A Guide to the Control of Respiratory Infection Outbreaks in Long-Term Care Homes

Public Health Division
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1.0 Introduction

Respiratory outbreaks occur in long-term care homes (LTCHs – formerly known as long-term care facilities) throughout the year but are more common from the fall to early spring. These lead to substantial morbidity and mortality and are disruptive and costly for the home. Occasionally not only one, but two or more infectious agents are implicated. Outbreak prevention, preparation/implementation of control measures and early detection are vital to effective outbreak management.

Respiratory tract infections are the most commonly diagnosed infections of LTCH residents. Residents are predisposed to such infections in part because they may be elderly, may have chronic illnesses which weaken their immune system, and may have chronic lung or neurological disease which impairs their ability to clear secretions from their lungs and airways. However, residents are also at risk because many viral and bacterial respiratory pathogens are easily transmitted in an institutional environment.

The importance of infection prevention and control has long been recognized in LTCHs. The recent emergence of Severe Acute Respiratory Syndrome (SARS) has heightened the need for enhanced surveillance, screening, early detection and infection prevention practices recognizing the risks not only within the home but also in the local community as well as the world.

Experience with new emerging or re-emerging infectious diseases has resulted in a greater emphasis on infection control practices, characterized by high standards of practice that reflect an enhanced awareness of the potential for transmission of infectious diseases in health care homes.

1.1 Purpose of the Guide

The purpose of this guide is to assist LTCHs in preventing, detecting and managing outbreaks of respiratory infections which arise from the transmission of common viral and bacterial pathogens.

This guide is intended to update and replace the existing guide:

- "A Guide to the Control of Respiratory Disease Outbreaks in Long-Term Care Facilities", Ontario Ministry of Health and Long-Term Care 2001;

And to be used in conjunction with:

- "Influenza Prevention and Surveillance Protocol for Ontario Long-Term Care Facilities", Ontario Ministry of Health and Long-Term Care 1999.

The following documents are designed to assist LTCHs in preventing and managing respiratory outbreaks:

- "Preventing Respiratory Illnesses Protecting Residents and Staff in Non-Acute Care Institutions - Infection Control and Surveillance Standards for

Febrile Respiratory Illness (FRI) in Non-Outbreak Conditions" Ontario Ministry of Health and Long-Term Care 2004;

- "Routine Practices and Additional Precautions for Preventing the Transmission of Infections in Health Care", Health Canada 1999;

All directives issued during the SARS outbreak applicable to the spectrum of healthcare settings including non-acute care should be followed during a SARS outbreak and can be found at:
http://www.health.gov.on.ca/english/providers/program/pubhealth/sars/sars_mn.html#1

Useful links:

- Ministry of Health website: http://www.health.gov.on.ca/
- Health Canada websites: http://www.hc-sc.gc.ca/pphb-dgspsp/dird-dimr/index.html http://www.hc-sc.gc.ca/pphb-dgspsp/sars-sras/index.html
- Ontario Drug Benefit Program: http://www.health.gov.on.ca/english/public/program/drugs/drugs_mn.html
- Ontario Drug Benefit Formulary: http://www.health.gov.on.ca/english/providers/program/drugs/odbf_mn.html

This guide will:

- help homes prevent outbreaks of respiratory disease
- help homes develop surveillance systems to monitor respiratory illness and identify outbreaks early
- help homes meet the requirements associated with the designation of *Respiratory Infection Outbreaks in Institutions* as a reportable disease under O. Reg. 559/91 made under the Health Protection and Promotion Act
- help homes and health unit staff in investigating and managing outbreaks of respiratory infections. Investigation and management include:
  - ✓ identifying symptoms to form a case definition for the specific outbreak
  - ✓ consulting promptly with health units when there is suspicion of an outbreak
  - ✓ activating an Outbreak Management Team (OMT)
  - ✓ ensuring that OMT members understand their roles and responsibilities
  - ✓ outlining outbreak control measures
  - ✓ ensuring that staff collect appropriate specimens in a timely manner to verify diagnosis
  - ✓ updating information regarding changes to procedures, laboratory guidelines, etc.
  - ✓ addressing the availability of new drugs i.e., neuraminidase inhibitors

This guide is primarily intended for LTCHs (see glossary for definition); however, many of these principles apply to other facilities such as complex continuing care (formerly known as chronic care) hospitals or retirement homes. Given that respiratory outbreaks are most commonly caused by viruses, this document was designed for the prevention and management of viral outbreaks. Although many aspects of this guide may be used

for respiratory outbreaks caused by bacterial pathogens, specific management of these will not be covered in this document.

It should be noted that respiratory infection caused by *Mycobacterium tuberculosis* is not addressed in this document. For protocols to be followed for patients with tuberculosis, please refer to the following documents:

- "Guidelines for Preventing the Transmission of tuberculosis in Canadian Health Care Facilities and Other Institutional Settings", April 1996 Canada Communicable Disease Report, Supplement Vol. 22S1, April 1996

- "Ontario Guidelines for the detection and management of tuberculosis in residents of long-term care facilities (amended)", Ontario Ministry of Health December 21, 1994

- "Communicable disease surveillance protocols for workers in Ontario long-term care facilities and implementation guide", Ontario Ministry of Health December, 1994

1.2 The Role of Local Public Health

In the *Mandatory Health Programs and Services Guidelines, December 1997*, under the *Health Promotion and Protection Act* (HPPA), the infection control program specifies the following requirement:

"The board of health shall ensure that infection control programs are in place in all nursing homes and homes for the aged."

Also, in the same document, the vaccine preventable diseases program has the objectives to reduce the age-adjusted mortality rate for pneumonia and influenza, and to achieve certain coverage rates for pneumococcal and influenza vaccinations for residents of long-term care homes and for influenza vaccination for health care workers.

In line with the above requirements, health units and their staff are committed to providing support to all LTCHs, including:

- annual promotion of influenza vaccination to staff of LTCHs
- provision of annual in-service education for staff on infectious diseases
- development of infection control policies and an outbreak contingency plan, in collaboration with the LTCH
- ongoing consultation about communicable disease surveillance program to include the collection, analysis and appropriate management of nosocomial infections
- assistance in the investigation, confirmation and management of the outbreak, when notified of a suspected respiratory outbreak

- provision of specimen kits, and transport of the same to the laboratory
- Notifying nursing agencies of outbreak homes. It is the responsibility of the agencies to notify public health of the appropriate contact numbers.

Public health representation on infection control committees will establish good two-way communication between the health unit and the home about all aspects of their infection control program.

2.0 Outbreak Prevention and Preparation of Control Measures

In preventing and preparing for respiratory outbreaks, LTCHs should focus on immunization, education and development/revision of appropriate surveillance and outbreak control policies and procedures. This section includes specific recommendations in these areas.

2.1 Prevention

2.1.1 Immunization

Influenza and pneumococcal vaccination of LTCH residents is necessary to reduce the impact of these vaccine-preventable diseases. Residents should receive annual influenza vaccination, unless contraindicated. Residents should also receive at least one dose of pneumococcal vaccine during their lifetime.

Influenza immunization of people capable of transmitting influenza to LTCH residents should be required on an annual basis. This includes all persons carrying on activities within the home, i.e. employees, students, attending physicians, and both health care and non-health care contract workers and volunteers. Visitors (including families) to the home should have their annual influenza immunization. However, it is not the responsibility of the home to verify the immunization status of visitors and family beyond informing them through appropriate visible signage.

Few valid medical contraindications to these vaccines exist. Such medical contraindications must be documented to be considered sufficient grounds for failure to be vaccinated (see glossary for medical contraindications).

Immunization Policy

Each home must have an immunization policy for influenza and pneumococcal disease, as well as for other vaccine-preventable diseases, which addresses both residents, staff and all persons carrying on activities within the home. Homes should ensure their immunization policies are updated and communicated to all concerned each year. Homes should have an exclusion policy to be used for staff and volunteers who choose not to be immunized and/or take antiviral drugs. (see Appendices re suggestions for exclusion policy content). If a staff/volunteer chooses not to be immunized or take antiviral drugs during an outbreak, the home should not incur the cost of staff treatment with antivirals.
Employee Health or the Unit Supervisor shall inform the Infection Control Professional (ICP) of significant staff illness.

Residents

Prior to, or upon admission, each resident should be assessed regarding vaccination and medical status. Based on this assessment, informed consent from the resident or substitute decision-maker should be obtained for influenza and pneumococcal vaccines, and antiviral drugs for influenza prophylaxis in the event of an outbreak.

Immunity after influenza vaccination usually lasts less than 1 year. However, in the elderly, antibody levels may fall below protective levels in 4 to 6 months. To ensure that protection lasts throughout the influenza season, the recommended time for influenza immunization is from October to mid-November unless otherwise advised by your local public health unit. If the resident is admitted after the home's fall vaccination program and before the influenza season is over (usually late March), vaccination must be offered, unless the person has already received the current season's influenza vaccine.

If the influenza immunization status of a resident is not available or unknown, the resident should be considered unvaccinated, and vaccination should be given.

The immunization record of the resident should be retained in a readily accessible part of their health record. Upon transfer, the residents' recent immunization status should be shared with the receiving health care facility.

Staff

Annual immunization against influenza should be required for all persons carrying on activities in the LTCH unless medically contraindicated. Influenza immunization may be received at the LTCH's annual influenza clinic or from any other health care provider. All staff who receive the influenza vaccine from a source other than the LTCH must provide proof of influenza immunization.

Health care workers involved in direct resident care should consider it their responsibility to provide the highest standard of care, which includes undergoing annual influenza vaccination. In the absence of contraindications, refusal of health care workers who are involved in direct resident care to be immunized against influenza implies failure in their duty of care to their patients (NACI 2004/05 statement on influenza vaccination).

Only the following should be accepted as proof of influenza immunization:

- a personal immunization record documenting receipt of the current season's influenza vaccine signed by a health care professional or,
- a signed physician's note indicating immunization or,
- documented immunization from another home or institution.

If this documentation is not available, the LTCH should not consider the staff member immunized, and the employer must offer influenza immunization to the person.

Vaccine Administration

Availability of on-site vaccination clinics for all staff is recommended to provide optimal access to immunization services.
LTCHs should:

- ensure that all staff are provided with information annually regarding the influenza vaccine and the homes' immunization and exclusion policies
- promote and implement accessible influenza vaccination clinics
- keep an updated record of all staff influenza immunizations
- advise outside agencies that provide staff to the LTCH of the home's immunization/exclusion policy
- develop a staffing contingency plan based on immunization rates in their own home.

Home administrative staff must keep an updated list of staff and resident vaccination status throughout the influenza season. The home must report immunization status among residents, staff, and volunteers to the local medical officer of health by December 1st of each year.

2.1.2 Education

Ongoing education of staff, volunteers, residents and residents' families about infection and outbreak prevention and related policies must be part of the infection control program.

Topics to include in education programs for all staff and residents are:

- hand hygiene
- appropriate disinfection of equipment (any equipment that is shared between residents must be disinfected after each use)
- barrier precautions e.g. appropriate use of gloves and gowns, eye protection and masks (N95/surgical)
- standard environmental cleaning
- persons experiencing symptoms of infection should not be working/visiting the home
- immunization and exclusion policy.

At the time of hiring and orientation of staff and volunteers, and annually thereafter, educational information about influenza must be provided to all persons carrying on activities in the LTCH. This shall include:

- risks, benefits, and myths regarding influenza immunization
- information about influenza morbidity, mortality, transmission, as well as prevention of influenza, and the requirement for annual influenza vaccination
- influenza outbreak management and exclusion policies of the home.

Residents, visitors and volunteers shall be provided with similar information.

2.1.3 Policy Preparation

Each home must have a policy to address respiratory disease surveillance, prevention (including annual influenza immunization) and outbreak control. These policies must be based on current directives, guidelines, protocols, policies, standards and criteria as outlined by the Ministry of Health and Long-Term Care, the local public health unit, and other appropriate sources.

Policies should address the following topics:

- procedures for surveillance, early recognition for potential transmission of infectious conditions, and management of an outbreak including the composition and mandate of the OMT
- exclusion policy for non-immunized staff during an influenza outbreak
- staffing contingency plan addressing varying levels of available staff during outbreaks due to illness, failure to immunize, unwillingness or contraindication to antiviral agents
- a staffing plan to address adequate nurse to patient ratios. As workload increases during an outbreak, staffing plans need to address continued provision of care and full implementation of infection control measures
- a policy on antiviral use, oseltamivir (Tamiflu™) as first line of defense
- for those homes using amantadine, a policy to annually estimate creatinine clearance and amantadine dosage for each resident (serum creatinine levels for this assessment should have been performed in the previous 12 months), to allow for rapid administration of amantadine (see Table 1, Section 4)
- process to rapidly access specimen kits, testing facilities, and results of laboratory tests in the event of a suspect outbreak
- ensuring that staff is available who is competent in the appropriate technique for the collection of nasopharyngeal specimens
- obtaining consent for prophylaxis with antivirals from residents or substitute decision-makers
- obtaining pre-approved orders from physicians or a “medical directive” signed by the Medical Director for antiviral prophylaxis
- establishing lines of communication between the home, health unit, and laboratory
- ongoing effective communication with residents, families of residents, staff and the media
- annual review of policies related to outbreak prevention and control.

2.2 Surveillance

2.2.1 Definition and Goal

i. Background

Surveillance is an essential component of any effective infection control program. Surveillance establishes baseline information about the frequency and types of infections that exist in the LTCH. This information is used to determine deviations from baseline levels.

ii. Definition

Surveillance is the ongoing systematic collection, collation, analysis, and interpretation of data; and the dissemination of information to those who need to know in order that action be taken. (World Health Organization)

iii. Goal of Surveillance

An important goal of surveillance is to ensure early identification of a potential outbreak or an outbreak in its early stages so that control measures can be instituted as soon as possible.

iv. Personnel Requirement

The designated trained Infection Control Professional (ICP, see glossary) is responsible for surveillance and outbreak management activities. In their absence a competent person (see glossary) must be designated to continue these functions, including on weekends and during holiday periods.

2.2.2 Target Groups for Surveillance

Surveillance should be done for both resident and staff populations. Although resource implications may impact the home's ability to conduct year round staff surveillance, all efforts should be made to include this as an essential component of the infection control program.

i. Resident Surveillance

Continuous home-wide surveillance is required to establish baseline levels of infection throughout the year. Potential outbreaks are recognized when infection rates increase above the baseline. It is important that LTCHs are also able to recognize outbreaks during off-hours (weekends, holidays). Targeted surveillance for respiratory symptoms should be enhanced during the influenza season (November to April) and when influenza activity has been reported in the local community. All staff

who provide direct care must be aware of the symptoms of respiratory illness, the criteria for a suspected outbreak and the procedures for reporting to the ICP.

Homes are required to have ongoing surveillance programs to determine the presence of infections. Key features of these programs shall include:

- a sufficiently sensitive surveillance program to identify sentinel events and trends
- analysis of surveillance data by the ICP in order to trigger actions designed to reduce or eliminate disease transmission
- surveillance strategies that take community disease prevalence and the unique epidemiology of infection in long-term care into account.

ii. Staff Surveillance

Surveillance for influenza-like illness among staff shall be done during the influenza season, and should be conducted throughout the year. All staff should be aware of early signs and symptoms of respiratory infection. Staff shall be asked to report their respiratory infection to their supervisor or Employee Health. The supervisor or Employee Health shall inform the ICP or designate of cases/clusters of employees/contract staff who are absent from work for 72 hours with febrile respiratory infection. The information should be reported non-nominally (without using names) to protect the employees' right to confidentiality.

iii Non-staff surveillance (Visitors, Family Members, Community and Professional Groups, Contractors, etc.)

- all persons carrying on activities within the home must self screen based on the signage posted and exclude themselves from entering the home when they have respiratory symptoms (i.e., new cough, new shortness of breath, fever)
- handwashing facilities and/or hand hygiene products are to be made available throughout the home for use by all persons entering the home
- screening tools and policies are to be posted, and followed by all entering the home.

2.2.3 Methods of Data Collection for Surveillance

Daily surveillance is the most effective way to detect respiratory infections. There are two methods to conduct daily surveillance: active and passive.

i. Passive Surveillance

Passive surveillance involves looking for infections while providing routine daily care or activities. Residents with respiratory and other symptoms should be noted on the daily surveillance form. This form should be easy to use and include patient identification and location, date of onset, a checklist of relevant signs and symptoms, including fever, diagnostic tests and results when available. The completed form

should be forwarded to the ICP on a daily basis. Any suspected outbreak should be reported immediately to the ICP (see Step #3 of Outbreak Detection and Management) It is important to maintain a high index of suspicion for respiratory infections, especially during flu season.

ii. Active Surveillance

Active surveillance involves seeking out residents with an infectious process.

Several strategies may be used including:

- conduct unit rounds
- review unit reports, which may include elevated temperature reports
- review physician/staff communication books
- chart review of medical and/or nursing progress notes
- review pharmacy antibiotic utilization records
- review laboratory reports
- verbal report from unit staff, based on clinical observations

All available sources of information within the home may contribute to the surveillance activities. The method used by each home should be practical in that setting.

iii. Analysis

The ICP or designate reviews the results of surveillance data to determine whether these meet the criteria for infection in each resident and if a suspected outbreak exists.

2.2.4 Clinical Case Definitions for Respiratory Tract Infections

Different respiratory viruses often cause similar acute respiratory symptoms. The following case definitions are general; **each respiratory outbreak requires its own definition**. The case definition should be developed for each individual outbreak based on its characteristics, reviewed during the course of the outbreak, and modified if necessary, to ensure that the majority of cases are captured by the definition.

Health care workers shall maintain a high index of suspicion of any person experiencing any of the signs and symptoms of respiratory infection, especially during influenza season.

Whenever there are **two cases of acute respiratory tract illness within 48 hours on one unit,** an outbreak should be suspected and tests should be done to determine the causative organism. The clinical presentation of influenza in an elderly, fully immunized population can differ from the usual clinical presentation of influenza. Because influenza in the elderly often causes tiredness (malaise), muscle aches (myalgia), loss of appetite, headache, and chills, the incorporation of these symptoms

into the case definition, if they occur, may be useful. In the elderly, fever could be absent or manifest as follows: abnormal temperature for the resident or a temperature ≤ 35.5°C or ≥ 37.5°C.

i. Upper respiratory tract illness (includes common cold, pharyngitis)

The resident must have least 2 of the following (new) symptoms:

- runny nose or sneezing
- stuffy nose (i.e. congestion)
- sore throat or hoarseness or difficulty swallowing
- dry cough
- swollen or tender glands in the neck (cervical lymphadenopathy)
- fever/abnormal temperature for the resident may be present, but is not required.

For suspected influenza outbreaks you may also consider adding the following symptoms: tiredness (malaise), muscle aches (myalgia), loss of appetite, headache, chills.

ii. Pneumonia

All of the following criteria must be met:

- interpretation of a chest x-ray as pneumonia, probable pneumonia, or presence of infiltrate
- the resident must have at least two of the signs and symptoms described under other lower respiratory tract infection (see below)
- other noninfectious causes of symptoms, in particular congestive heart failure, must be ruled out.

iii. Other lower respiratory tract infection (bronchitis, tracheobronchitis)

The resident must have at least three of the following:

- new or increased cough
- new or increased sputum production
- abnormal temperature for the resident, or a temperature of ≤ 35.5°C or ≥ 37.5°C
- pleuritic chest pain
- new physical findings on examination (rales, rhonchi, wheezes, bronchial breathing)
- one of the following to indicate change in status or breathing difficulty:
  - new /increased shortness of breath

- respiratory rate >25/minute
- worsening functional or mental status (deterioration in resident's ability to perform activities of daily living or lowering of their level of consciousness)

If a cluster of pneumonia or lower respiratory infection cases are suspected, steps must be taken to determine a common causative agent. E.g. chest x-ray, serology, NP swabs, urine for Legionella antigens, sputum smear/culture, etc.

iv. SARS

Case definitions for SARS are in evolution and may change periodically. These definitions are current at this time. For the most recent definitions consult the following web site:

http://www.hc-sc.gc.ca/pphb-dgspsp/sars-sras/prof_e.html

A) Confirmed Case of SARS

A person with:

Early clinical presentation of SARS, i.e.:
Fever (over 38ºC) **AND** cough or breathing difficulty

AND Radiographic evidence consistent with SARS, i.e.:
Radiographic evidence of infiltrates consistent with pneumonia or respiratory distress syndrome (RDS)

AND Laboratory evidence of SARS-associated coronavirus (SARS-CoV) infection, i.e.:

- Nucleic acid amplification test (e.g. PCR) positive results or seroconversion or virus isolation.

OR

A deceased person with:

A history of early clinical presentation of SARS, i.e.:
Fever **AND** cough or difficulty breathing resulting in death.

AND Autopsy findings consistent with SARS, i.e.:
Evidence of pneumonia or RDS without an alternate identifiable cause.

AND Laboratory evidence of SARS coronavirus infection, i.e.:
Nucleic acid amplification test (e.g. PCR) positive results or seroconversion or virus isolation.

B) Probable Case of SARS

A person with:
Early clinical presentation of SARS, i.e.:

- Fever ≥ 38ºC **AND** cough or breathing difficulty

AND Radiographic evidence consistent with SARS, i.e.:

- Radiographic evidence of infiltrates consistent with pneumonia or respiratory distress syndrome (RDS).

AND Epidemiologically linked to a person or place linked to SARS, i.e.:
Close contact with a confirmed SARS case, within 10 days of onset of symptoms.

OR Close contact with a symptomatic person who has laboratory evidence of SARS-CoV infection, within 10 days of onset of symptoms.

OR Residence, recent travel or visit to an "Area with recent local transmission of SARS" within the 10 days prior to onset of symptoms.

OR

A deceased person with:

A history of early clinical presentation of SARS, i.e.:

- Fever **AND** cough or difficulty breathing resulting in death.

AND Autopsy findings consistent with SARS, i.e.:

- Consistent with the pathology of RDS without an identifiable cause.

AND Epidemiologically linked to a person or place linked to SARS, i.e.

- Close contact with a confirmed SARS case, within 10 days of onset of symptoms.

OR

Close contact with a symptomatic person who has laboratory evidence of SARS-CoV infection, within 10 days of onset of symptoms.

OR

- Residence, recent travel or visit to an "Area with recent local transmission of SARS" within the 10 days prior to onset of symptoms **OR** close contact (including health care providers) with a probable case who has been to an "Area with recent local transmission of SARS" within the 10 days prior to onset of symptoms.

OR

A deceased person with:

A history of early clinical presentation of SARS, i.e.:

- Fever **AND** cough or difficulty breathing resulting in death

AND Laboratory evidence of SARS coronavirus infection, i.e.:

- PCR positive results or seroconversion or virus isolation.

v. Emerging and Re-emerging Pathogens

The recent experience with SARS has resulted in a heightened awareness of the potential for transmission of infectious diseases in health care homes. Due to changing life patterns

and world travel, we need to be aware of new or re-emerging infectious diseases locally, nationally, and internationally.

In the post SARS outbreak period Health Canada, following World Health Organization (WHO) recommendations, issued minimum surveillance requirements for early detection of severe or emerging respiratory infections. Based on these minimum requirements the Ministry of Health and Long-Term Care established infection control and surveillance standards for febrile respiratory illness (FRI) in acute care, non-acute care and in community settings in non-outbreak conditions in Ontario.

The infection control and surveillance standard document and accompanying slide presentation pertaining to LTCHs are available at:
http://www.health.gov.on.ca/english/providers/program/pubhealth/sars/sars_mn.html#RNA

2.2.5 Potential Outbreak Definition

ii. Criteria for a potential influenza outbreak is:

- one laboratory confirmed case of influenza

OR

- Two cases of acute respiratory tract illness occurring within 48 hours in a geographic area (e.g., unit, floor)

OR

- More than one unit having a case of acute respiratory illness within 48 hours

i. Criteria for a potential respiratory disease outbreak caused by other organisms e.g. Mycoplasma, Legionella, Chlamydia:

- two cases of acute respiratory tract illness occurring within 48 hours in a geographic area (e.g., unit, floor)

OR

- more than one unit having a case of acute respiratory illness within 48 hours

Homes are required to call their local public health unit whenever a respiratory outbreak is suspected.

When the criteria in *i or ii* have been met, initiate assessment of the potential outbreak situation (see Step #1 of outbreak detection and management).

2.2.6 Outbreak Definition

Any further progression (additional cases or laboratory confirmations) of the "potential outbreak" will be considered an outbreak.

An outbreak can be declared at any time by the Medical Officer of Health, or their designate, or the Medical Director for the LTCH.

There should be a discussion between the Medical Officer of Health or designate and the home regarding whether to declare a facility-wide outbreak or unit specific outbreak when the cases are on one unit and can be confined to that unit. Chemoprophylaxis should be made available to non-symptomatic residents in a home where an influenza outbreak is occurring.

3.0 Outbreak Detection and Management

Even a relatively small respiratory outbreak in an institution is disruptive. Early recognition of situations signaling suspected outbreaks and swift action are essential for effective management. Timely specimen collection, communication and the implementation of appropriate control measures will make the difference in the impact of the outbreak and ultimately benefit both the residents and the staff. **The home is responsible for ensuring that the following steps are carried out. Assistance from the public health unit and role/responsibility clarification should be confirmed at the initial OMT Meeting.**

Step 1. Assess the Potential or Confirmed Outbreak

Begin a line listing from routinely collected surveillance data about residents who are ill with respiratory symptoms. (See Appendix 6 for example of a line listing). The line listing provides for rapid assessment of the extent and nature of the suspected outbreak. It may be expanded to include other relevant data beyond what is recommended here as the investigation proceeds.

Confirm the population at risk in the home. This shall include:

- the total number of residents and the number of all staff, including casual workers and non-patient care staff, employed at the home
- if the outbreak is restricted to a unit, the number of staff at risk shall be identified by the OMT
- for large homes, keeping a separate line listing for each unit affected by the outbreak may be useful. As well, a separate line listing should be completed for staff with symptoms suggestive of a respiratory illness.

Included on the line listing shall be documentation of the following information for all residents/staff who meet with the case definition developed:

Resident line listing:

- name of resident
- age
- location in home such as unit, room
- date of onset
- case defining symptoms and signs
- treatment given such as antibiotics or antiviral medications
- diagnostic tests such as x-rays
- samples taken including date and results if known (e.g. nasopharyngeal swab)
- immunization history for influenza and pneumococcal vaccine
- hospitalized/deceased and date (if deceased, cause of death)
- date when isolation of resident was started.

Staff line listing documentation:

- name of staff
- work assignments in the home including notation of assigned wards/units
- date of onset
- case defining symptoms and signs
- antiviral medication given for treatment
- influenza immunization history
- any diagnostic tests including results if available
- last day of work of ill staff member
- whether they work at another facility.

Step 2 Implement General Infection Control Measures

Control measures are to be implemented as soon as an outbreak is suspected. All staff shall be notified quickly of the outbreak, supplies (i.e. gloves, masks, etc.) shall be made available as necessary and the following measures instituted:

- reinforce the need for good hand hygiene before and after providing care to residents. Hands shall be washed after any close contact with any resident including handling used tissues and assisting in feeding. Alcohol based hand sanitizers are as effective as soap and water when hands are not visibly soiled.
- use barrier precautions, (i.e. gloves and masks) when providing direct personal care to ill residents. Masks and gloves shall be removed, discarded and hands washed/disinfected upon exiting the room and/or prior to providing care to other residents. Reinforce the importance of hand hygiene following removal of mask, eye protection, and gloves. Handwashing/hand hygiene after removing gloves and masks prevents contamination of hands with virus from used gloves and masks.

  LTCHs should use the MOHLTC document "Preventing Respiratory Illnesses Protecting Residents and Staff in Non-Acute Care Institutions" at http://www.health.gov.on.ca/english/providers/program/pubhealth/sars/sars_mn.html#1 which is based on Health Canada's Infection Control Precautions for Respiratory Infection Transmitted by Large Droplet/Contact: Infection Control Guidance in a Non-Outbreak Setting, When an Individual Presents With a Respiratory Infection as the basis for establishing infection control standards and practices for febrile respiratory illness: http://www.hc-sc.gc.ca/pphb-dgspsp/sars-sras/pdf/sars-icg-nonoutbreak_e.pdf

  The appropriate level of precaution should be driven by the procedure being undertaken and the resident's symptoms. Infection control programs should reinforce the importance of droplet precautions for staff providing direct care.

- provide isolation where indicated. In most cases it is not feasible to do more than to restrict ill residents to their rooms. Limit visitation to isolated residents and ensure that such visitors exit the home immediately thereafter (see section 4.4.3)
- avoid both resident and staff interaction between affected and unaffected units.

Step 3 Notify the local Medical Officer of Health or Designate at your Health Unit of the Potential or Confirmed Outbreak

- provide the Medical Officer of Health or designate with an updated line listing. Note: do not wait until the line listing is completed to notify the MOH
- provide the Medical Officer of Health or designate with the name of the primary ICP at the home responsible for the outbreak investigation along with the person's phone number and/or pager number. The home should designate a staff person to be responsible for the management of the outbreak at all times including weekends, holidays and vacation. Contact names and appropriate numbers shall be provided to the Medical Officer of Health or designate
- report the initial control measures that have been instituted
- request an Investigation Number (formerly referred to as an Outbreak Number) to assign to the investigation and to record on all laboratory submission forms (this is an eight or nine digit number assigned by the health unit)
- health units are responsible for notifying the Public Health Laboratory of the investigation and providing the laboratory with the particulars of the suspected outbreak. The laboratory notification sheet is to be completed and faxed to the laboratory by the health unit. It is suggested that the health unit follows up the fax with a telephone call, especially prior to the weekend
- discuss with the health unit how specimens will be collected, stored and submitted to the laboratory. Confirm the number of laboratory specimens to be taken during the initial outbreak investigation. Clarify which residents should be tested and establish which residents should not be tested. i.e. nasopharyngeal swabs for respiratory outbreaks should only be taken from residents with acute symptoms (onset within the preceding 24 or 48 hours) and preferably from a resident with the most classical clinical presentation of the illness suspected. All specimens must include the patient's name, the home's name and the Investigation Number. **The Public Health Laboratory will not process incompletely labeled or leaking specimens**
- testing for SARS-CoV is not to be routinely requested in LTCH respiratory outbreaks and is to be considered only in circumstances where there is a high index of suspicion for SARS. The Medical Officer of Health will discuss such requests with the Public Health Branch and the Public Health Laboratory before proceeding

- review and establish a preliminary case definition for the potential outbreak. Included should be clinical signs and symptoms, time frame of onset of illness, location in the home
- example of a case definition:

  A resident on any unit of the home with any two of the following symptoms having onset from (date): cough, fever, headache, chills, lethargy or muscle ache.

Step 4 Declare an Outbreak

- any further progression of the "potential outbreak" situation (additional cases or laboratory confirmations) will confirm an outbreak
- an outbreak can be declared at any time by the Medical Officer of Health or designate or the Medical Director for the LTCH
- arrange for an OMT meeting with designated individuals from the home and the health unit
- Once an outbreak has been declared, the LTCH will notify the Ministry of Health and Long-Term Care regional office as per the Long-Term Care Home Program manual.

Step 5 Notify Appropriate Individuals Associated with the Home of the Outbreak and the Initial Outbreak Management Team Meeting

In addition to notifying the local Medical Officer of Health or designate about the outbreak (see step 3), notification may include some or all of the following individuals as appropriate for the home:

- medical consultant or medical director
- director of care or director of nursing
- administrator
- the operator or board of directors
- chair of the infection control committee
- infection control professional
- provider of home's laboratory services
- employee health nurse
- director of food services
- director of housekeeping
- patient representatives
- pharmacist
- staff members
- community volunteers (family members/ caregivers)
- attending physician
- registered nurses in the extended class (nurse practitioners)

Step 6 Hold an initial OMT Meeting

The OMT directs and oversees the management of all aspects of an outbreak. It should include representatives who have decision making authority within the home as well as a representative from the health unit. The following roles and responsibilities should be assigned to members of the Team:

Chairperson

The chairperson is responsible for coordinating the outbreak control meetings, setting the meeting time, agenda and delegating tasks. The Medical Officer of Health or designate will consult with the appropriate home representatives regarding the selection of the chairperson.

Outbreak Coordinator

This role is often given to the Infection Control Professional. The coordinator ensures that all decisions of the OMT are carried out, and coordinates all activities required to investigate and contain the outbreak.

Secretary

Sets location and notifies committee members of any changes. Records and distributes minutes of meetings.

Media Spokespersons (Health Unit and Home)

The individuals assigned this responsibility are the only representatives of the OMT who should give information to members of the news media. The media spokesperson can be a representative from the home or the health unit or alternatively, a spokesperson from each organization can be selected.

The Outbreak Management Team Meeting should:

1. Review the line listing information to confirm an outbreak exists and ensures that all members of the team have a common understanding of the situation.

2. Develop a working case definition for the outbreak. A case definition is the criteria that will be used throughout the outbreak to consider a resident or staff member as outbreak associated case. The case definition developed for residents may be different from that developed for staff. Residents who meet this case definition will be considered a case regardless of the results of laboratory testing unless another diagnosis is confirmed.

3. Review the control measures necessary to prevent the outbreak from spreading. See Section 4.0 for Respiratory Outbreak Control Measures. Confirm the ICP or designate of the home is responsible for ensuring that agreed upon control measures are in place and enforced. Control measures may differ for different organisms and may need to be modified on an ongoing basis.

4. Appropriate signs and their placement should be confirmed

5. For influenza outbreaks, confirm the use of anti-viral medications for treatment of cases and/or prophylaxis of well residents and non-immunized staff.

6. For influenza outbreaks, confirm the implementation of the exclusion policy, review and implement the staffing contingency plan.

7. Determine if additional influenza immunization clinics are required for non-immunized staff, and if so, how they will be organized.

8. Confirm the arrangements for the collection and submission of specimens for laboratory analysis.

9. Develop a process for resolving conflicts about use of personal protective equipment.

10. Identify any additional persons/institutions that require notification of the outbreak:
    - residents' physicians
    - other health care providers, e.g. physiotherapists
    - acute care hospitals for information on transfers (infection control practitioner, admitting, emergency)
    - families of ill residents or families of all residents in the home
    - compliance advisor from the Ministry of Health and Long-Term Care
    - CCAC/other LTCHs
    - staffing agencies
    - emergency services, including dispatch

    There should be consideration of notifying the following:
    - coroner's office
    - physicians in the community
    - adjacent health units
    - confirm that the Medical Officer of Health may release as much information (including the name of the home) as is necessary to the media or others in order to decrease the risk of disease transmission to the community and to other homes within the health unit's jurisdiction.

11. Prepare a communication plan, including media release as necessary.

12. Prepare internal communications for resident, family and staff groups. Determine if education sessions are required for staff members and confirm who will conduct them.

13. Confirm who will be responsible for the ongoing monitoring of the outbreak in both residents and staff members (see Step 8).

14. Confirm that the Public Health Laboratory will phone results directly to the health unit. Health unit staff are responsible for informing the home's ICP. Review the process for discussing laboratory results and control measures with health unit staff and the home's ICP, or designate.

15. Confirm how and when daily communications will take place between the home and the health unit. Ensure that contact telephone numbers are available for both the health unit and home at all times.

16. Decide how frequently the OMT will meet and set next meeting.

Step 7 Communicate the Results of Laboratory Tests

Public Health Laboratory will also notify the health unit (or the home, if specifically requested or health unit staff is not available) by phone of the results of the specimen testing, both positive and negative. Health unit staff are responsible for informing the home's ICP. Direction will be provided at that time regarding any additional control, treatment or prophylaxis measures to be implemented.

The Public Health Laboratory will send a hard copy of all results (negative and positive) to the health unit or submitter indicated on the data sheet.

Step 8 Monitor the Outbreak on an Ongoing Basis

Monitoring of the outbreak must include ongoing surveillance to identify new cases and update the status of ill residents and staff. The ICP, or designate of the home will update the line listing with new information and communicate this to the health unit contact person as previously arranged. The review of the updated information should examine the issues of ongoing transmission, and the effectiveness of control measures and prophylaxis. Changes in the outbreak control measures may be indicated from the review of the data. Some control measures may be lifted as the outbreak comes under control or alternatively other measures may be added if the outbreak is not being controlled successfully. Additional laboratory testing may be indicated as well. If new cases continue to be identified, prophylaxis failure or a new organism causing infections must be considered.

Elements of ongoing surveillance should include all of the following in the updating of line listing:

Resident Surveillance

- addition of new cases with all appropriate information (see Step 1, Resident Line Listing Information)
- identification of residents who have recovered

- updating of status of ill residents including notation of issues such as worsening symptoms, clinical and/or x-ray diagnosis of pneumonia
- adverse reaction to any prescribed antiviral prophylactic medication, or discontinuation of antiviral prophylactic medication
- transfers to acute care hospitals
- deaths

Staff Surveillance

- addition of new staff cases including all appropriate information (see Step 1, Staff Line Listing Information)
- identification of staff who have recovered and confirmation with the health unit of return to work date

Step 9 Declare that the Outbreak is Over

The length of time from the onset of symptoms of the last case until the outbreak is declared over can vary and is dependent on whether the last case was a resident or staff. Prior to declaring an outbreak over, the home must not have experienced any new cases of infection (resident or staff) which meet the case definition for the period of time as defined by the OMT. *As a general rule, viral respiratory outbreaks can be declared over if no new cases have occurred in 8 days from the onset of symptoms of the last resident case*

The rationale for this definition is, if the outbreak were continuing, given active surveillance, new cases would have been identified within 8 days, since 8 days is the outer limit of the period of communicability of influenza (5 days) plus one incubation period (3 days). Note that if symptoms in the last resident case resolve sooner than 5 days, or if the last case is a staff member who should stay at home during the period of communicability, the time until the outbreak is declared over can be shortened accordingly. Since large LTCHs tend to have some sporadic influenza or respiratory infection cases in non-outbreak situations, the Outbreak Management Team (OMT) may need to attempt to differentiate between these sporadic cases and outbreak-associated cases in identifying the last outbreak related resident case.

Based on practicality, the *"8 days from the onset of symptoms of the last case"* rule in closing outbreaks could also be applied to outbreaks caused by other respiratory pathogens, with relatively short incubation periods, such as influenza.

Another common way to decide when to declare an outbreak over is to use two incubation periods for the disease. This is the approach taken with SARS.

The OMT may make decisions about ongoing surveillance needs after declaring the outbreak over. Included are the following:

- maintenance of general infection control measures as outlined in Step 2
- monitoring the status of ill residents, updating the line listing and communicating with the health unit representative
- notation of any deaths that occurred, including whether they had been a case, and informing the health unit representative
- notation of any spread amongst staff.

Once the outbreak has been declared over, all individuals notified of the outbreak at the beginning of the investigation are to be notified that the outbreak is over. Refer to Steps 5 and 6 for a listing of individuals to be notified of the end of the outbreak.

Step 10 Complete the Outbreak Investigation File

The outbreak file shall be reviewed to ensure that it contains the following:

- copies of laboratory and other results
- copies of all minutes and other communications
- any other documentation specific to the investigation and management of the outbreak.

Completion of the Final Report of an Institutional Respiratory Outbreak is to be done jointly by the home and the health unit. For a confirmed influenza outbreak the health unit will submit the completed report to the Ministry of Health and Long-Term Care within three weeks after the outbreak has been declared over. Copies of all documents related to the outbreak are to be kept on file by the Infection Control staff at the home.

Step 11 Review the Outbreak

Arrange a meeting with health unit staff to review the course and management of the outbreak. The purpose of this meeting is to review what was handled well and what could be improved for future outbreaks. Provide the report to the infection control committee and a copy to be kept by the home administration.

4.0 Respiratory Outbreak Control Measures

Chemoprophylaxis should be made available to all residents in a home where an influenza outbreak is occurring.

4.1 General Control Measures

4.1.1 Background

It is recognized that respiratory viruses, such as influenza, Respiratory Syncytial virus (RSV), SARS, parainfluenza, rhinovirus and adenovirus are also spread through hands, underlining the importance of frequent and thorough hand washing with soap and/or alcohol hand sanitizers.

However, many of these diseases are primarily transmitted by large respiratory droplets. Some organisms can remain viable for up to 24 hours, after landing on hard surfaces. Handwashing after contact with residents and their environment will interrupt this mode of disease transmission.

4.1.2 Hand Hygiene

- hand hygiene is the most important measure in preventing the spread of infection.
- avoid touching one's face and mucous membranes (including eyes) with hands.
- hand hygiene should be performed:

  -before direct contact with a resident

  -after any direct contact with a resident and before contact with the next resident

  -before performing invasive procedures

  -after contact with blood, body fluids, secretions and excretions

  -after contact with items known or considered likely to be contaminated with blood, body fluids, secretions and excretions, including respiratory secretions (e.g. oxygen tubing, masks used tissues and other items handled by the resident)

  -immediately after removing gloves and other personal protective equipment

  -between certain procedures on the same resident where soiling of hands is likely, to avoid cross-contamination of body sites

-before preparing, handling, serving or eating food and before feeding a resident.

- waterless alcohol antiseptic hand rinses are as effective as handwashing if hands are not visibly soiled. If there is visible soiling, hands must be washed with soap and running water before using hand rinses. If soap and running water are not available, cleanse hands first with detergent-containing towelettes to remove visible soil, and then use alcohol hand rinse.
- ideally, one should not wash one's hands in a resident's washroom. If a resident's washroom is used, care must be taken to avoid hand contamination from the environment. Using an alcohol hand rinse after handwashing in this circumstance is recommended.
- residents, staff, and volunteers should be instructed in proper hand hygiene.

Care of hand hygiene in residents is necessary at all times and especially during high risk seasons. Hands should be washed or sanitized frequently but especially after using the bathroom, and before meals.

4.1.3 Gloves

- gloves are recommended when providing care involving direct contact with an ill resident
- gloves should be used as an additional measure, not as a substitute for hand hygiene
- gloves should be put on before entering and removed prior to leaving the resident's room or dedicated bed space
- gloves should fit the wearer to prevent cross contamination through contact
- gloves should be changed between dirty and cleaner procedures on the same resident, e.g ., after open suctioning of a tracheostomy, and remainder of care
- hands must be washed immediately after removing gloves
- when a gown is worn, the cuff of the gloves must cover the cuffs of the gown
- single-use gloves should not be reused or washed

4.1.4 Masks

- whenever the term mask is used in this document, the term refers to **fluid resistant surgical masks,** unless explicitly stated otherwise
- masks are recommended when providing care involving direct contact with ill residents
- for the care of a resident with respiratory illness, put a surgical mask on the resident, if tolerated, whenever the resident is not in his/her room (e.g. transfer to hospital)
- masks should be changed if they become wet, or contaminated by secretions
- staff wearing masks must remove their mask before caring for another resident, and when leaving the residents dedicated space/room
- masks should be handled only by the strings/ ties, to prevent self contamination
- masks should be changed according to the manufacturer's recommendations

- hands should be washed after mask removal
- during treatment of confirmed or suspected airborne diseases such as TB, fit tested N95 masks are recommended.

Health Canada guidelines "Infection Control Precautions for Respiratory Infections Transmitted by Large Droplet and Contact: Infection Control Guidance in a Non-Outbreak Setting, When an Individual Presents to a Health Care Institution With a Respiratory Infection" (December 17, 2003) designed to prevent the transmission of respiratory infections recommend the use of fluid resistant surgical masks.

4.1.5 Eye Protection

- eye protection includes the use of safety glasses, goggles, and face shields. It does not include personal eye glasses
- eye protection should be worn where there is a potential for splattering or spraying of blood, body fluids, secretions or excretions, including cough producing aerosol-generating procedures, while providing direct resident care
- safety glasses, goggles and face shields should be removed carefully to prevent self-contamination
- if re-used, eye protection should be cleaned in a manner that will not lead to contamination. The safety glasses, goggles, or face shields should be cleaned between uses according to the manufacturer's recommendations using a minimum of a low level disinfectant
- to prevent self-contamination, health care workers should not touch their eyes during care of a resident with a respiratory illness
- hands should be washed after removal of eye protection.

4.1.6 Gowning

- long-sleeved gowns should be worn to protect the forearms and clothing from splashing and soiling with body substances during procedures and resident care activities which are likely to generate splashes or sprays of blood, body fluids, secretions, or excretions.
- gowns should be removed before leaving the residents' room or dedicated space.

4.2 Control Measures for Residents

4.2.1 Restriction of Cases to Their Room

Restrict cases (ill residents) to their room until 5 days after the onset of acute illness or until symptoms have completely resolved (whichever is shorter). For some pathogens the period of communicability may be longer than 5 days, but for practical reasons, this could be applied to outbreaks caused by respiratory viruses other than influenza. Restriction of ill

residents to their room is recommended as long as it does not cause the resident undue stress or agitation and can be done without applying restraints.

4.2.2 Restriction of Residents to Their Unit

If cases are confined to one unit, all residents from that unit should avoid contact with residents in the remainder of the home.

4.2.3 Admissions and Re-admissions

i. New Admissions
Admissions of new residents to the affected unit during the outbreak is generally not permitted. If required, this measure may be altered as the outbreak comes under control. Changes in this outbreak control measure should be made in consultation with the health unit. See 4.2.3.iii for specific considerations.

ii. Re-admission of Cases
The re-admission of residents who met the case definition is permitted provided appropriate accommodation and care can be provided.

iii. Re-admission of Non-cases
The re-admission of residents who have not been line listed in the outbreak (i.e. are not known cases) is generally not permitted during an outbreak. If required, this measure may be altered as the outbreak comes under control. Changes in this outbreak control measure will be made in consultation with the health unit. Factors to assess if re-admission of non-cases is being considered include:

- the outbreak is under control
- the resident's attending physician has agreed to the re-admission based on a review of the current health status of the resident in hospital
- adequate staff are available at the Long-Term care home to care for the re-admitted resident
- if the outbreak is due to influenza, the resident is protected from influenza by vaccination and/or an anti-viral drug
- appropriate accommodation is available for the returning resident
- the patient/resident or their substitute decision-maker has given informed consent for the return.

Note: A resident's bed will be kept for up to 21 days while he/she receives treatment in an acute care facility, or 45 days for psychiatric leave. In the event that a resident's hospital or psychiatric stay will exceed the maximum allowable days due to an outbreak situation in the home, the MOHLTC should be notified that the period for the time the resident may remain away from the home will need to be extended.

4.2.4 Medical Appointments

Non-urgent appointments made before the outbreak shall be rescheduled.

4.2.5 Transfer to Hospital

Receiving health care facilities and the Provincial Transfer Authorization Centre (PTAC) are to be advised by the sending home when any resident is to be transferred to the hospital from a home experiencing an outbreak. The hospital ICP must be provided with the details of the outbreak to ensure control measures are in place when the resident arrives at the hospital. The hospital ICP shall be informed of whether or not the resident to be transferred has been identified as a case. The outbreak transfer letter attached in Appendix 10 can be used to provide the required information.
Please note that all transfers from one healthcare facility to another must follow a transfer authorization process at all times. Fax PTAC at 416-397-9061 for a transfer request, or use the web-based application if available. If approved, an authorization number will be issued immediately and faxed or issued on-line to the home.
Directives can be found at:
http://www.health.gov.on.ca/english/providers/program/emu/sars/forms/ptac_nonoutbreak_082604.pdf
http://www.health.gov.on.ca/english/providers/program/emu/sars/sars_obc/directives/dir_102203_outbreak_patient_tansfer_procedure.pdf

4.2.6 Transfer to Another Long-Term Care Home

Resident transfers (from anywhere in the home) to another LTCH are not recommended during an outbreak. Possible exceptions to this recommendation should be approved by the Medical Officer of Health or designate on a case by case basis. Refer to the PTAC approval process above.

4.2.7 Communal Meetings

As much as possible, restrict all residents to their units. Previously scheduled events, (e.g. holiday events) might have to be rescheduled. The OMT should discuss restriction of activities, revisiting the issue as the outbreak progresses.

4.3 Control Measures for Staff and Volunteers

4.3.1 Reporting of Respiratory Illness

Staff and volunteers with any respiratory illness should not enter the LTCH, but should report any respiratory illness to their supervisor who shall report to the employee health nurse or the ICP.

4.3.2 Exclusion of Staff, Students, and Volunteers

Staff, students, or volunteers with any respiratory symptoms are to be excluded from work for 5 days from the onset of symptoms of a respiratory illness or until symptoms have resolved, whichever is shorter.

For a confirmed influenza outbreak, ill staff, students, or volunteers taking antiviral medication for treatment (not prophylaxis) shall be excluded from work for 5 days from onset of symptoms or until symptoms have resolved, whichever is shorter.

4.3.3 Working at Other Facilities

During non-influenza outbreaks, staff, students, and volunteers should be advised not to work at any other facility. During an influenza outbreak, immunized staff have no restrictions on their ability to work at other facilities, provided the individual changes their uniform between facilities. However, non-immunized staff not receiving prophylactic therapy must wait one incubation period (**3 days**) from the last day that they worked at the outbreak facility/unit prior to working in a non-outbreak facility, to ensure they are not incubating influenza. Staff, students, and volunteers experiencing respiratory symptoms or fever should not work in any health care setting.

4.3.4 Cohort Staffing

During non-influenza outbreaks, consider the possibility of one staff member looking after only ill residents and others looking after only well residents. Alternatively, consider the possibility of keeping staff members working on only one unit if possible. Attempts should be made to minimize movement of staff, students, or volunteers between floors/resident home areas, especially if some units are unaffected. These measures should not be required during influenza outbreaks where all persons are immunized or on an appropriate antiviral drug.

4.3.5 Exclusion of Non-immunized Staff

During a confirmed influenza outbreak, only immunized staff shall be working in the outbreak home. Non-immunized staff may return to work at the affected home if they are receiving appropriate anti-viral prophylaxis as soon as they have started to take the medication. The home's policy should require proof of taking the prescribed anti-viral medication. If issues arise regarding compliance with work exclusions, options should be reviewed with the OMT.

4.4 Control Measures for Visitors (including family) and Communal Activities

4.4.1 Notification of Visitors

The institution shall post outbreak notification signs at all entrances to the home indicating the institution is in an outbreak. Visitors shall be advised of the potential risk of acquiring illness within the home, and the re-introduction of illness into the home, and of the visiting restrictions as indicated below. Family members of ill residents shall be contacted and advised of the illness in their relative. Where possible, the home may wish to keep a telephone list of frequent visitors. These individuals may be contacted and advised of the outbreak.

4.4.2 Visitor Restrictions

Ill visitors shall not be permitted in the home. Visitors should be encouraged to postpone visits wherever possible. Visitors who choose to visit during an outbreak shall be required:

- to wash hands on arrival and just before leaving the resident's room
- to visit only one resident and exit the home immediately after the visit
- visitors should wear personal protective equipment as per Section 4.1.

Complete closure of visitation is not recommended, as it may cause emotional hardship to both the residents and the relatives, especially if they traveled from a distance. Visitation restrictions shall take into consideration whether or not the visitor/family member has been immunized or has taken prophylaxis. Visitation restrictions should be discussed by the OMT.

4.4.3 Visiting Ill Residents

- notices shall be placed on the door of the rooms of ill residents or in other visible locations advising all visitors to check at the nursing station before entering the room. Visitors are to be advised of the above visitor restrictions
- ill residents should be visited in their room only.

4.4.4. Communal and Other Activities

Visitation by outside groups, e.g. entertainers, meetings, community groups, etc., shall not be permitted. Also, visitation of multiple residents shall be restricted.

Onsite adult and childcare programs may continue provided there is no interaction between LTCH residents who are ill and participants of the program.

4.5 Cleaning

4.5.1 Environmental Cleaning

- procedures should be established for assigning responsibility and accountability for routine cleaning of all environmental surfaces including furniture (e.g. bed rails and overbed table) and non-critical resident care items (e.g. call bell)
- disinfection methods should be reviewed
- frequent cleaning of environmental surfaces and non-critical patient care items using hospital approved detergent-disinfectant is recommended
- components of an effective cleaning process include a sufficient quantity of detergent-disinfectant in the correct concentration applied with a clean cloth. It is important to comply with contact time on manufacturer's label and workplace safety requirements
- all horizontal and frequently touched surfaces should be cleaned daily and more often when soiled
- routine practices should be applied in the handling of soiled linen
- routine practices should be applied to handling clinical waste. Double bagging of waste is not required. Disposable dishes and cutlery are not required.

4.5.2. Resident Care Equipment

- remind staff, students and volunteers of the recommendations for cleaning, disinfecting and sterilizing patient care equipment in "Hand Washing, Cleaning, Disinfection and Sterilization in Health Care", 1998 (Health Canada).
- disposable equipment should be used whenever possible
- soiled patient care equipment should be handled in a manner that prevents exposure of skin and mucous membranes and contamination of clothing or the environment
- equipment should be cleaned and disinfected prior to use and between residents.

4.6 Influenza Immunization

Offer the Influenza Vaccine

During influenza outbreaks, influenza vaccine should be offered to all unvaccinated residents, staff members, visitors and volunteers. It takes approximately two weeks for the vaccine to become effective. The home or health unit will make arrangements for influenza vaccine to be delivered to the home. Staff, volunteers, and visitors may also be directed to their family physicians for immunization. Influenza vaccine is provided free to all Ontario residents over the age of six months.

4.7 Antiviral Medication

4.7.1 Antiviral Medication for Prevention

During an influenza outbreak, antiviral medication for prevention shall be offered to all residents, whether vaccinated or unvaccinated, and to all unvaccinated staff members. Currently approved drugs for prophylaxis are amantadine, for influenza A only, and a neuraminidase inhibitor – oseltamivir (Tamiflu™). There is evidence from randomized, controlled trials that show efficacy of neuraminidase inhibitors for both prophylaxis and treatment. **Oseltamivir (Tamiflu™)** is currently funded by the Ministry of Health and Long-Term Care for institutionalized individuals, and **is the recommended drug of choice for both prophylaxis and treatment in an influenza outbreak.** Reimbursement for residents applies only during a Public Health confirmed influenza outbreak for patients requiring treatment (up to five [5] days therapy) and for patients requiring prophylactic therapy (up to six [6] weeks).

Antiviral prophylaxis should not replace annual influenza vaccination! Vaccination remains our primary tool for the prevention of influenza infection and illness.

Prescriptions of neuraminidase inhibitors, as for all other medications, are the responsibility of the medical directors or attending physicians of the residents.

4.7.2 Antiviral Medication for Treatment

Treatment decisions are the responsibility of the attending physicians. Whatever drug choice, treatment must be started within 48 hours of onset of symptoms to be effective and may decrease the rate of complications. The earlier treatment is started, the more effective it is. Oseltamivir (Tamiflu™) and amantadine have been approved for both treatment and prophylaxis. Amantadine is effective against influenza A only, while oseltamivir is effective against both influenza A and B. Zanamivir, (Relenza™), also a neuraminidase inhibitor, effective against influenza A and B, has been approved only for the treatment of influenza. **Oseltamivir is the preferred treatment/prophylaxis option based on effectiveness, side effect profile, risk of development of amantadine resistance, and ease of administration.**

If amantadine is being used for prophylaxis in an outbreak it is not recommended for treatment of ill residents in the same home, due to the easy development of resistance. Emergence of a resistant virus may result in prolongation of the outbreak or in a second outbreak wave. However, if it must be used:

- a monitoring system shall be in place to ensure that the patient is on the medication for no more than 48 hours after the end of symptoms and not more than a total of 5 days.

See recommendations for dosage of antiviral drugs for the prevention of influenza in persons over the age of 65 years in 4.7.4. (Tables 2 and 3)

4.7.3 Treatment and Prevention of Influenza with Neuraminidase Inhibitors

Neuraminidase inhibitors are a class of antiviral agents that are active against both influenza A and B. They are approved by Health Canada for prophylaxis and/or treatment of influenza in healthy adults and/or children (see the current edition of the *Compendium of Pharmaceuticals and Specialties* for details on indications, age limitations, etc.) Dosing schedules and other key details about oseltamivir (Tamiflu™) and zanamivir (Relenza™) are provided in the Table 1 below. Zanamivir is not reimbursed under the Ontario Drug Benefit program.

Note: Measurement of serum creatinine and estimation of creatinine clearance is not required for the use of neuraminidase inhibitors (e.g. oseltamivir, zanamivir). Measurement of serum creatinine is required only if there is a clinical reason to suspect a new onset of renal impairment.

If treatment of influenza is started within 48 hours after the first symptoms, there is a modest reduction in symptom duration and severity (about 25-35%), and possibly some reduction in the risk of complications. Treatment started more than 48 hours after the onset of illness will not provide any benefit.

Two oseltamivir studies, one in household contacts and one in nursing home residents, demonstrate efficacy of 73% and 91% in the prevention of illness, respectively. Two zanamivir studies, one in healthy adults during influenza season and one in household contacts, demonstrate equal effectiveness in the prevention of influenza.

Recommendations regarding the use of influenza antiviral prophylaxis:*

- Antiviral prophylaxis should be given to all residents who are not already ill with influenza, whether previously vaccinated or not, and to unvaccinated staff, until the outbreak is declared over.
- Prophylaxis should also be considered for HCWs, regardless of vaccination status, during outbreaks caused by influenza A strains that are not well matched by the vaccine.
- When an unvaccinated healthcare worker is vaccinated only at the start of the outbreak, antiviral prophylaxis should be continued until 2 weeks after the care provider has been vaccinated. It is reasonable to allow these individuals to work with high-risk patients as soon as they start antiviral prophylaxis. These workers must be alert of the symptoms and signs of influenza, particularly within the first 48 hours after starting antiviral prophylaxis, and should be excluded from patient care environment if these develop.

* National Advisory Committee on Immunization (NACI), Statement on Influenza vaccination for the 2004-2005 season

Table 1: Oseltamivir and Zanamivir Prophylaxis and Treatment

	OSELTAMIVIR **Tamiflu™**	**ZANAMIVIR** **Relenza™**
Available Format	75 mg. capsule	5 mg. powder in blister pack*
Prophylactic Dosage £	**A No known renal disease, or if in the presence of renal disease and the serum creatinine is less than 150µmol/l** *75 mg OD (once daily) for 14 days or until the outbreak is declared over.*****	Not applicable (Health Canada has not approved zanamivir (Relenza™) for use in prophylaxis of influenza A or B)
	B Known renal disease and a serum creatinine of greater than 150µmol/l, or if on dialysis. *75mg OD x 5 days, stop for 5 days, then repeat 5 days on, 5 days off, then stop; or until outbreak is over.*	Not applicable
Treatment Dosage	**A No known renal disease or serum creatinine < 150 µmol/l** 75mg BID (twice daily) for 5 days.*****	**B No known renal disease** 2 puffs (10 mg) BID for 5 days
	B Known to have renal disease, serum creatinine is 150-250 µmol/l 75mg OD (daily) for 5 days If on dialysis and creatinine is >250 µmol/l, and can not take zanamivir, oseltamivir 75mg. OD for 2 days	**B Known renal disease and patient is on dialysis or has a serum creatinine of >250** 2 puffs (10 mg) BID (10mg= 2 blisters) for 5 days
Drug Interactions	None	None
Serious Side Effects	None	None***
Comments	Nausea and vomiting may occur in approximately 2.5-10% of all people Use in children § Use in pregnancy and lactation ¥	There is no need to adjust dose for renal failure. Many LTC residents have difficulty coordinating the inhalation required. Anyone who has wheezing immediately after a dose should discontinue therapy.

Compendium of Pharmaceuticals and Specialties (CPS) 2004
Oseltamivir - page 1957-58; zanamivir - page 1717-1718

§ Use in children < 13 years of age has not been evaluated adequately

* 4 blisters make up a disc. Each disc is inserted into a Diskhaler device that punctures the disc, dropping the powder into a well, which is then ready for inhalation.

** Under normal circumstances outbreaks are declared over 8 days after the onset of the last case.

*** http://www.hc-sc.gc.ca/hpfb-dgpsa/tpd-dpt/adrv10n4_e.html Canadian Adverse Drug Reaction Newsletter by Health Canada. Volume 10 Number 4 October 2000.

**** Oseltamivir (Tamiflu) is available for reimbursement under the ODB program as a Limited Use product. Reimbursement for institutionalized individuals applies only during a Public Health confirmed influenza outbreak for patients requiring prophylactic therapy (up to six weeks).

Oseltamivir prophylaxis should be continued until the outbreak is declared over; there are no recommended minimum days of prophylaxis (although reimbursement through the ODB program is limited to 6 weeks as above).

***** Oseltamivir (Tamiflu) is available for reimbursement under the ODB program as a Limited Use product. Reimbursement for institutionalized individuals applies only during a Public Health confirmed influenza outbreak for patients requiring treatment (up to five days of therapy).

\+ as a result of reported GI upset, it is recommended that oseltamivir (Tamiflu™) be given with a snack or at mealtime. GI upset, if it occurs, is usually associated with the first dose.

(Serum creatinine of 250 µmol/l corresponds roughly to creatinine clearance of 11 in a 40kg, 85 year old person.)

£ If respiratory symptoms develop in a patient on prophylaxis with oseltamivir, the dose should be changed to the therapeutic dose and continued for a total of five (5) days, starting from the day when the therapeutic dose was first given.

¥ Oseltamivir should be used during pregnancy and lactation only if the potential benefit justifies the potential risk to the fetus or nursing infant. Insufficient data are currently available regarding possible toxic effects on the fetus. It is not known whether oseltamivir or its active metabolite is excreted in human milk.

Amantadine

Amantadine is no longer preferred for prophylaxis or treatment due to its limitations, adverse side effects, and the emergence of amantadine resistant influenza A strains. If amantadine is used as prophylaxis, it should not be used for treatment in the same home.

Table 2: National Advisory Committee on Immunization§ recommended amantadine hydrochloroide prophylactic dosage by age and renal status

Age	Dosage
No renal impairment	
1-9 years*	5mg/kg once daily, or divided, twice daily, total daily dose not to exceed 150 mg
10-64 years	200 mg once daily, or divided twice daily**†
≥ 65 years	100 mg once daily‡

Renal impairment

Creatinine clearance (mL/min/1.73m^2)	Dosage for those 10-64 years	Dosage for those ≥ 65 years
≥ 80 mL/min	100 mg twice daily	100 mg twice daily
60-79 mL/min	Alternating daily doses of 200 mg and 100 mg	Alternating daily doses of 100 mg and 50 mg
40-59 mL/min	100 mg once daily	100 mg every 2 days
30-39 mL/min	200 mg twice weekly	100 mg twice weekly
20-29 mL/min	100 mg three times/week	50 mg three times/week
10-19 mL/min	Alternating weekly doses of 200 mg and 100 mg	Alternating weekly doses of 100 mg and 50 mg

§ National Advisory Committee on Immunization (NACI), Statement on Influenza vaccination for the 2004-2005 season

*Use in children < 1 year of age has not been evaluated adequately.

**Reduction of dosage to 100 mg/day is recommended for people with a seizure disorder, because they may be at risk of more frequent seizures when the dosage is 200mg/day.

†For children who are 10 years of age but who weigh < 40 kg, a dosage of 5 mg/kg/day is advised regardless of age.

‡The reduced dosage is recommended to minimize the risk of toxic effects, because renal function generally declines with age and because side effects have been reported more frequently in the elderly.

- **Calculation of estimated creatinine clearance**:

For males: $$\text{CrCl ml/min} = \frac{(140 - \text{age}) \times \text{weight (kg)}}{\text{Serum creatinine } (\mu\text{mol/L}) \times 0.81}$$

For females: $$\text{CrCl ml/min} = 0.85 \times \text{CrCl (male)}$$

The following dosing schedule was developed to retain the efficacy of the standard NACI

recommendations for dosage of amantadine, yet to be practical to administer without an increase in side effects. The disadvantage of this schedule is that, overall, more doses need to be administered. Homes should take the advantages and disadvantages of the two different schedules into consideration when selecting a regimen for their residents.

Table 3: Proposed once daily dosing schedule§ for amantadine solution (10mg/ml) in persons > 65 years*

Creatine Clearance	Initial Dose (day 1)	Subsequent doses (starting Day 2)
≥ 80 ml/min	100 mg	100 mg daily (10 ml)
60-79 ml/min	100 mg	75 mg daily (7.5 ml)
40-59 ml/min	100 mg	50 mg daily (5 ml)
20-39 ml/min	100 mg	25 mg daily (2.5 ml)
10-19 ml/min	100 mg	‡

§ National Advisory Committee on Immunization (NACI), Statement on Influenza vaccination for the 2004-2005 season

***** Daily dosing increments set at 2.5 mL to permit the use of medicine cups marked at 2.5 mL.

‡No daily dose; if outbreak continues, repeat 100mg. dose every 7 days during the outbreak.

4.7.4 Procedures for obtaining reimbursement for antiviral agents from the Drugs Programs Branch

Antiviral agents are listed in the ODB formulary as General Benefit or Limited Use Drugs, and other agents may be reimbursed through the Individual Clinical Review (Section 8) mechanism. For more details, please see Part XIII of the Formulary for Section 8 policies and Part XII for Limited Use policies. (http://www.health.gov.on.ca/english/providers/program/drugs/odbf_mn.html)

Amantadine is available as a General Benefit in the ODB Formulary. Oseltamivir (Tamiflu) is available as a Limited Use (LU) product (please see ODB Formulary No. 38, Update B, page 18), and is the recommended drug of choice for both prophylaxis and treatment in an influenza outbreak. Reimbursement for institutionalized individuals applies only during a Public Health confirmed influenza outbreak for patients requiring treatment (up to five days of therapy) and for patients requiring prophylactic therapy (up to six weeks). The LU criteria for oseltamivir are as follows:

Reason for use code: 371

For the prophylaxis (max: 75mg daily) of institutionalized individuals during confirmed* outbreaks of Influenza A or Influenza B.
Note: Network will limit supply to 6 weeks.

Reason for use code: 372
For the treatment (max: 75 mg twice a day) of institutionalized individuals during confirmed* outbreaks due to: Influenza B or, Influenza A (as an alternative to amantadine) or, Influenza A where new cases have developed despite amantadine prophylaxis.
Note: Network will limit supply to 5 days.

*The outbreaks must be confirmed by Public Health

Under the LU process, an individual LU form must be completed for each patient and kept on file at the dispensing pharmacy. Recognizing that this could result in a delay in therapy in institutions with large numbers of residents, the Ministry has created an exception to this requirement for oseltamivir only.

The Ministry will accept a single LU form to be completed for multiple patients who require treatment or prophylaxis and meet one of the approved criteria. All institutions are eligible for the exemption provided the outbreak was confirmed by Public Health. Once confirmation of an outbreak is received and an attending physician decides to prescribe oseltamivir (Tamiflu), the prescribing physician must complete a LU form by filling in the appropriate LU code, date, CPSO number and signing the form. The name of the home should be written in under “Patient’s name”. The completed LU form must then be attached to a list of affected patients and forwarded to the dispensing pharmacy. One LU form should be used for patients requiring treatment (up to 5 days therapy) and a separate LU form must be completed for patients requiring prophylactic therapy (up to 6 weeks therapy) during the influenza outbreak.

The standard LU process (i.e., one completed form for each patient) is also acceptable.

5.0 References

1. Bradley et al. SHEA position paper. Prevention of Influenza in long-term care Facilities. *Infection Control Hosp. Epidemiology* 1999;20:629-37
Under outbreak management (Page 635) recommendation 9a. (category 11B)

2. Tablan et al. Guidelines for the prevention of nosocomial pneumonia. Infection Control and Hospital Epidemiology 1994;15:587-627. (these are CDC guidelines; supporting references are included)

3. Influenza Prevention and Surveillance Protocol for Ontario Long-Term Care Facilities October 2001

4. Statement on Influenza vaccination for the 2003-2004 season, National Advisory Committee on Immunization (NACI) *Canada Communicable Disease Report*; 15 August 2003, Vol 29 1:20

5. Centers for Disease Control and Prevention: Prevention and Control of Influenza: Recommendations of the Advisory Committee on Immunization Practices (ACIP). *MMWR May 28, 2004, 53(RR06);1-40*

6. Carman WF, Elder AG, Wallace LA, et al. Effects of influenza vaccination of health-care workers on mortality of elderly people in long-term car: a randomized controlled trial. *Lancet* 2000; 355:93-7

7. Tamblyn SE. Preventing influenza outbreaks in long-term care facilities. *Can Med Assoc J.* 1997. 157(7):927

8. Ohmit SE, Arden NH, Monto AS. Effectiveness of inactivated influenza vaccine among nursing home residents during an influenza type A (H3N2) epidemic. *J Am Geriatr Soc.* 1999; 47: 165-71.

9. Gomolin IH, Leib HB, Arden NH, Sherman FT. Control of influenza outbreaks in the nursing home: guidelines for diagnosis and management. *J Am Geriatr Soc.* 1995; 43:71-74.

10. Isaacs S. Outbreak of influenza A in an Ontario nursing home. *Can Commun Dis Rep.* 1997; 23(14). http://www.hc-sc.gc.ca/hpb/lcdc/publicat/ccdr/97vol23/

11. Taylor JL, Dwyer DM, Coffman T, Groves C, Patel J, Israel E. Nursing home outbreak of influenza A (H3N2): evaluation of vaccine efficacy and influenza case definitions. *Infect Control Hosp Epidemiol.* 1992; 13:93-7.

12. Simor AE, Augustin A, Staynor K, Clark BA, Petric G, Kasuspki F, McGeer A. Influenza A in elderly nursing home residents: evaluation of vaccine efficiency and case definitions of influenza-like illness (ILI). Abstract 1393, 33rd ICAAC.

13. Arden N, Monto A, Ohmit SE. Vaccine use and the risk of outbreaks in a sample of nursing homes during an influenza epidemic. *Am J Public Health.* 1995; 85(3): 399-401.

14. Patriarca PA, Weber JA, Parker RA *et al.* Efficacy of influenza vaccine in nursing homes. *JAMA*. 1985; 253(8): 1136-1139.

15. Benenson AS (ed.). Control of Communicable Diseases Manual, 16th ed., 1995: p. 245.

16. Laboratory Centre for Disease Control. Routine practices and additional precautions for preventing the transmission of influenza in health care. *Can Commun Dis Rep*. *Supplement* Vol. 25S4. July 1999.

17. Morens DM, Rash VM. Lessons from a nursing home outbreak of influenza A. *Infect Control Hosp Epidemiol.* 1995; 16:275-280.

18. Adal KA, Flowers RH, Anglim AM *et al.* Prevention of nosocomial influenza. *Infect Control Hosp Epidemiol.* 1996; 17:641-648.

19. Chapman LE. Amantadine use for control of institutional influenza A. In: Hannoun C., Kendal AP, Klenk HD, Ruben FL. Editors, *Options for the Control of Influenza II*, Elsevier 1993; 343-8.

20. Tamblyn S. Amantadine use in influenza outbreaks in long-term care facilities. *Can Med Assoc J.* 1997; 157: 1573-4.

21. Drinka PJ, Gravenstein S, Krause P *et al.* Outbreaks of influenza A and B in a highly immunized nursing home population. *J Fam Pract*. 1997; 45(6): 509-514.

22. Mostow SR. Prevention, management, and control of influenza. Role of amantadine. *Am J Med.* 1987; 82(6A): 35-41.

23. Drinka PJ, Gravenstein S, Schilling M *et al.* Duration of antiviral prophylaxis during nursing home outbreaks of influenza A: a comparison of 2 protocols. *Arch Intern Med.* 1998; 158(19): 2155-2159.

24. Stilianakis NI, Perelson AS, Hayden FG. Emergence of drug resistance during an influenza epidemic: Insights from a mathematical model. *J Infect Dis.* 177:863-73.

25. Houck P, Hemphill M, LaCroix S, Hirsh D, Cox N. Amantadine-resistant influenza A in nursing homes. *Arch Intern Med.* 1995; 155: 533-7.

26. Degelau J, Sonair SK, Cooper SL, Guay DRP, Crossley KB. Amantadine-resistant influenza A in a nursing facility. *Arch Intern Med.* 1992; 152:390-2.

27. Mast EE, Harmon MW, Gravenstein S, Wu SP, Arden NH, Circo R *et al.*, Emergence and possible transmission of amantadine-resistant viruses during nursing home outbreaks of influenza A (H3N2). *Am J Epidemiol.* 1991; 134: 988-97.

28. Peters NL, Oboler S, Hair C *et al.* Treatment of an influenza A outbreak in a teaching nursing home. *J Am Geriatr Soc.* 1989; 37; 210-218.

29. Younkin SW, Betts RF, Roth FK *et al.* Reduction in fever and symptoms in young adults with influenza A/Brazil/78 H1N1 infection after treatment with aspirin or amantadine. *Antimicrob Agents Chemother*. 1983; 23:577-82.

30. Pachucki CT, Pappas SA, Fuller GF *et al.* Influenza A among hospital personnel and patients. *Arch Intern Med.* 1989; 149: 7780.

31. Cartter ML, Renzullo PO, Helgerson SD *et al.* Influenza outbreaks in nursing homes; how effective is the influenza vaccine in the institutionalized elderly. *Infect Control Hosp Epidemiol.* 1990; 11(9) 473-478.

32. Gross PA, Hermogenes AW, Sacks HS *et al.* The efficacy of influenza vaccines in elderly persons: a meta-analysis and review of the literature. *Ann Intern Med.* 1995; 123(7): 518-527.

33. Libow LS, Neufield RR, Olson E *et al*. Sequential outbreak of influenza A and B in a nursing home: efficacy of vaccine and amantadine. *J Am Geriatr Soc.* 1996; 44:1153-1157.

34. Evans ME, Hall KL, Berry SE. Influenza control in acute care hospitals. *Am J Infect Control.* 1997; 25(4): 357-362.

35. Drinka PJ, Krause P, Schilling M *et al.* Report of an outbreak: nursing home architecture and influenza A attack rates. *J Am Geriatr Soc.* 1996; 44: 910-913.

36. Falsey AR. Noninfluenza respiratory virus infection in Long-term care facilities. *Infection Control and Hospital Epidemiology* 1991;12:602-8.

37. Bradley SF. Prevention of influenza in Long-term care facilities (A position paper from the Society of Healthcare Epidemiology of America). *Infection Control and Hospital Epidemiology* 1999;20:629-37.

38. Preventing Respiratory Illnesses Protecting Residents and Staff in Non-Acute Care Institutions - Infection Control and Surveillance Standards for Febrile Respiratory Illness (FRI) in Non-Outbreak Conditions found at: http://www.health.gov.on.ca/english/providers/program/pubhealth/sars/sars_mn.html#RNA

39. Rea E, Upshur R. Semmelweis revisitied: the ethics of infection prevention among health care workers. *CMAJ 2001;164(10):1447-1448*

40. Verweij M, van den Hoven, M. Influenza vaccination rates and informed consent in Dutch nursing homes:Survey of nursing home physicians. *BMJ* 2002;324:328

41. Stevenson CG, McArthur MA, Naus M, Abraham E, McGeer AJ. Prevention of influenza and pneumococcal pneumonia in Canadian Long-term care Facilities: How are we doing? *CMAJ* 2001;164(10):1413-1419

42. Last JM. A Dictionary of Epidemiology, Second Edition. Oxford: Oxford University Press, 1988

Articles about neuraminidase inhibitors

1. Anon Neuraminidase inhibitors for treatment of influenza A and B infections. *MMWR* 1999;48 (RR-14):1-9. Medical Letter 1999;41:41-2

2. Hayden FG, et al. Efficacy and safety of the neuraminidase inhibitor zanamivir in the treatment of influenza virus infections. *New Eng J Med* 1997;337:874-880.

3. A McGeer, DS Sitar, SE Tamblyn, F Kolbe, P Orr, FY Aoki. Use of antiviral prophylaxis in influenza outbreaks in Long-Term care facilities. *Can. J Infect Dis* 2000;11(4):187:192.

4. Cooper NJ, Sutton AJ, Abrams KR, Wailoo A, Turner DA, Nicholson KG. Effectiveness of neuraminidase inhibitors in treatment and prevention of influenza A and B: Systematic review and meta-analyses of randomised controlled trials. BMJ 2003;326:1235-1239

5. Kaiser L, Wat C, Mills T, Mahoney P. Impact of Oseltamivir Treatment on influenza-related lower respiratory tract complications and hospitalizations. *Arch Intern Med* 2003;163:1667-1672

6. Health Canada. National Advisory Committee on Immunization (NACI) Statement on Influenza Vaccination for the 2004-2005 Season. *Can Commun Dis Rep*. Vol. 30. 15 June 2004.

7. Bowles SK, Lee W, Simor AW et al. Use of oseltamivir during influenza outbreaks in Ontario nursing homes. *J Am Geriatr Soc*. 2002;50:608-16

8. Parker R, Loewen N, Skowronski D. Experience with oseltamivir in the control of a nursing home influenza B outbreak. CCDR 2001;27(5):37-40.

Websites with information about influenza

www.health.gov.on.ca
Current health issues. Updated regularly

www.health.gov.on.ca/english/public/pub/immun/influenza.html
Influenza Vaccine Fact Sheets at the Ontario MOHLTC website. Additional information and material will be available later. For more information please call 1-866-FLU-NYOU or 1-866-358-6968

www.health.gov.on.ca/english/providers/program/pubhealth/flu/flu_03/flubul_mn.html
The Ontario Influenza Bulletin – the most useful site for Ontario specific data on influenza. The Ontario Ministry of Health Web page for influenza bulletins. These are published weekly for the province and have region specific data for nursing home outbreaks, sentinel physician activity and laboratory testing.

http://www.hc-sc.gc.ca/pphb-dgspsp/fluwatch/index.html
Health Canada's web page on influenza surveillance. Updated every two weeks, with data on laboratory results for respiratory virus identification, and influenza activity across Canada

www.flupill.com can be accessed by www.theweathernetwork.com
Sponsored by Roche with basic information about influenza, along with cross-Canada data on influenza activity in different centres (see article on surveillance)

www.City.toronto.on.ca/health/flu.htm
Good public information about influenza and vaccination

www.cdc.gov./ncidod/diseases/flu/fluvirus.htm
Patient information on influenza, US surveillance data

Ontario Drug Benefit Program
http://www.health.gov.on.ca/english/public/program/drugs/drugs_mn.html

Ontario Drug Benefit Formulary
http://www.health.gov.on.ca/english/providers/program/drugs/odbf_mn.html

6.0 Appendices

Role of the Laboratory

The main role of the Laboratory in Outbreak Management involves the following functions:

1) To advise on the collection and transportation of appropriate specimens
2) To isolate and identify the etiological agent(s)
3) To co-ordinate the transfer of cultures/specimens to reference laboratories as required
4) To communicate laboratory results, both positive or negative, promptly to the health unit

Public Health Laboratories are uniquely prepared to deal with outbreaks of infectious disease. Specialized testing procedures not normally offered by routine clinical laboratories are available through Public Health Laboratories. In addition, to ensure complete continuity and collation of data, the services of the Public Health Laboratory should always be utilized in outbreak/epidemic situations.

Information Essential for Efficient Laboratory Investigation

The following information is required on the respiratory outbreak information form:

- source or event associated with the outbreak
- outbreak number given by the health unit
- date of onset
- number of persons ill/at risk/hospitalized/died
- location of the outbreak (names and addresses of the home)
- number of residents/visitors/staff
- most common symptoms
- incubation period, if known
- duration of illness
- reports of any pathogens isolated by other laboratories, related to same outbreak
- suspected mode of transmission
- travel or other history, if pertinent

From the Specimen Collection Guide, Ontario Public Health Laboratories, 2004 (under revision)

Table 1 COMMON VIRUSES THAT CAUSE RESPIRATORY OUTBREAKS					
VIRUS	**EPIDEMIOLOGY**	**INCUBATION**	**SYMPTOMS**	**DIAGNOSTIC TEST**	**TREATMENT & PROPHYLAXIS**
Influenza A & B	Winter/Early Spring (usually Dec. through Mar.)	18-72 hours	Fever, muscle aches, headache, cold-like symptoms	1) Rapid Antigen Detection (results in ≤48 hours) 2) Virus Culture	Amantadine (Influenza A only), Neuraminidase inhibitors (Influenza A& B) Vaccine (A & B) - Yearly for prevention
Respiratory Syncytial Virus (RSV)	Late winter, early spring	2-8 days	Fever, cough, wheezing, bronchiolitis (in children), pneumonia in adults	1) Rapid Antigen Detection (results in ≤48 hours) 2) Virus Culture	Ribavirin (very ill children with cardiac or lung disease only)
Parainfluenza	Entire year (young children and elderly)	2-5 days	Fever, cough, wheezing and croup	Virus Culture	Symptomatic
Adenovirus	Fall, winter (all ages)	4-5 days	Conjunctivitis, sore throat,fever, other respiratory symptoms	Virus Culture	Symptomatic
Rhinovirus (common cold)	Fall, winter	4-24 hours	Runny nose, cough, congestion	Virus Culture	Symptomatic

SARS-CoV is an uncommon cause of respiratory illness outbreaks, especially when no cases have been identified globally. It is important that in the absence of SARS, testing for SARS-CoV be restricted to cases with a high clinical index of suspicion.

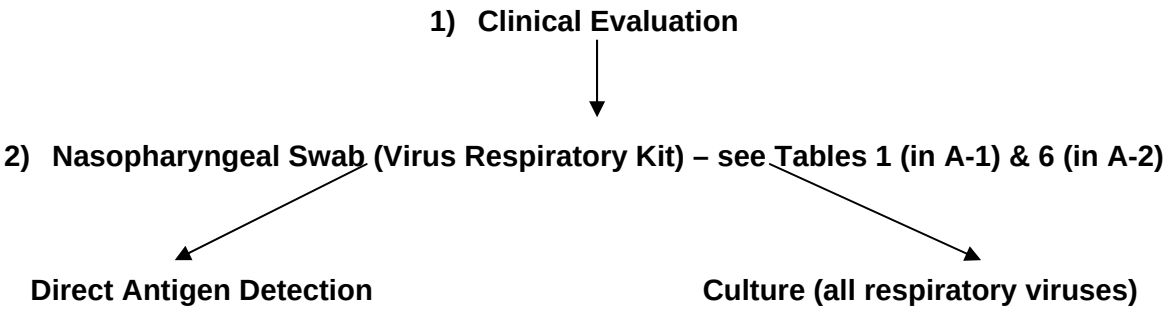
Table 2 COMMON BACTERIA THAT CAUSE RESPIRATORY OUTBREAKS					
AGENT	**EPIDEMIOLOGY**	**INCUBATION**	**SYMPTOMS**	**DIAGNOSTIC TEST**	**TREATMENT & PROPHYLAXIS**
Bordetella pertussis (Whooping cough)	Highest incidence in late summer through winter months; transmitted by direct contact with infected secretions	7-10 days	Insidious onset-initial catarrhal stage with cough, becoming paroxysmal, within 1-2 weeks and may last 1-2 months	Nasopharyngeal swab-analysis by NAAT Nasopharyngeal swab-culture	Erythromycin or TMP/SMX (decreases infectivity and limits communicability)
Chlamydia pneumoniae	Assumed to be transmitted person-to-person via infected respiratory secretions	On average, 21 days	Asymptomatic to mild/moderate illness, pharyngitis with productive cough	Nasopharyngeal swab, sputum, BAL, Auger suction - NAAT	Erythromycin (and other macrolides), Doxycycline, Fluoroquinolones
Legionella spp. (Legionnaires' Disease and Pontiac Fever)	Acquired through inhalation of aerosols ego (water, soil) contaminated with legionellae	2-10 days - Legionnaires' Disease 1-2 days - Pontiac Fever	Acute fever, headache, rigors, weakness, myalgia with absence of productive cough	Nasopharyngeal swab, sputum, BAL, Auger suction - DFA/Culture; Serum, acute and convalescent (lgG, IgM) Urine-ELISA	Erythromycin (and other macrolides): Rifampin, Fluoroquinolones
Mycoplasma pneumoniae (Atypical Pneumonia)	Highly infectious; transmitted by infected respiratory secretions/ droplets	7-28 days	Predominantly a febrile lower respiratory tract infection; Onset gradual with headache, malaise, cough; may develop into pneumonia	Nasopharyngeal swab, sputum, BAL, Auger suction-NAAT/Culture; Serum, acute and convalescent (lgG, IgM)	Erythromycin (and other macrolides), Doxycycline, Fluoroquinolones

From the Specimen Collection Guide, Ontario Public Health Laboratories, 2004 (under revision)

Appendix 2

Respiratory Outbreak Algorithm

Clinical Symptoms in Multiple Patients



Influenza A, Influenza B and RSV may be screened by Rapid Antigen Detection on the first few acutely ill patients. Results usually available within 24 hours of receipt at the Public Health Laboratory

For Central PHL, consult the Virus Detection Lab at (416) 235-5731 during regular hours or the Emergency Duty Officer after hours or weekends at 416-605-3113, or your local Regional Public Health Laboratory

3) Consider other possible pathogens as well, and collect NPS for C*hlamydia pneumoniae, Mycoplasma pneumoniae,* or Bordetella pertussis. These specimens should be submitted as per the appropriate transport media (see table 4), with the specimens for virus detection. If results of viral antigen detection and culture are negative after four days, these specimens will be tested.

For the detection of *Legionella* spp. It is recommended that urine be submitted for the rapid antigen detection test (ELISA). Lower respiratory tract sypecimens e.g. sputum, BAL (for culture and DFA), as well as serum for antibody/seroconversion should also be submitted.

Consult the Medical Microbiologist at 416-235-5712, or your local Regional Public Health Laboratory

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Source: Ministry of Health & Long-Term Care, Laboratories Branch

Helpline: 1-800-640-7221

The following tables outline the types of specimens to be submitted and the Laboratory's Branch kits to be used in a respiratory Outbreak Investigation, based upon the disease suspected and/or analysis required

Table 3 From the Specimen Collection Guide, Ontario Public Health Laboratories, 2004 (under revision)

RESPIRATORY – VIRAL				
EPIDEMIOLOGY	**SPECIMENS**	**KIT NAME**	**CONTENTS**	**INSTRUCTIONS**
Influenza A &B, Respiratory Syncytial Virus, Parainfluenza, Adenovirus, Rhinovirus	Nasopharyngeal swab Throat swab	Virus-R Respiratory (6-pack)	6 multi-organism transport media conical tubes (pink), 6 nasopharyngeal swabs (wire) 6 sterile, cotton-tipped swabs (plastic shaft) 6 biohazard plastic bags 6 requisitions with instructions	**Nasopharyngeal swab** 1) clean nasal passage with cotton swab 2) with patient's head tilted back, insert nasopharyngeal swab to posterior pharynx; withdraw slightly and re-insert, rotating several times, if possible (see kit instructions) 3) place wire swab into transport media and cut excess with scissors 4) replace and tighten screw-cap 5) label specimens
	Blood, clotted or serum (Influenza A and Influenza B only)	BL-S (6-pack)	6 vacutainers (red top) 6 requisitions 6 biohazard bags	**Cotton swab (Throat)** 1) swab back of throat including tonsillar crypts 2) place swab in transport media, breaking off excess shaft 3) replace and tighten screw-cap

Specimen Kits

Table 4 From the Specimen Collection Guide, Ontario Public Health Laboratories, 2004 (under revision)

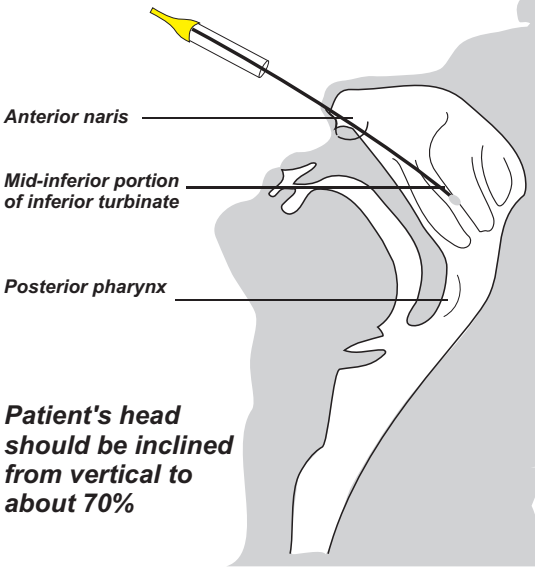
RESPIRATORY – BACTERIAL				
AGENT	*SPECIMENS*	*KIT*	**CONTENTS**	**INSTRUCTIONS**
Bordetella pertussis (whooping cough)	Nasopharyngeal swab	Bordetella pertussis -PCR (6-pack)	6 nasopharyngeal swabs 6 PCR transport vials 6 biohazard bags 6 requisitions with instructions	Nasopharyngeal swab 1) with patient's head tilted back, insert nasopharyngeal swab to posterior pharynx; withdraw slightly and re-insert (see kit instructions) 2) place wire swab into transport media and cut excess with scissors 3) re-place and tighten screw-cap
Chlamydia Pneumoniae	Nasopharyngeal swab, BAL, lung tissue	Chlamydia Respiratory (6-pack)	6 vials of multi-organism transport media 6 nasopharyngeal swabs 6 biohazard bags 6 requisitions with instructions 6 CHLAM labels	Instructions as above Attach CHLAM label to outside of biohazard bag
Legionella spp. (Legionnaires' Disease)	BAL, sputum, auger suction, transtracheal aspirate, lung tissue Urine Serum, acute and convalescent,	CB CB BL-S (6-pack)	90 mL sterile container (screw cap) plastic bag (whirl-pak) requisition 6 vacutainers (red top) 6 requisitions 6 biohazard bags	For Environmental sources, consult Environmental Bacteriology at (416) 235-5718.

RESPIRATORY – BACTERIAL				
AGENT	*SPECIMENS*	*KIT*	**CONTENTS**	**INSTRUCTIONS**
Mycoplasma pneumoniae	Throat swab, sputum, bronchial aspirate	MP (6-pack)	6 vials multi-organism transport media 6 cotton-tipped, plastic-shafted swabs 6 biohazard bags 6 requisitions with instructions	
	Blood, clotted or serum	BL-S (6-pack)	6 biohazard bags 6 requisitions 6 biohazard bags	Attach MP label to outside of biohazard bag

NASOPHARYNGEAL SPECIMEN COLLECTION

Ontario

Nasopharyngeal swab method for pertussis culture or respiratory virus detection



Patient's head should be inclined from vertical to about 70%

The laboratory needs high levels of organism for detection Bordetella pertussis or respiratory viruses such as RSV, influenzavirus A & B or parainfluenzavirus. A properly taken nasopharyngeal swab will yield high levels of organism.

- Wear appropppriate PPE (below).
- Tilt the patient's head back.
- Remove any excess mucous using the larger cotton tipped swab.
- Gently bend the wire swab while in the sterile package, to give it a slight arc.
- Insert the flexible Nasopharyngeal swab into one nostril.
- Rub the swab back and forth several times, and leave the swab in place a few times to absorb the material.
- Withdraw the swab and insert into transport medium.
- Refrigerate and transport to the lab as soon as possible

N. B. Rule of thumb to determine when swab is placed properly: insert swab to one-half the distance from the tip of the nose to the tip of the earlobe.

How do I swab ?

Wear appropriate PPE on as per the **How do I protect Myself ?** *(Section Below).* Gently bend the wire (blue tipped) swab while in the sterile package to give it a slight arc. Tilt the head gently back (about 70°). Remove any excess mucous using the larger wooden, cotton tipped swab. Place the thin wire swab in one nostril about 4-6cm, rub back and forth several times, leave in place a few seconds, withdraw, and place in transport medium. Cut excess wire with scissors, and screw the lid on securely. Place the specimen in the plastic bag provided, and complete the requisition. Transport to the lab as soon as possible. Refrigerate the specimen until it is sent to the lab.

How do I protect myself ?

Risk assessment should be conducted for specimen collection procedures in order to identify associated risks and apply appropriate control measures to reduce risk of disease transmission. This may involve a combination of administrative controls (safe work practices, procedures) and the use of personal protective equipment in accordance to the risk of exposure when collecting the specimen.

Masks and eye protection or face shields should be worn where appropriate to protect the mucous membranes of the eyes, nose and mouth during procedures and patient care activities likely to generate splashes or sprays of blood, body fluids, secretions or excretions. Gowns should be used to protect uncovered skin and prevent soiling of clothing during procedures and patient care activities likely to generate splashes or sprays of blood, body fluids, secretions, or excretions.

WASH HANDS before and after the procedure !

Ontario

Ministry of Health and Long-term Care
Laboratories Branch

Date received yyyy / /mm / dd PHL No.

Public Health Laboratory Test Requisition

Fully Complete sections 1 & 2 **Complete sections 3 through 6 as applicable**

Patient Information

1. Health Card no. / HRN	**Date of Birth** yyyyy/mm/dd	**Sex** ☐ M ☐ F
Surname	**First Name**	**Initial**

Address

Sender's Lab No.

2. Physician/ Referring Laboratory Physician ID

Telephone ( ) **Fax ( )**

Agency ID **Courier Code**

Provide:
Submitter's Name
Return Address
City and Province
Postal Code

3. Test(s) Requested *(please see test codes on reverse)*

4. Specimen type and site

Date Collected

☐ Acute yyyy / /mm / dd ☐ Convalescent yyyy / /mm / dd

5. Reason for test

☐ to diagnose disease
☐ to determine immune status
☐ Other – *(please specify)*
☐ immigration requirent
☐ Prenatal
☐ plus Rubella

6. Clinical Information

☐ Diarrhea ☐ Gastroenteritis ☐ Rash ☐ STD
☐ Fever ☐ Headache/stiff neck ☐ Respiratory ☐ Symptomatic Symptoms ☐ Asymptomatic

Recent Travel:
Other – *please specify* *Onset Date*
yyyy / /mm / dd

Comments ☐ Stat – Telephone # ( )

Laboratory Result For laboratory use only

☐ **Further Report to follow**

Date Reported: **Checked by:** **Specimen(s) transferred to:** **Date Transferred:**

FOR HIV, please use the HIV Serology form. For Referred Cultures, please use the Reference Bacteriology form. 97-44 (08/99)

CPHLN/RLSPC

The Canadian Public Health Laboratory Network

Laboratory Testing for Patients with Severe Respiratory Illness (SRI)
Not Yet Diagnosed (NYD)

The following are suggested laboratory diagnostic tests that may be considered in the work-up of patients presenting with symptoms of SRI NYD. Relevant medical history, as well as clinical signs and symptoms will dictate appropriate testing for each patient.

Blood culture

Sputum for C&S

Nasopharyngeal swab in viral transport for:
- virus culture (influenza, parainfluenza, RSV, adenovirus)
- direct antigen testing

Nasopharyngeal swab in transport medium for:
- *Chlamydia pneumoniae* PCR or culture
- *Mycoplasma pneumoniae* PCR or culture

Serology for *Mycoplasma pneumoniae*

Other diagnoses to consider may include:
- Tuberculosis: sputum, lower respiratory tract specimen such as BAL if available
- Legionella: urine, sputum, lower respiratory tract specimen such as BAL if available, acute and convalescent serum

The Canadian Public Health Laboratory Network
November 7, 2003

Appendix 7- Sample Line Listing Form

RESPIRATORY OUTBREAK LINE LISTING FORM

SAMPLE

CHECK ONE ONLY: ☐ STAFF DATA ☐ RESIDENT DATA

INSTITUTION NAME: _____

INVESTIGATION NUMBER:

Case Identification				Symptoms																Complications				Specimens / Diagnostics						Prophylaxis / Treatment			
Case Number (sequentially)	Name and Location (floor, room)	Gender (M/F)	Age	Onset date of first symptom (d/m)	abnormal temperature (°C)	dry cough (new)	runny nose / sneezing	nasal congestion / stuffy nose	sore throat	hoarseness / difficult swallowing	chills	myalgia	malaise	productive cough (new)	headache	poor appetite	other - please specify	bronchitis (date d/m)	pneumonia (date d/m)	hospitalization (date d/m)	death (date d/m)	Nasopharyngeal (date d/m)	result (date d/m)	x-ray conf. pneumonia (Y/N)	result date (d/m)	other - specify (date d/m)	result (date d/m)	Amantadine (date d/m)	Flu Vaccine (date d/m)	Pneumo Vaccine (date d/m)	Antibiotic (date d/m)

Comments:

Appendix 8 - Use of Oseltamivir During Influenza Outbreaks in Ontario Nursing Homes, 1999-2000

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Department of Pharmacy, Sunnybrook and Women's College Health Sciences Centre, Toronto, Ontario.

OBJECTIVES: To describe the experience of Ontario long-term care facilities that used oseltamivir during influenza outbreaks in 1999/2000.

DESIGN: Case series.

SETTING: Ten **Ontario long-term care facilities for older people and their residents.**

PARTICIPANTS: Older residents of long-term care facilities.

INTERVENTION: Oseltamivir for treatment or prophylaxis during 11 influenza outbreaks in 1999/2000.

MEASUREMENTS: Control of outbreaks; pneumonia, hospitalization, and death complicating acute influenza.

RESULTS: All outbreaks were due to influenza A//H3N2/Sydney/05/97. One facility elected to use oseltamivir for treatment and amantadine for prophylaxis. The remaining nine facilities (10 outbreaks) recommended oseltamivir for treatment and prophylaxis (after amantadine failure in five and as primary prophylaxis in five). Use of oseltamivir was associated with termination of the outbreak in all eight evaluable outbreaks. Overall, 178/185 (96%) case-residents met the case definition of influenza and had complete data for evaluation. Of these, 63 (35%) were treated with antibiotics, 37 (21%) were diagnosed with pneumonia, 19 (11%) were hospitalized, and 16 (9%) died. Compared with residents receiving no therapy or who became ill while taking amantadine, residents who received oseltamivir within 48 hours of the onset of symptoms were less likely to be prescribed antibiotics, to be hospitalized, or to die ($P < .05$ for each outcome). These differences persisted and remained statistically significant when corrected for influenza immunization status. A total of 730 residents received oseltamivir prophylaxis for a median of 9 days (range 5-12). Of these, side effects were identified in 30 (4.1%), the most common being diarrhea (12 residents, 1.6%), cough (5, 0.7%), confusion (4, 0.5%) and nausea (4, 0.5%).
CONCLUSIONS: Oseltamivir is safe and appears to be effective when used as treatment or prophylaxis to control outbreaks of influenza in older nursing home residents.

Appendix 9- Additional information about Oseltamivir for Medical and Pharmaceutical personnel

Rationale for prophylactic and treatment doses of Oseltamivir in the LTCH setting where patient's renal history is unknown.

Source: Dr. Allison McGeer, Infectious disease specialist, Microbiologist, Director of Infection Control Program at Mount Sinai Hospital, Toronto

Because of the high toxic to therapeutic ratio, oseltamivir is very similar to penicillin in the need to give consideration to changing doses in the setting of renal failure. The Compendium of Pharmaceuticals and Specialties (CPS) states for penicillin: patients with impaired renal function (<0.5ml/sec) require modification of dose and interval. For oseltamivir (dose 75 mg bid x 5 days) the CPS states: no dose adjustment is necessary for patients with a creatinine clearance above 30ml/min (=0.5ml/s); for patients with a creatinine clearance less than 30ml/min, it is recommended that the dose is reduced to 75mg once daily for five days. The drug has not been studied in patients with renal failure (creatinine clearance <10ml/min); therefore caution is advised when administering the drug to those patient populations.

Dose adjustment of oseltamivir should be treated just as dose adjustment for penicillin is. Although the CPS states that you need to dose adjust from 75 mg bid in the presence of CrCl <30ml/min, in practice, the drug is safe enough that you don't need to check the creatinine clearance routinely (remember that the way CrCl is calculated is an estimate, and is not entirely accurate. It is important to note that 75mg od x 5 days is SAFE in patients with creatinine clearance 10-30ml/min. There is no recommendation to dose adjust below this level.

Data from the British Columbia Centres for Disease Control suggests that fewer than 2% of residents have creatinine clearances of <10ml/min, and they almost always have serum creatinines >150 (in data from unpublished outbreak investigations involving more than 1000 nursing home residents, there were no residents with a CrCl of <10 whose serum creatinine was less than 150).

Thus measuring creatinine clearance is necessary for amantadine use, but is not necessary for oseltamivir use. It is difficult to give up measuring serum creatinines because everyone is used to it, but there is no reason to be doing it any longer.
The annual calculation of creatinine clearance for residents in Ontario nursing homes requires an additional blood test for most residents, and the estimated costs would be $1,750,000 per year in Ontario.

For residents with a serum creatinine above 150, giving oseltamivir every other day for 10 days is a reasonable alternative to 75 mg per day for 5 days, then no drug for 5 days. However, because residents may not get completely effective drug levels until after the second dose, every other day dosing means that this occurs on day three instead of on day two, in a situation when the risk is highest early on. This is why the recommendation is to give daily doses for 5 days then stop.

Appendix 10 - Use of Antiviral Prophylaxis in Influenza Outbreaks in Long-Term Care Facilities

A McGeer, DS Sitar, SE Tamblyn, F Kolbe, P Orr , FY Aoki. *Can J Infect Dis* 2000;11(4):187-192

Despite the fact that more than 90% of residents of long term care facilities in Canada are vaccinated against influenza annually, almost half of such facilities report detecting at least one influenza outbreak each year (1,2). Although there are no randomized controlled trials assessing the effectiveness of antiviral prophylaxis in the control of outbreaks, amantadine has been shown to be effective in preventing influenza A in exposed persons (3,4), and numerous reports document its success in terminating influenza A spread in the long term care setting (1,2,5-9). Thus, both US and Canadian expert advisory committees recommend antiviral prophylaxis for residents for the control of influenza A outbreaks (10,11), and such prophylaxis has become a standard part of outbreak management in Canadian long term care facilities (1,2). There are, however, numerous areas of disagreement about how best to manage mass prophylaxis, and the advent of neuraminidase inhibitors offers new challenges in selecting the best options for prevention of influenza in this setting. We will discuss issues surrounding the initiation and discontinuation of prophylaxis, the use of amantadine, and the potential place of neuraminidase inhibitors in outbreak control.

Decisions about the initiation of prophylaxis

Amantadine for antiviral prophylaxis of residents is useful to prevent morbidity and mortality when influenza A is being transmitted in the long term care facility. For optimal use of prophylaxis, it is important that clusters of acute respiratory infection are detected early, that facilities have the ability to obtain nasopharyngeal swabs and have rapid antigen testing for influenza performed seven days per week, and that consent for the use of prophylaxis be obtained either on admission to the long term care facility, or prior to influenza season annually.

Diagnosing influenza using clinical inquiry and examination is difficult. Overall, the symptom complex with the best predictive value (illness associated with the abrupt onset of fever >38.5^{0}C and dry cough) has only a 35% positive predictive value for the diagnosis of influenza among unvaccinated, elderly independently living adults (12). When influenza is present in the community, a similar constellation of signs and symptoms in healthy younger adults is about 60% predictive of influenza (13). However, in vaccinated residents of long term care facilities, whose illness may be modified by vaccine, who may not mount a febrile response, and who are often unable to describe symptoms clearly, the predictive value of such signs and symptoms is much poorer (14). Therefore, influenza outbreaks in nursing homes can only be reliably diagnosed by laboratory testing in the setting of clusters of acute respiratory illness.

Gomolin has suggested that a cluster of infection should be considered to be three residents on one unit who develop acute respiratory illness within 72 hours of each other (15). In this circumstance, case finding should be enhanced, and nasopharyngeal swabs should be obtained from the initial cases as well as from the next 3-5 new cases. The identification of two residents with laboratory confirmed influenza confirms that influenza is being transmitted, and prophylaxis should be started for all asymptomatic residents. With a single laboratory confirmation from the cluster, judgment should be used, and a decision on whether or not to start prophylaxis should be made jointly between the facility and public health.

Prophylaxis should be offered to residents who are asymptomatic at the time of the decision to initiate mass prophylaxis. Treatment may be considered for those who have had had symptoms for less than 48 hours (16). It is important to remember that influenza is a self-limited disease even in elderly nursing home residents, and hospitalization and death are most often due to complications rather than to the influenza itself. Residents who have had symptoms for more than 48 hours will not benefit from antiviral treatment (17). Minimizing the use of antivirals for treatment is particularly important for

amantadine because influenza A strains develop resistance to amantadine very easily when exposed to it (3). Amantadine resistant viruses are as virulent and transmissible as susceptible viruses, and failure of amantadine to control outbreaks due to the emergence of resistance has been identified (17-21). Limiting amantadine treatment to 3-5 days, and discontinuing prophylaxis in residents who develop symptoms may help to obviate the emergence of resistance (22); use of a neuraminidase inhibitor instead of amantadine for treatment may also be helpful (see below).

In smaller facilities, there is almost always substantial mixing of both residents and staff on different units, so that it is generally essential to offer prophylaxis to all asymptomatic residents in the facility. In larger facilities, it may be possible to limit prophylaxis to one or more geographically separated units. It is important to realize that, when an outbreak is recognized, a substantial number of exposed residents and staff may be in the incubation phase but not yet be ill. The ability to successfully limit prophylaxis to one unit depends on both the degree of contact between staff and residents on the affected unit and other units in the three days prior to detection of the outbreak (are residents and staff on other units incubating influenza?), and on the extent to which such contact can be prevented over the next few days. Clearly, the vaccination rate among staff is important, since exposed vaccinated staff are less likely to become ill.

Vaccine efficacy in healthy adults <65 years of age is 80% or greater (23,24), so that current recommendations specify that only unvaccinated staff require chemoprophylaxis (10,11). The majority (65%) of facilities across Canada now offer prophylaxis routinely to unvaccinated staff (1). This protects staff and their families from illness and reduces absenteeism during the outbreak, at a time when staffing may be difficult. In addition, since staff are infectious at or before the onset of symptoms (25), and onset may occur in the middle of a shift, prophylaxis likely adds a degree of protection for residents and reduces the risk of propagation of the outbreak. This argument has led a number of long term care facilities and public health units across Canada to require unvaccinated staff to take prophylaxis if they wish to continue to work during outbreaks. The Ontario Labour Relations Board and the Ontario Nurses Association have supported such policies.

Decisions about discontinuing prophylaxis

In more than 75% of outbreaks, the initiation of mass antiviral prophylaxis is associated with termination of the outbreak (1,2,4-9,21). Because the efficacy of antivirals in preventing infection is not absolute, particularly in those residents and staff who were incubating the infection when prophylaxis was initiated, a few cases may occur in the first 72 hours after the initiation of prophylaxis. Prophylaxis should be continued until the outbreak is over: that is, until one complete incubation period passes following the infectious period (or period of communicability) in the last case in the facility. In general, the last infectious case occurs in a resident, and significant viral shedding occurs for 3-5 days after the onset of symptoms (26,27). The incubation period of influenza is one to three days, so that prophylaxis should be continued until eight days after the onset of symptoms in the last case.

In about 20% of outbreaks, new cases may continue to occur more than 72 hours after prophylaxis is started (1,2,9,21), and further investigation is necessary. There are a number of reasons why antiviral prophylaxis may fail to stop the outbreak. First, if amantadine is being used, the virus may be resistant (either at the start of the outbreak, or because it has developed during the outbreak). Second, another respiratory virus may be co-circulating and causing illness clinically indistinguishable from influenza. In one study, at least one case of illness due to another virus was identified in five of six LTCF outbreaks of influenza (28). Third, new cases may be occurring because non-immune, unprotected residents or staff continue to propagate the outbreak. Which of these possibilities is occurring can only be determined by diagnostic testing of nasopharyngeal swabs from new cases of disease. Since rapid antigen testing by ELISA is only available currently for influenza and RSV, testing by direct fluorescent antibody, which can detect influenza, RSV, parainfluenza and adenovirus, offers advantages in this situation.

Amantadine resistance testing is not yet available in a sufficiently timely manner for use in outbreak management. Amantadine resistance should be suspected when laboratory confirmed cases of influenza A continue to occur in residents or staff receiving adequate prophylaxis, particularly if the number of new cases starts to increase again. If resistance is suspected, amantadine should be discontinued, and prophylaxis with a neuraminidase inhibitor substituted (see below). If illness is due to a different virus, a clinical decision must be made as to when the last case of influenza occurred. Amantadine may be discontinued eight days after the onset of this case.

Dosing regimens for amantadine

Serum levels of amantadine are affected by variation in both its apparent volume of distribution and the rate of its renal elimination. The apparent volume of distribution of amantadine is most directly related to body weight, but is inversely related to dose. Renal elimination is directly related to creatinine clearance. In addition, amantadine renal clearance is one-third less in females than males of the same weight, probably due to a gender difference in renal tubular secretion rate (29,30). The net effect of these interdependent factors in a given patient has contributed to the difficulty of designing effective and well tolerated amantadine dosing schedules for frail elderly residents of institutions.

When doses recommended for prophylaxis in younger adults are used in residents of nursing homes, a significant increase in the rate of dose-related side effects of amantadine, including dizziness, irritability, confusion, and the potentiation of adverse events due to drugs with anti-cholinergic side effects have been reported (3,31). These side effects may result in falls, fractured hips, and deaths in this population (18).

The Canadian National Advisory Committee on Immunization (NACI) has published recommendations on individualized amantadine dosing taking into account age and estimated creatinine clearance (Table 1) (10). The majority (79%) of long term care facilities in Canada use these recommendations, and report that, if this dosing regimen is used, fewer than 2% of residents started on amantadine need to have their medication discontinued due to side effects (1,9). Obviously, calculated creatinine clearances are only estimates of true creatinine clearances, and a recent study of amantadine levels in residents (32) found that serum levels may be below those predicted to be effective when this dosing regimen is used. Nonetheless, cumulative experience in Canadian nursing homes suggests that this regimen is safe and effective in controlling influenza A outbreaks. (1,2,9,21).

The NACI individualized dosing recommendations have three drawbacks. First, the initial dose of amantadine is 100mg for most residents, but 50 mg for one group. Since the volume of distribution is independent of creatinine clearance, the loading dose should be based only on weight, not creatinine clearance. Given that the initial dose selected by the NACI guidelines has been found to be associated with a low risk of side effects, it is safe and reasonable to give each resident an initial dose of 100mg. If an influenza outbreak occurs and individualized doses have not been calculated in advance for each resident (as is desirable), this means that an initial dose may be given to each resident, before individualized dosing regimens are calculated. Second, the intermittent dosing schedule, with intervals of 2-7 days between doses, results in substantial peaks in drug concentrations after subsequent 100 mg doses, which may put residents at increased risk of side effects (33). Finally, some facilities have felt that it is confusing to have dosing schedules for which different residents receive medication in different amounts and on different days.

For these reasons, we have developed a second dosing schedule in which all residents receive an initial dose of 100 mg of amantadine, followed by a daily dose of amantadine solution, adjusted for estimated creatinine clearance (Table 2). As with the dosing regimen recommended by NACI, this regimen takes creatinine clearance into account, but does not adjust for other pharmacokinetic effects of resident weight and gender (e.g. on volume of distribution). It is also simplified to account for the fact that amantadine solution is likely to be dispensed in medication cups marked in 2.5 ml increments. Pharmacokinetic calculations suggest that this dosing regimen should be as effective as the standard NACI guidelines, without an increase in side effects. It has the disadvantage that, overall, more doses

of medication need to be administered. Facilities should take the advantages and disadvantages of the two different schedules into consideration when selecting a regimen for their residents.

For prophylaxis, initial studies in healthy adults under the age of 65 years used the currently recommended dose of 100mg twice daily. At this dose, annoying neurologic side effects (e.g. insomnia, dry mouth) are reported by as many as 30% of subjects. In the largest randomized controlled trial of amantadine prophylaxis, 20% of subjects discontinued drug because of side effects (34). A dose of 100mg daily has been shown to be effective in prophylaxis in one trial (35). Because this dose is associated with a significantly reduced rate of side effects, it may be preferable for staff prophylaxis.

Role of neuraminidase inhibitors

In the fall of 1999, two neuraminidase inhibitors with activity against influenza (zanamivir, oseltamivir) were licensed in Canada for the treatment of influenza in adults. There is good evidence from randomized controlled trials that these medications are also effective in prophylaxis (36,37). Oseltamivir has been shown to be 80% effective in preventing influenza in nursing home residents exposed to influenza (38), and zanamivir has been shown to be effective in control of influenza in at least two outbreaks (39,40). Through the influenza season of 1999/2000, numerous public health units and long term care facilities used these medications off label in the management of influenza outbreaks in institutions.

Zanamivir is a powder, which is taken via an inhaler. The recommended treatment dose is 10mg (2puffs) bid; that for prophylaxis is 10mg (2 puffs) daily. About 20% of long term care facility residents have some difficulty coordinating the inhalations (20). Only about 3% of a dose is absorbed. In randomized controlled trials to date, no side effects have been identified, but there continues to be concern about the risk of bronchospasm in subjects with asthma. In clinical trials, zanamivir appears well tolerated in mild to moderate asthma (13). However, one patient with severe chronic obstructive lung disease (COPD) who took repeated doses of zanamivir noted wheezing after each dose and required hospitalization for respiratory distress on the third day of therapy (41). The US FDA has reported that other patients with asthma or underlying COPD have also experienced deterioration after zanamivir inhalation.

Oseltamivir is supplied as a 75 mg capsule, with the adult treatment dose being 75mg bid, and the prophylaxis dose being 75 mg daily. A suspension form of this medication is expected to become available within the next two years. Oseltamivir is excreted renally. It is recommended that the treatment dose be halved in persons with creatinine clearances <30ml/min; no adjustment is required for the prophylactic dose for those with a lesser degree of renal dysfunction. No interactions between oseltamivir and other drugs have been identified. The most common side effect is nausea and vomiting (13,37,38). This is reported to occur most prominently on the first dose, and can be reduced by taking the first dose with food. It also more common in females and younger adults (excess rate over placebo 5-9%) than in nursing home residents (excess rate over placebo 2.5%).

Antiviral resistance can be induced in the laboratory to both of the neuraminidase inhibitors; however, it is much more difficult to induce than resistance to amantadine (13). In addition, the resistant viruses identified to date have been less infectious than their susceptible counterparts. Resistance to zanamivir has been identified in only one, and to oseltamivir in fewer than 10 clinical isolates (13). Because of their activity against influenza A and B, their improved side effect profile, the reduced risk of medication errors when a single dose is used, and the reduced selection of resistance, it seems likely that neuraminidase inhibitors will become the drugs of choice for mass antiviral prophylaxis in long term care facilities. However, more data are required to establish their efficacy, and they are at the moment considerably more expensive than amantadine. Institutions, as well as those responsible for the administration and payment for antiviral prophylaxis in nursing home outbreaks will need to look carefully at the overall costs of amantadine (including the cost of annual resident assessment and individualized dose calculations) and the potential risks and benefits of each drug before deciding which should be recommended and reimbursed in future seasons. Similarly, facilities and public health departments considering offering or requiring staff prophylaxis should take into

account not only drug cost, but also the rate of perceived and actual side effects, and the impact of this on staffing during an outbreak.

There are, however, several situations for which neuraminidase inhibitors are already indicated (Table 3). In the setting of clinical amantadine failures during influenza A outbreaks, continuing influenza A causes serious disease (18-21) and neuraminidase inhibitors are effective in its prevention (21,38-40,43,44). Influenza B outbreaks are associated with substantial morbidity and mortality in long term care (2), and prophylaxis will benefit residents in at least some outbreaks. Data on the impact of prevention of influenza B outbreaks in long term care will be difficult to obtain, but are urgently needed.

Amantadine has been associated with an increased risk of seizures in those with seizure disorders (31), and with potentiation of anti-cholinergic side effects in patients on anticholinergic medications. In such patients, it is difficult to justify the risks of amantadine side effects when another, equally effective medication is available, and the cost of using neuraminidase inhibitors may be offset by the reduced need for added care and investigation when adverse events occur. This is particularly true in settings where a majority of residents have contraindications or relative contraindications. In such settings, using amantadine for some residents and neuraminidase inhibitors for others significantly complicates management in a setting of great stress, and using a neuraminidase inhibitor for all residents may be the preferred strategy.

Finally, the value of amantadine prophylaxis in outbreaks may be compromised by emerging resistance if amantadine is used concomitantly to treat residents with influenza (3). Both amantadine and neuraminidase inhibitors have been shown to reduce the duration and severity of illness in acutely ill adults, if treatment can be started within 48 hours of the onset of symptoms (3,12). Although data on the benefits of treatment in the frail elderly are few, there is no reason to believe that treatment efficacy will be different in this age group, and treatment of acute influenza in the frail institutionalized elderly may be reasonable, as long as it is started within the first 48 hours of symptoms. Treatment with amantadine will increase the risk of selection for amantadine resistance and failure to control the outbreak. Thus, in an outbreak in which amantadine is being used for mass prophylaxis of residents, neuraminidase inhibitors should be considered for treatment of illness.

REFERENCES

1. Stevenson C, McArthur M, Abraham E, Naus M, McGeer A. Progress in the control of influenza and pneumococcal disease in Canadian LTCFs – where do we stand? Abstract at the 3rd Decennial CDC Meeting on Nosocomial Infections, Atlanta, GA, March 5-9, 2000.
2. Henry B. Summary report of the Ontario influenza 1998/9 season. Public Health and Epidemiology Report, Ontario 1999;10:144-59.
3. Aoki F. Amantadine and Rimantadine. Chapter 35 in Textbook of Influenza, Nicholson KG, Webster RG, Hay AJ, eds. Blackwell Science Ltd., Oxford, 1998. pp. 457-476.
4. O'Donoghue JM, Ray CG, Terry DW Jr, Beaty HN. Prevention of nosocomial influenza infection with amantadine. Am J Epidemiol 1973;97:276-85.
5. Arden NH, Patriarca PA, Fasano MB, et al. The roles of vaccination and amantadine prophylaxis in controlling an outbreak of influenza A (H3N2) in a nursing home. Arch Intern Med 1988;148:865-8.
6. Staynor K, Foster G, McArthur M, McGeer A, Petric M, Simor AE. Influenza A outbreak in a nursing home: the value of early diagnosis and the use of amantadine hydrochloride. Can J Infect Control 1994;9:109-111.
7. Kobayashi JM. Control of influenza A outbreaks in nursing homes: amantadine as an adjunct to vaccine - Washington, 1989-90. MMWR Morb Mortal Wkly Rep1991;40:841-4.
8. Libow LS, Neufeld RR, Oslon E, Breuer B, Starer P. Sequential outbreak of influenza A and B in a nursing home: efficacy of vaccine and amantadine. J Am Geriatr Soc 1996;44:1153-7.

9. Tamblyn SE. Influenza control in long term care facilities: the Perth County experience. Abstract R4-7, at Options for the Control of Influenza III, Cairns, Australia, May 4-9, 1996.
10. National Advisory Committee on Immunization. Statement on Influenza Vaccination for the 1999-2000 season. CCDR 1999;25:ACS-2
11. Advisory Committee on Immunization Practice. Prevention and control of influenza: recommendations of the advisory committee on immunization practices MMWR Morb Mortal Wkly Rep 2000;48 (RR03):1-38.
12. Goevart TM, Dinant GJ, Aretz K, Knottnerus JA. The predictive value of influenza symptomatology in elderly people. Fam Pract 1998;15:16-22
13. Gubareva LV, Kaiser L, Hayden FG. Influenza virus neuraminidase inhibitors Lancet 2000;355:827-835.
14. Simor AE, Augustin A, Staynor et al. Influenza A in elderly nursing homes residents: evaluation of vaccine efficacy and case definitions of influenza-like illness. Abstract #1383 at the 33rd Interscience Conference on Antimicrobial Agents and Chemotherapy, New Orleans, Louisiana, October 17-20, 1993.
15. Gomolin IH, Leib HB, Arden NH, Sherman FT. Control of influenza outbreaks in the nursing home: guidelines for diagnosis and management. J Am Geriatr Soc 1995; 43: 71 – 74.
16. Monto AS, Guidelines for the clinical use of antivirals. Chapter 38 in Textbook of Influenza, Nicholson KG, Webster RG, Hay AJ, eds. Blackwell Science Ltd., Oxford, 1998. Pp 506-14.
17. Mast EE, Harmon MW, Gravenstein S, et al. Emergence and possible transmission of amantadine-resistant viruses during nursing home outbreaks of influenza A (H3N2). Am J Epidemiol. 1991;134:988-997.
18. Degelau J, Somani S, Cooper S, Guay D, Crossley K. Amantadine-resistant influenza A in a nursing facility. Arch Intern Med 1992;152:390-392.
19. Houck P, Hemphill M, LaCroix S, Hirsh D, Cox N. Amantadine-resistant influenza A in a nursing homes. Arch Intern Med 1995;155:533-537
20. Lee C, Loeb M, Phillips A, et al. Use of zanamivir to control an outbreak of influenza A. Abstract #283, 39th Interscience Conference on Antimicrobial Agents and Chemotherapy, San Francisco, CA, September 26-29, 1999.
21. Tamblyn SE. Antiviral use during influenza outbreaks in long term care facilities, Abstract #255 presented at Options for the Control of Influenza IV, Crete, Greece, September 23-28, 2000.
22. Hall CB, Dolin R, Gala CL et al. Children with influenza A infection: treatment with amantadine. Pediatrics 1987;80:275-82.
23. Nichol KL, Lind A, Margolis KL, et al. The effectiveness of vaccination against influenza in healthy, working adults. N Engl J Med 1995; 333:889-93.
24. Wilde JA, McMillan JA, Serwint J, Butta J, O'Riordan MA, Steinhoff MC. Effectiveness of influenza vaccine in health care professionals: a randomized trial. JAMA 1999 281:908-13.
25. Dolin R. Influenza: current concepts. Am Fam Physician 1976;14:72-7.
26. American Public Health Association. Control of Communicable Diseases in Man, Benenson AS, ed., 16th edition, 1995, pp. 245-51.
27. Kilbourne ED. Influenza in Man, Chapter 7 in Influenza, Plenum Publishing Corp., New York, New York, 1987, pp 157-218.
28. Loeb M, McGeer A, McArthur, M, Peeling RW, Petric M, Simor AE. Prospective surveillance for outbreaks of respiratory infection in long-term care facilities CMAJ 2000;162:1133-7.
29. Gaudry SE, Sitar DS, Smyth DD, McKenzie JK, Aoki FY. Gender and age as factors in the inhibition of renal clearance of amantadine by quinine and quinidine. Clin Pharmacol Ther 1993;54:23-27.
30. Wong LT, Sitar DS, Aoki FY. Chronic tobacco smoking and gender as variables affecting amantadine disposition in healthy subjects. Br J Clin Pharmacol 1995;39:81-84.

31. Atkinson WL, Arden NH, Patriarca PA, Leslie N, Lui KJ, Gohd R. Amantadine prophylaxis during an institutional outbreak of type A (H1N1) influenza. Arch Intern Med 1986;146:1751-6.
32. Sitar, DS, Kolbe F, Papaioannou A, Campbell G. Individualized dosing and side effects of amantadine during influenza a outbreaks in nursing homes, Abstract PIII-50, 2000 Annual Meeting of the American Society for Clinical Pharmacology and Therapeutics, Clin Pharmacol Therap 2000;67:153.
33. Hayden FG, Hoffman HE, Spyker DA. Differences in side effects of amantadine hydrochloride and rimantadine hydrochloride related to differences in pharmacokinetics. Antimicrob Agents Chemother 1983;23:458-464.
34. Dolin R, Reichman RC, Madore HP, Maynard R, Linton PN, Webber-Jones J. A controlled trial of amantadine and rimantadine in the prophylaxis of influenza A infection. N Engl J Med 1982;307:580-4.
35. Reuman PD, Bernstein JI, Keefer MC, Young EC, Sherwood JR, Schiff GM. Efficacy and safety of low dosage amantadine hydrochloride as prophylaxis for influenza A. Antiviral Res 1989;11:27-40.
36. Monto AS, Robinson DP, Herlocher L, Hinson JM, Elliott M, Crisp A. Zanamivir in the prevention of influenza among healthy adults. JAMA 1999;282:31-36.
37. Hayden FG, Atmar RL, Schilling M, et al. Use of the selective oral neuraminidase inhibitor oseltamivir to prevent influenza. N Engl J Med 1999;341:1336-43.
38. Peters PH, Norwood P, DeBock V, et al. Oseltamivir is effective in the long term prophylaxis of influenza in vaccinated frail elderly. II International Symposium on Influenza and other Respiratory Viruses, Grand Cayman, December 10-12, 1999.
39. Hirji Z, O'Grady S, Bonham J, et al. Utility of zanamivir for the treatment and prophylaxis of concomitant influenza A and B infection in a complex continuing care and medical rehabilitation population. Abstract #1701, 39th Interscience Conference on Antimicrobial Agents and Chemotherapy, San Francisco, CA, September 26-29, 1999.
40. Lee W, Loeb M, Phillips A, et al. Use of zanamivir to control an outbreak of influenza A. Presented at the CHICA-Canada Annual Meeting, Toronto, Ontario, May 29-31, 2000.
41. Williamson JC, Pegram PS. Respiratory distress associated with zanamivir. N Engl J Med 2000;342:661-2
42. Anonymous. Neuraminidase inhibitors for treatment of influenza A and B infections. MMWR Morb Mortal Wkly Rep 48 (RR-14)1-9, 1999.
43. Lee W, McArthur M, Bowles et al. Experience with Zanamivir in Influenza A Outbreaks in Long Term Care. Submitted to 40th Interscience Conference on Antimicrobial Agents and Chemotherapy, Toronto, Ontario, September 17-20, 2000.

Appendix 11 - Respiratory Outbreak Investigation Checklist

Outbreak Investigation Action	**Date Completed**
Is there a suspected outbreak and has an assessment been conducted?	
Have general infection control measures been implemented?	
Has the local Medical Officer of Health or designate been notified?	
Has an outbreak investigation laboratory number been obtained from the health unit?	
Have appropriate individuals associated with the Home been notified of the suspected/confirmed outbreak?	
Has an initial Outbreak Management Team meeting been set which will address the establishment of a working case definition for the outbreak, review of control measures and confirming communication issues and systems?	
Has the communication of laboratory results been reviewed?	
Have organism specific control measures for influenza A or B been reviewed and implemented (if appropriate to do so)?	
Has the responsibility for ongoing monitoring of the outbreak been established?	
Have the criteria to declare the outbreak over been confirmed?	
Have the individuals who were notified of the onset of the outbreak been notified that the outbreak has been declared over?	
Once the outbreak has been declared over, has the outbreak summary report been completed?	
Has a post outbreak review meeting been set to review the management of the outbreak?	

Appendix 12 - Sample Consent Form

To be used in conjunction with fact sheets on Influenza and Pneumococcal vaccines on next pages

Consent for Pneumococcal Vaccination

I _____ have been informed of the treatment, benefits,
(Resident/Substitute decision-maker)
contraindications and side effects to the administration of a dose of pneumococcal vaccine and understand the procedure. I give consent to the administration of a dose of the pneumococcal vaccine to _____ by a registered nurse or attending physician.
(Resident)

_____ _____
Signature of resident/substitute decision-maker giving consent Date

Appendix 13 - Sample Consent Form

Consent for Annual Influenza Vaccination

I _____ have been informed of the treatments, benefits,
(Resident/Substitute decision-maker)
contraindications to the administration of the influenza vaccine every autumn and understand the procedure and its side effects. I give consent to the administration of the influenza vaccine to _____ by a registered nurse or attending physician. I
(Resident)
understand that the vaccine will not be given if the resident has a contraindication to receipt at the scheduled time of administration of the vaccine.

_____ _____
Signature of resident/substitute decision-maker giving consent Date

Please return this form promptly by mail or in person. Telephone consent may be given.

Appendix 14 – Outbreak Transfer Notification

Sample only

Please be advised that _____ is being transferred from a facility

Name of Resident

where there is a **potential** OR **confirmed** influenza outbreak. Please ensure that appropriate isolation precautions are taken upon receipt of this resident.

At the time of transfer, this resident was **confirmed** OR **suspected** OR **appears free** of influenza.

Resident is on antiviral medication _____ starting on _____. Dose of the medication _____

Resident's vaccination status is: pneumococcal yes_____ no _____

influenza yes_____ no _____

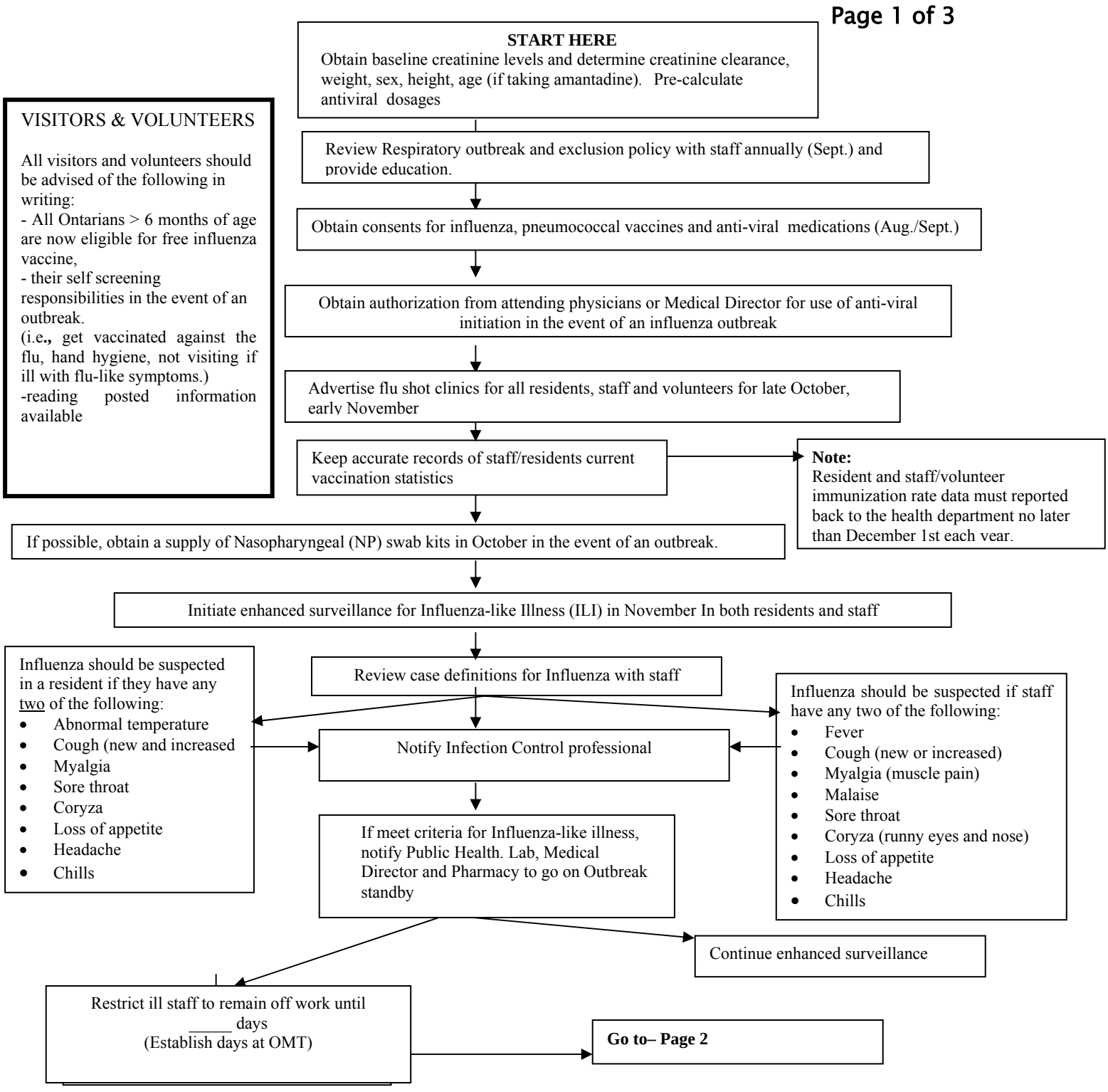
For further information, contact _____, Infection Control Professional

Name of Infection Control Practitioner

at _____ at ____ ____- _____

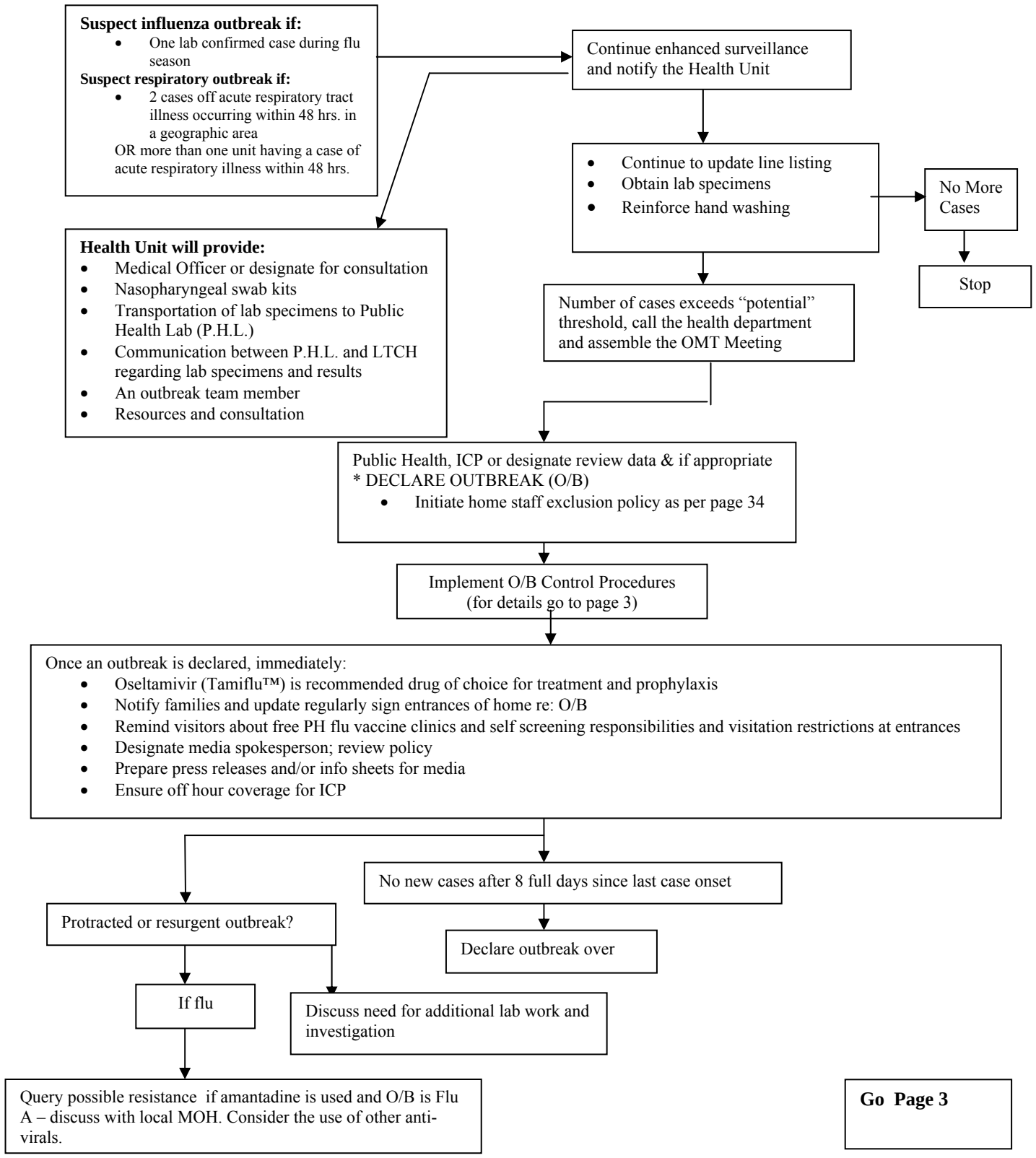
Name of Home Phone Number

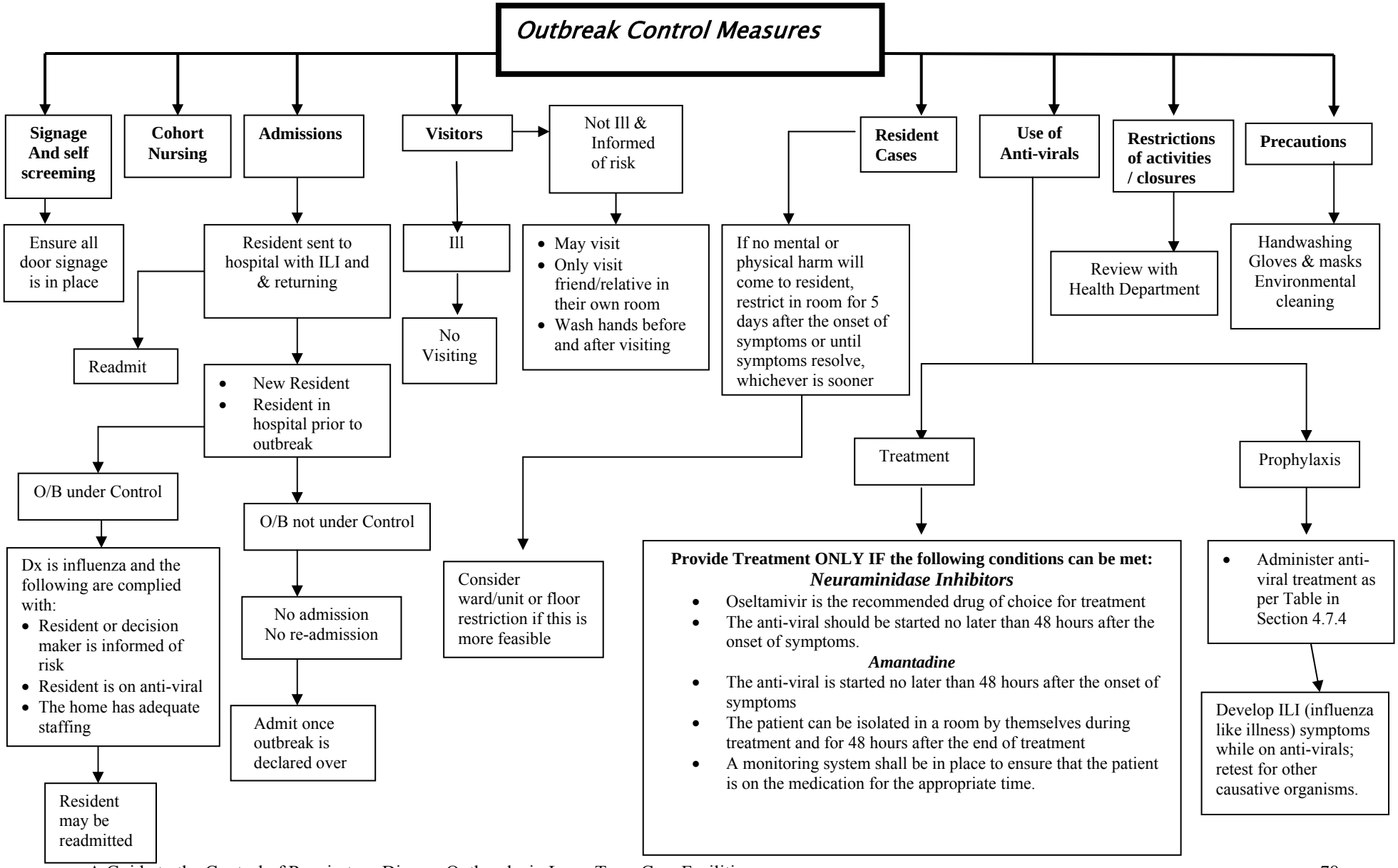
Appendix 15 – Strategies for Influenza Prevention and Outbreak Control – Algorithm



Strategies for Influenza Prevention and Outbreak Control Page 2 of 3

Suspect Outbreak – Start Here




Outbreak Control Measures
Signage And self screeming
Cohort Nursing
Admissions
Visitors
Not Ill & Informed of risk
Resident Cases
Use of Anti-virals
Restrictions of activities / closures
Precautions
Ensure all door signage is in place
Resident sent to hospital with ILI and & returning
Ill
May visit
Only visit friend/relative in their own room
Wash hands before and after visiting
If no mental or physical harm will come to resident, restrict in room for 5 days after the onset of symptoms or until symptoms resolve, whichever is sooner
Review with Health Department
Handwashing Gloves & masks Environmental cleaning
Readmit
No Visiting
New Resident
Resident in hospital prior to outbreak
Treatment
Prophylaxis
O/B under Control
O/B not under Control
Consider ward/unit or floor restriction if this is more feasible
Dx is influenza and the following are complied with:
Resident or decision maker is informed of risk
Resident is on anti-viral
The home has adequate staffing
No admission No re-admission
Admit once outbreak is declared over
Resident may be readmitted
Provide Treatment ONLY IF the following conditions can be met:
Neuraminidase Inhibitors
Oseltamivir is the recommended drug of choice for treatment
The anti-viral should be started no later than 48 hours after the onset of symptoms.
Amantadine
The anti-viral is started no later than 48 hours after the onset of symptoms
The patient can be isolated in a room by themselves during treatment and for 48 hours after the end of treatment
A monitoring system shall be in place to ensure that the patient is on the medication for the appropriate time.
Administer anti-viral treatment as per Table in Section 4.7.4
Develop ILI (influenza like illness) symptoms while on anti-virals; retest for other causative organisms.

Appendix 16- Sample letter to physicians regarding antiviral prophylaxis for staff in LTCHs

Dear Doctor

_____ (staff member's name) is a LTCH employee who has chosen not to be immunized against influenza this year. In the event of an influenza outbreak in the LTCH this employee, in accordance with the home's exclusion policy, will not be allowed to return to work until the outbreak is declared over by the Medical Officer of Health or designate unless he/she is taking antiviral prophylaxis for influenza.

Please provide a prescription for the recommended medication for influenza prophlaxis. Recommended antiviral medication is:

Oseltamivir (Tamiflu™)- preferred choice
75mg daily x 14 days or until outbreak is declared over

If you have any questions, please contact the local Public Health office.

Appendix 17 - Exclusion Policy

Points to consider for inclusion in the development of an exclusion policy:

- How and when the exclusion policy comes into effect
- Who falls under the definition of staff
- Consequences of failure to comply
- Managing shared staff working in a home with a declared outbreak
- Length of exclusion time clearly defined when staff are not on an antiviral drug
- How to verify staff are taking the antiviral
- How staff will be educated and updated re policy
- Obtaining antiviral prescription pre-season from staff member's health care provider (as per Appendix 12)
- Define HR issues, e.g. time off designation, cost of anti-virals.

Rationale for Influenza Prevention and Surveillance Protocol

This protocol was developed to ensure that those at greatest risk of complications and death from influenza are optimally protected through the appropriate use of influenza vaccine.

Long-Term Care Facilities will develop policies for annual influenza vaccination of residents and staff (see II. Applicability section of Protocol), and policies for the surveillance, prevention and control of influenza cases and outbreaks.

This protocol does not address other preventive measures such as anti-viral drugs or infection control measures, and the reader is referred to existing Ministry and other guidelines [1,2].

Influenza

Influenza is an acute viral disease of the respiratory tract characterized by fever, headache, myalgia, prostration, sore throat and cough. Measures for influenza prevention are important due to the rapidity with which epidemics evolve, the widespread morbidity, and the seriousness of complications, notably viral and bacterial pneumonia. During epidemics, severe illness and deaths occur, primarily among the elderly and those with underlying diseases. Attack rates during epidemics range from 1.0% to 20% in the general community to over 50% in closed populations [3]. Long-Term Care Facilities house people at high risk of developing serious, sometimes fatal, complications related to influenza.

Vaccination of persons at high risk of complications, and of people who are potentially capable of transmitting influenza to those at high risk, each year before the influenza season is currently the most effective measure for reducing the impact of influenza [4]. Appropriate anti-viral drugs such as amantadine use should be considered a supplementary measure to be used in specific circumstances.

In a season when the circulating influenza viruses and the vaccine are well matched, influenza vaccination will prevent illness in about 70% of healthy children and adults. The efficacy of the vaccine in preventing illness is only 30 to 40% among elderly residents of nursing homes. However, among these persons, the vaccine will prevent 50 to 60% of hospitalizations and pneumonia, and up to 85% of deaths [4].

A recent study showed a 44% reduction in influenza mortality among residents of geriatric medical long-term care sites following an intensive campaign to immunize health care workers [5]. The vaccine has also been shown to be effective in reducing absenteeism and febrile respiratory illness among health care workers and other working adults[6, 7].

Annual immunization is required because the vaccine is updated each year in response to changes in the influenza virus. Protection from the vaccine generally begins about 2 weeks after immunization and may last 6 months or longer in healthy, young individuals. Among the

elderly, antibody levels decline below protective levels in 4 months or less. The recommended time for influenza immunization is from October to mid-November.

Influenza Prevention and Surveillance Protocol for Ontario Long-Term Care Facilities

I. Purpose

The purpose of this protocol is:

i) To provide direction to Long-Term Care Facilities for preventing influenza virus infections among residents and persons carrying on activities in the facility, reduce morbidity and mortality among residents, and

ii) To prevent the transmission of influenza virus to residents by persons carrying on activities in the Long-Term Care Facilities

II. Applicability

This protocol applies to all residents of the Long-Term Care Facility, and to persons who carry on activities in the Long-Term Care Facility, including but not limited to employees, students, attending physicians, and both health care and non-health care contract workers (see glossary).

When hiring contract workers or training students, the Long-Term Care Facility must inform the supplying agency/school that the agency/school is responsible for the appropriate education, and vaccination of their personnel, and documentation of receipt of immunization.

This protocol does not apply to visitors. However, visitors such as family members should be encouraged to be immunized against influenza each autumn and informed to defer their visit if they are ill with influenza-like illness.

III. Pre-placement/Pre-Appointment and Regular Annual Vaccination

Residents

Prior to or upon admission, informed consent from the resident or substitute decision-maker should be obtained for the prevention of influenza and its complications. These include immunization against influenza and pneumococcal disease, and anti-microbial drugs for prophylaxis or treatment during an outbreak of influenza. If the resident is admitted during influenza season (approximately November through April) and has no record of receipt of the current season's influenza vaccine, influenza vaccine should be administered upon admission, with informed consent.

Thereafter, each resident should be immunized in the autumn with the current season's influenza vaccine, unless medical contraindications exist.

The immunization record of the resident should be retained in a readily accessible part of their health record.

Persons carrying on activities in the facility

At the time of hiring or placement, information must be provided to all persons carrying on activities in the Long-Term Care Facility about the requirement for annual influenza vaccination.

Additionally, if the time of hiring or placement occurs during the influenza season, the person responsible for the infection control program in the facility must ask any new employee for evidence of immunization with the current year's influenza vaccine.

Persons who are not newly placed or appointed to the facility should be informed about the requirement for annual immunization against influenza.

Only the following should be accepted as proof of influenza immunization:

- A personal immunization record (e.g., Ontario yellow card record) documenting receipt of the current season's influenza vaccine

If this documentation is not available, the facility administration must offer influenza immunization to the person.

Persons who decline influenza vaccination due to medical contraindications (see valid medical contraindications below) should provide a physician's documentation of their contraindication. This documentation should be placed in their personnel file for reference in future years. Persons who decline influenza vaccination but have no medical contraindications should be offered vaccine in subsequent years.

Persons who are unimmunized against influenza for any reason should be informed that in the event of an outbreak, they will be excluded from working in the facility or given the option of taking anti-viral medication for the duration of the outbreak. Additionally, these persons should be assessed for eligibility for anti-viral drugs such as amantadine prior to the influenza season and this information should be kept on-hand at the facility for timely implementation of anti-viral prophylaxis.

Facility administration must keep a list of persons who are not immunized up to date and on-hand during the influenza season in order to promptly implement control measures.

Valid medical exemptions to influenza immunization

Influenza vaccine should not be given to persons who had an anaphylactic reaction to a previous dose or with known anaphylactic hypersensitivity to eggs which is manifested as hives, swelling of the mouth and throat, difficulty in breathing, hypotension, and shock.

IV. Requirement for facility policy for the surveillance, prevention, and control of influenza and for reporting of immunization coverage to the local medical officer of health

Each facility must have a policy to address influenza surveillance, prevention (including annual immunization), and outbreak control. These policies must be based on existing current guidelines available from the Ministry, appropriate association(s) and the local public health department.

Availability of on-site vaccination clinics for all staff is recommended to provide optimal access to immunization services.

On-site immunization, or documentation of immunization, should be completed annually by November 15th unless otherwise recommended by the Chief Medical Officer of Health. The facility must report immunization status among residents and persons carrying on activities in the facility to the local medical officer of health by December 1st of each year.

V. Exposure to Influenza during an Outbreak

The Long-Term Care Facility must have in place an outbreak investigation and control plan which outlines how outbreaks of influenza will be managed. This plan must be based on existing current guidelines available from the Ministry, expert advisory committee guidelines, and appropriate associations. In addition, the plan should incorporate relevant local agencies including the public health department and laboratory(ies).

As soon as an outbreak of influenza is suspected, unimmunized residents and persons carrying on activities in the facility who do not have contraindications to vaccination should be offered the vaccine. When an outbreak is declared, immunized personnel may continue to work without disruption of their work pattern. The facility should exclude unimmunized personnel from work. Unimmunized personnel who agree to be immunized during an outbreak may return to work 14 days following receipt of vaccine (the duration required to achieve vaccine-induced immunity). They may return earlier if the outbreak is due to influenza A and they begin a course of anti-viral prophylaxis.

Anti-viral drugs for staff members may be prescribed by either the medical director of the facility or their family doctor. The mechanism for doing this must ensure that individual staff are assessed for the presence of contraindications and that eligible staff can start taking anti-virals in a timely manner.

Unimmunized staff can work in a non-outbreak facility if three or more days (1 incubation period) have passed since their last day of activities in an outbreak facility.

VI. Respiratory illness or Influenza-like-illness

The facility administration shall remind all persons carrying on activities in the facility that if they experience symptoms of influenza-like-illness, they must self-report this as soon as possible, and prior to coming to work, to the person responsible for infection control in the facility. If these symptoms occur in the context of a suspect or confirmed influenza outbreak in the facility, ill persons should be off work for 5 days after the onset of symptoms or until symptom-free, if symptoms persist longer. If these symptoms occur during the influenza season without an outbreak in the facility, the staff must obtain approval from the person responsible for infection control in the facility prior to coming to work.

Visitors should be similarly informed that if they experience influenza-like illness, they should defer their visit until their symptoms have resolved.

References

1. A Guide to the Control of Respiratory Disease Outbreaks in Long-term Care Facilities, Ministry of Health, 1997.

2. Guidelines for the Prevention and Management of Influenza in Long-Term Care Facilities, Ontario Nursing Home Association, 1997.

3. Benenson AS. Control of Communicable Diseases Manual, 16th edition, 1995, page 245.

4. National Advisory Committee on Immunization, Statement on Influenza Vaccination for the 1999-2000 Season. Canada Communicable Disease Report. Vol. 25(ACS-2): 1-16.

5. Potter J, Stott DJ, Robert MA, et al. Influenza Vaccination of Health Care Workers in Long-Term Care Hospitals Reduces the Mortality of Elderly Patients. The Journal of Infectious Diseases .1997; 175:1-6.

6. Wilde JA, McMillan JA, Serwint J, et al. Effectiveness of Influenza Vaccine in Health Care Professionals. Journal of the American Medical Association. 1999; 281:908-913.

7. Nichol KL, Lind A, Margolis KL, et al. The Effectiveness of Vaccination Against Influenza in Healthy, Working Adults. New England Journal of Medicine. 1995;333:889-893.

Appendix 19

How can you tell the difference between a cold, the flu or SARS ?

The following chart describes symptoms associated with a cold, the flu and SARS. Talk to your healthcare provider for more information.

Symptom	Cold	Flu	SARS
Fever	Rare	Usual, high sudden onset, lasts 3-4 days (39° – 40°C)	Fever is quite high and present at some time in almost every patient (> 38 °C) and begins suddenly
Headache	Rare	Usual, can be sudden	Yes, may be reported
General aches and pains	Generally mild	Usual, often severe	Sore muscles
Fatigue (malaise)	Generally mild	Usual, severe, may last 2-3 weeks	Common
Runny, stuffy nose	Common	Common	Not common
Sneezing	Common	Sometimes	Not common
Sore throat	Common	Common	Not common
Chest discomfort, cough	Sometimes, mild	Usual, can be severe to moderate. Cough may last for weeks.	Within 3 to 7 days of onset cough, shortness of breath or difficulty breathing develop
Complications	Can lead to sinus congestion or earache	Can lead to pneumonia & respiratory failure, can worsen a chronic condition, can be life-threatening	X-ray of the lungs show signs of pneumonia
Initial signs	No – begins with respiratory symptoms	No – begins with fever and respiratory symptoms	Yes – fever 3-7 days before respiratory symptoms

FOR MORE INFORMATION

For more information on Ontario's new universal flu campaign, please call
1-866-FLU-'N YOU or **1-866-358-6968**.
In Toronto, call 416-327-0427, (TTY : 1-800-387-5559).

Visit HealthyOntario.com for information on a wide variety of consumer health topics.

Or, contact your local Public Health Unit.

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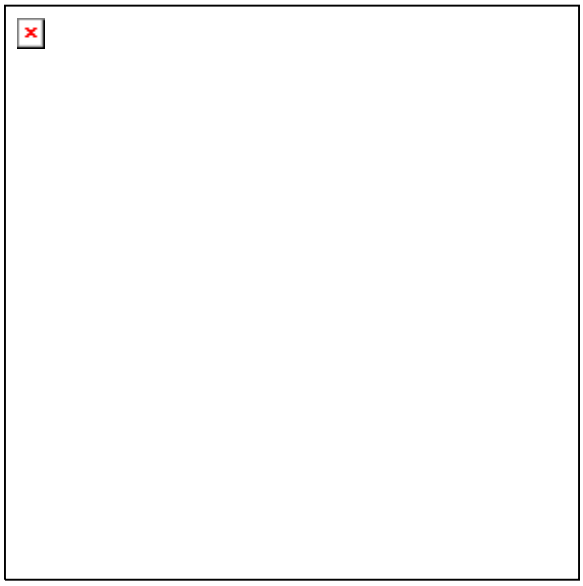
Pneumococcal Vaccine



Vaccines or needles are the best way to protect against some very serious infections. The National Advisory Committee on Immunization strongly recommends routine immunization.

This vaccine protects adults and children more than 2 years old against pneumococcal infections like pneumonia.

What causes pneumonia?

There are two main kinds of pneumonia, one caused by viruses and the other caused by bacteria. One type of bacteria is called Streptococcus pneumoniae (or pneumococcus). When these bacteria invade the lungs, they cause bacterial pneumonia. About 8 out of 10 cases of bacterial pneumonia are caused by pneumococcus. These bacteria also attack different parts of the body. They can attack the blood cells and cause a serious infection called bacteraemia. They can also cause meningitis. Meningitis is a serious infection of the fluid and lining of the brain and spinal cord. Pneumonia, bacteraemia or meningitis can cause death in people with high risk medical conditions and the elderly. About 4 out of 10 healthy people have pneumococcal bacteria in their mouths and upper respiratory systems. In most people, the bacteria will not cause serious illness. But in some people with high risk medical conditions, the bacteria can cause disease when it gets into the lung or blood. Pneumococcal pneumonia, bacteraemia and meningitis are serious. Each year in Ontario, about 1,500 cases of serious pneumococcal disease are confirmed by laboratory tests, but the true number of cases is probably about 20 times higher.

Why is pneumococcal vaccine important?

Pneumococcal vaccine can prevent pneumonia and other infections caused by 23 types of the Streptococcus pneumoniae bacteria. These 23 types account for 9 out of 10 cases of pneumococcal disease. The vaccine is recommended for people with certain Long-Term diseases listed below, and people more than 65 years of age. Eight out of 10 cases occur in these high risk groups. The vaccine protects about 60 per cent of people against pneumococcal infection. Vaccination also makes the disease milder for those who may catch it.
This pneumococcal vaccine has been used in Canada since 1983.

Who should get the vaccine?

Pneumococcal vaccine should be given to anyone over 65. Adults and children more than 2 years old who have the following high risk medical conditions:

- chronic heart, kidney or lung disease (except asthma);
- nephrotic syndrome;
- cirrhosis of the liver;
- alcoholism;
- diabetes mellitus;
- chronic cerebrospinal fluid leak;
- HIV infection and AIDS;
- other diseases that suppress the immune system;
- no spleen or a spleen that does not work properly;
- sickle cell disease.

When should pneumococcal vaccine be given?

The best time to get the needle is as soon as you develop a high risk medical condition or when you turn 65. Because many people who should get the pneumococcal vaccine also get the flu shot (influenza vaccine) every autumn, it would be a good idea to get them both at the same time. But remember - the pneumococcal vaccine is given once in your lifetime and the influenza vaccine is given every year. Only a few people will need a second dose of the pneumococcal vaccine. Your doctor will know if you need another dose.

Are there side effects?

Some people have side effects from the vaccine, but these are usually minor and last only a short time - 5 out of 10 people will have some swelling and soreness in the arm where the needle was given. Occasionally slight fever may occur. Fewer than one in 100 people will have fever and muscle pain as well as some more serious swelling and pain on the arm.

Who should not have the vaccine?

The pneumococcal vaccine used between 1978 and 1983 protected against only 14 types of the pneumococcus. People who received this vaccine do not usually need to get another shot.

- If you think you have already been vaccinated for pneumococcal disease, let your doctor know.
- Pneumococcal vaccine is not recommended for children under 2 years of age.
- You should not have the vaccine if you have a severe allergy to any component of the vaccine.

Who should I talk to if I have any questions?

Talk to your doctor or call your local public health department.

Your record of protection

After you get any immunization, make sure your doctor updates your personal immunization record, such as your "Yellow Card". Keep it in a safe place!

Immunization – Influenza Vaccine

This fact sheet provides basic information only. It must not take the place of medical advice, diagnosis or treatment. Always talk to a healthcare professional about any health concerns you have, and before you make any changes to your diet, lifestyle or treatment.

Influenza Vaccine

Vaccines are the best way to protect against some very serious infections. Influenza vaccine protects adults and children 6 months of age and older (for whom contraindications are not present) against influenza, which can be a serious illness for some people.

What is Influenza?

Influenza (commonly known as "the flu") is a serious, acute respiratory infection that is caused by a virus. People who get influenza have a cough, fever, chills, sore throat, headache, muscle aches and fatigue. Children can also get ear aches, nausea, vomiting, and diarrhea. Illness due to influenza usually lasts from three to five days, but can last longer. The cough and fatigue can persist for several weeks, making the return to full personal and work activities difficult.

People of any age can get the flu. Most people who get influenza are ill for only a few days. However, some people can become very ill/sick, and need to go to an emergency room or to the doctor's office.

Flu spreads easily from infected people through coughing and sneezing. It is also spread through direct contact with contaminated surfaces, unwashed hands, or objects such as toys and eating utensils, which have been contaminated by the influenza virus.

Avian Influenza

Avian Influenza is an infection that is found in birds (i.e., poultry) and can be transmitted to humans. Unless a person is directly involved in the culling (destruction) of these infected birds, the risk of infection is small. However, it is recommended that all persons directly involved with live poultry and/or involved in the slaughtering process be vaccinated.

How well does influenza vaccine protect against the flu?

Protection from the vaccine develops by two weeks after the shot, and may last up to one year. The vaccine is about 70 to 90 per cent effective in preventing influenza infection in healthy adults. In children, it is about 77 to 91 per cent effective against influenza respiratory illness. In elderly people, the vaccine can prevent pneumonia and hospitalization in about six out of 10 people, and prevent death in about eight out of 10 people. The viruses that cause influenza change often. Because of this, the influenza vaccine is updated each year.

People who receive the vaccine can still get influenza, but if they do, it is usually milder than it would have been without the shot.

Who should get the flu vaccine?

Much of the illness caused by the flu can be prevented by annual flu immunization. Anyone who wants to avoid getting the flu should consider getting vaccinated.

The vaccine is especially important for people in high-priority groups. These groups include people who are at high risk of complications from influenza and people who are most likely

to spread the virus to the high-risk population. The high-priority groups are listed below:

- adults and children with chronic cardiac or pulmonary disorders
- all staff, volunteers, and residents of long-term care facilities (e.g. homes for the aged, nursing homes, chronic care facilities/units, retirement homes) as well as staff, volunteers and students of hospitals and any other health care settings
- persons 65 years of age or over
- healthy children aged 6-23 months
- adults and children with chronic medical conditions such as diabetes mellitus and other metabolic diseases, cancer, immunodeficiency (including HIV infection), immunosuppression (including that of transplant recipients), renal disease, anemia and hemoglobinopathy
- children and adolescents (age 6 months to 18 yrs) with conditions treated for long periods with acetylsalicylic acid
- people at high risk of influenza complications embarking on foreign travel to destinations where influenza is likely to be circulating
- other health care workers and personnel who have significant contact with people in the high risk groups (e.g. health care workers in the community (including students) and their support staff, home care workers and volunteers, staff of public health units)
- All emergency response workers (fire, police and ambulance staff) and others who provide essential community services.
- Household contacts of all adults and children at high risk of flu complications.
- pregnant women expecting to deliver during the flu season as they will become household contacts to their newborns, as well as healthy women who will be in the second or third trimester of pregnancy during the flu season
- anyone providing regular child care to children aged 0-23 months, whether in or out of the house
- anyone who provides services within closed or relatively closed setting to people at high risk (e.g. crews on ships)
- people in direct contact with live poultry and/or involved in the slaughtering process

Why should healthy adults and children get the flu vaccine?

Healthy people should get vaccinated to protect themselves and their families from influenza and to avoid missing quality time (including holidays) with their families, to avoid losing time from work, and to avoid spreading the virus to others.

Influenza is much worse than a cold. Even healthy, young people can become quite ill. You might bring the influenza virus home to a baby, older relative, or someone with a medical condition who can develop serious complications from influenza.

Children can also benefit from influenza immunization. Influenza in preschoolers is associated with acute middle ear infections. Influenza may also lead to hospitalization in healthy children (particularly those under two years of age), as well as in children with underlying high-risk medical conditions. Children are also the main spreaders of the virus, in both the school and household settings. Influenza immunization can decrease the incidence of middle ear infections associated with influenza, reduce school absenteeism and prevent community transmission of influenza.

Who should <u>not</u> get the influenza vaccine?

The following persons should not get the influenza vaccine:

- infants under six months of age (the current vaccine is not recommended for this age group)
- anyone with a serious allergy (anaphylaxis) to eggs or egg products. A serious allergic reaction usually means that the person develops hives, swelling of the mouth and

throat or trouble breathing after eating eggs or egg products
- anyone who has a severe allergy to any component of the vaccine. Two influenza vaccines will be distributed through Ontario's Universal Influenza Immunization Program this season (2004/05); Vaxigrip® (produced by Aventis Pasteur) and Fluviral® (produced by [ID Biomedical (Shire)]). Both vaccines may contain trace amounts of Thimerosal (a preservative) and formaldehyde. In addition, Vaxigrip® may contain traces of the antibiotic neomycin. Please check with your physician or other health care provider to make sure that you do not have a severe allergy to any component of the vaccine that you will be getting
- anyone who had a serious allergic reaction to a previous dose of the influenza vaccine.

Also:

- people with a history of Guillain-Barré Syndrome should consult their physician before getting the vaccine
- people who are acutely ill with a fever at the time that the shot is being given should usually wait until they recover before getting influenza vaccine

Do I have to pay for the flu shot?

No. For the 2004-05 season, the influenza vaccine is again available free of charge to all Ontarians aged 6 months and older. The vaccine will be available through various sites including physicians' offices, community-based clinics administered by health units, hospitals, community health centres and pharmacies, and through employer-sponsored clinics at the workplace.

What are the risks from influenza vaccine?

The influenza vaccine, like any medicine, is capable of causing side effects, which can be either mild or, in few cases, severe. The risk of the vaccine causing serious harm is extremely small. Almost all people who get the flu vaccine have no serious problems.

Most people who get the vaccine have either no side effects, or mild side effects such as soreness, redness or swelling where the shot was given. Life-threatening allergic reactions are very rare. If they do occur, it is within a few minutes to a few hours after the shot.

Guillain-Barré Syndrome (or GBS) is a very uncommon disease that causes muscle paralysis and has been associated with certain infectious diseases. It is not known whether influenza virus infection itself is associated with GBS.

Overall, the risk of GBS occurring in association with vaccination is small. In comparison to the small risk of GBS, the risk of illness and death associated with influenza are much greater. Because it is not known whether influenza immunization increases the risk of recurrent GBS in persons who had GBS in the past, it is recommended that persons who developed GBS within six to eight weeks of a previous immunization should not be immunized at this time.

During the 2000/2001 season, a small number of people who received the vaccine developed a generally mild side effect called Oculo-Respiratory Syndrome, or ORS.

The revised case definition of ORS is: the onset of bilateral red eyes and /or respiratory symptoms (cough, wheeze, chest tightness, difficulty breathing, difficulty swallowing, hoarseness or sore throat) and/or facial swelling occurring within 24 hours of influenza immunization. There are no deaths reported in association with ORS.

Re-vaccination of ORS patients was found to be safe. In a recent study, ORS recurred in 8% in 2001 and 15% in 2002; most episodes were mild, very few required medical consultation, none led to hospitalization, and no patients had an anaphylactic reaction. The risk of ORS recurrence after revaccination is minimal

compared with the serious threat posed by influenza. For those who have had severe lower respiratory symptoms (wheeze, chest tightness, difficulty breathing), or any other symptom that raise concern regarding the safety or re-immunization, within 24 hours of influenza vaccination, expert advice should be sought.

Can influenza vaccine cause the flu?

No. The vaccine does not contain live viruses so you cannot get the flu from the vaccine. However, the vaccine will not protect you against colds and other respiratory illnesses that may be mistaken for influenza.

Can women who are pregnant or breastfeeding get the influenza vaccine?

The vaccine is considered safe for pregnant women at all stages of pregnancy or who are breastfeeding.

When should influenza vaccine be given?

It is best to receive the influenza vaccine in October to mid-November before the flu season starts. This will give your body time to build protection against the influenza virus. It takes about two weeks after the immunization to develop protection against influenza.

How many doses of the vaccine do I need?

Because the influenza virus changes often, it is necessary to get the flu shot every year, for protection against the virus strains that are expected that year. Children younger than nine years of age being vaccinated for flu for the first time need two shots, given at least one month apart.

When should I call my doctor?

You should call your doctor or see a doctor right away if you develop any of these symptoms within three days after the shot:

- hives
- swelling of the mouth or throat
- trouble breathing, hoarseness or wheezing
- paleness, weakness, a fast heart beat or dizziness
- any other unusual condition or serious reaction to the vaccine.

Signs or symptoms of ORS: the onset of bilateral red eyes and /or respiratory symptoms (cough, wheeze, chest tightness, difficulty breathing, difficulty swallowing, hoarseness or sore throat) and/or facial swelling occurring within 24 hours of influenza immunization should also be reported within three days.

Your local public health should also be informed of serious reactions to *any* vaccine.

Who should I talk to if I have any questions about influenza or any other vaccines?

If you are looking for general information about influenza or the vaccine, the province's Universal Influenza Immunization Program or the location of a clinic near you, please call: 1-866-FLU'N YOU (1-888-358-6968) (TTY#1-800-387-5559) or visit website: www.health.gov.on.ca

If you have questions about the vaccine that are specific to your medical condition, you should ask your doctor or call your local public health unit.

How can I keep track of my flu shots and other immunization?

After you receive your immunization, ensure that the doctor or nurse updates your personal immunization record, or "yellow card." Keep it in a safe place!

For additional information on influenza, please visit the following websites:

Health Canada sites:

- Fluwatch (http://www.hc-sc.gc.ca/hpb/lcdc/bid/respdis/fluwatch/index.html)

- National Advisory Committee on Immunization (NACI) Statements http://www.hc-sc.gc.ca/pphb-dgspsp/naci-ccni/index.html

Canadian Coalition for Influenza Immunization

http://www.influenza.cpha.ca/english/start.htm

Centers for Disease Control (CDC) Influenza

Prevention and Control Home Page
http://www.cdc.gov/flu/

National Foundation for Infectious Diseases

Pediatric Influenza Prevention Program
http://64.242.251.230/index1.html

For information about health services and resources:

www.health.gov.on.ca

For consumer-friendly health tips and information:
www.HealthyOntario.com

INFOline: 1-877-234-4343 toll free in Ontario
TTY: 1-800-387-5559

Telehealth Ontario: 1-866-797-0000

TTY 1-866-797-0007

Or call your local public health unit.

Version francaise disponible en communiquant avec le 1 877 234-4343 ATS : 1 800 387-5559
Web www.SanteOntario.com

Glossary

Anti-viral Medication

Medication capable of preventing or treating viral infection. Two anti-viral drugs, neuraminidase inhibitors (oseltamivir, zanamivir) are licensed in Canada, for the treatment of influenza in adults. Oseltamivir is also licensed for prophylaxis. Neuraminidase inhibitors are effective against both influenza A and B. **Oseltamivir (Tamiflu™) is the recommended anti-viral of choice for influenza A & B treatment and prophylaxis.**

Amantadine is effective against influenza A, but not influenza B; it is licensed for both treatment and prophylaxis.

Competent Person

A person who:

a) is qualified because of knowledge, training and experience
b) is familiar with the regulations that apply
c) has knowledge of any potential or actual danger to the health of the residents in the home

Contract Worker

Contract workers from a supplying agency such as health care workers, maintenance workers (e.g., janitorial, repair, etc.) and other workers who carry on activities in resident care areas or come into contact with residents (e.g., hairdressers).

Incubation Period

The time interval between initial contact with an infectious agent and the first appearance of symptoms associated with the infection. For influenza, the incubation period is 1-3 days.

Infected/Infectious Individual

A person who harbours an infectious agent and who has either manifest disease (shows symptoms) or inapparent infection (does not show symptoms). An infectious person is one from whom the infectious agent can be acquired.

Infection Control Professional (ICP)

A regulated health professional designated to be responsible for infection control programs in the home, in accordance with the Long-Term Care Facility Program Manual.

Influenza

Influenza is a viral infection of the respiratory system. Symptoms of influenza include fever, cough, sore throat, muscle ache, extreme fatigue, and headache. Unlike the common cold and most other respiratory viruses commonly called "the flu", influenza virus infection can result in severe illness, pneumonia and even death. The incubation period of influenza is 1-3 days; duration of infectivity is usually not more than 5 days after onset of symptoms. Influenza can cause epidemics, or outbreaks, which are a cluster of cases occurring within a short period of time in a defined geographic area (e.g., schools or health care institutions) or group of people.

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

Influenza Vaccine in Pregnancy

Influenza vaccine is considered safe for pregnant women at all stages of pregnancy, and for breastfeeding mothers.

Long-Term Care Home

A Long-Term Care Home means a nursing home under the *Nursing Homes Act*, a home under the *Homes for the Aged and Rest Homes Act*, and an approved charitable home for the aged under the *Charitable Institutions Act*.

Medical Contraindication to Influenza Immunization

Influenza vaccine should <u>not</u> be given to people who had an anaphylactic reaction to a previous dose or with known anaphylactic hypersensitivity to eggs manifested as hives, swelling of the mouth and throat, difficulty in breathing, hypotension, and shock.

Individuals with acute febrile illness usually should not be vaccinated until their symptoms have abated.

Individuals who are allergic to any of the components of the vaccine.

Individuals who developed Guillan-Barré within 6 to 8 weeks of a previous influenza vaccination

Recommended Recipients

People at high risk for influenza-related complications, such as people with long-term medical conditions and people 65 years of age and older,

People capable of transmitting influenza to those at high risk for influenza-related complications, such as Health Care Workers and other personnel who have significant contact with people in the high-risk groups,

People who provide essential community services.

Healthy adults and their children who wish to protect themselves from influenza.

Sentinel events

A condition that can be used to assess the stability or change in health levels of a population, usually by monitoring mortality statistics.

Staff

All persons who carry on activities in the long-term care home, including but not limited to employees, volunteers, students, attending physicians, and both health care and non-health care contract workers.

Surveillance of Disease

The continuing scrutiny of all aspects of occurrence and spread of a disease that are pertinent to effective control. Included are the systematic collection and evaluation of:

- data on individual cases
- laboratory test results
- information about immunity or vaccination status
- use of medications
- other relevant data

Transmission of Influenza

Influenza is spread from person to person by inhalation of tiny droplets produced by the cough or sneeze of a person infected with influenza. It can also be spread by contact with infected respiratory secretions through articles such as bedrails, facial tissue, or (unwashed) utensils.

Visitors

Visitors are relatives or friends of residents who visit usually one (the same) resident occasionally or on a regular basis.

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