

# INFLUENZA

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2024



# Definition of flu

- Definition might be different according to Flu alert status

- Classic definition:

1) Fever

2) Cough or sore throat

3) One of the following items:

- malaise( ill appearance?)
- Neck pain(calf tenderness?)(muscle pain)
- Shivering
- Mucosal irritation
- Hx of contact to suspicious flu case

- Definition during pandemic:

Illness with both of the following:

1)  $T > 38^{\circ}\text{C}$

2) cough, sore throat, or dyspnea + constitutional s&s



# Interferes with work & leisure time activities

## 4.1 Course and impact of epidemics

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Morbidity associated with ILI in workers

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Work loss	2.8 days
Effectiveness at work	4.6 (scale of 1 to 10)
Confined to bed	2.4 days
Caregiver assistance	0.4 days
Interference with activities at home	73%
Interference with leisure activities	84%

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# Symptoms & Diagnosis:

- Chills
- Body aches, especially throat and joints
- Coughing and sneezing
- Extreme fever
- Fatigue, headache, and nasal congestion
- ***Though similar symptoms occur with a cold, they are much more severe with the flu!***



# Signs and symptoms

Symptoms of novel H1N1 flu in people are similar to those associated with seasonal flu.

- Fever
- Cough
- Sore throat
- Runny or stuffy nose
- Body aches
- Headache
- Chills
- Fatigue
- In addition, vomiting (25%) and diarrhea (25%) have been reported. (Higher rate than for seasonal flu.)



# Clinical findings .2

Uncomplicated course:

- Persistence of systemic s&s FOR 3 DAYS
- Cough become more prominent & can continue for a few days after stopping the fever
- A few wks convalescence





# When do you suspect to flu in a case?

Very important key findings:

- Characteristics of fever
- Toxic appearance at presentation+/-
- Body pain+/-

## Differences of findings in pediatric age group

More common features in pediatric patients:

- More sudden onset
- Anorexia
- Abd. Pain & GI s&s
- Very high fever
- Cervical LNP
- Specially in younger kids: non obvious respiratory s&s
- Newborn period: like sepsis
- Febrile convulsion



## COMPARISON OF FINDINGS IN ADULTS VS CHILDREN(%)

<b>SYMPTOMS</b>	<b>CHILDREN</b>	<b>ADULTS</b>
Sudden onset	<b>66</b>	46
myalgia	33	<b>62</b>
Nasal discharge	67	<b>82</b>
Sneezing	38	<b>67</b>
Abd pain	<b>31</b>	0
Vomiting	<b>26</b>	7
Cervical LNP	<b>38</b>	8

# Differentiating between COVID-19 and influenza

- For both viruses, the common symptoms include fever, cough, muscle pain, nausea and/or vomiting, and diarrhea.
- The symptoms will be similar enough to likely cause confusion and even panic among patients.
- If symptoms develop during flu season with no known exposure to COVID-19, influenza is a quick test and the priority since we have treatment options.
- We anticipate an increased demand for testing for both flu and COVID-19 to delineate between the two



# diagnosis

- Epidemiologic clues
- Routine lab tests: nonspecific

In adults: moderate leukocytosis and relative lymphopenia is common

In children: quite variable: WBC mostly NL, sometimes leukopenia/ dif:NL/  
relative lymphopenia /relative neutropenia

- CXR
- PFT if possible
- VIRUS ISOLATION
- RAPID DX
- SEROLOGY



## Complications of Flu

- Most flu symptoms gradually improve over two to five days, but it's not uncommon to feel run down for a week or more. A common complication of the flu is pneumonia, particularly in the young, elderly, or people with lung or heart problems (shortness of breath, fever that comes back after having been gone for a day or two).
- Ear infections,
- Sinus infections,
- Dehydration, and
- Worsening of chronic medical conditions, such as congestive heart failure, asthma, or diabetes.



# IMPACT OF INFLUENZA ON CHILDREN

- ~9% develop symptomatic infection annually
- Significant morbidity in hospitalized children
  - 20% require ICU care
  - 17% with pneumonia
  - 5% require mechanical ventilation
  - 8-10% experience neurologic complication
  - 0.5% die
- Post-discharge sequelae (critical influenza)



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Photo Credit: *Red Book Online*  
Influenza pneumonia in a 12-year-old with respiratory failure. Courtesy of Benjamin Estrada, MD



# If you get sick...

- Stay home if you're sick for 7 days after your symptoms begin or until you've been symptom-free for 24 hours, whichever is longer.
- If you are sick, limit your contact with other people as much as possible.





# Emergency warning signs in children

If a child gets sick and experiences any of these warning signs, seek emergency medical care.

In children:

- Fast breathing or trouble breathing
- Bluish or gray skin color
- Not drinking enough fluids
- Severe or persistent vomiting
- Not waking up or not interacting
- Irritable, the child does not want to be held
- Flu-like symptoms improve but then return with fever and worse cough



**TABLE 2 High-Risk Groups for Influenza Complications**

Category	Description
Demographic characteristics	Children <5 y, especially those <2 y <sup>a</sup>
	Children born preterm or near term <sup>b</sup>
	Residents of a chronic care facility or nursing home
Underlying condition or treatment with common examples <sup>c</sup>	
Chronic pulmonary disease	Asthma <sup>11</sup>
	Cystic fibrosis
	Bronchopulmonary dysplasia <sup>11</sup>
	Compromised respiratory function (eg, requiring mechanical ventilation, tracheostomy)
Cardiovascular disease	Hemodynamically significant conditions (excluding hypertension alone)
Kidney disease	Chronic kidney disease, including end-stage kidney disease
	Dialysis
Hepatic disease	Chronic liver disease
	Cirrhosis <sup>12,15</sup>
Hematologic disease	Sickle cell disease
	Other hemoglobinopathies
Metabolic disorders	Diabetes mellitus
Neurologic and neurodevelopmental conditions	Cerebral palsy
	Epilepsy
	Stroke
	Intellectual developmental disorder
	Moderate to severe developmental delay
	Muscular dystrophy
	Spinal cord injury
Extreme obesity	BMI $\geq 40$ for adults <sup>d</sup>
Immunosuppression	Receipt of immunocompromising medications
	Receipt of bone marrow, hematopoietic stem cell transplant, and solid organ transplant
	Congenital or acquired immune deficiency, including HIV
	Asplenia
Receiving treatment with aspirin- or salicylate-containing therapies <sup>e</sup>	
Pregnancy and up to 2 wk postpartum	

# Treatment clues

- Isolation, infection control practice, visitors
- Supportive care (O<sub>2</sub>, hydration, stress ulcer, GCS, repeated CXR, CALORIES, ORGAN FAILURES..)
- Oseltamivir, dose, duration, resistance,
- Indications
- Other drugs
- Antibiotics
- IVIG, Corticosteroid, m2 inhibitors, alpha interferon, peep



**Recommendation Recommendations for  
Prevention and ontrol of Influenza in  
Children,2023–2024s for Prevention and  
Control of Influenza in Children,2023–2024  
AAP**

Antiviral treatment is recommended for children with suspected (eg, influenza-like illness [fever with either cough or sore throat]) or confirmed influenza who are:

- hospitalized,
- have severe or progressive disease, or
- have underlying conditions that increase their risk of complications of influenza, regardless of duration of illness.
- Antiviral treatment should be initiated as soon as possible.

# OUTPATIENT SETTING

- for symptomatic children with suspected or confirmed influenza disease who are not at high risk for influenza complications, if treatment can be initiated within 48 hours of illness onset.
- Antiviral treatment may also be considered for children with suspected or confirmed influenza disease whose siblings or household contacts either are younger than 6 months or have a high-risk condition that predisposes them to complications of influenza.



# Medication Summary

- Oseltamivir and zanamivir are antiviral neuraminidase inhibitors that are used for chemoprophylaxis and treatment of influenza A and B infection

**TABLE 6** Recommended Dosage and Schedule of Influenza Antiviral Medications for Treatment and Chemoprophylaxis in Children for the 2023–2024 Influenza Season: United States

Medication	Treatment		Chemoprophylaxis		Common Adverse Events
	Dosage	Duration	Dosage	Duration After Last Exposure	
Oseltamivir <sup>a,b</sup>					
Adults	75 mg, twice daily	5 d	75 mg, once daily	7 d	Nausea Vomiting Headache Skin reactions Diarrhea (children aged <1 y)
Children ≥12 mo					
≤15 kg	30 mg, twice daily	5 d	30 mg, once daily	7 d	
>15 kg–23 kg	45 mg, twice daily	5 d	45 mg, once daily	7 d	
>23 kg–40 kg	60 mg, twice daily	5 d	60 mg, once daily	7 d	
>40 kg	75 mg, twice daily	5 d	75 mg, once daily	7 d	
Infants 9–11 mo <sup>c</sup>	3.5 mg/kg per dose, twice daily	5 d	3.5 mg/kg per dose, once daily	7 d	
Term infants 0–8 mo <sup>c</sup>	3.0 mg/kg per dose, twice daily	5 d	3–8 mo: 3.0 mg/kg per dose, once daily	7 d	
Preterm infants <sup>d</sup>					
<38 wk PMA	1.0 mg/kg per dose, twice daily	5 d	3–8 mo: 3.0 mg/kg per dose, once daily	7 d	
38–40 wk PMA	1.5 mg/kg per dose, twice daily	5 d	3–8 mo: 3.0 mg/kg per dose, once daily	7 d	
>40 wk PMA	3.0 mg/kg per dose, twice daily	5 d	3–8 mo: 3.0 mg/kg per dose, once daily	7 d	

Zanamivir <sup>a,c</sup>					
Adults	10 mg (2.5-mg inhalations), twice daily	5 d	10 mg (2.5-mg inhalations), once daily	7 d <sup>b</sup>	Bronchospasm Skin reactions
Children	≥7 y. 10 mg (2.5-mg inhalations), twice daily	5 d	≥5 y. 10 mg (2.5-mg inhalations), once daily	7 d <sup>b</sup>	
Peramivir <sup>f</sup>					
Adults	1 600-mg dose via intravenous infusion, given over 15–30 min	N/A	Not recommended		Diarrhea Skin reactions
Children 6 mo–12 y	1 12 mg/kg-dose (600 mg maximum) via intravenous infusion over 15–30 min	N/A	Not recommended		
13–17 y	1 600-mg dose, via intravenous infusion over 15–30 min	N/A	Not recommended		
Baloxavir <sup>g</sup>					
Individuals ≥5 y					Nausea Vomiting Diarrhea
<20 kg	2 mg/kg as single dose, orally	N/A	2 mg/kg as single dose, orally	N/A	
20 kg–<80 kg	1 40-mg dose, orally	N/A	1 40-mg dose, orally	N/A	
≥80 kg	1 80-mg dose, orally	N/A	1 80-mg dose, orally	N/A	



