

Training Bulletin

Influenza Educational Review 2013/2014

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Introduction

Influenza continues to be a major cause of morbidity and mortality worldwide. Health Canada estimates that in a given year up to 20,000 hospitalizations related to influenza may occur and that as many as 4,000 Canadians, mostly seniors, may die of influenza and other serious flu-related complications. Rates of influenza infection are highest in children aged 5-9 years, but rates of serious illness and death are highest in children aged <2 years, older persons (>65 years), and persons with underlying medical conditions. It is estimated that between 10-20% of the population becomes infected with influenza each year.¹ Both the Public Health Agency of Canada (PHAC) and the Center for Disease Control and Prevention in the United States recognize that the morbidity and mortality from influenza can be significantly reduced through the vaccination of recommended recipients (i.e. people at high risk of influenza-related complications or those more likely to require hospitalization, people capable of transmitting influenza to those at high risk for complications, including health care and other care providers).¹

In Ontario, a Universal Influenza Immunization Program (UIIP) offers influenza vaccine at no cost to anyone 6 months of age and older who lives, works or attends school in Ontario.

Past experience has given Health Care Workers (HCWs) a heightened awareness about infectious respiratory diseases. It also confirmed that HCWs, including paramedics, have a higher risk of acquiring viral respiratory infections related to occupational exposure and they should be aware of their potential to unknowingly transmit such infections to high risk patients for two reasons:

- Adults may spread influenza to others one (1) day before the onset of symptoms and up to 5 to 7 days after infection, and
- Many health care workers experience sub-clinical infection.¹ In a British study, 59% of HCWs with serologic evidence of recent influenza infection could not recall having influenza.²

In 2009 the world saw the emergence of the Pandemic (H1N1) 2009 influenza virus. Recently, the World Health Organization (WHO) reported that there continues to be subtypes of influenza A viruses, currently influenza A (H1N1) and A (H3N2) that are circulating among humans³ throughout the Northern Hemisphere.¹ “Based on knowledge about past pandemics, the H1N1 (2009) virus is expected to continue to circulate as a seasonal virus for some years to come.”⁴ There are programs that monitor of circulating strains of the flu virus (like H1N1) and assess their sensitivity to antiviral medications. Antivirals, when used by doctors to treat flu, can help reduce the severity of the illness and the recovery time for a patient.⁵

¹ National Advisory Committee on Immunization, *Statement of Seasonal Influenza Vaccine for 2013-2014*

² Nguyen-Van-Tam J, Granfield R, Pearson J, et al, *Do influenza epidemics affect patterns of sickness absence among British hospital staff?*

³ World Health Organization, *Media Centre World – Influenza (Seasonal)*

⁴ Centers for Disease Control and Prevention, *2009 H1N1 Flu* - August 2010

⁵ Public Health Agency of Canada, *FightFlu.ca – “Information for Health Professionals”* - November 2013

The three seasonal influenzas – A, B, and C cannot be reliably predicted and as such, paramedics must remain alert and take all necessary precautions when managing patients with suspected infectious respiratory illnesses.

Globally from September 2012 to date a total of 163 confirmed cases of human infection with a novel coronavirus have been reported to the WHO; 71 deaths.⁶ Coronaviruses are a large family of viruses that includes viruses that many cause a range of illnesses in humans, from the common cold to SARS. Viruses of this family also cause a number of animal diseases. From the information available thus far, it appears that the novel coronavirus cannot be easily transmitted from person to person. The virus is persistent with sporadic cases however the pattern of transmission currently being observed in Saudi Arabia increases the level of concern regarding this novel pathogen.⁷

On March 31, 2013, The WHO was notified of case of human infection with influenza A (H7N9) by the China Health and Family Planning Commission of the People's Republic of China. This is the first time that this virus has been detected in humans and the situation is being monitored very closely.¹

One of the most important lessons learned as a result of respiratory infection outbreaks is that prevention is the key to containing and controlling the spread of infectious diseases, including influenza. Systematic reviews have also demonstrated that influenza vaccine decreases the incidence of pneumonia, hospital admissions and deaths in the elderly, and the number of physician visits, hospitalizations and deaths and reduces exacerbations in high risk persons.¹

The National Advisory Committee on Immunization (NACI) releases an annual statement on influenza vaccination which provides medical, scientific and public health advice relating to influenza vaccination. The information in this Training Bulletin includes information and the recommendations from the NACI *Statement on Seasonal Influenza Vaccine for 2013-2014*.

The following is a summary of the changes that have been incorporated into the Influenza Educational Review for 2013/2014 based on the advice presented within the NACI *Statement on Seasonal Influenza Vaccine for 2013-2014*.¹

- The seasonal trivalent vaccine for 2013-2014 available through the publicly funded UIIP as recommended by the WHO for the northern hemisphere contains 3 antigenic strains: an A/California/7/2009 (H1N1)pdm09-like virus; an A (H3N2) virus antigenically like cell-propagated prototype virus A/Victoria/361/2011 (A/Texas/50/2012 viruses, which are antigenically like the A/Victoria/361/2011, will be used in manufacturing the influenza vaccine); and a B/Massachusetts/2/2012-like virus (Yamagata lineage).
- The WHO recommends that where available, seasonal quadrivalent influenza vaccines for 2013-2014 contain the above three viruses and a B/Brisbane/60/ 2008-like virus. Quadrivalent influenza vaccines are not authorized for use in Canada as of June 2013.

⁶ World Health Organization – *Middle East respiratory syndrome coronavirus (MERS-CoV)* – update – December 2 2013

⁷ World Health Organization – *Novel Coronavirus Summary and Literature Update* – 8 May 2013

- There have been no changes in the recommended recipients for influenza vaccine since the Statement on Seasonal Influenza Vaccine for 2013-2014. However there is an updated outline for the following:
 - After careful review, NACI concluded that egg allergic individuals may be vaccinated against influenza using Trivalent Inactivated Influenza Vaccines (TIV) without prior influenza vaccine skin test and with the full dose, with consideration being given to the most appropriate setting for the vaccine administration. These individuals should always be kept under observation for 30 minutes post vaccination;
 - The influenza vaccine should not be given to people who have had an anaphylactic reaction to a previous dose or to any vaccine components, with the exception of egg;
 - Administration of seasonal influenza vaccine should usually be postponed in persons with serious acute illness until their symptoms have abated. Immunization should not be delayed because the minor acute illness, with or without fever. If significant nasal congestion is present that might impede delivery of Live Attenuated Influenza Vaccine (LAIV) to the nasopharyngeal mucosa, TIV can be administered or LAIV could be deferred until resolution of the illness;
 - The recommendations for the administration of LAIV for the following: for persons 2-59 years of age, children <24 months should not receive LAIV due to increased risk of wheezing also for children and adolescents (2-17) currently receiving aspirin or aspirin containing therapy due to the association of Reye's syndrome (there should be a delay of aspirin-containing products in children <18 years for 4 weeks after receipt of LAIV), and those persons with severe asthma or those with medically attended wheezing in the 7 days prior to vaccination;
 - Pregnant women, as there is a lack of safety data at this time but not contraindication for nursing mothers, and persons with immune compromising conditions due to underlying disease.

In their *Statement on Seasonal Influenza Vaccine for 2013-2014*; NACI considers **“the provision of influenza vaccination for HCWs involved in direct patient care to be an essential component of the standard of care for influenza prevention for the protection of their patients. HCWs who have direct patient contact should consider it their responsibility to provide the highest standard of care, which includes receiving annual influenza vaccination, refusal of HCW who have direct patient contact to be immunized against influenza implies failure in their duty of care to patients.”**¹

For the purposes of the document, NACI defines a HCW as a person who provides direct patient care as well as an individual who provides health services in an indirect fashion, such as a person who performs administrative activities. The term “direct patient contact” is defined as activities that allow opportunities for influenza transmission between HCWs and patients. Vaccination of paramedics should be encouraged in order to minimize the disruption of services and routine activities during annual epidemics. Employers and paramedics should consider yearly influenza immunization as this has been shown to decrease work absenteeism due to respiratory and other illnesses.¹

This Training Bulletin has been produced to provide paramedics with the information necessary to help limit the spread of influenza. This information is especially important since a substantial number of patients transported in ambulances each year are within the high risk categories. The information within the Routine Practices and Additional Precautions section of this bulletin is consistent with the *Ambulance Service Patient Care and Transportation Standards (revised October 2007)* and the *Infection Prevention and Control-Best Practices Manual for Land Ambulance Paramedics (March 2007)*.

What is Influenza?

Influenza, commonly referred to as the “flu”, is a highly contagious respiratory disease that is caused by the influenza virus and generally occurs each year in the late fall and winter months. There are three types of influenza viruses, Influenza A, B and C. Influenza is a respiratory infection caused by influenza A and B viruses. Influenza type C infections cause a much milder respiratory illness and are not thought to cause epidemics. Influenza A viruses are classified into subtypes on the basis of two surface antigens: hemagglutinin (H) and neuraminidase (N). Immunity to these antigens will reduce the likelihood of becoming infected and lessens the severity of the disease if infection does occur. Infection with a virus of one subtype gives little or no protection against viruses of other subtypes.

Furthermore, over time, influenza viruses can change or mutate. The most common way that a virus can change is called “antigenic drift”. The small changes that occur in the virus produce “new” virus strains that may not be recognized by the body’s immune system. Antigenic drift, which may occur in one or more influenza vaccine components, generally requires seasonal influenza vaccines to be reformulated annually. This is the main reason why people get influenza multiple times throughout their lifetime and why annual immunization is recommended.¹

More than 100 viruses are capable of causing respiratory infections with similar symptoms. Influenza vaccines provide protection from influenza only. This is the reason that people who receive the “flu vaccine” may still experience colds and influenza-like illness as other respiratory organisms can cause symptoms similar to influenza.

Identification of Influenza Strains for Seasonal Vaccine Purposes

Antigenic characteristics of current and emerging influenza strains are tracked by the WHO. This allows the WHO to recommend the most appropriate strains to be included in each year’s supply of influenza vaccine. All influenza vaccines include two strains of influenza A virus and one strain of an influenza B virus that the WHO predicts will best provide immunity to the influenza types determined to be associated with the 2013-2014 influenza season.

The publicly funded influenza vaccines offered through the UIIP will contain the three WHO recommended antigenic strains; an A/California/7/2009 (H1N1)pdm09-like virus; an A (H3N2) virus antigenically like cell-propagated prototype virus A/Victoria/361/2011 (A/Texas/50/2012 viruses, which are antigenically like the A/Victoria/361/2011, will be used in manufacturing the influenza vaccine); and a B/Massachusetts/2/2012-like virus (Yamagata lineage).¹

Seasonal Influenza Vaccine Effectiveness

Protection from the vaccine generally develops by two weeks after the vaccination, and may last up to one year in healthy adults and children. When there is a good match between circulating influenza virus and the vaccines for the current season, the vaccine is 70-90% effective in healthy children and adults. Systematic reviews have also demonstrated that influenza vaccine decreases the incidence and severity of pneumonia, hospital admission, work absenteeism and death in the elderly.¹

Best efforts are made to predict the upcoming year's circulating strain(s) and to include those strains in the vaccine, however, there may be influenza seasons where a good match is not achieved. In these seasons, the efficacy of the vaccine is not optimal, but still provides some measure of protection.

Each year there is a new vaccine to protect against the influenza virus strains that are expected in the coming influenza season. Even if the strains have not changed, getting the influenza vaccine every year is necessary to maximize protection.¹

Signs and Symptoms of Influenza

A person is considered contagious and can spread the influenza virus up to one (1) day before the onset of symptoms during the incubation period with a communicability of 3 to 7 days from clinical onset of symptoms.⁸ Heymann, 19th edition states; "The average incubation period is 1-2 days and the period of communicability is greatest in the first 3-5 days of illness but can last up to 10 days or longer in immune-compromised persons". Persons with sub-clinical infection are also capable of spreading the infection.² Influenza symptoms usually come on suddenly and may include any of the following signs and symptoms:

- Fever, chills
- Sore throat
- Headache
- Tiredness (can be extreme)
- Body aches
- Dry cough
- Loss of appetite
- Nasal congestion

Nausea, vomiting and diarrhea may accompany influenza infection, especially in children, but these are not common symptoms. Sometimes influenza can be mistaken for the common cold. However, in most cases influenza onset is faster and has more severe symptoms than a cold. Illness due to influenza usually lasts from three to five days; however, complete recovery can sometimes take one to two weeks. Complications of influenza include pneumonia, bronchitis, and sinus and ear infections. Influenza often exacerbates symptoms in people with chronic health problems such as asthma and chronic obstructive pulmonary disease (COPD), causing complications and possibly respiratory or heart failure. The seasonal influenza vaccine is an important protective resource that paramedics have access to every year, in time for the influenza season.

⁸ Public Health Agency of Canada. Influenza. [Internet]. Ottawa: [cited Oct. 11, 2011]. Available from: <http://www.phac-aspc.gc.ca/influenza/>

Modes of Influenza Virus Transmission

Influenza transmission occurs predominately by large respiratory droplets (particles $>5\mu$ [microns] in diameter) that are expelled from the respiratory tract during coughing or sneezing. Particles do not remain suspended in the air; however, people with the flu can spread it to others up to 2 metres away⁹. Transmission also occurs through direct contact with respiratory droplets/secretions or contaminated objects (including equipment), followed by touching one's nose, mouth or eyes. The influenza virus can survive for several hours on environmental surfaces.

Recommended Recipients of Seasonal Influenza Vaccine

All individuals aged 6 months or older, who live, work or attend school in Ontario and who have no contraindications and are planning on traveling internationally this year, regardless of whether or not they are considered to be at high risk or healthy, are encouraged to receive the publicly funded influenza vaccine through the UIIP).

In Ontario, the 2013/2014 seasonal influenza vaccine is recommended for the following groups according to the NACI:

1) People at high risk of influenza-related complications or hospitalization:

- Adults (including pregnant women) and children with the following chronic health conditions:
 - cardiac or pulmonary disorders (including bronchopulmonary dysplasia, cystic fibrosis and asthma);
 - diabetes mellitus and other metabolic diseases;
 - cancer, immune compromising conditions (due to underlying disease and/or therapy);
 - renal disease;
 - anemia or hemoglobinopathy;
 - conditions that compromise the management of respiratory secretions and are associated with an increased risk of aspiration;
 - morbid obesity (BMI ≥ 40); and
 - Children and adolescents with conditions treated for long periods with acetylsalicylic acid.
- People of any age who are residents of nursing homes and other chronic care facilities.
- People ≥ 65 years of age.
- All children 6 to 59 months of age.
- Healthy pregnant women (the risk of influenza-related hospitalization increases with increasing length of gestation; i.e. it is higher in the third than the second trimester).
- Aboriginal peoples.

⁹ Centers for Disease Control and Prevention. [Internet] Atlanta, GA.
Available from: <http://www.cdc.gov/flu/about/disease/spread.htm>

2) People capable of transmitting influenza to those at high risk:

- Health care and other care providers in facilities and community settings who, through their activities, are capable of transmitting influenza to those at high risk of influenza complications.
- Household contacts (adults and children) of individuals at high risk of influenza-related complications (whether or not the individual at high risk has been immunized):
 - household contacts of individuals at high risk as listed in the section above;
 - household contacts of infants <6 months of age as these infants are at high risk of complications but cannot receive influenza vaccine; and
 - members of a household expecting a newborn during the influenza season.
- Those providing regular child care to children ≤59 months of age, whether in or out of the home.
- Those who provide services within closed or relatively closed settings to persons at high risk (e.g. crew on ships).

3) Others:

- People who provide essential community services.
- People in direct contact during culling operations with poultry infected with avian influenza.

Note: Healthy persons aged 5 to 64 years without contraindication are encouraged to receive influenza vaccine even if they are not in one of the priority groups.

Note: Currently available influenza vaccines are not recommended for infants under 6 months of age.

Note: All children 6 to 59 months of age, regardless of chronic conditions, are recommended recipients of seasonal influenza vaccination. Accordingly, individuals providing regular child care to children 6 to 59 months, whether in or out of the home, are also recommended recipients of seasonal influenza vaccination.

Note: In the 2012-2013 statement, NACI recommends avoiding re-vaccination if Guillain-Barré Syndrome (GBS) developed within six weeks after a previous influenza immunization. This was changed from eight weeks.

Ways to Reduce the Risk of Influenza for You and Your Patient

Immunization

There is clear scientific evidence that immunization each year is the most effective way to prevent being infected with the influenza virus

In the NACI document titled *Statement on Seasonal Influenza Vaccine for 2013-2014*, the following statements are made:

- *“Vaccination is recognized as the cornerstone for preventing or attenuating influenza for those at high risk of serious illness or death from influenza infection and related complications”.*
- *“People who are potentially capable of transmitting influenza to those at high risk should receive annual vaccination regardless of whether the high risk person(s) is immunized”.*
- *“Transmission of influenza between infected HCWs and their vulnerable patients results in significant morbidity and mortality”.*
- *“In one study, 59% of HCWs with serologic evidence of recent influenza infection could not recall having influenza, suggesting that many HCWs experience subclinical infection”.*
- *“To reduce the morbidity and mortality associated with influenza, immunization programs should focus on those at high risk of influenza-related complications, those capable of transmitting influenza to individuals at high risk of complications and those who provide essential community services”.*

Let’s Get Fluless

The Province of Ontario has coordinated a “Let’s Get Fluless” campaign to encourage more health care workers across all health sectors to get the flu shot. The aim of the communication initiative by the Ministry of Health is to rally all health care workers towards getting the flu shot and keeping themselves, their patients and their families healthy. This is the first step in demonstrating a consolidated movement across all health care sectors to increase influenza immunizations in health care workers.¹⁰

Influenza Control Standard

For more information regarding the responsibilities of paramedics and ambulance service operators to prevent and control the spread of influenza, please refer to Section C (Influenza Control) of the *Ambulance Service Patient Care and Transportation Standards (revised October 2007)* and any updates to this standard as issued by the Ministry.

¹⁰ Ministry of Health and Long-Term Care – Let’s Get Fluless - 8 November 2013
Influenza Educational Review
Issue Number 102 - version 12. 0

Routine Practices and Additional Precautions

In addition to the requirements in Section C, the *Ambulance Service Patient Care and Transportation Standards* describe Routine Practices and Additional Precautions for preventing the transmission of infection, especially infectious respiratory diseases. Routine Practices are to be followed at all times.

Appropriate and consistent use of these practices not only reduces the incidence of cross infection of patients, especially the most vulnerable, but also the incidences of infection transmission to co-workers, family members and the public.

The following is a brief summary of Routine Practices and Additional Precautions (droplet/contact) that are to be followed at all times.

Hand Hygiene

Hand hygiene is the most important measure in preventing the spread of infection. The use of an alcohol-based hand rub containing 70-90% alcohol (isopropanol or ethanol) is the most effective method of hand hygiene as it kills organisms in seconds when applied correctly. Alcohol-based hand rubs are the preferred method for cleaning hands, with the exception of when hands are visibly soiled. When hands are visibly soiled, first remove the soil with a moistened towel/towelette followed by alcohol hand rub. Hands must be rubbed until completely dry. It is important not to touch one's face and mucous membranes (including eyes) with the hands until appropriate hand hygiene has been completed.

Washing hands with soap and water is an effective method to remove microorganisms. Soap suspends easily removable organisms from the skin and allows them to be rinsed off.

Hand hygiene shall be performed:

- before patient contact;
- after direct patient contact;
- after contact with blood, body fluids, secretions, excretions, items known or considered likely to be contaminated with secretions, etc;
- before contact with the paramedic's face;
- before cleaning/decontamination of equipment and vehicles;
- immediately after removing gloves and other protective equipment.

In addition to the points above, it is considered best practice to perform hand hygiene:

- any time hands are visibly soiled;
- before performing invasive procedures;
- before entering the emergency department;
- before leaving the emergency department;
- before and after handling food;
- before and after smoking;
- after using the bathroom, or other personal body functions (e.g. sneezing, coughing);
- at the end of a shift;
- whenever there is doubt about the necessity to do so.

For more information on hand hygiene practices, paramedics may wish to review the information included on the Ministry of Health and Long-Term Care “*Just Clean Your Hands*” website available at <http://www.health.gov.on.ca/en/ms/handhygiene/> and in the Provincial Infectious Diseases Advisory Committee (PIDAC) Hand Hygiene best practice document found at: www.amgh.ca/data/1/rec_docs/115_MOHLTC_Hand_Hygiene.pdf

Gloves

Gloves are to be used as an additional measure, not as a substitute for proper hand hygiene. Medical grade, non-latex, non-sterile gloves shall be worn when anticipating contact with blood, body fluids, secretions, excretions, mucous membranes or non-intact skin. In addition:

- gloves must cover the sleeve cuffs when a gown is worn;
- gloves should be changed between patient care activities and procedures with the same patient after contact with materials that may contain high concentrations of microorganisms such as after open suctioning of an endotracheal tube;
- hand hygiene must be performed immediately after removing gloves, before touching one’s nose, mouth or eyes, or touching another person;
- gloves should not be worn in the cab of an ambulance to prevent contamination of surfaces and equipment.

Gowns/Coveralls

Long-sleeved gowns or coveralls are to be worn to protect uncovered skin and to prevent soiling of clothes during procedures and patient care activities likely to generate splashes or sprays of blood, body fluids, secretions or excretions, which include cough producing and aerosol-generating procedures. Gowns should be securely tied at the neck and waist and discarded in an appropriate hazardous materials receptacle as soon as the interaction is complete.

Masks

Masks, protective eyewear or face shields shall be worn 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, which include cough-producing and aerosol-generating procedures.

However, to minimize the transmission of infectious respiratory diseases transmitted by large droplets, including influenza, a mask should be worn when face to face with patients exhibiting new onset cough or respiratory symptoms.

In the general health care setting, fluid resistant surgical masks are considered adequate to prevent transmission of respiratory infections spread predominantly by large droplets. However, in the pre-hospital setting where situations are often uncontrolled and procedures with potential for aerosolization are frequently carried out, the routine use of a Particulate Respirator Mask is accepted.

Masks should be:

- used and changed according to manufacturer's recommendations;
- removed carefully, using the straps so as not to self-contaminate;
- discarded if crushed, wet or contaminated by patient or paramedic's secretions;
- seal checked on each use (if a particulate respirator mask is used).

Appropriate hand hygiene needs to be performed after removal of the mask.

Particulate Respirator Mask

When in contact with patients in the pre-hospital setting presenting with respiratory symptoms suggestive of a respiratory infection, or when performing a procedure with potential for aerosolization, paramedics must wear a particulate respirator mask. Particulate respirator masks are designed to filter sub-micron particulate ranging in size from 0.1 to >10 microns.

In cases of airborne respiratory infection, such as tuberculosis or measles, standard surgical masks do not afford paramedics the necessary level of protection provided by a particulate respirator mask, because they filter less than 50% of airborne particles that are 1-5 microns in size. Standard surgical masks also do not provide an adequate facial seal necessary to prevent infection. The choice of particulate respirator mask must comply with the Particulate Respirator Mask minimum requirements, as listed in the *Provincial Equipment Standards for Ontario Ambulance Services, version 2.0*. This will ensure that the particulate respirator mask will filter a minimum of 95% of airborne particles, ranging in size from 0.1 to >10 microns to maximize protection for the paramedic.

Particulate respirator masks must be qualitatively fit tested and seal checked to ensure maximum respirator effectiveness. It is important that individuals perform a particulate respirator mask fit test to determine which respirator mask is best suited to their facial features and respiratory needs. Once the testing is complete, paramedics should note and use the appropriate style and size of particulate respirator mask assigned to them.

Protective Eyewear

Protective eyewear shall be utilized to prevent the exposure of the conjunctiva of the eyes from respiratory droplets that might contain infectious microorganisms. Paramedics should consider the following points with respect to eye protection:

- Prescription eye glasses do not provide adequate protection against splashes and sprays. Paramedics must utilize appropriate protective eyewear specifically designed to be worn over prescription eye glasses.
- Appropriate eye protection that does not impair vision and thereby interfere with patient care must be chosen.
- To prevent self-contamination, paramedics must not touch their eyes or face during care of a patient with a respiratory infection.
- Protective eyewear must be removed carefully to prevent self-contamination.
- Following the removal of eye protection, appropriate hand hygiene must be performed.

Masking of Patients with Symptoms of Respiratory Infection

As an added precaution, patients presenting with symptoms of an undiagnosed respiratory infection should be fitted with a surgical mask, if tolerated, to contain respiratory secretions.

Oxygen Administration for Patients with Symptoms of Respiratory Infection

The patient will wear:

- a surgical mask, if tolerated, with a nasal cannula if low concentration oxygen is required;
- low flow/high concentration oxygen mask outfitted with a hydrophobic submicron filter if high concentration oxygen is required;
- for patients requiring ventilatory assistance using a face mask or an endotracheal tube (ETT), a tube extender and a hydrophobic submicron filter shall be used. A tube extender is not necessary for pediatric patients and must not be used for any infants (<1 year old).

Use of Antiviral Agents for Influenza Prevention

There are a number of antiviral medications approved by the Public Health Agency of Canada for prophylactic use in the prevention of influenza virus infections. Prescriptions for antiviral agents, as for all other prescription medications, are the responsibility of the individual's physician. Paramedics should discuss the use of antiviral medications directly with their personal physician if they have been in direct contact with a person suspected with influenza. Antivirals should be started within 48 hours of contact with an ill, infectious person for maximum efficacy.¹¹ Antivirals can help reduce the severity of the illness and the recovery time.⁵

Paramedics should review the *Ambulance Service Patient Care and Transportation Standards (revised October 2007)* Section C – Influenza Control in relation to requirements for unvaccinated paramedics when providing patient care during declared outbreaks, including the use of antiviral medications and PPE.

¹¹ Aoki F, Allen U
The Use of Antiviral Drugs for Influenza: Guidance for Practitioners, 2010-2011
Available from: <http://www.ammi.ca/pdf/UseOfAntiviralDrugs.pdf>

Frequently Asked Questions

1. When is influenza season?

This will vary, but in Canada, influenza season usually runs from October to May.

2. Can getting the influenza vaccine cause me to come down with influenza?

No. The vaccine contains an inactivated influenza virus and therefore cannot cause influenza. Soreness at the injection site is the most common side effect and may last up to two days. Taking acetaminophen may prevent soreness at the injection site. Other potential side effects, such as allergic reactions, are rare.

3. How soon after vaccination will I be protected?

Protection is generally achieved two weeks following vaccination. However, sometimes individuals may acquire the influenza infection after vaccination, but the disease will be milder.

4. How effective is the seasonal influenza vaccine?

From the NACI statement on influenza vaccination: “Systematic reviews of randomized controlled trials in healthy children and adults show that inactivated influenza vaccine is about 70% - 90% effective in preventing laboratory-confirmed influenza infection”.

5. How are the components of the season influenza vaccine determined?

The World Health Organization (WHO) convenes technical consultations each year to recommend viruses for inclusion in influenza vaccines. The publicly funded influenza vaccines offered through the Universal Influenza Immunization Program (UIIP) will contain the three WHO-recommended antigenic strains for the 2013-2014 influenza season in the northern hemisphere; an A/California/7/2009 (H1N1)pdm09-like virus; an A (H3N2) virus antigenically like cell-propagated prototype virus A/Victoria/361/2011 (A/Texas/50/2012 viruses, which are antigenically like the A/Victoria/361/2011, will be used in manufacturing the influenza vaccine); and a B/Massachusetts/2/2012-like virus (Yamagata lineage).

6. Can pregnant women or women that are breast feeding be immunized for influenza?

Yes. The Trivalent Inactivated Influenza Vaccine (TIV) is recommended for pregnant and lactating women but there is not enough supporting safety data for pregnant women to receive the Live Attenuated Influenza Vaccine (LAIV). Current evidence indicates that influenza vaccine is safe for pregnant women at all stages of pregnancy and for breastfeeding mothers. The influenza vaccine is safe for use in the first trimester. In the past, there was a concern about the administration of the influenza vaccine during the first trimester due to a perceived association between receipt of the influenza vaccine and spontaneous abortion. This was found to be coincidental, not casual, as both conditions are common in the first trimester.

Frequently Asked Questions (continued)

7. Are there any contraindications and/or precautions for the influenza vaccine?

Egg allergy is no longer considered a contraindication for Trivalent Inactivated Influenza Vaccine (TIV). Egg-allergic individuals may be vaccinated against influenza. Individuals with egg allergy should arrange to be vaccinated in a medical clinic, allergy office or hospital where appropriate expertise and equipment to manage respiratory or cardiovascular compromise is available.

All influenza vaccines currently available in Canada are considered safe for use in the persons with latex allergy.

The influenza vaccine should not be administered to those with severe anaphylactic reaction to a previous dose or to any vaccine component, with the exception of egg.

Persons with an acute febrile illness should wait until their fever has abated to be vaccinated.

8. I've heard that the influenza vaccine can cause Guillain-Barré syndrome (GBS). Is this true?

Severe allergic reactions to flu shots are rare. A rare but possible side effect of influenza vaccination is Guillain-Barré syndrome (GBS). This is an autoimmune disease that attacks the nervous system and results in weakness and abnormal sensations. Most patients recover fully. GBS is a very uncommon disease that causes muscle paralysis and has been associated with certain infectious diseases (e.g. Campylobacter bacteria). Overall, the risk of GBS occurring in association with immunization is small in comparison to the small risk of GBS. The risk of illness and death associated with influenza is much greater compared to the risk of GBS.

According to the National Advisory Committee on Immunization (NACI), 2012; the risk of GBS following influenza vaccination is about one case per 1 million vaccines given.

9. Why should I get the influenza vaccine every year?

Every year the influenza vaccine is updated to address the fact that influenza viruses mutate and the influenza vaccine is prepared to include the current and anticipated strains of viruses for the upcoming influenza season. The vaccine used in previous years may not protect against a newer virus. As well, your immunity to influenza declines over time and may be too low to afford adequate protection after one year.

Frequently Asked Questions (continued)

10. If I get the influenza vaccine every year, will my immune system become weaker, and will I get sick?

The influenza vaccine protects you for the coming season. It does not weaken your ability to fight the flu or other infections. Getting a flu shot every year has been shown to be your best protection against the flu and possibly against passing it on to your patients or to others.

11. I exercise, eat well and take vitamins. Isn't this enough to protect me from influenza?

While a healthy lifestyle can strengthen your defense system in general, it cannot protect you from a specific infectious agent (bacteria or virus).

12. I understand that an intranasal mist influenza vaccine is now available. Would the use of this type of product be suitable for paramedics?

The intranasal mist vaccine is not publicly funded under the Universal Influenza Immunization Program (UIIP). Currently, only the Trivalent Inactivated Influenza Vaccine (TIV) is publicly funded under the UIIP. The intranasal vaccine is a Live Attenuated Influenza Vaccine (LAIV) and is only available through the private market.

According to the NACI *Statement on Seasonal Influenza Vaccine for 2013-2014*, both children and adults can shed vaccine viruses after vaccination with a LAIV. However, frequency of shedding decreases with increasing age and time from vaccination.

NACI recommends that a TIV, instead of LAIV, be used for HCWs who provide care to individuals with immune compromising conditions, unless the HCW will only accept LAIV. If a HCW or other person receives LAIV and is providing care to individuals with severe immune compromising conditions, they should wait two weeks following receipt of LAIV (i.e., intranasal mist) before continuing to provide care to such individuals.

13. Where can I go to receive the influenza vaccine?

The seasonal influenza vaccine is available through your local public health unit or your family physician.

To find locations of influenza immunization clinics near you, please contact your local public health unit. A list of health units can be found at:

<http://www.health.gov.on.ca/en/public/programs/publichealth/flu/clinics.aspx>.

Frequently Asked Questions (continued)

14. Is there a link between the influenza vaccine and an increased risk of Alzheimer's disease?

There is no evidence that influenza vaccine increases the risk of Alzheimer's disease. Alzheimer's is a complex illness involving damage to and degeneration of the neurons within the brain. Its cause isn't fully understood, however it may be due to abnormal protein (amyloid) deposits and inflammation in the brain. While it was once thought that aluminum contributed to this process, most experts believe that there is no clear evidence to support this theory. Moreover, the vaccine does not contain aluminum.

15. The influenza vaccine from the multi-dose vial contains trace amounts of thimerosal; is thimerosal toxic?

Thimerosal is a preservative used in minute quantities in several influenza vaccines. Thimerosal contains *ethyl* mercury, which is structurally different than methyl mercury.

It is important to note that the minute amount of ethyl mercury in the vaccine and the daily average intake for mercury (from food) totals less than the daily tolerated amount defined by national guidelines. There is no evidence that the mercury in thimerosal is harmful at such low levels.

References

For further information on the prevention of disease transmission, including influenza, paramedics are encouraged to review the following documents:

National Advisory Committee on Immunization (NACI)
Statement on Seasonal Influenza Vaccine for 2013-2014
<http://www.phac-aspc.gc.ca/naci-ccni/>

Ministry of Health and Long-Term Care- Flu – Ministry Programs – Health Care Professionals
Let's Get Fluless
<http://www.health.gov.on.ca/en/pro/programs/publichealth/flu/healthcareworkers.aspx>

Ministry of Health and Long-Term Care
Just Clean Your Hands
<http://www.health.gov.on.ca/en/ms/handhygiene/>

Ministry of Health and Long-Term Care - Emergency Health Services Branch
Ambulance Service Patient Care and Transportation Standards (revised October 2007)
http://www.ambulance-transition.com/pdf_documents/amb_service_patient_care_transportation_standards.pdf

Ministry of Health and Long-Term Care - Emergency Health Services Branch
Infection Prevention and Control
Best Practices Manual for Land Ambulance Paramedics (March 2007)
http://www.ambulance-transition.com/pdf_documents/infection_prevention_&_control_best_practices_manual.pdf

Ministry of Health and Long-Term Care – Emergency Health Services Branch
Preventing and Assessing Occupational Exposures to Communicable Diseases (January 1996)
http://www.ambulance-transition.com/pdf_documents/occupational_exposure_to_selected_communicable_diseases.pdf

Ministry of Health and Long-Term Care – Emergency Health Services Branch
Basic Life Support Patient Care Standards, Version 2.0 (January 2007)
http://www.ambulance-transition.com/pdf_documents/bls_patient_care_standards_2.0.pdf

World Health Organization – 8 May 2013 and 2 December 2013
Global Alert and Response (GAR) Novel Coronavirus Summary and Literature Update and Middle East respiratory syndrome coronavirus (MERS-CoV) - Update
www.who.int/entity/csr/disease/coronavirus_infections/en/

