

Management Guideline for Influenza A-H1N1 for Paediatric Patients

Case definition

A confirmed case of novel influenza A(H1N1) in pediatrics is defined as children (< 12 years old) who has influenza-like illness (fever $\geq 38^{\circ}\text{C}$ with cough and/or sore throat) and confirmed positive laboratory tests either by real-time PCR or viral culture.

Signs and Symptoms

Most influenza A(H1N1) infection in children are mild and self-limiting. The common symptoms on presentation are fever $\geq 38^{\circ}\text{C}$ (100%) and cough (100%), sore-throat (66%), myalgia (44%), vomiting and diarrhea (25%). Other uncommon presentation are altered conscious level (10%) or hypotension or sepsis-like picture. (Mexico and U.S case series)

Only 10% influenza A(H1N1) infection require admission. The 2 most common reasons for admission are pneumonia and dehydration.

Criteria for admission

Children with influenza-like illness (fever $\geq 38^{\circ}\text{C}$ with cough and/or sore throat) with complications listed as below:

Severe respiratory distress Lower chest wall indrawing, sternal recession, grunting, or noisy breathing when calm.
Increased respiratory rate. Measured over at least 30 seconds. ≥ 50 breaths per minute if under 1 year, or ≥ 40 breaths per minute if ≥ 1 year.
Oxygen saturation $\leq 92\%$ on pulse oximetry, breathing air <i>or</i> on oxygen. Absence of cyanosis is a poor discriminator for severe illness.
Respiratory exhaustion or apnoeic episode Apnoea defined as a ≥ 20 second pause in breathing.
Evidence of severe clinical dehydration or clinical shock Sternal capillary refill time > 2 seconds, reduced skin turgor, sunken eyes or fontanelle.
Altered conscious level Strikingly agitated or irritable, seizures, or floppy infant.

Hospitalization

Once admitted, all hospitalized patients (those with moderate to severe disease) with confirmed or suspected novel influenza A H1N1 should be started on antiviral treatment. (Table 3 &4) The antiviral treatment maybe stopped if the results are negative.

Patients admitted with moderate to severe disease with co-morbid factors (table 1) should be observed closely as they may have more severe and rapid progression of disease.

Table 1 : List of co-morbid factors

- cardiac disease
- chronic respiratory disease (eg asthma, bronchopulmonary dysplasia)
- other chronic diseases (e.g., diabetes, chronic metabolic diseases, chronic renal failure, haemoglobinopathies)
- chronic neurological disorders e.g. muscular dystrophies.
- impaired immunity, including HIV infection, child with malignancy or immunosuppressive therapy
- children aged 6 months – 10 years on long-term aspirin therapy
- malnourished or obese

Mild cases of Influenza-like illness do not need admission and no investigations are needed. (Refer outpatient management)

Respiratory specimens that are taken to diagnose InfluenzaA-H1N1 infections are nasopharyngeal aspirate or nasal / throat swab. These specimens are taken under full PPE

Criteria of Discharge for Pediatric patients

For children admitted to hospital with Influenza A-H1N1 (confirmed case), he or she can be discharged if :

1. Had completed 5 day course of oseltamivir.
2. If need arise for child to be discharge earlier, he/she can be discharged after completing 3 days (or 6 doses) as long as the child does not have complications, afebrile for the last 24 hours and not from the high risk group. The need for early discharge is reviewed, on a case by case basis if required.

** For all children who have been discharged, they need further home quarantine for total of 7 days from ONSET of illness (including the time of admission).

Post exposure chemoprophylaxis in children.

Chemoprophylaxis for children is recommended for close contact (defined as those who live in the same house / premises (household contacts) and those who have sustained close contact (< 3feet) for at least 4 hours) who fulfill following criteria:

1. **Children < 2 years old with co-morbidity (Refer Table 1).
2. Within 48 hours of contact with the confirmed index patient.

The dosage of the antiviral is stated in Table 3 below.

Recommendation for Home Assessment for Pediatric patients

For children nursed at home, child need to be monitored daily by parents or guardian for appearance of new symptoms or worsening of symptoms that suggest complications.

Home assessment tool for parents and caregivers

Children should be brought to the nearest hospital for further assessment if they developed the following symptoms and signs:

1-Lethary or poor oral intake
2-Change in mental status or behavior eg. Drowsiness , irritability
3-Signs of dehydration: sunken eyes, dry tongue, absence of tears during crying or poor urine output.
4-Increasing respiratory rate: fast breathing, noisy breathing, presence of chest recession (chest in-drawing)
5-Fits.
6-Cyanosis.
7-Persistent fever.

Drugs used in treatment and prophylaxis for children

Most commonly used anti-viral for influenza is oseltamivir. Duration of chemoprophylaxis is for **10 days (daily dose) and for treatment 5 days (BD dose)**

The reported side effects are gastrointestinal i.e. nausea, vomiting and abdominal pain. These side effects may be mitigated by administration with food. There are limited data on the use of oseltamivir in children less than 12 months of age, studies in older children had shown oseltamivir to be effective in treatment of seasonal flu by reducing duration of symptoms. Use of oseltamivir was also associated with a reduction in the incidence of antibiotic use and lower respiratory tract infections.

Table 3. Antiviral medication dosing recommendations for treatment or chemoprophylaxis of novel influenza A (H1N1) infection.

Agent, group	Treatment	Chemoprophylaxis
Oseltamivir		
Children ≥ 12 months	15 kg or less 60 mg per day divided into 2 doses	30 mg once per day
	16-23 kg 90 mg per day divided into 2 doses	45 mg once per day
	24-40 kg 120 mg per day divided into 2 doses	60 mg once per day
	>40 kg 150 mg per day divided into 2 doses	75 mg once per day
Zanamivir		
Children	Two 5-mg inhalations (10 mg total) twice per day (age, 7 years or older)	Two 5-mg inhalations (10 mg total) once per day (age, 5 years or older)

Antiviral Usage in children below 1 years old

Children under one year of age are at high risk for complications from seasonal human influenza virus infection. The characteristics of human infection novel (H1N1) influenza virus are still being studied, and it is not known whether infants are at higher risk for complications associated with novel (H1N1) influenza virus infection compared to older children and adults. Oseltamivir is not licensed for use in children less than 1 year of age. However, limited safety data on oseltamivir treatment for seasonal influenza in children less than one year of age suggest that severe adverse events are rare.

Tables 4. Dosing recommendations for antiviral treatment of children younger than 1 year using oseltamivir.

Age	Recommended treatment dose for 5 days
<3 months	12 mg twice daily
3-5 months	20 mg twice daily
6-11 months	25 mg twice daily

Table 3. Dosing recommendations for antiviral chemoprophylaxis of children younger than 1 year using oseltamivir.

Age	Recommended prophylaxis dose for 10 days
<3 months	Not recommended unless situation judged critical due to limited data on use in this age group
3-5 months	20 mg once daily
6-11 months	25 mg once daily