What it is and Who is vulnerable

» Uncomplicated influenza illness is characterized by the abrupt onset of constitutional and respiratory signs and symptoms.

» Signs and symptoms include: fever, myalgia, headache, malaise, nonproductive cough, sore throat, rhinitis, otitis media, nausea, vomiting.

» Uncomplicated illness resolves in 3–7 days, cough and malaise can last over 2 weeks. The majority of hospitalizations are less than 2 days. Approximately 4–11% of patients require PICU and 3% require mechanical ventilation.

» High-risk pediatric patients:
  › <2 years old
  › Immunosuppression (cancer, medications, HIV, primary immune deficiencies etc)
  › <19 y.o. on long term aspirin therapy or aspirin-containing products
  › Chronic illnesses:
    • pulmonary (such as asthma, cystic fibrosis)
    • cardiovascular (such as congenital heart disease, hemodynamically significant lesions)
    • hepatic
    • hematological (sickle cell disease/hemoglobinopathy)
    • renal
    • neurologic
    • neuromuscular (such as muscular dystrophy)
    • metabolic disorders
  › American Indian/Alaska Native people
  › Pregnancy
  › Morbid obesity (ie, BMI ≥40)

Antiviral treatment candidates

» Hospitalized patients with presumed or confirmed influenza

» Patients with severe, complicated, or progressive illness attributable to influenza Infection of any severity in children at high risk of complications listed above

» All of the above are candidates for antivirals regardless of immunization status even if symptoms started over 48 hours prior

NOTES:

• Ideally antiviral within 48 hours of the start of symptoms (but can still be considered after 48 hours in progressive symptomatic illness)

• Outpatient uncomplicated febrile illness typically does not require treatment unless they are at higher risk of influenza complications, but can consider for otherwise healthy child for whom a decrease in duration of clinical symptoms is felt warranted by their physician (especially if medications are started within 48 hrs of symptoms). Also consider for children with household members less than 6 months of age or with conditions that predispose to complications.

• Oseltamivir may reduce illness duration by 1 to 1.5 days and can reduce symptoms
**Chemo-prophylaxis**

» **Unvaccinated patients with increased risk of complications from exposure to anyone with confirmed, probable or suspected influenza during the two weeks after vaccination if current circulating strains are included in vaccine**

» **Unimmunized or immunocompromised patients who may not respond to vaccine**

» **Unimmunized family members of high risk unimmunized contacts**

» **High risk children when circulating strains of influenza virus in the community are known to not match the seasonal influenza vaccine strains (based on CDC and local public health departments)**

**NOTES:**

- Not recommended younger than 3 months of age, unless the situation is judged critical
- Start within 48 hours of exposure
- Close contact is defined by the CDC as having cared for or lived with a person who is a confirmed, probable, or suspected case of influenza; or having been in a setting where there was a high likelihood of contact with respiratory droplets and/or body fluids of such a person. Close contact typically does not include activities such as walking by an infected person or sitting across from a symptomatic patient in a waiting room or office.

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**Oseltamivir Dosing Guide**

*(see CDC website for up-to-date recommendations)*

<table>
<thead>
<tr>
<th>Weight (Kg)</th>
<th>Age</th>
<th>Treatment Dose</th>
<th>Milliliters of suspension (6 mg/ml) for each dose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Term infants 0-8 months</td>
<td>3mg/kg twice daily</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>9 – 11 months</td>
<td>3.5mg/kg twice daily</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>&lt; 15 Kg</td>
<td>30 mg twice daily</td>
<td>5 ml</td>
<td></td>
</tr>
<tr>
<td>&gt; 15 to 23 Kg</td>
<td>Children 12 months of age or older</td>
<td>45 mg twice daily</td>
<td>7.5 ml</td>
</tr>
<tr>
<td>&gt; 23 to 40 Kg</td>
<td>Children 12 months of age or older</td>
<td>60 mg twice daily</td>
<td>10 ml or 30 mg capsules</td>
</tr>
<tr>
<td>&gt; 40 Kg</td>
<td>Children 12 months of age or older</td>
<td>75 mg twice daily</td>
<td>12.5 mL or 75 mg capsules</td>
</tr>
<tr>
<td>——</td>
<td>Adults</td>
<td>75 mg twice daily</td>
<td>Use 75 mg capsules</td>
</tr>
</tbody>
</table>

**NOTES:**

- Recommendations for optimal antiviral can change during influenza season based on national and regional surveillance for drug resistance. See [www.cdc.gov/flu/about/qa/antiviralresistance.htm](http://www.cdc.gov/flu/about/qa/antiviralresistance.htm) for most up to date recommendations.
- Dosing of oseltamivir should be adjusted for renal function.
- Treatment dose is given twice daily for 5 days.
- Prophylactic dose is half the daily dose (given once daily) for 10 days, not for children less than 3 months.

*notes continued*
OSELTAMIVIR NOTES continued:

- Oseltamivir is approved by the FDA down to 2 weeks of age. Given its known safety profile, oseltamivir can be used to treat influenza in both term and preterm infants. Oseltamivir can also be considered for older patients with the following risk factors: age ≥ 65, chronic pulmonary disease, cardiovascular disease (except hypertension), immunocompromised, hemoglobinopathy (e.g., sickle cell disease), long term aspirin therapy, chronic metabolic disorder including diabetes, neuromuscular disorder, pregnant, resident of a chronic-care facility.

- Dosing for preterm infants using their postmenstrual age (gestational age + chronological age): 1.0 mg/kg per dose, orally, twice daily, for those <38 wk postmenstrual age; 1.5 mg/kg per dose, orally, twice daily, for those 38 through 40 wk postmenstrual age; 3.0 mg/kg per dose, orally, twice daily, for those >40 wk postmenstrual age. For extremely premature infants (<28 wk postmenstrual age), consult a pediatric infectious disease physician.

Influenza Testing

**General principles:**

1. Influenza virus testing should not be performed unless the results will:
   a. Change care of that patient, or
   b. Influence clinical practice for other patients.

2. Initiation of antiviral treatment, if clinically indicated, should not be delayed pending results of testing.

3. If influenza is circulating in the community, a negative rapid influenza diagnostic test does not rule out influenza infection.

4. The rapid tests vary in terms of sensitivity and specificity when compared with viral culture or RT-PCR. Product insert information and research publications indicate that:
   a. Sensitivities are approximately 50–70%
   b. Specificities are approximately 90–95%

5. If laboratory-confirmed diagnosis desired can follow-up negative rapid results with confirmatory tests (i.e., RT-PCR or viral culture)

6. Full testing information can be found from the CDC: http://www.cdc.gov/flu/professionals/diagnosis/index.htm

<table>
<thead>
<tr>
<th>Method</th>
<th>Types Detected</th>
<th>Acceptable Specimens</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Viral cell culture (conventional)</td>
<td>A and B</td>
<td>NP swab, throat swab, NP or bronchial wash, nasal or endotracheal aspirate, sputum</td>
<td>3-10 days</td>
</tr>
<tr>
<td>Rapid cell culture (shell vials; cell mixtures)</td>
<td>A and B</td>
<td>As above</td>
<td>1-3 days</td>
</tr>
<tr>
<td>Immunofluorescence, Direct (DFA) or Indirect (IFA) Antibody Staining</td>
<td>A and B</td>
<td>NP swab or wash, bronchial wash, nasal or endotracheal aspirate</td>
<td>1-4 hours</td>
</tr>
<tr>
<td>RT-PCR (singleplex and multiplex; real-time and other RNA-based) and other molecular assays</td>
<td>A and B</td>
<td>NP swab, throat swab, NP or bronchial wash, nasal or endotracheal aspirate</td>
<td>Varied (Generally 1-6 hours)</td>
</tr>
<tr>
<td>Rapid Influenza Diagnostic Tests</td>
<td>A and B</td>
<td>NP swab, (throat swab), nasal wash, nasal aspirate</td>
<td>&lt;30 min</td>
</tr>
</tbody>
</table>
Admission Criteria

Admit to pediatric unit:
1. Hypoxemia: O2 sat < 91% while breathing room air
2. Dehydration or difficulty feeding
3. Moderate to severe respiratory distress
4. Concerning social situation or limited follow-up

Admit to PICU:
1. PCO2 > 50mmHg (NOTE: routine ABG is not recommended if not in severe distress)
2. PCO2 > 40mmHg with moderate to severe respiratory distress
3. Severe respiratory distress with no clinical improvement with therapy
4. O2sat < 93% on > 40% FiO2

NOTES:
All patients with suspected influenza should be placed on droplet precautions starting in triage and especially on admission if not done so already

References

Practice guidelines do not necessarily apply to every patient. A provider’s clinical judgment is essential. As always, clinicians are urged to document management strategies.

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