

## 4.5 Influenza

### Etiology

Influenza viruses belong to the *Orthomyxoviridae* family and are classified into three distinct types: influenza A, B and C. The majority of seasonal influenza epidemics are caused by influenza A and B viruses. Influenza A is further subtyped based on the 16 different hemagglutinin and nine unique neuraminidase surface glycoproteins.

### Case Definitions

#### Confirmed Case

Only confirmed cases of disease should be reported to the province.

Clinical illness<sup>3</sup> with laboratory confirmation of infection:

- isolation of influenza virus from an appropriate clinical specimen **OR**
- demonstration of influenza virus antigen in an appropriate clinical specimen **OR**
- significant rise (e.g. fourfold or greater) in influenza IgG titre between acute and convalescent sera **OR**
- detection of influenza RNA.

### Clinical Presentation

Influenza typically begins with an abrupt onset of fever, chills, headache, prostration, myalgia and dry cough. These symptoms are commonly followed by sore throat, nasal congestion and rhinitis. The cough can last two weeks or more with the fever and other symptoms resolving in 5 to 7 days in uncomplicated cases.

The onset of influenza in children is similar to adults although calf muscle myalgia, cervical adenopathy and fever may be particularly prominent. Gastrointestinal (GI) involvement (nausea, vomiting and diarrhea) have been reported in children with influenza but GI involvement in adults is uncommon.

Complications from influenza infection include primary influenza viral pneumonia, bacterial pneumonia (e.g., *Streptococcus pneumoniae* and *Streptococcus pyogenes*), exacerbation of chronic pulmonary conditions, sinusitis, otitis media, febrile seizures, encephalitis, myositis and death. Reye syndrome has also been associated with influenza infections in children. It is typically seen in children who have been given aspirin to treat fever from influenza.

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<sup>3</sup> Clinical illness defined as influenza-like illness (ILI) is characterized as follows: acute onset of respiratory illness with fever and cough and with one or more of the following: sore throat, arthralgia, myalgia and prostration that could be due to influenza virus. In children under five, or 65 and older, fever may not be prominent. Note: Illness associated with novel influenza viruses may present with other symptoms.

Outbreaks of influenza are often associated with excess morbidity and mortality, and characterized by higher than normal rates of pneumonia and influenza-related hospitalizations and deaths

## DIAGNOSIS

Clinical signs and symptoms are confirmed by laboratory findings. Kits for influenza testing are available through the Public Health Laboratory and information available at the website:<http://publichealthlab.ca/reportingname/influenza-virus-types-a-and-b/>

Information on specimen collection is available at the following web site

[http://www.health.gov.nl.ca/health/publichealth/cdc/flu/specimen\\_collect\\_submit\\_influenza.pdf](http://www.health.gov.nl.ca/health/publichealth/cdc/flu/specimen_collect_submit_influenza.pdf)

## EPIDEMIOLOGY

### Occurrence

Influenza occurs in annual epidemics of varying severity depending on the strain circulating. Between three and five million severe cases, and 250,000 to 500,000 deaths occur each year worldwide. In Canada, influenza or "flu" season usually runs from November to April and an estimated 10-20% of Canadians may get the flu each year. Although most of these people recover completely, an estimated 3,500 Canadians, primarily seniors, die every year from pneumonia related to influenza and many others may die from other serious complications of influenza.

### Reservoir

Humans; influenza A viruses can also circulate in birds, pigs, and horses. Influenza is usually not a zoonotic disease, although there can be exceptions. Influenza B viruses is believed to only circulate in humans. A third subtype of influenza virus exists, type C influenza, which is associated with sporadic cases and minor localized outbreaks. It does not cause nearly the significant burden of disease that influenza A and B does.

### Transmission

Influenza is transmitted from person-to-person primarily via large droplet particles and droplet nuclei (i.e., aerosol) that are generated when the infected individual coughs or sneezes. These large droplets can settle on the mucosal surfaces of the upper respiratory tract of susceptible people who are within two feet of the infected individual.

Indirect transmission may also occur such as when touching surfaces contaminated with influenza virus and then touching the eyes or nose.

The virus can survive on hard surfaces (door handles, telephones, computer keyboards, light switches, countertops, etc.) for 1 – 2 days and on soft surfaces (cloth, tissues and paper) for 8 – 12 hours.

### Incubation period

The incubation period for influenza is generally 1 to 3 days with an average of 2 days.

## Communicability

The period of communicability is generally a day from clinical onset until 5 days after. Prolonged shedding may occur in immunocompromised individuals.

# CONTROL MEASURES

## Management of Case

### *Investigation*

- Investigate all cases who have been hospitalized
- Obtain a case history including the immunization history

### *Treatment*

Supportive care and treatment of symptoms is required. Treatment with antivirals is NOT generally indicated for mild to moderate illness unless the individual is at high risk for influenza-related complications. Treatment should be considered for severe cases and for clusters in a closed setting such as long term care, under the advisement of the Medical Officer of Health (MOH).

### *Immunization*

Influenza vaccine is offered to targeted population in the fall of each year. The vaccine takes approximately two weeks to be effective. For more information on the immunization programs see:

[http://www.health.gov.nl.ca/health/publichealth/cdc/im\\_section5.pdf](http://www.health.gov.nl.ca/health/publichealth/cdc/im_section5.pdf)

### *Exclusion*

- People are asked to contain their illness by staying home when they are sick
- Droplet and contact precautions are recommended for patients hospitalized with influenza

## Management of Contacts

Contact tracing is not required.

### *Immunoprophylaxis*

Immunization is recommended as per NL Immunization Manual.

[http://www.health.gov.nl.ca/health/publichealth/cdc/im\\_section5.pdf](http://www.health.gov.nl.ca/health/publichealth/cdc/im_section5.pdf)

### *Chemoprophylaxis*

Post-exposure prophylaxis of contacts is not recommended. Antivirals are usually recommended for treatment only, generally in those individuals at high risk for influenza-related complications and in closed settings such as long term care. Use of antivirals is under the direction of the MOH.

***Exclusion***

There is no benefit to exclusion of contacts once the virus is circulating; people are asked to contain their illness by staying home if they become symptomatic.

**Management of Outbreaks**

An outbreak management team should be established to address infection prevention and control measures. The Outbreak summaries component of the Canadian Network for Public Health Intelligence (CNPHI) is the surveillance tool used to report outbreaks.

**EDUCATION AND PREVENTIVE MEASURES**

The Department of Health and Community Services provides additional information on influenza management at web site:

[http://www.health.gov.nl.ca/health/publichealth/cdc/infoforpros\\_edu.html](http://www.health.gov.nl.ca/health/publichealth/cdc/infoforpros_edu.html)

Education should be provided on methods to prevent the transmission of influenza.

These include:

- Clean your hands – Hand hygiene is the single most important way to prevent the transmission of infection
- Cover your cough – Tissues or the bend of the arm should be used to cover a cough
- Cover the nose and mouth when sneezing or coughing
- Clean hands after coughing, sneezing or using tissues
- Keep fingers/hands away from the eyes, nose and mouth
- Discard tissues after wiping the nose
- Contain your illness – If sick with influenza stay at home.
- Provide influenza vaccine to recommended recipients prior to the influenza season
- Provide pneumococcal vaccine to recommended recipients
  - For information on the vaccine go to the web site:  
[http://www.health.gov.nl.ca/health/publichealth/cdc/im\\_section5.pdf](http://www.health.gov.nl.ca/health/publichealth/cdc/im_section5.pdf)
- Household contacts should be instructed to:
  - Continue their normal activities but self-isolate if they develop symptoms of ILI.
  - Practice respiratory etiquette (e.g., cough into a sleeve).
  - Clean hands with soap and water frequently. Use alcohol-based hand gels (containing at least 60% alcohol) when soap and water are not available or when hands are not visibly dirty.
  - Ensure regular cleaning of high-touch objects and surfaces

A fact sheet is available at:

[http://www.health.gov.nl.ca/health/publichealth/h1n1\\_old/understanding\\_influenza.pdf](http://www.health.gov.nl.ca/health/publichealth/h1n1_old/understanding_influenza.pdf)

**Reporting Requirements and Procedures**

- The laboratory (hospital or public health laboratory) report case/s to the attending physician, the Chief Medical Officer of Health and the MOH
- MOH office will notify, as required, local physicians, nurse practitioners, environmental health officers, community health nurses, communicable disease

control nurses (CDCNs) and Infection control practitioners (ICP), in the particular region as required for follow-up and case investigation

- The CDCN in collaboration with the ICP (if necessary) will collect case details
- The CDCN will enter the case details into the electronic reporting system and utilize the Canadian Network for Public Health Intelligence (CNPHI) tool for alerts and/or outbreak summaries

### **Provincial Disease Control**

- Reports the aggregate case data to Public Health Agency of Canada
- Provides an analysis of the case/s with reports in the Quarterly Communicable Disease Report (CDR), also posted on the Public Health website  
<http://www.health.gov.nl.ca/health/publichealth/cdc/informationandsurveillance.html>
- Coordinates the response if an outbreak occurs across RHAs

## **REFERENCES**

American Academy of Pediatrics. Influenza. In: Pickering LL, Baker CJ, Kimberlin DW, Long SS, editors. Red Book: 2009 Report of the Committee on Infectious Diseases. 28 ed. Elk Grove Village, IL: American Academy of Pediatrics; 2009. p. 400-12.

Cohen-Daniel L, Zakay-Rones Z, Resnick IB, et al. Emergence of oseltamivir-resistant influenza A/H3N2 virus with altered hemagglutination *pattern* in a hematopoietic stem cell transplant recipient. *J Clin Virol* 2009 Feb; 44(2):138-40. Retrieved on June 12, 2013, from [www.ncbi.nlm.nih.gov/m/pubmed/19157971/?i=18&from=/15494906/related](http://www.ncbi.nlm.nih.gov/m/pubmed/19157971/?i=18&from=/15494906/related)

Dawood FS, Jain S, Finelli L, Shaw MW, Lindstrom S, Garten RJ, et al. Emergence of a novel swine-origin influenza A (H1N1) virus in humans. *N Engl J Med* 2009 Jun 18; 360(25):2605-15. Retrieved on June 12, 2013, from  
<http://www.ncbi.nlm.nih.gov/pubmed/19423869>

Fiore AE, Shay DK, Broder K, et al. Prevention and control of influenza: recommendations of the Advisory Committee on Immunization Practices (ACIP), 2008. *MMWR Recomm Rep* 2008 August 857(RR-7):1-60. Retrieved on June 12, 2013, from: URL: <http://www.cdc.gov/mmwr/preview/mmwrhtml/rr57e717a1.htm>

Heymann DL. Control of communicable diseases manual. 19th ed. 2008. Washington, DC, American Public Health Association.

Public Health Agency of Canada. (2012). *Canadian Immunization Guide* (Evergreen ed.). Ottawa, ON. Retrieved July 8, 2013, from <http://www.phac-aspc.gc.ca/publicat/cig-gci/p04-rube-eng.php>

Public Health Agency of Canada. (2009). Case Definitions for Communicable Diseases under National Surveillance. Public Health Agency of Canada 2009. Retrieved June 12, 2013, from: URL: <http://www.phac-aspc.gc.ca/publicat/ccdr-rmtc/09vol35/35s2/index>

Public Health Agency of Canada. (2010). Seasonal influenza – Infection prevention and control measures for healthcare workers in acute care and long term care settings. Retrieved August 14, 2013 from <http://www.phac-aspc.gc.ca/nois-sinp/guide/ac-sa-eng.php>

Public Health Agency of Canada. (2012). Seasonal influenza – Infection prevention and control guidance for management. Retrieved August 14, 2013 from <http://www.phac-aspc.gc.ca/nois-sinp/guide/flu-grippe/index-eng.php>