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OREGON PUBLIC HEALTH DIVISION • DEPARTMENT OF HUMAN SERVICES

VACCINES AND ANTIVIRALS: FLOGGING THE FLU

This issue of the *CD Summary* details the steps you should take to help minimize the grief caused by a few members of the orthomyxoviridae family, most mentionablely influenza A and B. These viruses circulate each winter and kill an average of 36,000 Americans each year.[1] The recommendations written here are endorsed by CDC's Advisory Committee on Immunization Practices (ACIP) and are further described in CDC's annual Morbidity and Mortality Weekly Report on Prevention and Control of Influenza.[2]

WHAT'S NEW?

- Annual vaccination of all children 6 months to 18 years of age is now recommended. If possible, this recommendation should be implemented for the 2008–09 season and no later than the 2009–10 season. Vaccination of children 6–59 months of age should be the primary focus as younger children are at higher risk for influenza complications.
- Either trivalent inactivated vaccine (TIV) or live, attenuated influenza vaccine (LAIV) can be used when vaccinating healthy persons 2–49 years old. The LAIV recommendation was expanded this past spring to include 2–5 year olds.
- The vaccine components are being overhauled; all three components have changed from the previous season and include A/Brisbane/59/2007 (H1N1)-like, A/Brisbane/10/2007 (H3N2)-like, and B/Florida/4/2006-like.
- Oseltamivir and zanamivir are the only two antivirals recommended for use in the United States.

GET VACCINATED!

Annual vaccination against influenza is recommended for the following *high-risk individuals:*

- All children 6 months to 18 years of age with emphasis on children 6–59 months and children at high risk for influenza complications including those on long-term aspirin therapy who may be at risk for Reye's syndrome;
- All adults ≥50 years of age;
- Women who will be pregnant during the influenza season;
- Persons with chronic pulmonary, cardiovascular, renal, hepatic, hematological or metabolic disorders, or any condition that can compromise respiratory function or the handling of respiratory secretions;
- The immunosuppressed;
- Residents of nursing homes or chronic-care facilities;

And their contacts:

- Health-care personnel;
- Household contacts and caregivers of persons with conditions that put them at increased risk of complications from influenza infection;
- Household contacts and caregivers of children <5 and ≥50 years of age, especially household contacts of children < 6 months of age for whom influenza vaccination has not been approved; and
- Any adult who wishes to reduce their risk of becoming infected and transmitting influenza to others!

THE SKINNY ON THE VACCINES:

Two types of vaccine are available: trivalent inactivated vaccine (TIV), for intramuscular injection; and a live-attenuated influenza vaccine (LAIV), which is a nasal spray. Both vaccines contain the same strains predicted to circulate during the 2008–09 season. It is anticipated that >130 million doses of influenza vaccine will be available for the 2008–09 season.

TIV can be used for any person ≥6 months of age, including those with high-risk conditions. TIV or LAIV should not be administered to persons who have anaphylactic reactions to eggs or other components of the vaccines. LAIV should only be used for healthy, non-pregnant persons 2–49 years of age; LAIV should not be administered to children <5 years with reactive airways disease or to close contacts of *severely* immunocompromised persons. Persons with febrile illness should delay vaccination until their symptoms have resolved.

Table 1. Approved influenza vaccine and dosage by age group, U.S., 2008–09 season

Age	Dose and Route
TIV	
6–35 months	0.25 mL, intramuscular
>36 months	0.5 mL, intramuscular
LAIV	
2–49 years	0.2 mL, nasal spray [0.1 mL per nostril]

Systemic reactions such as fever, malaise, and myalgia may occur within 6–12 hrs after vaccination with TIV and persist for 1–2 days. The most common symptoms associated with LAIV include nasal congestion, sore throat, fever and headache.

Vaccine Timing. Annual vaccination should begin in October or as soon as it is available. Vaccine should be offered during routine visits or during hospitalizations in order to take advantage of any opportunity to vaccinate. Given that influenza activity in Oregon peaked in late February or early March in four of the last five seasons, vaccination against influenza should be offered well past Christmas.

Children 6 months through 8 years should receive two doses of influenza vaccine separated by at least 4 weeks if they have not been previously vaccinated at any time. If a child 6 months through 8 years only received one dose in their first year of vaccination, they should receive two doses in their second year. Oregon is one of 10 sites participating in a study evaluating effectiveness of influenza vaccine in preventing hospitalizations in kids 6–59 months of age, and while the results are preliminary, we can reveal that two doses are pretty effective, but a single dose of flu vaccine does not do much good; make sure that parents understand the importance of dose #2.

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In Oregon, kids <5 years old are hospitalized at similar rates as adults over 65, yet only 12% of kids are fully vaccinated, compared to 70% of adults.

Vaccine Administration. When administering TIV, adults and older children should be vaccinated in the deltoid muscle with a needle ≥1 inch in length. Infants should be vaccinated in the anterolateral thigh with a needle ⅞–1 inch long.

LAIV is intended for intranasal administration. Half of the sprayer contents should be sprayed into each nostril. Severely immunocompromised individuals should not administer LAIV. LAIV should not be administered within 48 hours of receipt of antivirals; and antivirals should not be taken for two weeks after receipt of LAIV.

For Flu Clinic locations call, 1-800-SAFENET (723-3638).

ANTIVIRALS

Two neuraminidase inhibitors, zanamivir and oseltamivir, effective at reducing the duration and severity of uncomplicated influenza, are recommended for use in the United States.

Antiviral treatment should be considered for persons with laboratory-confirmed influenza who

- are hospitalized;
- have pneumonia;
- have a bacterial co-infection;
- are at risk for complications; or
- seek medical care within 48 hours of symptom onset and wish to decrease duration or severity of their illness.

Table 2 Approved antivirals by age, dose and duration, United States, 2008–2009 season

Antiviral	Treatment (5 day course)			Prophylaxis (while flu is in community)		
	Age	Dose	Frequency	Age	Dose	Frequency
Oseltamivir	≥1 year	by weight*	b.i.d.	≥1 year	by weight*	daily
Zanamivir	≥7 years	10 mg	b.i.d.	≥5 years	10 mg	daily

* ≤15 kg: 30 mg, >15-23 kg: 45 mg, >23-40 kg: 60 mg, >40 mg: 75 mg

Initiation of antiviral treatment should begin within two days of symptom onset. The benefits of antiviral use are greater the sooner treatment is initiated. For uncomplicated influenza there is little benefit from antiviral treatment that begins >48 hours after illness onset; effectiveness of delayed treatment for severe cases of influenza has yet to be evaluated.

Antivirals are no substitute for vaccination. However, antiviral chemoprophylaxis may be considered for the following:

- Persons at high risk of complications when influenza is circulating in their community during the two weeks after influenza vaccination;
- Persons at high risk for whom influenza vaccination is contraindicated;
- Unvaccinated contacts who are likely to have ongoing exposure to high-risk individuals or infants <6 months of age;
- Persons at high risk and their contacts if vaccine strains are poorly matched to the circulating viruses;
- Immunodeficient persons who may not respond to vaccine;
- Unvaccinated persons and residents of a closed institutional setting during an outbreak of influenza.

ANTIVIRAL RESISTANCE

Last season, 10% of the circulating influenza A (H1N1) viruses were resistant to oseltamivir in the United States. No resistance was seen among influenza A (H3N2) or influenza B, so oseltamivir is still recommended. Influenza A (H3N2) maintains its high resistance towards adamantanes (amantadine and rimantadine), and some resistance is also being reported among influenza A (H1N1) viruses. Furthermore, adamantanes do not treat influenza B.

For these reasons, adamantanes are no longer recommended.

THANKS!

... to all who support our flu surveillance; we look forward to working with you this year. To join Oregon's influenza surveillance network, call Meredith Vandermeer at 971-673-1111.

REFERENCES

1. Thompson WW, Shay DK, Weintraub E, et al. Mortality associated with influenza and respiratory syncytial virus in the United States. JAMA 2003;289(2):179–86.
2. CDC. Prevention and control of influenza: recommendations of the Advisory Committee on Immunization Practices (ACIP), 2008. MMWR 2008;57:1–60. Available at: *www.cdc.gov/mmwr/preview/mmwrhtml/rr57e717a1.htm*