



# PHYSICIANS' BULLETIN

## Influenza Immunization Recommendations for 2006-2007

Note: Medicare B reimburses for influenza vaccines.

Influenza is a viral respiratory illness which is mainly spread through sneezing and coughing. Each year in the United States about 36,000 people die due to influenza and its complications. Administration of influenza vaccine is the primary method for preventing flu and its severe complications. Both the trivalent inactivated influenza vaccine (TIV) and the live, attenuated influenza vaccine (LAIV) can be used to reduce the risk of influenza.

Extensive information on influenza disease and vaccine is available on the Internet at [www.cdc.gov/flu](http://www.cdc.gov/flu) and in print in the Centers for Disease Control and Prevention (CDC) National Immunization Program, *Prevention and Control of Influenza, Recommendations of the Advisory Committee on Immunization Practices*, MMWR 2006; Vol. 55:RR-10.

### Target Groups for Vaccination 2006-2007

**Vaccination with inactivated influenza vaccine (TIV) is recommended for the following persons who are at increased risk for severe complications from influenza:**

- Children aged 6–59 months (*note that preservative free [no thimerosal] is required by California law for those under three years of age and for pregnant women*);
- Persons aged  $\geq 50$  years;
- Women who will be pregnant during the influenza season (*see note in first bullet*);
- Children and adolescents (aged 6 months–18 years) who are receiving long-term aspirin therapy and, therefore, might be at risk for experiencing Reye syndrome after influenza infection;
- Adults and children who have chronic disorders of the pulmonary or cardiovascular systems, including asthma (hypertension is not considered a high-risk condition);
- Adults and children who have required regular medical follow-up or hospitalization during the preceding year because of chronic metabolic diseases (including diabetes mellitus), renal dysfunction, hemoglobinopathies, or immunodeficiency (including immunodeficiency caused by medications or by human immunodeficiency virus);
- Adults and children who have any condition (e.g., cognitive dysfunction, spinal cord injuries, seizure disorders, or other neuromuscular disorders) that can compromise respiratory function or the handling of respiratory secretions, or that can

increase the risk for aspiration;

- Residents of nursing homes and other chronic-care facilities that house persons of any age who have chronic medical conditions.

**Vaccination with influenza vaccine (TIV or LAIV if indicated) is also recommended for the following persons who live with or care for persons at high risk for influenza-related complications:**

- Persons living with or caring for persons at high risk for influenza-related complications; (see list at left)
- Household contacts and caregivers of children aged 0–59 months;
- Health-care workers (HCWs):
  - Physicians, nurses, and other workers in both hospital and outpatient-care settings,
  - Medical emergency-response workers (e.g., paramedics and emergency medical technicians),
  - Employees of nursing home and chronic care facilities who have contact with patients or residents.

### Importance of Vaccinating HCWs

HCWs should be vaccinated against influenza annually. Persons who are clinically or subclinically infected with influenza disease can transmit influenza virus to persons at high risk for complications from influenza. Studies indicate that hospital-based influenza outbreaks frequently occur where unvaccinated HCWs are employed. Beginning in October each year, health care facilities should offer influenza vaccinations to all workers, including night and weekend staff. Particular emphasis should be placed on providing vaccinations to persons who care for members of groups at high risk. Efforts should be made to educate HCWs regarding the benefits of vaccination and the potential health consequences of influenza illness for themselves, their family members, and their patients. All HCWs should be provided convenient access to influenza vaccine at the worksite, free of charge, as part of employee health programs.

### Additional Target Groups for Vaccination

- Persons who provide essential community services should be considered for vaccination to minimize disruption of essential activities during outbreaks;

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- Students or other persons in institutional settings (e.g., those who reside in dormitories) should be encouraged to receive vaccine to minimize the disruption of routine activities during epidemics; and
- Persons who wish to reduce their chance of catching influenza.

Use of LAIV is encouraged for eligible persons (see below) and this may increase the availability of the inactivated influenza vaccine (TIV) for those in the other target groups.

LAIV may be administered at any time to:

- nonpregnant healthy persons aged 5-49 years. This can include most HCW, most persons in close contact with groups at high risk, many of those providing essential community services, and many of those in dormitory-type settings.

**Influenza Vaccine and Thimerosal**

Thimerosal, a mercury-containing compound, has been used as a preservative in vaccines for many years. Although no scientific evidence indicates that thimerosal in vaccines leads to serious adverse events in vaccine recipients, in 1999 the U.S. Public Health Service and other organizations recommended that efforts be made to eliminate or reduce the thimerosal content in vaccines to decrease total mercury exposure, chiefly among infants.

As of July 1, 2006, California law prohibits the administration of influenza vaccine which contains more than 1mcg of mercury per 0.5mL of vaccine to pregnant women and children under three years old.

There is thimerosal-free flu vaccine available for children aged 6 months through 35 months and for women who are pregnant. See

Table 1 for details on dosages and thimerosal content.

**Side Effects and Adverse Reactions**

Possible side effects of TIV are soreness, redness or swelling at the injection site, as well as fever and aches. When educating patients regarding potential side effects, clinicians should emphasize that 1) TIV contains noninfectious killed viruses and cannot cause influenza; and 2) coincidental respiratory disease unrelated to influenza vaccination can occur after vaccination. The Vaccine Information Statements (VISs), *Inactivated Influenza Vaccine, What You Need to Know*, 2006-2007, and *Live, Attenuated Intranasal Vaccine, What You Need to Know*, 2006-2007 (see *Influenza and Immunization Resources*) can be effective tools to educate about the risks and benefits of the vaccine and side effects. **VISs are to be given to patients to read before administering flu vaccine.**

Health care professionals should promptly report all clinically significant adverse events after influenza vaccination to VAERS (see *Influenza and Immunization Resources*), even if they are not certain that the vaccine caused the event. Since 1978 Guillain-Barre Syndrome (GBS) has not been clearly linked to flu vaccine. Clarification about GBS and flu vaccine can be found on pages 16-17 of the MMWR 2006;Vol. 55:RR-10. Immediate, presumably allergic reactions (such as hives, angioedema, allergic asthma, and systemic anaphylaxis) rarely occur after influenza vaccination. These reactions probably result from hypersensitivity to certain vaccine components; the majority of reactions probably are caused by residual egg protein. Although current influenza vaccines, the LAIV as well as the inactivated, contain only a limited quantity of egg protein, this protein can induce immediate

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**Table 1: Approved Influenza Vaccines For Different Age Groups**

Vaccine*	Trade name	Manufacturer	Dose/ Presentation	Thimerosal mercury content (mcg Hg/0.5-mL dose)	Age group	No. of doses	Route
<b>Inactivated</b>							
TIV	Fluzone®	sanofi pasteur	0.25-mL prefilled syringe	0	6-35 mos	1 or 2†	Intramuscular§
			0.5-mL prefilled syringe	0	≥36 mos	1 or 2†	Intramuscular§
			0.5-mL vial	0	≥36 mos	1 or 2†	Intramuscular§
			5.0-mL multi-dose vial	25	≥36 mos in CA (≥6 mos in other states)	1 or 2†	Intramuscular§
TIV	Fluvirin®	Novartis Vaccine (formerly Chiron Corporation)	0.5-mL prefilled syringe	<1.0	≥4 yrs	1 or 2†	Intramuscular§
			5.0-mL multi-dose vial	24.5	≥4 yrs	1 or 2†	Intramuscular§
TIV	FLUARIX®	GlaxoSmithKline	0.5-mL prefilled syringe	<1.0	≥18 yrs	1	Intramuscular§
<b>Live, attenuated</b>							
LAIV	FluMist®	MedImmune	0.5-mL sprayer	0	5-49 yrs	1 or 2¶	Intranasal**

\* A 0.5-mL dose contains 15 mcg each of A/New Caledonia/20/1999 (H1N1)-like, A/Wisconsin/67/2005 (H3N2)-like, and B/Malaysia/2506/2004-like antigens. For the A/Wisconsin/67/2005 (H3N2)-like antigen, manufacturers may use the antigenically equivalent A/Hiroshima/52/2005 virus, and for the B/Malaysia/2506/2004-like antigen, manufacturers may use the antigenically equivalent B/Ohio/1/2005 virus.

† Two doses administered at least 1 month apart are recommended for children aged 6 months- <9 years who are receiving influenza vaccine for the first time.

§ For adults and older children, the recommended site of vaccination is the deltoid muscle. The preferred site for infants and young children is the anterolateral aspect of the thigh.

¶ Two doses administered at least 6 weeks apart are recommended for children aged 5- <9 years who are receiving influenza vaccine for the first time.

\*\* One dose equals 0.5 mL, divided equally between each nostril.

hypersensitivity reactions among persons who have severe egg allergy. Persons who have had hives or swelling of the lips or tongue, or who have experienced acute respiratory distress or collapse after eating eggs should consult a physician for appropriate evaluation to help determine if the vaccine should be administered. Persons who have documented immunoglobulin E (IgE)-mediated hypersensitivity to eggs, including those who have had occupational asthma or other allergic responses to egg protein, might also be at increased risk for allergic reactions to influenza vaccine, and consultation with a physician should be considered. See MMWR Recommendations and Reports, Vol. 55, RR-10, p. 16 referencing protocols to safely administer influenza vaccine to persons with egg allergies.

### Live, Attenuated Influenza Vaccine Recommendations

The LAIV licensed for use in the United States is produced by MedImmune, Inc. (Gaithersburg, Maryland; <http://www.medimmune.com>) and marketed under the name FluMist®.

It is a live, trivalent, intranasally administered vaccine that is attenuated, producing mild or no signs or symptoms related to influenza virus infection. Possible advantages of LAIV (as compared to TIV) include its potential to induce a broad mucosal and systemic immune response, its ease of administration, and the acceptability of an intranasal rather than intramuscular route of administration.

LAIV is approved for healthy persons age 5 years through 49 years who are not pregnant. The vaccine is supplied in individual sprayers for nasal administration, and must be stored at 5°F (-15°C) or colder preferably in a manual-defrost freezer or in the freezer compartment of a refrigerator/freezer with separate freezer and refrigerator doors. If necessary the vaccine can be thawed in a refrigerator and stored at 35-46°F (2-8°C) for up to 60 hours before use. It should not be refrozen after thawing.

Details on storage, dosage, administration, side effects of LAIV are detailed at [www.flumist.com](http://www.flumist.com), in the MMWR Volume 55, RR-10, as well as in the package insert. LAIV is intended for intranasal administration only and should not be administered by the intramuscular, intradermal, or intravenous route. Side effects can include runny nose and headache.

Low-level introduction of vaccine viruses into the environment is likely unavoidable when administering LAIV. The risk of acquiring vaccine viruses from the environment is unknown, but likely to be limited. Severely immunosuppressed persons (e.g., patients with hematopoietic stem cell transplants) should not administer LAIV. However, other persons at high risk for influenza complications may administer LAIV. People who have received LAIV may provide care or may visit anyone, except the severely immunocompromised in a protective environment (e.g., patients with hematopoietic stem cell transplants).

### Optimal Timing of Influenza Vaccine Activities

The optimal time to vaccinate is during October and November. In October, vaccination in provider-based settings should start for all patients--both high-risk and healthy--and extend throughout November. Vaccination of children aged <9 years who are receiving vaccine for the first time should also begin in October or earlier because those persons need a booster dose of the

inactivated flu vaccine 1 month after the initial dose, or 6 weeks after if using the LAIV.

In facilities housing older persons (e.g., nursing homes), vaccination before October typically should be avoided because antibody levels in such persons can begin to decline within a limited time after vaccination.

### Continue Vaccination in December and Later

After November, many persons who should or want to receive influenza vaccine remain unvaccinated. In addition, substantial amounts of vaccine have remained unused during three of the past four influenza seasons. To improve vaccine coverage, influenza vaccine should continue to be offered in **December and throughout the influenza season** as long as vaccine supplies are available, even after influenza activity has been documented in the community. In the U.S., seasonal influenza activity may be noted as early as October or November, but influenza activity has not reached peak levels in the majority of recent seasons until late December (as experienced in the 2003-2004 season) through early March.

### Recommendations for Using Antiviral Agents for Influenza

Although annual vaccination is the primary strategy for preventing complications of influenza virus infections, antiviral medications with activity against influenza viruses can be effective for the chemoprophylaxis and treatment of influenza. Four licensed influenza antiviral agents are available in the United States: amantadine, rimantadine, zanamivir, and oseltamivir. Influenza A virus resistance to amantadine and rimantadine can emerge rapidly during treatment. On the basis of antiviral testing results conducted at CDC and in Canada indicating high levels of resistance, ACIP recommends that neither amantadine nor rimantadine be used for the treatment or chemoprophylaxis of influenza A in the United States until susceptibility to these antiviral medications has been re-established among circulating

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The *Physicians' Bulletin* is published on an as-needed basis by the County of San Diego Health and Human Services Agency to provide updated information on health issues of concern to San Diego County's medical community.

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influenza A viruses. Oseltamivir or zanamivir can be prescribed if antiviral treatment of influenza is indicated. Oseltamivir is approved for treatment of persons aged  $\geq 1$  year, and zanamivir is approved for treatment of persons aged  $\geq 7$  years. Oseltamivir and zanamivir can be used for chemoprophylaxis of influenza; oseltamivir is licensed for use in persons aged  $\geq 1$  year, and zanamivir is licensed for use in persons aged  $\geq 5$  years. See Table 2 on page 5 for a summary of treatment and chemoprophylaxis dosing.

### Role of Laboratory Diagnosis

Appropriate treatment of patients with respiratory illness depends on accurate and timely diagnosis. Influenza surveillance information and diagnostic testing can aid clinical judgment and help guide treatment decisions. For example, early diagnosis of influenza can reduce the inappropriate use of antibiotics and provide the option of using antiviral therapy. However, because certain bacterial infections can produce symptoms similar to influenza, bacterial infections should be considered and appropriately treated, if suspected. In addition, bacterial infections can occur as a complication of influenza.

The accuracy of clinical diagnosis of influenza on the basis of symptoms alone is limited because symptoms from illness caused by other pathogens can overlap considerably with influenza. Because testing all patients who might have influenza is not feasible, influenza surveillance by state and local health departments and CDC can provide information regarding the presence of influenza viruses in the community.

Physicians and laboratories are encouraged to report positive influenza detections to the County of San Diego Public Health Laboratory by phone (619-692-8500) or fax (619-692-8558) and when possible, to submit specimens for viral culture and isolate subtyping. Surveillance data is available at [www.emansandiego.com](http://www.emansandiego.com).

### Influenza Vaccine Campaign Offers Opportunity to Provide Other Needed Adult Vaccines

Seniors and others at high risk of complications from influenza visit medical care providers each fall to receive influenza vaccine.

Medical care providers should use this opportunity to evaluate these adults for other needed vaccines as well.

Vaccines are listed below:

1. Pneumococcal polysaccharide vaccine (PPV-23),
2. Tetanus and diphtheria vaccine or tetanus, diphtheria and acellular pertussis vaccine.

And if medically and/or occupationally indicated:

3. Hepatitis A vaccine,
4. Hepatitis B vaccine,
5. Measles, mumps and rubella combination vaccine (MMR),
6. Varicella vaccine,
7. Meningococcal vaccine.

Physicians are urged to capitalize on office visits by those at risk for influenza to provide all needed vaccines. To receive a free chart on adult vaccine recommendations, call the Immunization Branch at (619) 692-8661.

### Influenza and Immunization Resources

The CDC's 2006 report, *Prevention and Control of Influenza, Recommendations of the Advisory Committee on Immunization Practices (ACIP)*, (Vol. 54, RR-10, July 28, 2006) includes information on the disease, vaccine, target groups, strategies and the use of antiviral agents in preventing and/or treating influenza. **For a copy of this report, please go to the CDC website noted below.**

The following is a list of World Wide Web sites for accessing information and promotional materials on influenza, influenza vaccine and related topics:

**[www.cdc.gov/flu](http://www.cdc.gov/flu):** This is the CDC flu site, and contains information about vaccine supply, flu treatment and management, a weekly flu activity report, and other items. There is a gallery of patient educational materials developed for the 2006-2007 flu season. The gallery contains downloadable master copies suitable for an office photocopier, and other masters intended for reproduction by commercial printers.

In addition to the CDC's influenza reports mentioned above, this site contains pneumococcal vaccine educational materials and a wide variety of links to other sites with fact sheets for providers and patients.

**[www.sdchip.org](http://www.sdchip.org):** This site is maintained by Community Health Improvement Partners (CHIP), a collaboration of health care organizations, providers and community groups working in San Diego County to increase awareness of and responsiveness to community health needs. When vaccine becomes available, this web site will feature a list of more than 300 public and private locations in San Diego County where flu shots will be offered. Also, the site has downloadable flu and pneumococcal information in English and 7 other languages, and links to other immunization-related web sites. Flu shot clinic information is also available through CHIP's toll-free number at 1-877-FLU-0202 (1-877-358-0202).

**[www.sdiz.org](http://www.sdiz.org):** The San Diego County Immunization Initiative website contains immunization information specifically for local health care providers, including general immunization recommendations for children and adults, vaccine safety issues, the San Diego Immunization Registry, flu information, as well as the flu shot clinic schedule (when available) at the County Public Health Centers. There are also links to other websites, such as the CDC's influenza information site.

**[www.immunize.org](http://www.immunize.org):** The Immunization Action Coalition has a wealth of print materials that can be downloaded and reproduced. Included are childhood and adult materials and official Vaccine Information Statements including, "*Influenza Vaccine, What You Need To Know*" in many languages. VISs are to be given to patients to read before flu vaccine is administered.

**[www.dhs.ca.gov/ps/dcdc/izgroup/flu.htm](http://www.dhs.ca.gov/ps/dcdc/izgroup/flu.htm):** The State of California Department of Health Services Immunization Branch has downloadable materials including public service announcements; the VIS for inactivated and live attenuated influenza vaccine in English and Spanish with consent portion attached; and links to CDC and others.

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[www.cms.hhs.gov/AdultImmunizations/](http://www.cms.hhs.gov/AdultImmunizations/): This is the Centers for Medicare and Medicaid Services (CMS) website and has information on how to bill Medicare for influenza and pneumonia vaccine, the 2006 reimbursement rates for vaccines, and general information on prevention.

[www.nfid.org](http://www.nfid.org): This is the web site of the National Foundation for Infectious Diseases (NFID), which has timely and helpful resources with strategies on increasing influenza immunization rates in infants and children and in HCWs. It also has a complete Campaign Kit to promote National Adult Immunization Awareness Week, September 24 through 30, 2006. A special project this season is the Key Strategies to Improve Low Influenza Vaccination Rates Among Children with Asthma at [www.nfid.org/docs/asthma.html](http://www.nfid.org/docs/asthma.html).

[www2.sdcounty.ca.gov/hhsa/ServiceDetails.asp?ServiceID=698](http://www2.sdcounty.ca.gov/hhsa/ServiceDetails.asp?ServiceID=698): This is the County of San Diego Health and Human Services Agency website, which has location and contact information for clinics which provide low-cost childhood and adult immunizations. (Please note that influenza immunization clinic information will probably not be available at this site until early October, when the specifics of the flu shot clinics are finalized.)

<http://vaers.hhs.gov>: This is the website for The Vaccine Adverse Event Reporting System (VAERS). Health care providers and manufacturers are required by law to report suspect reactions to

vaccines listed in the Vaccine Injury Table and are encouraged to report even if the vaccines are not listed. VAERS forms are available at 1-800-822-7967 or online at this site.

#### 2006-2007 Influenza Vaccine Manufacturers/Distributors

sanofi pasteur (*Fluzone*®) 1-800-VACCINE (1-800-822-2463)

Novartis Vaccine (*Fluvirin*®) 1-800-244-7668

GlaxoSmithKline (*Fluarix*®) 1-888-825-5249

MedImmune (*FluMist*®) 1-877-633-4411

#### Sources

1. Advisory Committee on Immunization Practices, National Immunization Program, Centers for Disease Control and Prevention. *Recommended Childhood and Adolescent Immunization Schedule, United States, 2006*.
2. Advisory Committee on Immunization Practices, National Immunization Program, Centers for Disease Control and Prevention. *Prevention and Control of Influenza, Recommendations of the Advisory Committee on Immunization Practices*. MMWR 2006;Vol. 55:RR-10.
3. National Foundation for Infectious Diseases. *Influenza Immunization Among Health Care Workers, Call To Action and Increasing Influenza Immunization Rates in Infants and Children: Putting Recommendations Into Practice*. Both are available at: [www.nfid.org](http://www.nfid.org).
4. Centers for Disease Control and Prevention. *Inactivated Influenza Vaccine, What You Need To Know*.
5. Centers for Disease Control and Prevention. *Live, Intranasal Influenza Vaccine, What You Need To Know*.

**Table 2: Recommended Daily Dosage of Influenza Antiviral Medications for Treatment and Prophylaxis**

See also section titled *Recommendations for Using Antiviral Agents for Influenza 2006* on p. 3

Antiviral agent	Age group (yrs)				
	1–6	7–9	10–12	13–64	≥65
Zanamivir*					
Treatment, influenza A and B	N/A†	10 mg (two inhalations) twice daily	10 mg (two inhalations) twice daily	10 mg (two inhalations) twice daily	10 mg (two inhalations) twice daily
Chemoprophylaxis, influenza A and B	Ages 1–4 N/A†	Ages 5–9 10 mg (two inhalations) once daily	10 mg (two inhalations) once daily	10 mg (two inhalations) once daily	10 mg (two inhalations) once daily
Oseltamivir					
Treatment,§ influenza A and B	Dose varies by child's weight¶	Dose varies by child's weight¶	Dose varies by child's weight¶	75 mg twice daily	75 mg twice daily
Chemoprophylaxis, influenza A and B	Dose varies by child's weight**	Dose varies by child's weight**	Dose varies by child's weight**	75 mg once daily	75 mg once daily

NOTE: Zanamivir is manufactured by GlaxoSmithKline (Relenza® — inhaled powder). Oseltamivir is manufactured by Roche Pharmaceuticals (Tamiflu® — tablet). This information is based on data published by the Food and Drug Administration (FDA), which is available at [www.fda.gov](http://www.fda.gov).

\* Zanamivir is administered through oral inhalation by using a plastic device included in the medication package. Patients will benefit from instruction and demonstration of the correct use of the device. Zanamivir is not recommended for those persons with underlying airway disease.

† Not applicable.

§ A reduction in the dose of oseltamivir is recommended for persons with creatinine clearance <30 mL/min.

¶ The treatment dosing recommendations of oseltamivir for children weighing ≤15 kg is 30 mg twice a day; for children weighing >15–23 kg, the dose is 45 mg twice a day; for children weighing >23–40 kg, the dose is 60 mg twice a day; and for children weighing >40 kg, the dose is 75 mg twice a day.

\*\*The chemoprophylaxis dosing recommendations of oseltamivir for children weighing ≤15 kg is 30 mg once a day; for children weighing >15–23 kg, the dose is 45 mg once a day; for children weighing >23–40 kg, the dose is 60 mg once a day; and for children >40 kg, the dose is 75 mg once a day.