disease prevention news

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Prevention and Control of Influenza Indications for Influenza Vaccine

*This report is a summary of the Advisory Committee on Immunization Practices (**ACIP**) recommendations for vaccine use during the 1997-98 influenza season (found in MMWR 1997; 46 [No. RR-9]:1-25). The principle changes from last year's recommendations include information about the influenza strains in the trivalent vaccine for 1997-98, and guidelines for vaccinating pregnant and breastfeeding women.*

Every year, infections due to influenza A virus or influenza B virus account for substantial upper respiratory morbidity during the late fall, winter, and early spring around the world. Central to this seasonal onslaught is the ability of the influenza viruses to alter the antigenic properties of their surface proteins in response to increasing levels of immunity in the population. Influenza A viruses can be classified into subtypes based on the antigenic characteristics of 2 major surface antigens: hemagglutinin (H) and neuraminidase (N). Currently 3 subtypes of hemagglutinin (H1, H2, H3) and 2 subtypes of neuraminidase (N1, N2) are associated with widespread seasonal disease in humans.

Immunity to these antigens, especially to the hemagglutinin, reduces the likelihood of infection and lessens the severity of disease if infection occurs. Infection with a virus of one subtype, however, confers little or no protection against infection due to viruses of other subtypes. Over time, antigenic variation (antigenic drift) within a subtype may be so marked that infection or vaccination with one strain may not induce effective immunity to distantly related strains of the same subtype. Although influenza B viruses have demonstrated comparatively more antigenic stability than have influenza A viruses, antigenic variation does occur. Consequently, new variants of influenza virus emerge every year around the world, necessitating an annual change in the composition of the influenza vaccine. The antigenic characteristics of current strains provide the basis for selecting which virus strains to include in each year's vaccine.

The influenza vaccine for the 1997-98 season will include the following components: 15 µg A/Wuhan/359/95-like (H3N2), A/Bayern/07/95-like (H1N1), and B/Beijing/184/93-like hemagglutinin antigens in each 0.5 mL. US maufacturers will use the antigenically equivalent strains A/Johannesburg/82/96(H1N1), A/Nanchang/933/95(H3N2), and B/Harbin/07/94 because of their growth properties.

Why Vaccinate Against Influenza?

Although influenza by itself is an acute, self-limiting upper respiratory infection, it can lead to more serious illness such as primary influenza pneumonia or secondary bacterial pneumonia. The risk for developing these secondary complications is especially high for the elderly and for persons with underlying health problems. To prevent morbidity and mortality due to severe influenza and its complications, influenza vaccine campaigns are targeted toward members of these medically at-risk groups. During major influenza epidemics hospitalization rates for high-risk populations increase 2- to 5-fold, depending on the age group.

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Also in this issue:

Influenza Vaccine* Dosage, by Age Group United States, 1997-98 Season

Age Group	Product	Dosage	No. Doses	Route
6-35 mos.	Split virus only	0.25 mL	1 or 2^	IM
3- 8 yrs.	Split virus only	0.50 mL	1 or 2^	IM
9-12 yrs.	Split virus only	0.50 mL	1	IM
>12 yrs	Whole or split virus	0.50 mL	1	IM

* Manufacturers include **Connaught Laboratories, Inc.** (Fluzone® whole or split); **Evans Medical Ltd.** distributed by **Adams Laboratories, Inc.** [Fluvirin™ purified-surface-antigen vaccine]); **Parke-Davis** (Fluogen® split); and **Wyeth–Ayerst Laboratories** (Flushield™ split). For further product information, contact Connaught, (800) 822-2463; Adams, (800) 932-1950; Parke-Davis, (800) 223-0432; Wyeth-Ayerst, (800) FLU-SHIELD [(800) 358-7443].

^ Two doses administered at least 1 month apart are recommended for previously unvaccinated children <9 years of age. The preferred site is the anterolateral aspect of the thigh for infants and young children.

Unless control measures are more vigorously implemented, the number of deaths from influenza and its complications is expected to increase.

The impact of such epidemics is also demonstrated by an increase in mortality. While influenza-associated mortality is a major concern for persons with chronic diseases, this increase is most marked in persons 65 years of age or older, with more than 90% of the deaths attributed to pneumonia and influenza occurring in persons of this age group. The proportion of elderly persons in the US population is increasing, and age and its associated chronic diseases are risk factors for severe influenza illness. Unless control measures are more vigorously implemented, the number of deaths from influenza and its complications is expected to increase. Preseason vaccination of persons in high-risk groups currently remains the most effective measure for reducing the impact of influenza.

Influenza Vaccine

Influenza vaccine is made from highly purified, egg-grown viruses that have been rendered noninfectious (inactivated). Each year's influenza vaccine contains 3 virus strains (usually 2 strains of type A and 1 of type B) representing those influenza viruses expected to circulate in the US during the upcoming season. The degree of similarity between the vaccine virus components and the circulating virus strains influences vaccine efficacy. When there is a close match, the vaccine can prevent illness in approximately 70% to 90% of healthy persons aged younger than 65 years.

The efficacy of the vaccine in preventing or attenuating illness also depends on the age and immunocompetence of the vaccine recipient.

Among the elderly who do **not** live in nursing homes, the efficacy of influenza vaccine in preventing hospitalization due to pneumonia and other complications ranges from 30% to 70%. Among those who do, influenza vaccine can be 50% to 60% effective in preventing pneumonia and hospitalization, and 80% effective in preventing death due to influenza and its complications. Vaccine efficacy in the frail elderly, however, is only 30% to 40%. Therefore, it is important that persons who have contact with the frail elderly, particularly their care givers, be vaccinated. Although the current influenza vaccine can contain one or more of the antigens administered in previous years, annual vaccination with the current vaccine is necessary because immunity declines in the year following vaccination. Because the 1997-98 vaccine differs from that used during the 1996-97 influenza season, supplies of the 1996-97 vaccine should not be administered to provide protection for the 1997-98 season.

Split-virus (subvirion and purified-surface-antigen) and whole-virus preparations of vaccine are available. Any of the preparations may be used for adults. To minimize febrile reactions, only subvirion or purified-surface-antigen preparations should be used for children.

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Most vaccine recipients will develop high levels of immunity to the vaccine strains or related variants within 2 to 4 weeks of vaccination. Although the elderly and persons with chronic disease may develop only low antibody titers after vaccination, and therefore may remain somewhat susceptible to influenza infection, the influenza vaccine has been shown to be effective in preventing severe complications, thereby reducing the risk of hospitalization and death.

Recommendations for Use of Influenza Vaccine

Influenza vaccine is strongly recommended for any person 6 months of age or older who is at increased risk for complications of influenza because of age or an underlying medical condition. Health care workers, household members, and others in close contact with persons in high-risk groups should also be vaccinated. Influenza vaccine also may be given to any person who wishes to reduce the chance of becoming infected with influenza.

A single dose of influenza vaccine is generally recommended for adults and previously vaccinated children. Two doses administered at least 1 month apart may be required for a satisfactory antibody

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Target Groups for Special Vaccination Programs

Members of the following high-risk groups and their close contacts should be targeted for organized vaccination programs:

- Persons 65 years of age or older
- Residents of nursing homes and other chronic-care facilities housing persons of any age who have chronic medical conditions
- Adults and children with chronic disorders of the pulmonary or cardiovascular systems, including children with asthma
- Adults and children who have required regular medical followup or hospitalization during the preceding year because of chronic metabolic diseases (including diabetes mellitus), renal dysfunction, hemoglobinopathies, or immunosuppression regardless of cause
- Children and teenagers (aged 6 months to 18 years) who are receiving long-term aspirin therapy and therefore may be at risk of developing Reye syndrome after influenza
- Women who will be in the second or third trimester of pregnancy during the influenza season.

Influenza vaccine is considered safe for pregnant women. Pregnant women who have other medical conditions that increase their risks for influenza-related complications should be vaccinated, regardless of the stage of pregnancy. Thus it is undesirable to delay vaccination of pregnant women who have high-risk conditions and who will be in the first trimester of pregnancy when the influenza season begins. In addition, recent studies suggest that women in the third trimester of pregnancy and early puerperium, including women without any underlying risk factors, might be at increased risk of serious complications from influenza. Influenza vaccination may be considered for all pregnant women who will be in the second or third trimester during the influenza season.

Persons who are clinically or subclinically infected and who are in close contact with members of high-risk groups can transmit influenza virus to them. To reduce the risk of exposure of high-risk persons to influenza via care providers, the following individuals should be vaccinated:

- Physicians, nurses, and other personnel in both hospital and out-patient-care settings
- Employees of nursing homes and chronic-care facilities
- Providers of home care to persons at high risk (eg, visiting nurses)
- Household members (including children) of persons in high-risk groups

response in previously unvaccinated children under 9 years of age. Influenza vaccine is administered via the intramuscular (IM) route for all age groups. Adults and older children should be vaccinated in the deltoid muscle, and infants and young children in the anterolateral aspect of the thigh.

Please note that current recommendations **DO NOT** include additional doses of influenza vaccine for adults during the second half of the season. Studies conducted with vaccines similar to those in current use have shown little or no improvement in antibody responses when a second dose is administered to adults during the same season.

Influenza vaccine can be administered at the same time as are other routine immunizations. . . .

Limited information exists regarding the frequency and severity of influenza illness among HIV-infected persons, but reports suggest that symptoms might be prolonged and the risk of complications increased for some HIV-infected persons. Influenza vaccine has produced protective immunity in vaccinated HIV-infected persons who have minimal AIDS-related symptoms and high CD4+ T-lymphocyte cell counts. In persons with advanced HIV disease and low CD4+ T-lymphocyte cell counts, the vaccine may not induce protective antibody titers. Nevertheless, influenza vaccination will benefit many HIV-infected persons.

Contraindications, Side Effects, and Adverse Reactions

Influenza vaccine contains only noninfectious viruses. Therefore, the vaccine does not cause influenza in vaccine recipients. Respiratory disease after vaccination represents coincidental illness unrelated to influenza vaccination. The most frequent side effect of vaccination is soreness at the injection site that lasts approximately 2 days. Two forms of systemic reactions also have been noted:

- Fever, malaise, myalgia, and other systemic symptoms (most often affecting persons who have had no exposure to influenza virus antigens in the vaccine [eg, young children]). These symptoms begin 6 to 12 hours after vaccination and may persist for 1 or 2 days.

- Immediate reactions (presumably allergic) resulting from hypersensitivity to a vaccine component (most often to residual egg protein). The protocol for influenza vaccination developed by Murphy and Strunk may be considered for high-risk patients with known sensitivities to egg proteins (see reference at the end of the article).

The potential exists for hypersensitivity reactions to any vaccine component. Reactions to thimerosal also may occur but are generally local delayed-hypersensitivity reactions.

Adults with acute febrile illness usually should not be vaccinated until their symptoms have abated. Minor illness with or without fever does not, however, contraindicate the use of influenza vaccine. This vaccine should not be given to persons with known anaphylactic hypersensitivity to eggs or to other components of the influenza vaccine without prior physician consultation. Vaccine inserts provided by each manufacturer contain specific contraindications.

Unlike the 1976 swine influenza vaccine, subsequent vaccines prepared from other influenza virus strains have not been clearly associated with an increased frequency of Guillain-Barré syndrome (GBS).

Timing of Influenza Vaccination Activities

Beginning in September, persons at high risk who are seen by health care providers for routine care or as a result of hospitalization should be offered

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influenza vaccine. Children aged 9 years or younger who have not been previously vaccinated should receive 2 doses of vaccine at least one month apart to maximize the chance of a satisfactory antibody response to all 3 vaccine components. The second dose for these children should be given before December, if possible. Vaccine should be offered to both children and adults up to and even after influenza virus activity is documented in a community. Influenza vaccine can be administered at the same time as are other routine immunizations, including pertussis vaccine (DTP or DTaP). Influenza vaccine and DTP both can cause fever in young children. Therefore, when influenza and pertussis vaccines are administered simultaneously, it is preferable to use DTaP. Vaccines should be administered at different sites on the body.

The optimal time for organized vaccination campaigns for persons in high-risk groups has been recently extended to a 6-week period covering all of October and the first half of November. Vaccination programs can be conducted as soon as influenza vaccine supplies become available, especially if regional influenza virus activity is expected to begin earlier than usual.

Influenza vaccination levels among persons older than 65 years have improved substantially from 33% in 1989 to 52% in 1993. However, vaccination levels among high-risk persons younger than 65 years are estimated to be less than 30%.

For further information regarding influenza vaccine, including updated informed-consent statements, contact the TDH Immunization Division at (512) 458-7284. For general epidemiologic and laboratory information, contact the TDH Infectious Disease Epidemiology & Surveillance Division at (512) 458-7676. The current TDH web site, ***http://www.tdh.state.tx.us/flu.htm****, contains general epidemiologic information on the 1996 influenza season in Texas, including a map of statewide influenza activity. Information for the 1997 influenza season will be provided when TDH begins receiving case reports, which is expected to occur in the first half of October. CDC information on national surveillance is available (toll free) at (888) 232-3228 and at their web site (****http://www.cdc.gov****).*

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Adapted from: CDC. Recommendations and Reports. Prevention and Control of Influenza: Recommendations of the Advisory Committee on Immunization Practices (ACIP), MMWR 1997; 46(RR-9).

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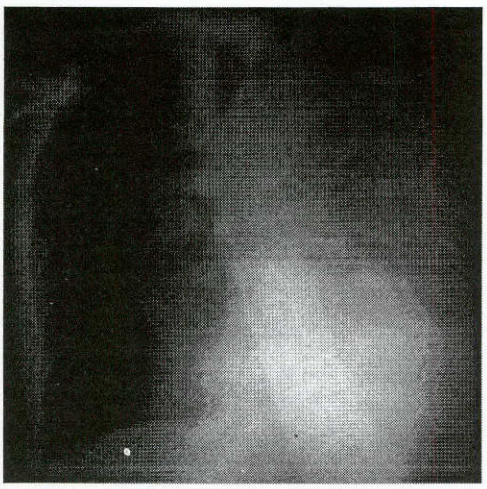
Vaccinating Against Pneumococcal Disease

Each year, more people die of pneumococcal pneumonia alone than die of breast cancer and AIDS combined. According to the Centers for Disease Control and Prevention, an estimated 40,000 deaths annually in the United States are cause by pneumococcal infection. Immunization of high-risk persons could prevent up to half of these deaths. As of 1993, however, only 23% of one of the highest-risk groups, persons aged 65 years and older, had received vaccination against peumococcal disease.

Figure 1. Chest X-Ray of Fatal Pneumococcal Case in a 98-Year-Old Woman



A tragic example of these national trends occurred in Texas last winter. In January 1997 a local health department alerted the Texas Department of Health (TDH) of 3 recent laboratory-confirmed *Streptococcal pneumoniae* infections at a Northeast Texas nursing home with 90 residents. Pneumococcal vaccine had been administered to only 10 (11%) of the residents prior to the outbreak. The remaining nursing home residents were promptly vaccinated and given antibiotics to prevent further cases. However, 2 of the 3 patients died. Figure 1 shows the chest x-ray of one of these patients.

A decade of use has confirmed the efficacy and safety of the current vaccine against pneumococcal disease. This polysaccharide vaccine contains 23 of the more than 80 pneumococcal serotypes; these 23 serotypes cause 88% of invasive pneumococcal disease in the US. Recent studies demonstrate overall vaccine efficacy rates of approximately 75% for immunocompetent persons 65 years of age and older. Pneumococcal vaccine can be administered simultaneously with influenza vaccine, at a different anatomical site. The vaccine is inexpensive, and its cost is reimbursed by Medicare.

The Advisory Committee on Immunization Practices (ACIP) currently recommends vaccination against pneumococcal disease for all persons 65 years of age and older. Vaccine is also recommended for persons aged 2 to 64 with certain health conditions. Most vaccine responders maintain elevated antibody levels for at least 5 years. Table 1 lists the populations CDC recommends should receive pneumococcal vaccine.

Vaccination coverage rates can be increased through organizational efforts such as hospital-based immunization strategies and community-based vaccination programs supported by public health departments. Strategies for use by individual health care providers also have been highly effective. Compared with other physicians, those who use patient tracking systems vaccinate 30% more eligible patients than physicians who do not.

For further general information on pneumococcal vaccination, contact James Shillito at (512) 458-7284. For information on computer tracking systems, for organizational or individual provider use, contact the TDH Immunization Tracking Group, also at (512) 458-7284.

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Table 1. Recommendations for pneumococcal vaccine use in various groups

Vaccination	Revaccination
Immunocompetent persons *	
aged ≥65 years	who received vaccine ≥5 years previously and were aged <65 years at the time of vaccination: single revaccination
aged 2 to 64 years with chronic cardiovascular disease,† chronic pulmonary disease,§ or diabetes mellitus	(not recommended)
aged 2 to 64 years with alcoholism, chronic liver disease,¶ or cerebrospinal fluid leaks	(not recommended)
aged 2 to 64 years with functional or anatomic asplenia**	aged >10 years: single revaccination ≥5 years after previous dose. aged ≤10 years: consider revaccination 3 years after previous dose
aged 2 to 64 years living in special environments or social settings††	(not recommended)
Immunocompromised persons	
aged ≥2 years, including those with HIV infection,§§ leukemia, lymphoma, Hodgkins disease, multiple myeloma, generalized malignancy, chronic renal failure, or nephrotic syndrome; those receiving immunosuppressive chemotherapy (including corticosteroids); and those who have received an organ or bone marrow transplant	who received first dose ≥5 years previously: single revaccination aged ≤10 years: consider revaccination 3 years after previous dose

* If earlier vaccination status is unknown, patients in this group should be administered pneumococcal vaccine.
† Including congestive heart failure and cardiomyopathies.
§ Including chronic obstructive pulmonary disease and emphysema, but not asthma.
¶ Including cirrhosis.
** Including sickle cell disease and splenectomy.
†† Including Alaskan Natives and certain American Indian populations.
§§ Vaccination should be done as soon as possible after HIV infection is confirmed.

Reimbursement of Vaccination Costs

Medicare and Medicaid providers (eg, physicians, hospitals, health departments) can obtain reimbursement for immunizations against influenza and against pneumococcal disease. The billing codes for Medicare reimbursement and for Medicaid reimbursement are the same: influenza vaccine, 1-90724; pneumococcal vaccine, 1-90732; administrative costs for both vaccinations, 1-90782. Detailed information regarding Medicaid coverage is contained in the Texas Medicaid Provider Procedures Manual, pp. 32-33 (which all Medicaid providers should have).

For further information regarding Medicaid billing, call the state Medicaid carrier, National Heritage Insurance Company, at (800) 873-6768 or (512) 343-4900. For information not covered in your Medicare materials, call (800) 638-6833 (national) or (800) 442-2620 (Texas).

TDH
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http://www.tdh.state.tx.us/phpep/dpnhome.htm
TDH Healthy Texans BBS: (800) 858-5833

Vaccine-Preventable Disease Update
Reported Cases With Onset From 7/1/97-8/31/97

Condition	County	Number of Cases	Date of Onset	Condition	County	Number of Cases	Date of Onset
Measles	Dallas	1	7/28	**Pertussis**	Johnson	1	7/1
	Harris	1	7/25			1	7/17
	Williamson	1	7/13		Nueces	1	7/6
					Parmer	1	7/3
Pertussis	Bexar	1	7/1		Smith	1	7/4
		2	7/4			1	7/9
		1	7/15		Travis	1	7/7
		1	7/16		Williamson	1	7/6
		1	8/1				
	Brazos	1	7/18	**Rubella**	Dallas	1	8/1
	Harris	1	7/2				
		1	7/3	**Tetanus**	Collin	1	7/16
	Jim Wells	1	7/3				

YTD	Measles	Mumps	Pertussis	Rubella	Tetanus
	7	22	90	4	3

Note:

The Bimonthly Statistical Summary of Reportable Diseases for July/August will be included in the next issue of DPN (Vol. 57, No. 21). The space in this issue originally designated for the disease summary was needed for critical, time-sensitive information regarding influenza vaccination and pneumococcal vaccination.