

## **18A. Pediatric Services Tools**

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## When Your Child is Sick with Uncomplicated Influenza

This fact sheet provides information for parents and caregivers about managing signs and symptoms of uncomplicated influenza at home.

### Influenza in Children

Older children and teens have the same symptoms of influenza as adults. Very young children and infants probably have similar symptoms, but do not know how to tell people they have sore muscles or a headache. These children may be irritable and eat poorly. They sometimes develop a hoarse cry and barking cough (croup). Younger children – particularly children under 6 months old – may also have diarrhea, vomiting and stomach pain.

### What You Can Do For Your Child

- Give acetaminophen or ibuprofen for fever and muscle pain in the dose recommended on the package (unless your doctor says otherwise). **DO NOT GIVE ASPIRIN.**
- Children under 18 should not take acetylsalicylic acid (ASA) or products contacting ASA.
- Your pharmacist can provide advice on appropriate over-the-counter medications for treating fever.
- Do not expect to be prescribed antibiotics for uncomplicated influenza, as they will not help. Antibiotics may be prescribed for complications of influenza such as pneumonia or ear infection.
- Dress the child in lightweight clothing and keep the room temperature at 20° C.
- Offer cool fluids frequently when the child is awake. Extra fluids are needed to replace what is lost in sweating. If your child's urine is darker than usual, he/she needs more to drink.
- Avoid cool baths.

- Allow the child to rest and stay at home if possible for 6 days or more, so the virus isn't spread to other children.
- Use salt-water nose drops to treat a stuffy nose.
- Teach the child to cover his/her mouth and nose with a tissue when coughing or sneezing and then to throw the tissue away.
- Wash your hands often with soap and warm water or an alcohol-based hand sanitizer and teach your child to do the same after wiping the nose.
- If you don't have a tissue, cough or sneeze into your upper arm, not into your hands and teach your child to do the same.
- Don't share eating utensils (e.g., cups or straws), toothbrushes or towels with your child.

### When to Seek Medical Care

Use the following decision-making tools to help you decide when to seek medical care:

**When to seek medical care for an infant or young child (under age 6)**

**When to seek medical care for older children or adolescents (6-16 years old)**

### For More Information

Visit our website at:

[www.health.gov.on.ca/pandemic](http://www.health.gov.on.ca/pandemic)

**INFOline:** 1-866-801-7242

TTY 1-900-387-5559

**Telehealth:** 1-866-797-0000

TTY : 1-866-797-0007

## Measuring a Child's Temperature and Breathing

This fact sheet provides information for parents and caregivers about how to take a temperature and how to measure breathing in children

### Ways to Take a Temperature

There are 3 ways to take a child's temperature:

- by the mouth (oral)
- under the armpit (axillary)
- in the ear (tympanic)

The best method to choose for an exact reading depends on your child's age:

Age	Best	2 <sup>nd</sup> Best	3 <sup>rd</sup> Best
Birth - 2	<b>Armpit</b>		
2 - 5	<b>Ear</b>	Armpit	
5 - adult	<b>Mouth</b>	Ear	Armpit

### What is a Normal Temperature?

**Mouth:** 35.5°C to 37.5°C (95.9°F to 99.5°F)

**Armpit:** 34.7°C to 37.3°C (94.5°F to 99.1°F)

**Ear:** 35.8°C to 38°C (96.4°F to 100.4°F)

### Types of Thermometers

There are two types of thermometers for taking temperatures by mouth and armpit:

- a glass thermometer has a long slender bulb at one end, containing mercury. As the mercury expands, in response to the heat from the child's body, it moves up the column. Use of a glass thermometer is not recommended for children under 5 since they may bite down, breaking the glass and injuring themselves. If you are purchasing a glass thermometer, look for one with a mercury column that is easy to see, and degree markings that are easy to read.
- a digital thermometer is made of sturdy plastic, is easy to read and measures temperature faster than glass.

Ear thermometers are available but are expensive.

**A fever strip is not recommended** because it does not give an accurate temperature reading.

Ask the pharmacist any questions you may have when you purchase your thermometer.

### How to Take a Child's Temperature

#### Mouth Method (Oral)

*If you are using a glass thermometer:*

Note: this method is **not recommended** for children **under 5 years of age**.

- Be sure it is an oral thermometer
- Clean the thermometer with cool, soapy water and rinse (hot water causes the mercury to expand and may burst the thermometer)
- Hold the thermometer at the end away from the mercury and shake it with firm downward flicks of the wrist so that the mercury goes below 36°C (96.8°F).
- Do not give the child cold or hot liquids for half an hour before taking his/her temperature.
- Carefully place the tip of the thermometer under the child's tongue. Tell him/her to close the mouth but not to bite down.
- With the child's mouth closed, leave the thermometer in place for 3 to 4 minutes. Stay with child and make sure he/she remains still.
- Remove thermometer; hold it near the light and slowly turn it until the line of mercury is seen. Read the thermometer where the line of mercury ends.
- Clean the thermometer with cool soapy water and rinse. Use a cotton swab soaked in alcohol to rub down the thermometer
- Store the thermometer in a container to prevent breakage.

*If you are using a digital thermometer:*

- Press the button to turn the thermometer "on".
- Put the thermometer tip under your child's tongue and tell him/her to close the mouth.
- Wait for the thermometer to beep.
- Read the temperature on the display.

- Press the button to turn the thermometer off.
- To clean a digital thermometer, wash only the tip with soap and warm (not hot) water and wipe off with alcohol after use. Dry well.

**Armpit Method (Axillary)**

*If you are using a glass thermometer:*

- Clean the thermometer and shake down the mercury as in “mouth method”.
- Place the silver tip of the thermometer in the center of the armpit.
- Make sure your child’s arm is tucked snugly against his/her body.
- Leave the thermometer in place for at least 4 minutes.
- Remove, read, clean and store the thermometer as in “mouth method”.

*If you are using a digital thermometer:*

- Press the button to turn the thermometer “on”.
- Put the thermometer under your child’s armpit. The silver tip must touch the skin.
- Hold the top of the thermometer with one hand and hold down your child’s arm with the other hand.
- Wait for the thermometer to beep.
- Read the temperature on the display.
- Press the button to turn the thermometer off.
- To clean a digital thermometer, wash only the tip with soap and warm (not hot) water and wipe off with alcohol after use. Dry well.

**Ear Method (Tympanic)**

*If you are using an ear thermometer:*

- Note: This method is not recommended for children under one year of age.
- Use a clean probe tip each time, and follow the manufacturer’s instructions carefully.
- Gently tug on the ear, pulling it up and back. This will help straighten the ear canal, and make a clear path inside the ear to the eardrum.
- Gently insert the thermometer until the ear canal is fully sealed off.

- Squeeze and hold down the button for one second.
- Remove the thermometer and read the temperature.

**How to Measure Breathing**

- For older children watch the chest rise and fall. Use a watch or clock and count the number of times the chest rises (or expands) in one minute (60 seconds).
- Children and infants use their stomachs to breathe. You should uncover the child so you can see their stomach. Count the number of times the stomach or chest rises in 60 seconds using a watch or clock.
- Compare the number you counted to the chart below. If the child’s breathing rate is equal to or higher than the number in the chart, it is a sign your child is having trouble breathing and you should seek medical attention.
- If the child has other symptoms or behaviors you are concerned about, contact your doctor or Telehealth for advice.

Age	Number of breaths per minute
< 2 months	> 60
2-12 months	> 50
12 months- 5 years	> 40
>5 years	> 30

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## What to do for Fever in Children

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This fact sheet provides information for parents and caregivers about what to do when a child has a fever.

### If Your Child Has a Fever

- Take off heavy clothing and blankets.
- Dress the child in lightweight clothing and keep the room temperature at 20° C.
- Give lukewarm sponge or tub baths. Avoid cool baths and never use alcohol rubs to bring down a fever.
- Offer cool fluids frequently when the child is awake.
- Give acetaminophen or ibuprofen for fever and muscle pain in the dose recommended on the package (unless your doctor says otherwise). **DO NOT GIVE ASPIRIN.** Children under 18 should not take acetylsalicylic acid (ASA) or products containing ASA. Your pharmacist can provide advice on appropriate over-the-counter medications for treating fever.
- Allow the child to rest and stay at home if possible for 6 days or more, so the virus isn't spread to other children.
- Teach the child to cover his or her mouth and nose with a tissue when coughing or sneezing and then to throw the tissue away.
- Wash your hands often with soap and warm water or an alcohol-based hand sanitizer and teach your child to do so after wiping the nose.
- If you don't have a tissue, cough or sneeze into your upper arm, not into your hands and teach your child to do the same.
- Don't share eating utensils (e.g., cups or straws), toothbrushes or towels with your child.
- See *How to Take a Temperature*

### What are Fever Seizures?

A fever seizure is a convulsion (a fit) in a child caused by a rapid rise of body temperature to over 39° C (102.2° F). Most seizures occur within the first day of the child becoming sick and not always when the fever is the highest. Sometimes the seizure is the first sign of a fever in an infant or child.

### Signs of a Fever Seizure

Your child may:

- Experience sudden stiffness of the muscles of the face, arms, or legs on both sides of the body.
- Begin to have jerky movements.
- Fall if standing
- May pass urine.
- Stop breathing and may begin to turn blue.
- Not respond to voice or touch.
- Cry or moan.

A **simple fever seizure** will stop by itself with a few seconds to 5 minutes. It is followed by a brief period where the child is sleepy or confused.

A **complex fever seizure** lasts longer than 15 minutes, occurs unevenly affecting one part of the body more than the rest, or happens again during the same illness.

### If Your Child Has a Fever Seizure

- Stay calm.
- Leave your child on the floor (you may want to slip a blanket under the child if the floor is hard).

- Loosen tight clothing, especially around the neck.
- Move the child only if he or she is in a dangerous location.
- Turn the child on his or her side or stomach to protect the head and to prevent the child from choking if he or she throws up.
- Don't hold your child down.
- Don't force anything into the mouth as this increases the risk of injury.
- Observe the child closely and time the fever seizure so you can tell the doctor what happened.

#### **When to Seek Medical Attention**

- If the child recovers on his/her own, call your doctor or Telehealth for advice.
- Take your child to see a doctor as soon as possible after the first fever seizure.
- If the seizure lasts longer than 5 minutes, call 911 and have an ambulance take your child to the hospital.

- If your child has repeated seizures during the same illness or if this looks like a new type of seizure for your child, take the child to see a doctor.

#### **Managing Further Fever Seizures**

If your child has a history of fever seizures and has a fever:

- Give your child acetaminophen at the first sign of fever.
- Sponge or bathe your child in lukewarm water; you may want to apply cool washcloths to the forehead and neck.
- Offer your child cool drinks.

#### **For More Information**

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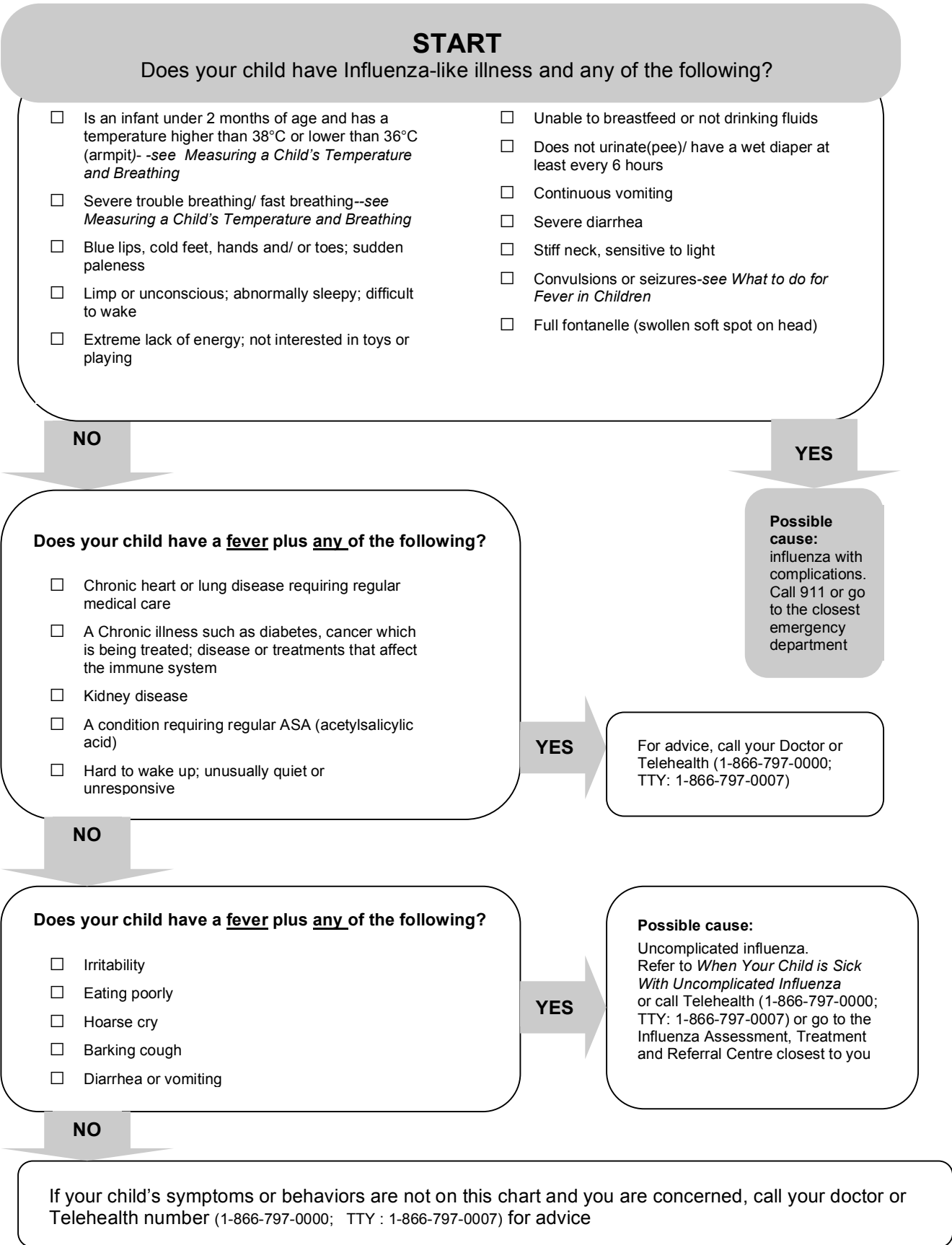
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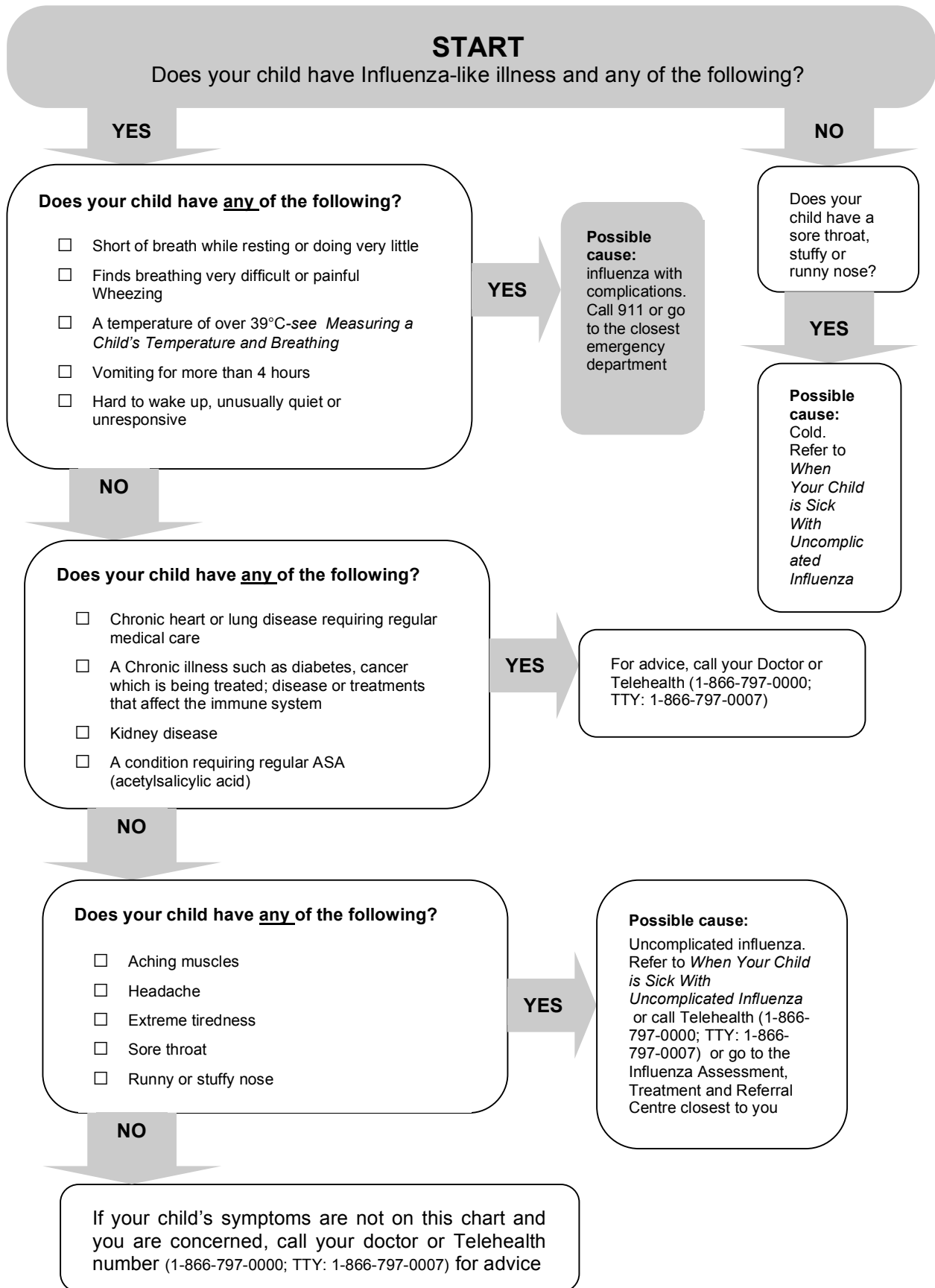
**Telehealth:** 1-866-797-0000

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# When to seek medical care for an infant or young child (to 6 years old) with Influenza-like illness



When to seek medical care for an **older child (to 6-16 years old)**  
with Influenza-like illness



## Diagnosing and Managing Paediatric Influenza

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This fact sheet provides information for health care providers about signs, symptoms and management of influenza in children during a pandemic.

### Influenza in Children

Children have the highest attack rates of influenza and could be major disseminators of the virus during a pandemic. Although uncomplicated influenza in children may be similar to the disease in adults, there are some age related differences in toddlers and infants.

- Young children usually develop higher temperatures (over 39.5° C) and may have febrile seizures.
- Unexplained fever can be the only manifestation of the disease in neonates and infants.
- Influenza viruses are an important cause of the common cold, pneumonia, laryngotracheobronchitis (croup), and bronchiolitis in young children.
- Invasive bacterial infection with respiratory pathogens (i.e., group A streptococcus, *Staphylococcus aureus*, *Streptococcus pneumoniae*) can occur with influenza virus infection and cause severe disease.
- 40 to 50% of young children (mainly occurring in children under age 3) will have gastrointestinal manifestations such as nausea, vomiting, diarrhea, and abdominal pain.
- Otitis media and non-purulent conjunctivitis occur more frequently in young children.
- A variety of central nervous system findings, including apnea, opisthotonos, and seizures can occur in a small proportion of infants with influenza. Children may also present with symptoms suggestive of meningitis, such as headache, vomiting, irritability, and photophobia.

- Myositis is a complication in young children.
- Respiratory illness caused by influenza is non-specific in children and can be difficult to distinguish from illness caused by other respiratory pathogens on the basis of symptoms alone. Many viral infections (respiratory syncytial virus - RSV, human metapneumovirus, parainfluenza, adenovirus, and rhinovirus), as well as other pyrexial diseases, can cause an illness that is clinically indistinguishable from influenza.

### Influenza Symptoms in Children Under 5

The most common presentation of influenza is sudden onset of fever and cough. Young infants (less than 2 months of age) can become ill and progress to severe illness rapidly. They are also much less likely to cough and frequently have only non-specific signs such as poor feeding, apnea, fever or low body temperature.

The term acute respiratory illness (ARI) is used to specifically refer to influenza-like illness in young children (less than 5 years of age) since the most distinguishing features in adults are not present until children reach the age of 10.

Symptoms of ARI include:

- fever (more than 38° C core temperature)
- apnea
- cough
- nasal congestion and/ or rhinorrhea
- difficulty breathing
- tachypnea
- hoarse voice
- ear ache.

Other associated non-respiratory symptoms of influenza in children include:

- malaise
- lethargy
- lack of interest in toys or play
- needing extra care
- poor feeding
- vomiting or diarrhea
- general irritability or excessive crying.

### **Influenza Symptoms in Children Over 5**

The most frequent symptoms in children over age 5 and adolescents include fever, chills, cough, non-localized throbbing headache, myalgia, and sneezing. The fever usually ranges from 38 to 40 ° C and a second peak, without bacterial superinfection, may occur around the fourth day of illness. Back ache, sore throat, conjunctival burning with watery eyes and epistaxis may be present, but gastrointestinal symptoms are infrequent. Chest auscultation is usually normal but occasionally coarse breath sounds and crackles may be heard.

### **Children at Risk of Influenza-Related Complications**

The Canadian National Advisory Committee on Immunization (NACI) considers the following groups of children to be at increased risk for complications from influenza. These include children between the ages of 6 and 23 months, as well as those (of any age) with:

- Chronic cardiac or pulmonary disorders (including bronchopulmonary dysplasia, cystic fibrosis, asthma) severe enough to require regular medical follow-up or hospital care.
- Chronic conditions such as diabetes mellitus, other metabolic diseases, cancer, immunodeficiency, immunosuppression, renal disease, anemia, hemoglobinopathy.
- Conditions treated with acetylsalicylic acid (e.g., Kawasaki disease, juvenile

rheumatoid arthritis, acute rheumatic fever) which may increase the risk of Reye's syndrome after influenza.

### **Signs of Influenza-Related Complications in Children**

Children, especially those younger than age 2, are particularly susceptible to complications arising from influenza. Because they may not be able to vocalize their distress, it is critical that healthcare providers are familiar with the symptoms that may suggest influenza-related complications.

For children under the age of 5 signs include:

- difficulty breathing (i.e. chest indrawing, nasal flaring, grunting, stridor, wheezing, tachypnea)
- cyanosis; sudden pallor, cold legs up to the knees
- oxygen saturation level of <93% on room air
- fever or low temperature
- inability to breastfeed or drink
- persistent vomiting (more than 2-3 times in 24 hr)
- fewer than 4 wet diapers in 24 hours
- lethargy or confusion
- abnormal sleepiness or difficult to wake
- unconsciousness
- convulsions or seizures
- full fontanelle
- stiff neck
- photophobia
- signs of pneumonia on clinical examination or chest x-ray

When these signs are present in infants less than 2 months of age, they suggest severe disease which may be life threatening.

Based on their clinical judgment, physicians may choose to refer paediatric patients who present with any of the aforementioned signs and symptoms of influenza on to the

next level of care (i.e. hospital; emergency department) for further assessment and treatment. In some cases children with uncomplicated influenza infections may be sent home if their condition is sufficiently stable and parents are provided education for managing the child at home.

### Influenza Anti-virals for Children

The indications for provision of antiviral therapy should be based on the recommendations of the Ontario Ministry of Health and Long Term Care at the time of a pandemic. As a guide however, the following table provides an overview of possible antiviral agents that may be prescribed in select pediatric patients.

Currently oseltamivir is the recommended antiviral medication for the treatment of children with influenza over age 1. No antiviral medications are currently approved for use in infants under 1 year of age. The potential for neurotoxicity with oseltamivir in this age group is of particular concern. The mainstay of management for children less than 12 months of age is supportive. Treatment of complications, such as secondary bacterial pneumonia, is essential. Infants less than 12 months of age with severe illness and/or co-morbidities, for whom antiviral therapy is thought to be warranted, should be referred to an infectious diseases expert for careful consideration of such therapy

Similar consultation regarding the potential use of oseltamivir should be sought for pregnant women with severe illness or if the pandemic strain shows spread beyond the respiratory tract.

Antiviral Agent	Dose	Recommendations
Oseltamivir	2mg/kg/dose divided b.i.d. (max. 75 mg/dose for 5 days)	Recommended 1 <sup>st</sup> line therapy for all patients except those <12 months of age, with creatinine clearance <10 ml/min, on dialysis, or if pregnant/ breast feeding. WARNING: not for use in children <12 months of age.
Zanamir	2mg/kg/dose divided b.i.d. (max. 75 mg/dose for 5 days)	Recommended if creatinine clearance <10 ml/min, on dialysis or pregnant/ breast feeding; children < age 7 unlikely to perform inhalation effectively. WARNING: use with caution in patients with reactive airways.
Amantadine	2mg/kg/dose divided b.i.d. (max. 75 mg/dose for 5 days)	Recommended 2 <sup>nd</sup> line therapy for non-avian influenza virus infections; not approved for children < 12 months of age. WARNING: not effective for H5N1 avian influenza.

The most common side effects observed in children who are treated with oseltamivir include vomiting, abdominal pain, epistaxis, ear disorder and conjunctivitis. It is reported that these side effects generally occur once and resolve despite continued dosing in children.

### Influenza Education for Child Care at Home

Children with uncomplicated influenza infections may be sent home, after parents have been advised on the following:

- How to maintain hydration
- Fever management
- Watching for signs of deterioration or failure to improve
- A follow-up plan (if necessary)
- Immunization or prophylactic treatment of high risk contacts in the household

- Infection control practices (i.e. avoiding close contact with others, hand hygiene, respiratory etiquette etc)
- When to return to the health centre (i.e. if child's condition worsens; does not feed well; if breathing becomes difficult).

#### **Fact Sheets for Parents and Caregivers**

The following fact sheets for parents and caregivers can help support influenza education associated with managing the sick child at home:

*When your Child is Sick with Uncomplicated Influenza*

*Measuring a Child's Temperature and Breathing*

*What to do for Fever in Children*

*When to seek medical care for an infant or young child (under age 6)*

*When to seek medical care for older children or adolescents (6-16 years old)*

#### **For More Information**

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# Decision Making Tool for Referral of Pediatric Patients with Influenza-like illness

## Influenza Assessment\*

*During an influenza pandemic, children presenting with fever and symptoms suggestive of influenza will require assessment and possible referral to Hospital or to an Influenza Assessment, Treatment and Referral Centre.*

### Clinical “Red Flags”

- Cyanosis, pallor; mottled; capillary refill >2 seconds
- Elevated heart rate
  - Neonate: > 180 beats/ min
  - 1-12 mos: > 160 beats/ min
  - 1-4 yrs: > 130 beats/ min
  - 5-6 yrs: > 120 beats/ min
  - > 6 yrs: > 100 beats/ min
- Difficulty breathing (i.e. intercostal indrawing, nasal flaring, grunting, stridor, crackles; wheezes; chest pain)
- Elevated respiratory rate
  - < 2 mos: > 60 / min
  - 2-12 mos: > 50 / min
  - 1-5 yrs: > 40 / min
  - > 5 yrs: > 30 / min
- Extreme lethargy; not interested in toys or playing difficult to wake; Limp or unconscious
- Unable to breastfeed or drink effectively
- Does not urinate at least every 6 hours
- Persistent vomiting (>2-3 times/ 24hrs); feeding poorly
- Severe diarrhea
- Stiff neck, photophobia
- Seizure
- Temperature instability (< 35°C; >39°C)

### High Risk Patients

- Chronic cardiac or pulmonary disease requiring regular medical care
- Chronic illness such as diabetes, cancer, immunodeficiency, immunosuppression
- Renal disease
- A condition requiring regular ASA (acetylsalicylic acid)

**Possibly Unstable**

**Consider referral to Hospital** for further assessment and treatment

**Presence of risk factors**

**Consider referral to Hospital** if clinical status warrants further assessment and treatment

**Consider Discharge Home** with relevant information sheets/ education; antiviral and/ or antibiotic therapy if clinical status warrants

### Uncomplicated influenza

**Consider Discharge Home** with relevant information sheets/education; antiviral and/ or antibiotic therapy if clinical status warrants

\* Refer to Pediatric Pandemic Influenza Office Assessment Form

## Paediatric Pandemic Influenza Office Assessment Form

### History & symptoms

Fever	<input type="checkbox"/>	Chills	<input type="checkbox"/>	Sore throat	<input type="checkbox"/>	Cough	<input type="checkbox"/>	Coryza	<input type="checkbox"/>
Stuffy nose	<input type="checkbox"/>	Dyspnea	<input type="checkbox"/>	Chest pain	<input type="checkbox"/>	Myalgia	<input type="checkbox"/>	Arthralgia	<input type="checkbox"/>
Headache	<input type="checkbox"/>	Vomiting	<input type="checkbox"/>	Confusion	<input type="checkbox"/>	Lethargy	<input type="checkbox"/>	Diarrhea	<input type="checkbox"/>

### Underlying medical condition(s)

### Medications

### Allergies

### Physical examination

*\* if available*

Temp.: \_\_\_\_\_ °C    RR \_\_\_\_\_/min    HR \_\_\_\_\_/min    BP \_\_\_\_/\_\_\_\_ mmHg    Weight \_\_\_\_\_ kg    O<sub>2</sub> Sat\* \_\_\_\_\_

HEENT \_\_\_\_\_ Genitourinary \_\_\_\_\_

Respiratory \_\_\_\_\_ Skin \_\_\_\_\_

Cardiovascular \_\_\_\_\_ Musculoskeletal \_\_\_\_\_

Abdomen \_\_\_\_\_ Neurological \_\_\_\_\_

### Disposition (please refer to second page of form for guidelines)

**Discharge home**    Suspected influenza    Yes  No

Information sheet(s) provided     When Your Child is Sick With Uncomplicated Influenza  
 Measuring a Child's Temperature and Breathing  
 What to do for Fever in Children  
 When to Seek Care Over 6  
 When to Seek Care Under 6

Antiviral therapy    Yes  No     **Oseltamivir**    Yes  No   
Dose: \_\_\_\_\_ mg b.i.d.  
**Zanamavir**    Yes  No   
Dose: 10 mg oral inhalation b.i.d.  
**Amantadine**    Yes  No   
Dose: \_\_\_\_\_ mg b.i.d.

Antibiotic therapy    Yes  No   
Agent and dose: \_\_\_\_\_

Follow-up appointment    Yes     Follow-up in \_\_\_\_\_ days  
As needed

**Referred to Hospital** for further assessment and treatment

Reason for referral    High risk medical condition      
Clinical features requiring further assessment   

\_\_\_\_\_  
Physician name

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date (d/m/y) & Time

## Criteria for assessing paediatric patients with suspected pandemic influenza

### High-risk patients

Includes, but is not restricted to, primary or secondary immune deficiency states, malignancy, chronic cardiac, pulmonary (including moderate to severe asthma), renal, liver or neurological conditions, diabetes mellitus.

All high-risk patients with significant illness should be referred to a Hospital for further evaluation.

### Physical examination

Temperature	<35.0°C or >39.0°C	Skin color	Cyanosis; pallor; mottled; capillary refill > 2 seconds
Pulse	Neonate: >180 beats/minute 1-12 months: >160 beats/minute 1-4 years: >130 beats/minute 5-6 years: >120 beats/minute >6 years: >100 beats/minute	Chest signs & symptoms	Increased work of breathing; grunting; nasal flaring; intercostal indrawing; crackles, wheezes or dullness to percussion on auscultation; chest pain
BP	Systolic BP < 80 + 2*age (years) <sup>+</sup> Symptomatic hypotension  <sup>+</sup> <i>Not applicable to neonates or young infants</i>	Mental status	Lethargic or unconsciousness; confused; irritability
RR	< 2 months: >60/min 2-12 months: >50/min >12 months to 5 years: >40/min >5 years: >30/min	Hydration	Unable to breast feed or drink effectively; persistent vomiting; feeding poorly

Children with one or more of the above clinical findings should be considered for referral to a Hospital for further assessment; referral may also be considered for children not meeting these criteria but who are thought (based on clinical judgment) to warrant such an assessment. A low threshold for referral is recommended or all children <12 months of age irrespective of clinical status.

*It is recognized that physicians may choose not to refer selected patients who fulfill one or more of the above criteria based on clinical judgment (i.e. appear well)*

### Antiviral therapy

Indications for antiviral therapy should be based on real time Ministry of Health recommendations

#### Antiviral agents

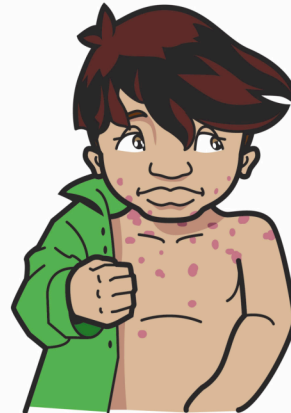
Oseltamivir	2 mg/kg/dose divided b.i.d (maximum 75 mg/dose) for 5 days	Recommended as first line therapy for all patients unless <12 months of age, CrCl < 10 ml/min, on dialysis, or if pregnant/breast feeding  <b>WARNING:</b> Oseltamivir should not be used in children < 12 months of age*
Zanamivir	10 mg (2 inhalations) b.i.d. for 5 days	Recommended if CrCl < 10 ml/min, on dialysis or pregnant/breast feeding; children < 7 years of age unlikely to be able to perform inhalation effectively  <b>WARNING:</b> Zanamivir should be used with caution in patients with reactive airways
Amantadine	2.5 mg/kg b.i.d. (maximum 150 mg/day if < 10 years of age; 200 mg/day if ≥10 years of age)	A second line agent for non-avian influenza virus infections; not approved for children < 12 months of age*  <b>WARNING:</b> Not effective for H5N1 avian influenza

*\*The mainstay of management for children less than 12 months of age is supportive. Treatment of complications, such as secondary bacterial pneumonia, is essential. Infants with severe illness and/or co-morbidities, for whom antiviral therapy is thought to be warranted, should be referred to an infectious diseases expert for careful consideration of such therapy.*

### Antibiotics

Antibiotic therapy for suspected secondary bacterial pneumonia may be considered in selected cases. The main pathogens that would need to be considered include *Streptococcus pneumoniae*, *Staphylococcus aureus*, *Streptococcus pyogenes* and non-typable *Haemophilus influenzae*.

## Paediatric Specific Passive Screening Signage



**If you have a fever,  
with a cough or rash,  
let us know.**



## **Obstetric Medical Management for Pandemic Influenza**

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### **1. Case Definitions**

#### ***Pandemic Alert***

During the pandemic alert period, the emphasis is on early detection of cases of novel influenza virus infection. Any symptoms or signs of influenza-like illness (ILI) in conjunction with a possible epidemiologic link to a novel influenza strain should be investigated. Any person with a possible epidemiological link (1.), as described below, PLUS symptoms described in (2.) should be considered a possible influenza case with novel virus infection.

#### **1. Epidemiologic link**

- a. Arrival within the last 14 days from a country that has had animal and/or human cases of influenza due to a potential pandemic influenza strain OR
- b. Exposure within the last 14 days to chickens or water fowl in a region where avian influenza has been documented.
- c. Exposure within the last 14 days to a presumptive or confirmed human case of influenza due to a novel influenza strain.

AND

#### **2. Symptoms**

- a. Fever of 38.0°C or higher OR
- b. Respiratory symptoms including cough, stuffy nose or rhinorrhea, sore throat, dyspnea or pleuritic chest pain OR
- c. Otherwise unexplained
  - i. Myalgia OR
  - ii. Diarrhea OR
  - iii. Encephalopathy (defined as a persistent decreased level of consciousness, significant change in personality or behavior or extreme irritability with or without seizures, opisthotonus or apnea).

#### ***Pandemic***

During the pandemic phase, when the pandemic virus is known to be circulating, the emphasis is on identifying symptoms or signs of ILI. The lack of an epidemiologic link cannot be relied upon to exclude the diagnosis. Thus, any person with any of the following symptoms should be considered a possible pandemic influenza case:

1. Fever of 38.0°C or higher OR
2. Respiratory symptoms including, but not restricted to, cough, stuffy nose or rhinorrhea, sore throat, dyspnea or pleuritic chest pain.

**Note:** The case definition may be modified during the pandemic based on observation of clinical symptoms and signs.

## 2. Obstetric Pandemic Alert Admission Assessment

### **Admission**

During the pandemic alert phase all women meeting the case definition (epidemiologic link AND symptoms) will be admitted, and the case reported to public health.

Women will be admitted to either the inpatient unit or ICU depending on clinical status. Admission to the ICU will take place on a case by case basis, depending on the patient's respiratory and overall status, and in consultation with ICU staff. The criteria for admission will be the same that is currently in place.

### **Initial investigations**

1. Routine blood work: blood cultures, CBC with differential, electrolytes, creatinine, urea, glucose
2. Chest radiograph (AP and lateral)
3. Microbiology
  - a. Nasal pharyngeal swabs and throat specimens for conventional respiratory virus detection by IF and culture (i.e. influenza, RSV, parainfluenza, adenovirus) and for other respiratory viruses/agents by PCR (i.e. SARS coronavirus, other coronaviruses, influenza H5, other human and avian influenzas, *M. pneumoniae*)
  - b. Sputum (if possible) or other lower respiratory specimen (i.e. ETT, BAL) for culture and sensitivity
  - c. Blood cultures (2 sites)
  - d. Stool for PCR
  - e. Serum for PCR
  - f. CSF for influenza PCR for encephalitis presentation
  - g. Other possible testing might include (depending on clinical presentation): *B. pertussis* PCR, lower respiratory specimen for fungal culture, *Chlamydia pneumoniae* PCR, *Legionella pneumophila* culture, *M. tuberculosis* culture and molecular detection. Other testing as indicated clinically or as knowledge is gained about the specific agent responsible.
4. Fetal non-stress test and/or biophysical profile to assure fetal well being.

### **Management**

1. Isolate if possible.
2. Use routine practices and appropriate precautions (droplet and contact) – see Chapter 7).
3. Consider beginning antiviral treatment (See Section 4.).
4. Maintain adequate hydration. (1/2 normal saline at 125 ml/hr.)
5. Treat fever above 38.0 C or pain with acetaminophen (1000 mg PO q 4 to 6 hours).

### **Discharge**

Women will be discharged when clinically well AND have been observed for the infectious period of the illness (time to be determined).

### **3. Obstetric Medical Management For Pandemic Influenza**

#### ***Admission***

During the pandemic phase, women who meet the case definition of pandemic influenza will be evaluated and considered for hospital admission. As more is known about the course and presentation of the pandemic strain, indications for admission may evolve. Because one third of all pregnant women will experience pandemic influenza, women with uncomplicated courses of influenza will be managed at home.

#### ***Pregnant Women with Uncomplicated Pandemic Influenza***

##### **A. Antepartum Women with Uncomplicated Influenza**

1. Manage at home.
2. Encourage to take antiviral medication (prescribed via telephone, See Section 4.)
3. Encourage to keep well hydrated
4. Follow their temperatures, to treat fever above 38.0 C or pain with acetaminophen (1000 mg PO q 4 to 6 hours)
5. Perform fetal movement counting once daily (4 kicks in one hour)
6. Encourage not to come to hospital or clinic unless one becomes short of breath, unable to tolerate oral fluids
7. Encourage frequent telephone consultation.

##### **B. Intrapartum Women with Uncomplicated Influenza**

1. Begin or continue antiviral medication (See Section 4.)
2. Treat fever above 38.0 C or pain with acetaminophen (1000 mg PO q 4 to 6 hours)
3. Maintain hydration (1/2 normal saline at 125 ml/hr)
4. Use routine practices and appropriate precautions (droplet, contact) – see Chapter 7.
5. Follow usual procedures for intrapartum management.

##### **C. Postpartum Women with Uncomplicated Influenza**

1. Begin or continue antiviral medication (See Section 4)
2. Treat fever above 38.0 C or pain with acetaminophen (1000 mg PO q 4 to 6 hours)
3. Maintain hydration (1/2 normal saline at 125 ml/hr)
4. Follow usual standard of care for postpartum management
5. Continue breastfeeding
6. Isolate if possible
7. Use routine practices and appropriate precautions (droplet, contact) – see Chapter 7.
8. Discharge early if appropriate.

## ***Pregnant Women with Complicated Pandemic Influenza***

### **A. Antepartum Women with Complicated Pandemic Influenza**

Hospitalize women who meet the case definition and have one of the following findings:

1. Unable to tolerate fluids orally.
2. Have symptoms and signs of respiratory tract infection AND require supplemental oxygen.
3. Have gastroenteritis AND are unable to maintain hydration with oral fluids.
4. Have encephalopathy (persistent decreased level of consciousness, significant change in personality or behavior or extreme irritability with or without seizures, opisthotonus or apnea).
5. Look unwell.

**Admission to the ICU should be made on a case by case basis in consultation with ICU staff.**

If during the pandemic, new clinical syndromes associated with the infection become apparent, a reassessment of admission and discharge criteria will be necessary for specific presentations.

#### ***Initial investigations***

1. Routine blood work should include a blood cultures, CBC with differential, electrolytes, creatinine, urea, glucose
2. Chest radiograph (AP and lateral)
3. Microbiology
  - a. Tests for influenza (pandemic strain) as per microbiology
  - b. Nasal pharyngeal swabs and throat specimens for conventional respiratory virus detection by IF and culture (i.e. influenza, RSV, parainfluenza, adenovirus) and for other respiratory viruses/agents by PCR (i.e. SARS coronavirus, other coronaviruses, influenza H5, other human and avian influenzas, *M. pneumoniae*)
  - c. Sputum (if possible) or other lower respiratory specimen (i.e. ETT, BAL) for culture and sensitivity
  - d. Blood cultures (2 sites)
  - e. Stool for PCR
  - f. Serum for PCR
  - g. CSF for influenza PCR for encephalitis presentation
  - h. Other possible testing might include (depending on clinical presentation): *B. pertussis* PCR, lower respiratory specimen for fungal culture, *Chlamydia pneumoniae* PCR, *Legionella pneumophila* culture, *M. tuberculosis* culture and molecular detection. Other testing as indicated clinically or as knowledge is gained about the specific agent responsible.

### **Treatment**

1. Check airway. Oxygen therapy if saturation below 95%
2. Treat fever above 38.0 C or pain with acetaminophen (1000 mg PO q 4 to 6 hours)
3. Maintain hydration (1/2 normal saline at 125 cc/hr)
4. Monitor patient's intake and output strictly
5. Begin or continue antiviral therapy (see Section 4)
6. Conduct fetal surveillance with daily NST's and weekly biophysical profiles
7. Isolate if possible
8. Use routine practices and appropriate precautions (routine, droplet, contact) — see Chapter 7.

### **Discharge**

Women will be discharged when clinically well. Depending on hospital bed availability, this may be before infectious period is over.

### **B. Intrapartum Women with Complicated Pandemic Influenza**

Admission to the ICU should be made on a case by case basis in consultation with MSH ICU staff.

*Note: if new clinical syndromes associated with the infection become apparent during the pandemic, admission and discharge criteria will be reassessed.*

### **Initial investigations**

1. Routine blood work should include a blood cultures, CBC with differential, electrolytes, creatinine, urea, glucose
2. Chest radiograph (AP and lateral)
3. Microbiology
  - a. Tests for influenza (pandemic strain) as per microbiology
  - b. Nasal pharyngeal swabs and throat specimens for conventional respiratory virus detection by IF and culture (i.e. influenza, RSV, parainfluenza, adenovirus) and for other respiratory viruses/agents by PCR (i.e. SARS coronavirus, other coronaviruses, influenza H5, other human and avian influenzas, *M. pneumoniae*)
  - c. Sputum (if possible) or other lower respiratory specimen (i.e. ETT, BAL) for culture and sensitivity
  - d. Blood cultures (2 sites)
  - e. Stool for PCR (SARS, influenza H5 or other influenza strains)
  - f. Serum for PCR (SARS, influenza H5 or other influenza strains)
  - g. CSF for influenza H5 PCR for encephalitis presentation
  - h. Other possible testing might include (depending on clinical presentation): *B. pertussis* PCR, lower respiratory specimen for fungal culture, *Chlamydia pneumoniae* PCR, *Legionella pneumophila* culture, *M. tuberculosis* culture and molecular detection.

Other testing as indicated clinically or as knowledge is gained about the specific agent responsible.

### **Treatment**

1. Check airway. Oxygen therapy if saturation below 95%.
2. Treat fever above 38.0 C or pain with acetaminophen (1000 mg PO q 4 to 6 hours).
3. Maintain hydration. (1/2 normal saline at 125 cc/hr.)
4. Monitor patient's intake and output strictly
5. Begin or continue antiviral therapy. (See Section 4.)
6. Monitor fetus continually
7. Continue standard protocols for intrapartum management and care
8. Isolate if possible.
9. Use routine practices and appropriate precautions (droplet, contact) — see Chapter 7.

### **Discharge**

Women will be discharged when clinically well. Depending on hospital bed availability, this may be before infectious period is over.

### **C. Postpartum Patient with Complicated Pandemic Influenza**

**Admission to the ICU should be made on a case by case assessment as is done currently.**

#### **Initial investigations**

1. Routine blood work should include a blood cultures, CBC with differential, electrolytes, creatinine, urea, glucose
2. Chest radiograph (AP and lateral)
3. Microbiology
  - a. Tests for influenza (pandemic strain) as per microbiology
  - b. Nasal pharyngeal swabs and throat specimens for conventional respiratory virus detection by IF and culture (i.e. influenza, RSV, parainfluenza, adenovirus) and for other respiratory viruses/agents by PCR
  - c. Sputum (if possible) or other lower respiratory specimen (i.e. ETT, BAL) for culture and sensitivity.
  - d. Blood cultures (2 sites)
  - e. Stool for PCR.
  - f. Serum for PCR
  - g. CSF for influenza PCR for encephalitis presentation.
  - h. Other possible testing might include (depending on clinical presentation): *B. pertussis* PCR, lower respiratory specimen for fungal culture, *Chlamydia pneumoniae* PCR, *Legionella pneumophila* culture, *M. tuberculosis* culture and molecular detection. Other testing as indicated clinically or as knowledge is gained about the specific agent responsible.

### ***Treatment***

1. Check airway. Oxygen therapy if saturation below 95%.
2. Treat fever above 38.0 C or pain with acetaminophen (1000 mg PO q 4 to 6 hours).
3. Maintain hydration. (1/2 normal saline at 125 cc/hr.)
4. Monitor patient's intake and output strictly
5. Begin or continue antiviral therapy. (See Section 4.)
6. Monitor baby continuously
7. Continue standard protocols for intrapartum management and care
8. Isolate mother and child if possible.
9. Use routine practices and appropriate precautions (droplet, contact) — see Chapter 7.

### ***Discharge***

Women will be discharged when clinically well, which may be before the infectious period is over.

#### 4. Antiviral Medication Recommendations for Pregnant Women with Pandemic Influenza

A women who is pregnant has a 1 to 3% chance of having a baby with a birth defect. The following guidelines will help with decision making when using antiviral medication in the setting of pandemic influenza.

There will be many medications used in the non pregnant population during the pandemic, most of which will lack safety evidence in pregnancy. In the event of a pandemic, the theoretical risk of teratogenicity and adverse effect of treatment will have to be weighed against the potential benefit to the pregnant woman with influenza.

Pregnant women (particularly during the second and third trimester) are believed to be at higher risk, than the general non pregnant population, for complications including death secondary to pandemic influenza. Therefore during a pandemic, it will be recommended that pregnant women take antiviral medication if they become ill.

**\*As pregnant women are at increased risk for complications secondary to pandemic influenza, treatment with a neuraminidase inhibitor should begin within 48 hours of the onset of influenza symptoms, preferably within 12-24 hours.**

**Antiviral Medication:** The neuraminidase inhibitors are the antiviral medications most likely to be used during an influenza pandemic. Both of the following drugs can be used to prevent or treat influenza A or B. Early treatment with neuraminidase inhibitors may decrease the risk of complications and hospitalization from influenza.

- \*Oseltamivir (Tamiflu®): Oral therapy.
- \*Zanamivir (Relenza®): Inhaled medication.

Zanamivir may be preferred in pregnant women as systemic blood levels are comparatively lower than oseltamivir. (2) However if systemic viral replication is thought to occur with the novel or pandemic virus, oseltamivir would be preferred as it has higher bioavailability outside of the respiratory tract. (3)

**Risk of Teratogenicity:** There have been no published reports of pregnancy outcomes following treatment with the above antiviral medications<sup>1</sup>. It is reassuring that animal studies on oseltamivir and zanamivir have not raised any concerns during pregnancy. As data are limited, we cannot be completely reassured that these medications are safe in pregnancy: however animal studies suggest that they would not be associated with a significantly increased risk of birth defects.

In contrast amantadine should not be used for treatment or prophylaxis of pregnant women because the M2 inhibitors have been shown to be teratogenic in animals in very high doses. (2)

**Breastfeeding:** Zanamivir results in limited amounts of drug in breast milk. However, no safety data is available. Likewise there is no information on the safety of breastfeeding while taking oseltamivir and it is not known if the drug is excreted in human milk. Once again, the risk vs. benefit ratio will have to be evaluated on an individual basis during an influenza pandemic.

**Dosing:**

**Prophylaxis for pandemic influenza:**

Drug	Adult Dose	Route	Duration
Oseltamivir	75 mg once daily	PO	10 days
Zanamivir	10 mg (two inhalations) once daily	oral inhalation	10 days

**Treatment for pandemic influenza:**

Drug	Adult Dose	Route	Duration
Oseltamivir	75 mg twice daily	PO	5 days
Zanamivir	10 mg (two inhalations) twice daily	oral inhalation	5 days

**Antibiotic therapy for suspected secondary bacterial pneumonia:**

**a. General consideration**

- Other potential causes of pneumonia, such as non-influenza respiratory viruses, *Mycoplasma pneumoniae*, *Streptococcus pneumoniae* etc should be considered in all pregnant women admitted with suspected pandemic influenza

**b. Common organisms implicated in secondary bacterial pneumonia**

- *Streptococcus pneumoniae*
- *Staphylococcus aureus*
- Non-typable *Haemophilus influenzae*

**c. Antibiotic choice in pregnant women with secondary bacterial pneumonia**

- Cefuroxime is expected to be the most widely used antibiotic due to its coverage of most strains of *Streptococcus pneumoniae*, non-typable *Haemophilus influenzae* and *Staphylococcus aureus*.
- In women with severe beta-lactam allergy (anaphylaxis) vancomycin or clindamycin should be given.

**Supportive therapies:**

- Bronchodilators
- Corticosteroids

**Other experimental therapies:**

- Intravenous immune globulin
- Interferon (generally not in pregnancy)
- Anti-TNF $\alpha$  (generally not in pregnancy)

**References:**

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