**CHILDREN PRESENTING WITH SIGNS AND SYMPTOMS THAT COULD BE H1N1 INFECTION?**

**Clinical Assessment – Key Points:**
- Clinicians should identify risk factors* for severe influenza and document vital signs** on all children with the following presentations.
- If treatment is indicated (see algorithm below), initiation as soon as possible within 48 hours of illness onset is recommended. If decision to treat is made, do not wait for test results.

**Symptoms of Influenza-like Illness (ILI):**

Clinicians should watch for symptoms that are most likely to be indicative of ILI, based upon data analysis from the first wave of pandemic H1N1 in 2009:  
*Note: Algorithm applies even if previously immunized with H1N1 vaccine.*

- **Almost always:** Cough and Fever
- **Common:** Fatigue, Muscle Aches, Sore Throat, Headache
- **Sometimes:** Nausea, Vomiting, Diarrhea

**Note:**
- Signs and symptoms of ILI, particularly fever, may be muted in very young children.
- Gastrointestinal symptoms may be present in children < 5 years of age.
- History of recent close contact with suspected/confirmed H1N1 (e.g., day care) may be helpful.

**H1N1 in children may also present with:**
- Respiratory presentations such as severe croup or evidence for bronchiolitis.
- Altered mental status, neurological findings (e.g., encephalitis, transverse myelitis, seizures) or evidence of sepsis.
- Apnea or unexplained respiratory distress, lethargy or poor feeding in infants and neonates.
- Exacerbations in chronic pulmonary conditions or airway disorders such as with cystic fibrosis, asthma or tracheostomy patients (e.g., increased secretions).
- Respiratory symptoms in absence of fever, in immunocompromised children.
- Exacerbations in the clinical status of children with neurological impairments, in whom determination of acute respiratory illnesses can be difficult (e.g., child with drooling, chronic cough).

**Risk Factors or Conditions predisposing to severe illness with influenza in neonates, children and youth:**
- Children < 5 years of age (especially those < 2 years).
- Cardiac or pulmonary disorders (including bronchopulmonary dysplasia, cystic fibrosis and asthma).
- Diabetes mellitus and other metabolic diseases.
- Renal disease.
- Hemoglobinopathy.
- Conditions that compromise the management of respiratory secretions and are associated with an increased risk of complications from influenza or be associated with delays in seeking or receiving care for mild or severe ILI.
- Significant obesity and/or malnutrition.
- Other conditions (e.g., smoking, substance abuse, alcoholism, homelessness) considered to increase the risk of complications from influenza or be associated with delays in seeking or receiving care for mild or severe ILI.
- Persons of Aboriginal ancestry are at increased risk for severe illness even in the absence of known or declared risk conditions.
- Pregnant women, especially later pregnancy, and women within six weeks post-partum.

**Treatment with antivirals** may be initiated at the discretion of the clinician and should occur within 48 hours of onset of illness, but is not strongly recommended as these patients have a lower risk for developing severe illness.

**NP Testing** is not generally recommended (see reverse). Consider other diagnostic testing as appropriate.

**Warning Signs Requiring Urgent Attention**
- Tachypnea, respiratory distress or cyanosis
- Severe chest pain or abdominal pain
- Hypotension or evidence of reduced peripheral perfusion (mottling, cool extremities, delayed capillary refill)
- Fever with rash
- Flu-like symptoms improve then return with fever and worse cough
- Severe or persistent vomiting
- Confusion, listlessness, altered consciousness
- Seizures
- Infants and toddlers: In addition to signs listed above, not drinking enough fluids, not waking up or interacting, extreme irritability, not wanting to be held

**Is patient ill enough to require hospitalization or emergency evaluation?**

- NO: Follow closely to monitor for and promptly manage changes in condition.
- YES: Refer for emergency evaluation and possible hospital admission.

**PANDEMIC H1N1 IN 2009:**

- **Vital Signs C**
  - Warning Signs Requiring Urgent Attention
  - Infants and toddlers:
    - Seizures
    - Severe or persistent vomiting
    - Flu-like symptoms improve then return with fever and worse cough
    - Severe chest pain or abdominal pain
  - Hypotension or evidence of reduced peripheral perfusion (mottling, cool extremities, delayed capillary refill)
  - Fever with rash
  - Confusion, listlessness, altered consciousness
  - Seizures
  - Infants and toddlers: In addition to signs listed above, not drinking enough fluids, not waking up or interacting, extreme irritability, not wanting to be held

**Treatment should be initiated unless contraindicated – Do not wait for NP test results.**

**NP Testing** is not generally recommended (see reverse).

Consultation with Pediatric Infectious Diseases is recommended (204) 787-2071.

Consider initiation of antimicrobial therapy based upon clinical history and assessment.

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*Risk Factors or Conditions predisposing to severe illness with influenza in neonates, children and youth:
**B Management of Mild Illness:**
Patients with mild illness should 1) be assessed and provided with advice 2) be encouraged to stay at home and 3) follow routine precautions to prevent spread to family members and the community. If the patient’s condition worsens they should seek medical help by calling their primary health provider or Health Links-Info Santé at 788-8200 in Winnipeg or toll-free at 1-888-315-9257.

**C Vital Signs (VSs) in Children < 18 Years of Age:**

<table>
<thead>
<tr>
<th>Vital Sign</th>
<th>Agegroup</th>
<th>Normal or Abnormal Values</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pulse/Heart Rate:</strong> Normal Range</td>
<td></td>
<td></td>
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<tr>
<td>Note: It is expected that children with fever, dehydration or other clinical conditions may have an elevated heart rate.</td>
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<tr>
<td>Newborn to 3 mos:</td>
<td>Awake</td>
<td>Mean</td>
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<tr>
<td>85 – 205</td>
<td>140</td>
<td>80 – 100</td>
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<tr>
<td>3 mos to 2 years:</td>
<td>100 – 190</td>
<td>130</td>
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<tr>
<td>2 – 10 years:</td>
<td>60 – 140</td>
<td>80</td>
</tr>
<tr>
<td>&gt; 10 years:</td>
<td>60 – 100</td>
<td>75</td>
</tr>
<tr>
<td><strong>Respiratory Rate:</strong> Normal Range</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Infant (&lt; 1 year):</td>
<td>30 – 60 / min</td>
<td></td>
</tr>
<tr>
<td>Toddler (1 – 3 years):</td>
<td>24 – 40 / min</td>
<td></td>
</tr>
<tr>
<td>Preschool (4 – 5 years):</td>
<td>22 – 34 / min</td>
<td></td>
</tr>
<tr>
<td>School Age (6 – 12 years):</td>
<td>18 – 30 / min</td>
<td></td>
</tr>
<tr>
<td><strong>Abnormal Blood Pressure:</strong></td>
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<tr>
<td>Hypotension by systolic blood pressure and age.</td>
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<td></td>
</tr>
<tr>
<td>Neonates (1 – 30 days):</td>
<td>&lt; 60 mm Hg</td>
<td></td>
</tr>
<tr>
<td>Infants (1 – 12 mos):</td>
<td>&lt; 70 mm Hg</td>
<td></td>
</tr>
<tr>
<td>Children (1 – 10 years):</td>
<td>&lt; 70 + (2 x age in years) mm Hg</td>
<td></td>
</tr>
<tr>
<td>Children and Adolescents (&gt; 10 years):</td>
<td>&lt; 90 mm Hg</td>
<td></td>
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</tbody>
</table>


**Pediatric Advanced Life Support (PALS)**

**D Nasopharyngeal (NP) Testing:** Test patients with ILI who are:
- hospitalized;
- being observed in emergency departments, observation units, etc.;
- immuno-compromised;
- seen at designated sentinel sites, as authorized by regional and provincial public health authorities.

If the indication is recorded on the Cadhram Provincial Laboratory (CPL) requisition, the specimen will receive priority testing (e.g., “hospitalized”, “immuno-compromised”, “pregnant” [include trimester], “child < 1” etc.). If the indication is not recorded, specimen testing may be delayed. Nasopharyngeal (NP) aspirate is the specimen of choice for children < 5 years. For all others a NP swab should be taken. Inadequately packaged specimens (e.g., leaking) may not be processed. A fact sheet about these procedures for testing can be found at: [http://www.gov.mb.ca/health/publichealth/sri/docs/nasopharyngeal_collection.pdf](http://www.gov.mb.ca/health/publichealth/sri/docs/nasopharyngeal_collection.pdf)

**E Treatment:**
- Oseltamivir (Tamiflu®) must be given within 48 hours of symptom onset. NOTE: Clinical benefit from antiviral treatment is documented if instituted with 48 hours of illness onset, but there are limited data beyond this time. If the duration of illness is greater than 48 hours when the patient presents to a health care provider, consultation is recommended with Infectious Diseases to determine if antivirals are still appropriate. Infectious Diseases may be paged at (204) 787-2071.
- Adults and children ≥ 13 years of age: Oseltamivir (Tamiflu®) 75 mg orally twice daily for 5 days.
- Children <12 years of age: Pediatric doses (>12 months) by weight, as per the table below.
- **Antiviral Use for Pregnant and Post-partum Women:** Refer to the Interim Clinical Care Guidance for Pregnant and Post-partum Women in the Context of Pandemic H1N1 Influenza


**F Other considerations for the use of antivirals for treatment of H1N1 influenza:**
Recommendations for use of antiviral medications may change as data on antiviral effectiveness, clinical spectrum of illness, adverse events from antiviral use, or resistance among circulating viruses become available. While oseltamivir-resistance appears to be rare at this time, oseltamivir-resistant 2009 H1N1 viruses have been identified, typically among persons who develop illness while receiving oseltamivir for chemoprophylaxis or immuno-compromised patients with influenza who are being treated. For more information on H1N1 antiviral resistant strains, refer to WHO Pandemic (H1N1) 2009 briefing note 12- Antiviral use and the risk of drug resistance. [http://www.who.int/csr/disease/swineflu/note/12/11_H1N1_antiviral_use_20090925/en/index.html](http://www.who.int/csr/disease/swineflu/note/12/11_H1N1_antiviral_use_20090925/en/index.html)

It is recommended that household contacts of individuals with significant risk factors (i.e., pregnant women, immuno-compromised hosts, elderly persons ≥ 65 years) be counseled about early signs and symptoms of pandemic H1N1 and encouraged to seek early treatment if symptomatic.

**Antimicrobial Therapy:** Due to the high risk of bacterial superinfections in patients with influenza A, there should be a low threshold for starting antimicrobial therapy in patients with serious illness. Consider initiation of antimicrobial therapy based upon clinical history & assessment. Consultation with Pediatric Infectious Diseases is recommended (204) 787-2071.

**These guidelines were adapted from MHHL draft documents and may change as more information on infection with novel influenza A (H1N1) becomes available.**

**WHRA Interim H1N1 Pediatric Algorithm Oct-20-09 2300**