hand hygiene products should be made available throughout the health care setting for use by all persons entering and exiting. *Page 18*

All staff should have regular continuing competence training and demonstrate sound knowledge of precautions, PPE required, and how to put on and take off PPE correctly to avoid exposure. *Page 20*

It is strongly recommended that the OPMT schedule a debriefing session as soon as feasible following the conclusion of an outbreak. *Page 22*

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. *Page 24*

A record of immunization status should be maintained so that it is readily available in the event of a respiratory outbreak. *Page 24*

Pre-printed antiviral orders for both prophylaxis and treatment should be signed by a physician and available on each patient/resident chart at least one month prior to the start of the influenza season (early October). 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. *Page 25*

Appendix 3: Checklist of Yearly Preparation for RI Outbreaks

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

Pre-season Planning, Preparation and Prevention Checklist

August/September

1. Designate the members of the Outbreak Prevention and Management Team for your Facility
2. Update Physician Pre-printed Orders for influenza immunization, pneumococcal immunization (if needed), serum creatinine level (if needed) and anti-influenza medications against influenza [oseltamivir(Tamiflu®) for all Influenza A and B outbreaks unless oseltamivir resistance is detected]
3. Provide your pharmacy with residents' weights, ages, gender and serum creatinine levels for calculation of anti-influenza medication doses
4. Assemble a Respiratory Outbreak Resource Kit
 - a. Make a list of important contact numbers:
 - i. Outbreak Prevention and Management Team
 - ii. Public Health Outbreak Management Contact
 - iii. Infection Prevention and Control Professional
 - iv. Ancillary services
 - v. BC Ambulance
 - vi. HandyDART or other transport services
 - vii. Laboratory serving your facility
 - viii. Pharmacy serving your facility
 - ix. Medical gas/oxygen provider
 - x. Environmental cleaning service
 - xi. Hairdresser, physiotherapist, podiatrist and other service provider
 - b. Order nasal swab collection kits from the BCCDC laboratory. The form is found on line at:
<http://www.bccdc.ca/resource-gallery/Documents/Guidelines%20and%20Forms/Forms/Labs/PHLOrderForm.pdf>
 - c. Include specific outbreak signage, all forms that would be used in the outbreak management (i.e. daily report)
5. Review Infection Prevention and Control supplies needed in preparation for respiratory virus season, including Personal Protective Equipment (PPE) and ensure adequate quantities are available:
 - a. Neutral hand soap
 - b. Alcohol-based hand rub (70 – 90%)
 - c. PPE (gowns, gloves, surgical/procedural masks, eye protection such as goggles)
 - d. Hospital grade disinfectant (with a Drug Identification Number [DIN] number)

October/November/December

6. Post appropriate preventive signage, ENCOURAGE visitors and others to be immunized as recommended against influenza
7. Review with Staff:
 - a. Hand Hygiene
 - b. Routine Practices including practice donning and doffing of PPE
 - c. Information on influenza vaccines, treatment and prophylaxis for patients/residents and themselves
8. Encourage all staff, volunteers and students, and contract workers to be vaccinated (start date as advised by public health - as soon as possible after vaccine available).
 - a. Make a list of staff/volunteers/students and contract workers who have had the current season's recommended influenza vaccines (suggest keeping this list in outbreak kit)
9. Vaccinate residents as soon as feasible after influenza vaccine is made available to you
 - a. Make a list of residents (including those admitted for respite care) who have had this season's influenza vaccine
 - b. Make a list of residents who have had pneumococcal vaccine
10. Check with your pharmacy re: readiness to start anti-influenza medications if needed

Remainder of Season

11. Stay alert for symptoms consistent with respiratory illness in your patients, staff, volunteers and visitors throughout the Respiratory Outbreak season (October through May)
 - a. Note: Each year the "active influenza season" dates are declared by the Provincial Health Officer

Appendix 4: Quick Reference Checklist

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

RI Outbreak may be suspected in the following circumstances:

One laboratory confirmed case of an RI-causing organism and no other cases of RI within 7 days and within a geographic area.

or

More than one geographic area having a case of RI within 7 days.

In these circumstances, staff should isolate cases of RI, be on the alert for more cases, and be ready to implement full unit-wide control measures.

Definition of a 'RI outbreak':

Two or more cases of RI occurring within 7 days in a geographic area (e.g., unit or floor – may vary depending on facility layout and movement of staff/residents). One of the two or more cases may be in a staff member epidemiologically linked to the resident/patient/client.

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
- Restrict visitors

Collect

- Collect and send specimens

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 should use droplet and 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:

- 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.

Appendix 5: Common 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>
Influenza A	<ul style="list-style-type: none"> ▪ Typically 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 Duration: 2-7 days	<ul style="list-style-type: none"> ▪ Probably 3-5 days from clinical onset in adults; up to 7 days in young children ▪ Asymptomatic people may be infectious 	<ul style="list-style-type: none"> ▪ Yearly vaccine (for A&B) ▪ Antivirals for prophylaxis and treatment: ▪ Neuraminidase inhibitors are preferred (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)
Influenza B	<ul style="list-style-type: none"> ▪ November-April ▪ Causes milder infection ▪ Mostly affects children ▪ Can cause outbreaks 			<ul style="list-style-type: none"> ▪ Probably 3-5 days from clinical onset in adults; up to 7 days in young children ▪ Asymptomatic people may be infectious 	
Parainfluenza virus	<ul style="list-style-type: none"> ▪ 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

<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>
Respiratory Syncytial virus (RSV)	<ul style="list-style-type: none"> ▪ 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
Adenovirus	<ul style="list-style-type: none"> ▪ 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	<ul style="list-style-type: none"> ▪ 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
Common respiratory viruses such as: -Rhinovirus -Coronavirus Metapneumovirus -Echovirus -Coxsackievirus -other enteroviruses. <i>(Currently included in multiplex panels)</i>	<ul style="list-style-type: none"> ▪ 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	<ul style="list-style-type: none"> ▪ 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
Bacterial Organism	<u>Epidemiology</u>	<u>Incubation period</u>	<u>Symptoms and symptom duration</u>	<u>Period of communicability</u>	<u>Prophylaxis and treatment</u>
<i>Chlamydia pneumoniae</i>	<ul style="list-style-type: none"> ▪ Throughout year, no 	21 days	Fever, sore throat, prolonged	Not defined	Antibiotics based on clinical picture

<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>
	seasonality		cough, headache, malaise		
<i>Bordetella pertussis</i>	<ul style="list-style-type: none"> 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>	<ul style="list-style-type: none"> 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>	<ul style="list-style-type: none"> Worldwide 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 6: Laboratory Services for Testing of Respiratory Specimens

Laboratory	Tests Offered	Specimens Accepted	Area Served	Turn-around Time
BCCDC Public Health Laboratory	<ul style="list-style-type: none"> RT-PCR for Influenza A/B, and RSV. Test run M-F and Sun. Influenza A subtyping once a week (outside respiratory season); twice a week during respiratory season Multiplex RT-PCR test on Monday, Wednesday, Thursday and Friday (subset of specimens tested negative by Flu A/B/RSV assay). 	<ul style="list-style-type: none"> All respiratory specimens NP swab or wash preferred 	All of BC. Reference Laboratory	<p>M-F, Sun: Specimens received by 13:00 - Same day for Influenza A, B and RSV. Specimens received after 13:00 tested next day except Friday.</p> <p>STAT requests with Microbiologist consult: 4 hrs</p>
BC Children's Hospital	<p>Influenza A/B</p> <ul style="list-style-type: none"> Rapid NAT during flu season, RSV Rapid Test during RSV season Respiratory NAT Panel for severely ill, complex, or immunocompromised patients, year-round 	<p>Nasopharyngeal (NP) flocked swabs preferred.</p> <ul style="list-style-type: none"> NP wash accepted Tracheal aspirate BAL 	BCCH, BCWH, all of BC (pediatric/maternal)	<ul style="list-style-type: none"> Influenza Rapid NAT < 1 hour during winter. RSV Rapid Test <2 hours in winter Respiratory NAT Panel next afternoon
Northern Health University Hospital of Northern BC (UHNBC)	<ul style="list-style-type: none"> University Hospital of Northern BC (UHNBC): Rapid NAT for flu A/B/RSV. MMH/PRRH/FSJH Rapid NAT for flu A/B 	<p>NP wash or flocked swabs</p> <p>Other respiratory specimens are referred out</p>	Inpatients and up to 3 samples form a RCF when an RI outbreak is suspected	Same day results for tests run daily during department hours (not available evenings or nights)
Island Health Victoria	<ul style="list-style-type: none"> Influenza A, B & RSV (restricted to 	NP swabs and bronchoscopy	Island Health	1 day (most samples are

Laboratory	Tests Offered	Specimens Accepted	Area Served	Turn-around Time
General Hospital – Molecular Diagnostic Lab (MDL): Open Sunday through Friday 0800 hrs to 1600 hrs. Closed on Saturdays.	in-patients, ILI outbreaks or patients waiting in ER) <ul style="list-style-type: none"> *RPP = Respiratory Pathogen Panel includes 22 targets (restricted to patients in intensive care, ILI outbreaks, immunocompromised patients or pediatric inpatients who are under 5 years old) 	specimens (BW,BAL)		tested within 24 hours of collection depending on when they reach the lab and the day of the week)
Interior Health	<ul style="list-style-type: none"> • KGH & RIH: Influenza A/B/RSV available 7 days a week • KGH all populations tested. RIH outbreak and inpatients tested. 	KGH & RIH: NP swab KGH only: bronchoscopy specimens, NP wash	Central and West Interior Health regions. No on site testing in Kootenay areas.	1 day
Fraser Health	Influenza A/B & RSV PCR (restricted to inpatient and ER admission {active; not discharged})	<ul style="list-style-type: none"> • NP aspirate • NP washing • NP swab 	All FHA hospitals	1 day
Vancouver Coastal Health	<ul style="list-style-type: none"> • Influenza A/B & RSV NAT available 7 days a week. Routine performed once a day but increase number of runs during peak flu season. • Rapid Influenza A/B & RSV NAT Rapid Respiratory Panel.	Influenza/RSV <ul style="list-style-type: none"> • Nasopharyngeal swab (preferred) • Nasopharyngeal wash • Baylor wash • Bronchial aspirate, lavage, wash, brush • Nasal wash • Sputum • Tracheal aspirate 	Vancouver General Hospital Other Vancouver Coastal Health sites for STAT testing after consultation with Medical Microbiologist	Influenza A/B & RSV NAT - available 7 days a week. Same day results if sample is received in laboratory by 0830 hrs. Increase testing during peak flu season. <ul style="list-style-type: none"> • Rapid Influenza A/B & RSV NAT - available 7 days a week 24/7 for emergency patients being admitted to

Laboratory	Tests Offered	Specimens Accepted	Area Served	Turn-around Time
		Rapid Influenza & RSV <ul style="list-style-type: none"> • Nasopharyngeal swab (preferred) • Nasopharyngeal wash • Baylor wash • Nasal wash Rapid Respiratory Panel <ul style="list-style-type: none"> • Nasopharyngeal swab (preferred) • Nasopharyngeal wash • Baylor wash • Nasal wash 		hospital unit & for immunocompromised patients. TAT between 1-2 hrs. <ul style="list-style-type: none"> • Rapid Respiratory Panel - available 7 days a week 24/7 for ICU and immunocompromised patients. TAT between 1-2 hrs. TAT for rapid influenza/RSV testing may decrease with new instrumentation

Appendix 7: 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 centimetres 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 center 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:
 - I. 5cc sterile syringe,
 - II. Sterile plastic suction catheter with standard tip
 - #8- Child or Adult
 - #10-Adult
 - III. Sterile saline 10 cc

- IV. Sterile specimen container with no preservative
 - V. Personal protection equipment (i.e., mask, gloves, eye protection, gowns as required)
 - VI. 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
 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.

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: _____

Appendix 9: Additional Precautions for Acute Respiratory Infection Across the Continuum of Care

Element	Acute Care	Residential Care	Ambulatory Clinic Setting	Home Care
Accommodation	Door may be open			Not applicable
	Single room with dedicated toilet and patient sink preferred	If feasible resident to remain in room or wear a mask (if tolerated) when within 2 meters of other residents	Triage patient into a single room asap or place in a space with a 2 meter separation from others	
	Cohort with same (lab confirmed) infectious illness	Draw privacy curtain if in shared room	Ask patient to do hand hygiene and wear a mask if tolerated for duration of visit	
	Remain in room except for diagnostic or medically necessary procedures			
Signage	Yes			
Mask with Eye Protection	When within 2 meters of patient/resident/client			
Gloves	When providing care or in contact with surfaces in bed space			
Gown	When providing care or in contact with surfaces in bed space			
Equipment and Items in the Bed Space	Dedicate if possible Clean and disinfect items before using with another patient Chart (paper or mobile electronic) to be left and used outside room			
Environmental Cleaning	Clean frequently touched surfaces in bed space and bathroom daily and before discontinuing precautions Remove and launder privacy and shower curtain on discharge/transfer			Routine household cleaning
Transport	Patient/resident to wear a mask and staff to wear gloves and gown during transport Transport staff to wear gloves, gown and mask with eye protection, if patient unable to tolerate a mask Clean and disinfect equipment used after transport			Not applicable

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:

Further actions required:

Signature: _____

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): _____

Attach rate for patients/residents (# of exposed divided by # of cases, multiply by 100): _____

Number of HCPs exposed: _____ **Total number of cases (HCPs):** _____

Attach 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:

Signature: _____

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