disease prevention news

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Prevention and Control of Influenza
Part I: Indications for Influenza Vaccine

*This report is a summary of the Advisory Committee on Immunization Practices (***ACIP***) recommendations for vaccine use during the 1999-2000 influenza season (found in MMWR 1999; 48 [No. RR-4]:1-28). The complete report is at the Internet site* http://www.cdc.gov/ncidod/diseases/flu/fluvirus.htm. *Look for* Part II: Treatment and Chemoprophylaxis of Influenza *in the November 22, 1999, issue of* Disease Prevention News.

Every year, influenza viruses account for substantial upper respiratory morbidity worldwide during the late fall, winter, and early spring. Central to this seasonal epidemic is the tendency of the antigenic properties of influenza virus surface proteins to be altered 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 influenza A viruses have, antigenic variation does occur. Consequently, new variants of influenza virus emerge every year around the world, necessitating a change in the composition of the influenza vaccine almost every year. 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 1999-2000 season includes the following components: A/Sydney/5/97-like (H3N2), A/Beijing/262/95-like (H1N1), and B/Beijing/184/93-like hemagglutinin antigens. For the B/Beijing/184/93-like antigen, US manufacturers are using the antigenically equivalent B/Yamanashi/166/98 virus because of its growth properties and because it is representative of currently circulating B viruses.

Why Vaccinate Against Influenza?

Although influenza is usually 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. Influenza-associated hospitalizations averaged approximately 130,000-170,000 per epidemic from 1969-70 through 1993-94. On average, 20,000 influenza-associated deaths are estimated to occur annually in the US alone. To prevent morbidity and mortality due to severe influenza and its complications, influenza vaccine campaigns are targeted toward members of 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, 1999-2000 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.** (Fluzone7™ whole or split); **Medeva Pharma Ltd.** (Fluvirin™ purified-surface-antigen vaccine]); **Parkedale Pharmaceuticals, Inc.** (Fluogen7™ split); and **Wyeth-Ayerst Laboratories** (Flushield™ split). Further product information is available from Connaught, (800) 822-2463; Medeva (800) 234-5535; Parkedale, (888) 358-6436; and Wyeth-Ayerst, (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.

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. Because the proportion of elderly persons in the US population is increasing and because age and its associated chronic diseases are risk factors for severe influenza illness, the number of deaths from influenza and its complications is expected to increase unless control measures are more vigorously implemented. **Preseason vaccination of persons in high-risk groups currently remains the most effective measure for reducing the impact of influenza.**

1998-99 Texas Influenza Epidemic

Sporadic positive influenza cultures were reported from several cities in Texas from September through December 1998. The frequency of influenza positive cultures rose dramatically the first week of January and peaked during the second and third weeks of February. Influenza positive cultures continued to be reported through March. The initial positive influenza culture was submitted to Texas Department of Health (TDH) Laboratory on 11/9/98. TDH identified 519 influenza positive cultures. An additional 502 positive cultures were reported from other laboratories. Almost 68% (693) of the total positive cultures were influenza A(H3N2), 1 isolate was A(H_1N_1), and the remainder were type B. The last influenza positive culture was reported from the TDH lab on April 5, 1999. Overall, the 1998-99 vaccine strains were well matched with the circulating virus strains.

Influenza Vaccine and Recommendations for Use

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 type A and one 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,

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the vaccine can prevent illness in approximately 70% of healthy children and young adults. The efficacy of the vaccine in preventing or attenuating illness also depends on the age and immunocompetence of the vaccine recipient.

The efficacy of influenza vaccine in preventing hospitalization due to pneumonia and other complications among the elderly ranges from 30% to 90%. Among elderly persons residing in nursing homes, 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. Although the antigens included in this years' vaccine are the same as those used in the 1998-99 vaccine, vaccine remaining from last year should not be used for the 1999-2000 season.

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 response in previously unvaccinated children under 9 years of age. Influenza vaccine is administered via the intramuscular 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.

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 that house 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 follow-up or hospitalization during the preceding year because of chronic metabolic diseases (including diabetes mellitus), renal dysfunction, hemoglobinopathies, or immunosuppression (including immunosuppression caused by medications)
- 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 medical conditions that increase their risk for influenza-related complications should be vaccinated before the influenza season regardless of the stage of pregnancy. Women whose pregnancy has progressed beyond the first trimester of pregnancy (≥14 weeks gestation) during the influenza season should be vaccinated.

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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

Contraindications, Side Effects, and Adverse Reactions

Influenza vaccine contains only noninfectious viruses. Therefore, the vaccine cannot 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, which most often affect 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 can persist 1 to 2 days.

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

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). However, in a recent study of the 1992-93 and 1993-94 seasons, investigators found an elevation of the overall relative risk for GBS of 1.83 (95% confidence interval=1.12-3.00) during the 6 weeks following vaccination, representing an excess of an estimated 1 to 2 cases per million persons vaccinated.

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 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

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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 for those children aged 15 months or older who are receiving the fourth or fifth dose of pertussis vaccine. (DTaP causes fewer febrile reactions, but it is not licensed for the initial 3-dose series of pertussis vaccine.) 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 >65 years of age have improved substantially from 23% in 1985 to 65.5% in 1997. However, vaccination levels among high-risk persons <65 years of age are estimated to be <30%.

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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 1999:48(RR-4).

Associateship of Disease Control and Prevention. Epidemiology in Texas 1997 Annual Report. Austin: Texas Department of Health 1998.

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Murphy KR and Strunk RC. Safe administration of influenza vaccine in asthmatic children hypersensitive to egg proteins. Pediatric. 1985; 106:931-933.

CDC. Final results: Medicare influenza vaccine demonstration—selected states, 1988-1992. MMWR 1993; (42)31:601-604.

For further information regarding the availability and use of influenza vaccine, including updated informed consent statements, contact the TDH Immunization Division at (512) 458-7284. For general information about the epidemiology of influenza and laboratory identification of influenza viruses in Texas, contact the TDH Infectious Disease Epidemiology & Surveillance Division, at (512) 458-7676, or the TDH web site, **http://www.tdh.state.tx.us/flu.htm**. *Information about national surveillance is available through the CDC Voice Information System: phone, (404) 332-4555; FAX, (404) 332-4565 (document #361100); Web site* **http://www.cdc.gov**.

Enterovirus Activity: Texas, 1999

As of September 9, the Texas Department of Health Laboratory identified 126 enterovirus isolates, a number that indicates a significant level of activity in Texas in 1999. Enteroviruses are the primary cause of aseptic meningitis, although disease due to the enteroviruses may range from subclinical infections to aseptic meningitis. These viruses can be transmitted by fecal-oral and by respiratory routes. Although enterovirus infections occur year round, most (usually at least 80%) occur June through November.

This year, echovirus 11 was the primary enterovirus circulating in the spring and early summer, while echoviruses 14 and 16 predominated in the late summer months. The viruses that have been detected in 1999 include coxsackievirus A9 (5), coxsackievirus B3 (2), coxsackievirus B4 (2), echovirus 6 (6), echovirus 9 (14), echovirus 11 (54), echovirus 14 (12), echovirus 16 (20), echovirus 25 (6), echovirus 30 (1), and enterovirus 71 (4). Forty-four of the 126 isolates were isolated from CSF indicating aseptic meningitis. The viruses isolated from CSF included coxsackievirus A9 (3), coxsackievirus B3 (1), coxsackievirus B4 (1), echovirus 6 (1), echovirus 9 (8), echovirus 11 (18), echovirus 14 (4), and echovirus 16 (8). The remaining 82 isolates were recovered from respiratory specimens (30), stool/rectal specimens (44), other specimens (4), and unknown specimens (4).

As is common, the majority of the enterovirus isolates were from young children. Sixty-eight of the isolates were from children younger than 6 months. An additional 18 of the isolates were from children 6 months to 3 years of age. Only 4 isolates for which an age was known were from patients older than 25 years.

If aseptic meningitis is suspected in a patient, a specimen may be submitted to the Texas Department of Health Laboratory for diagnosis. The specimen of choice is CSF. At least 0.5 ml is needed, but 1.0 ml is preferred. The specimen should be shipped **cold** by overnight carrier. If there will be a delay in shipping the specimen, it should be shipped **frozen** on dry ice. A completed G-1 laboratory submission form must accompany the specimen. If CSF is not available, a throat specimen is acceptable as virus shedding may occur from the throat for up to a week after onset. In addition, other laboratories may send presumptive enterovirus isolates to the TDH laboratory for typing purposes.

For additional information, contact the Susan Neill, PhD, in the Medical Virology Branch of the TDH Laboratory (512) 458-7515.

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Bimonthly Statistical Summary of Selected Reportable Diseases, Provisional Data

Jul/Aug 1999

Selected Diseases/Conditions	HHSC Region 1	2	3	4	5	6	7	8	9	10	11	Selected Texas Counties Bexar	Dallas	El Paso	Harris	Hidalgo	Nueces	Tarrant	Travis	This Period 1998	1999	Cumulative[1] 1998	1999
Sexually Transmitted Diseases[2]																							
Syphilis, primary and secondary	*0	*2	34	13	*1	*15	*5	*1	*0	1	*0	*1	31	1	*10	*0	*0	2	*3	74	*72	285	*302
Congenital Syphilis	*0	*0	1	2	*0	*3	*0	*0	*0	0	*0	*0	1	0	*3	*0	*0	0	*0	16	*6	71	*56
Resistant Neisseria gonorrhoeae	*0	*0	0	0	*0	*1	*0	*0	*0	0	*0	*0	0	0	*0	*0	*0	0	*0	3	*1	6	*2
Enteric Diseases																							
Salmonellosis	30	6	25	3	2	6	12	10	2	6	40	1	12	6	2	11	11	3	6	1009	142	2058	1357
Shigellosis	40	3	24	4	0	6	6	3	5	5	26	2	8	5	3	9	9	8	2	612	122	2251	1042
Hepatitis A	9	11	23	0	3	10	28	2	2	0	23	0	12	0	7	14	0	4	25	524	111	2457	1554
Campylobacteriosis	27	0	18	2	0	3	23	3	0	1	13	1	8	1	3	4	6	7	18	140	90	543	578
Bacterial Infections																							
H. influenzae type b, invasive	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	2	2	4
Meningococcal, invasive	0	0	3	0	1	1	1	0	0	0	1	0	1	0	0	0	0	1	1	24	7	138	73
Lyme disease	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	6	1	14	20
Vibrio species	1	0	1	0	0	2	0	1	0	0	0	1	1	0	2	0	0	0	0	6	5	10	14
Other Conditions																							
AIDS[4]	14	6	91	10	13	96	54	34	11	9	6	30	58	8	89	2	0	9	28	692	374	2837	1972
Hepatitis B	2	2	15	3	3	1	5	4	5	1	3	3	7	1	1	0	2	2	1	373	44	1435	540
Adult elevated blood lead levels	0	0	190	0	0	3	0	1	0	0	0	0	38	0	1	0	0	2	0	187	195	901	629
Animal rabies - total	3	5	3	2	0	2	16	9	5	1	7	1	0	0	1	0	0	2	4	47	53	227	241
Animal rabies - dogs and cats	0	4	0	0	0	0	1	2	1	0	5	0	0	0	0	0	0	0	0	0	13	14	28
Tuberculosis Disease[2]																							
Children (0-14 years)	0	0	4	1	0	3	0	0	0	1	2	0	3	1	2	0	0	1	0	25	11	91	50
Adults (>14 years)	5	3	70	1	3	47	24	18	2	8	30	7	46	8	39	6	6	16	15	283	211	1039	783
Injuries[2]																							
Spinal Cord Injuries (5)	0	0	1	0	0	0	0	0	0	1	1	0	0	1	0	0	1	1	0	36	3	60	259

1. Cumulative to this month. 2. Data for the STD's, Tuberculosis, and spinal cord injuries are provided by date of report, rather than date of onset. 3. Voluntary reporting. 4. AIDS totals include reported cases from Texas Department of Corrections, which are not included in the regional and county totals. 5. 6 reports were missing PHR identification *Data incomplete.

Call 1-800-705-8868 to report

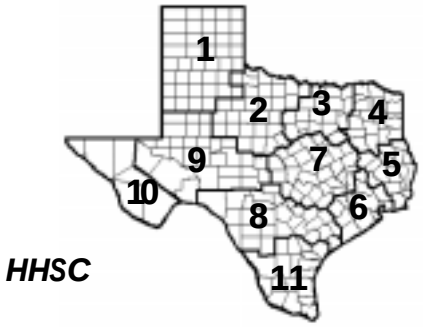
1999 POPULATION ESTIMATES

HHSC REGIONS

1	770,443	**4**	971,877	**7**	1,989,767	**10**	784,287
2	533,633	**5**	690,501	**8**	2,076,931	**11**	1,687,473
3	5,366,008	**6**	4,557,450	**9**	567,058		
STATEWIDE TOTAL			19,995,428				

SELECTED COUNTIES

Bexar	1,360,411	**Hidalgo**	528,300
Dallas	2,172,486	**Nueces**	315,965
El Paso	755,339	**Tarrant**	1,506,790
Harris	3,268,099	**Travis**	647,366



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Vaccine-Preventable Disease Update, Provisional Data
Reported Cases with Onset From 07/01/99 - 08/31/99

Condition	County	Number of Cases	Date of Onset	Condition	County	Number of Cases	Date of Onset
Measles	Williamson	1	7/18	**Pertussis**	Lubbock	2	7/6
		1	7/26		Navarro	2	7/11
Pertussis	Bexar	1	7/11		Tarrant	1	7/19
	Collin	1	7/9			1	7/21
	Dallas	1	7/1		Travis	1	7/5
		1	7/9			2	7/8
	Ector	2	7/19	**Rubella**	Cameron	1	7/20
	Harris	2	7/15			1	7/22

YTD:	Measles	Mumps	Pertussis	Rubella	Tetanus
	6	**23**	**95**	**6**	**2**