

## **SECTION 11: INFLUENZA AND PNEUMOCOCCAL IMMUNIZATIONS**

Concern	Care/Test	Frequency
Immunizations	◆ Provide influenza vaccine..... ◆ Provide pneumococcal vaccine.....	Annually, if age ≥ 6 months Once; then per Advisory Committee on Immunization Practices

Main topics included in this section:

- ◆ Influenza Vaccine
- ◆ Pneumococcal Polysaccharide Vaccine and Pneumococcal Conjugate Vaccine
- ◆ Preventing Pneumococcal Disease in Infants and Children
- ◆ Essential Education
- ◆ Immunization Record Keeping
- ◆ References

Despite vaccine-preventable diseases greatly decreasing since the beginning of the 20<sup>th</sup> century, an estimated 42,000 adults and 300 children still die in the United States each year from these diseases or their complications. The majority of these are adults who die of complications from influenza and pneumococcal disease. In Wisconsin in 2006, influenza and pneumococcal disease together were the eighth leading cause of death for all ages and the sixth leading cause of death for adults 85 years and older. The elderly and people with chronic health conditions like diabetes are more likely to develop serious, life-threatening complications than younger, healthier people. Influenza exacerbates underlying chronic conditions like diabetes and can compromise glucose control, resulting in erratic blood sugars (i.e., hypoglycemia or hyperglycemia).

### ***Influenza Vaccine***

In the year 2006, only 33% of United States adults and 36% of Wisconsin adults were immunized for seasonal influenza despite evidence that an annual influenza vaccination can prevent illness and death caused by influenza. Of those with diabetes, 58% of United States adults and 69% of Wisconsin adults were immunized for influenza. While Wisconsin is immunizing a higher percentage of adults with diabetes than the United States, there is still much improvement needed in Wisconsin. In 2005, approximately 22,000 people were hospitalized in Wisconsin for influenza and pneumonia and there were 1,267 resident deaths. One study found that influenza vaccination reduced hospital admissions by 79% for persons with diabetes.

The Advisory Committee on Immunization Practices (ACIP) recommends the trivalent inactivated influenza vaccine (TIV) **annually** for all people with diabetes aged 6 months and above. Two doses of influenza vaccine (doses separated by  $\geq 4$  weeks) are recommended for children 6 months through 8 years of age who are receiving the vaccine for the first time. Vaccination is also advised for healthy household contacts (including children) and caregivers of children aged  $< 5$  years and adults aged  $\geq 50$  years, with particular emphasis on vaccinating contacts of children aged  $< 6$  months. The live, attenuated influenza vaccine (LAIV) vaccine (FluMist®) is approved for use among healthy people aged 2-49 years. However, people with diabetes should **not** be vaccinated with the nasal-spray flu vaccine LAIV (FluMist®), as it is a live vaccine. Precautions regarding use in households with immunocompromised people must be followed.

Immunization is advised for healthy household contacts (including children) and caregivers of persons with medical conditions that put them at higher risk for severe complications for influenza (including diabetes). No preference is indicated for use of the trivalent inactivated vaccination (as opposed to the live attenuated influenza vaccine) by persons who have close contact to persons with diabetes unless the LAIV is contraindicated. It is important that all health care providers serving people with diabetes are vaccinated against influenza to reduce the transmission of the virus from health care provider to vulnerable persons.

All women with diabetes who are pregnant or will be pregnant during influenza season should be vaccinated with TIV. LAIV is **not licensed** for use in pregnant women and is **not recommended** in people with diabetes. ACIP recommends that pregnant women be given the influenza vaccine during **any** trimester of pregnancy. If a woman failed to receive the influenza vaccine during the

pregnancy, she should be given the influenza vaccine in the immediate postpartum period as a household contact of the infant.

Annual revaccination with a current vaccine, usually from mid-October through December, is necessary because immunity only lasts 6-8 months and vaccine components may fail to include protection against virus currently in circulation. Peak activity for seasonal influenza can vary, but generally occurs in January or February. Vaccination efforts should continue throughout the season because duration of the flu season varies. Immunized can begin as early as September when vaccine for the forthcoming influenza season becomes available.

For more specific precautions, specific contraindications to vaccination, side effects, and adverse reactions, consult ACIP recommendations. Table 18 provides recommendations for influenza vaccinations for adults with diabetes 19 years and older.

### ***Pneumococcal Polysaccharide Vaccine and Pneumococcal Conjugate Vaccine***

In the year 2006, 52% of United States adults with diabetes and 64% of Wisconsin adults with diabetes reported ever having received the pneumococcal vaccination.

*Streptococcus pneumoniae* (pneumococcus) infection is among the leading causes worldwide of illness and death for children, people with underlying debilitating medical conditions, and the elderly. Annually, the bacterium causes serious infections, resulting in an estimated 175,000 hospitalized cases of pneumococcal pneumonia, more than 50,000 cases of bacteremia, and an estimated 3,000 to 6,000 cases of bacterial meningitis. According to the Centers for Disease Control and Prevention (CDC), invasive pneumococcal disease causes more than 6,000 deaths annually. About half of these deaths are preventable with the use of the 23-valent pneumococcal polysaccharide vaccine (PPV23). The risk of serious complications, as well as the recent evidence of antibiotic-resistant *pneumococci*, compound the management of invasive pneumococcal disease and emphasize the importance of the recommendations from ACIP and the Academy of Pediatrics Report of the Committee on Infectious Diseases. Pneumococcal vaccination is intended for reduction of the occurrence of invasive pneumococcal disease; however, the efficacy of the vaccine in preventing against non-invasive pneumococcal infection is limited.

All people  $\geq 65$  years should receive **one dose** of the PPV23. This includes previously unvaccinated people and people who have not received the vaccine within five years and were  $< 65$  years of age at the time of vaccination. Table 18 provides recommendations for influenza vaccinations for adults with diabetes 19 years and older.

### ***Preventing Pneumococcal Disease in Infants and Children***

Infants and children (especially those with diabetes) are at risk for pneumococcal infection. The immunization and reimmunization schedules are complex and lengthy; therefore, they are not included in this document. Detailed recommendations for use of the pneumococcal conjugate vaccine (PCV7) and the pneumococcal polysaccharide vaccine (PPV23) for children age 6 weeks to age 18 years can be found in:

- Recommended immunization schedules for persons aged 0-18 years – United States, 2008. MMWR 2007; 56(51&52):Q1-Q4, <http://www.cdc.gov/MMWR/preview/mmwrhtml/mm5701a8.htm>;
- Updated recommendations from the Advisory Committee on Immunization Practices (ACIP) for use of 7-valent pneumococcal conjugate vaccine (PCV7) in children aged 24-59 months who are not completely vaccinated. MMWR 2008; 57(13):343-344, <http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5713a4.htm>;
- Preventing pneumococcal disease among infants and young children: recommendations of the Advisory Committee on Immunization Practices (ACIP). MMWR 2000; 49(RR09); 1-38, <http://www.cdc.gov/MMWR/preview/mmwrhtml/rr4909a1.htm>.

### ***Essential Education***

Educational strategies should take into consideration special educational or cultural needs and literacy level/skill, while respecting the individual’s willingness to change behavior. Education may include, but is not limited to:

- Receiving immunization prevents serious illness, complications, and the need for hospitalizations associated with influenza and pneumococcal disease.
- Informing people of side effects and adverse reactions to immunizations. The pamphlet titled “*Protect Yourself against Influenza and Pneumococcal Pneumonia*,” POH 4366, is available from the Wisconsin Immunization Program, 1 W. Wilson Street, Rm 318, PO Box 2659, Madison, WI 53701-2659, phone (608) 266-2346.

### ***Immunization Record Keeping***

To help prevent the administration of unnecessary doses, every person should receive a record of their vaccinations. Recording vaccinations in a shared electronic registry, such as the Wisconsin Immunization Registry (<http://dhs.wisconsin.gov/immunization/WIR.htm>), is recommended to allow health care providers around the state access to individual vaccination records. Primary care providers should also ensure that childhood and other recommended preventive vaccinations are up-to-date.

**Table 18: Recommended Adult Immunization Schedule, by Vaccine and Age Group – 19 Years and Older – United States, October 2007-September 2008**

Vaccine	Age group (yrs)		
	19-49	50-64	≥65
Influenza <sup>1</sup> ♦	1 dose annually	1 dose annually	
Pneumococcal (polysaccharide) <sup>2,3</sup>	1-2 doses		1 dose

♦ Covered by the Vaccine Injury Compensation Program.

	For all persons in this category who meet the age requirements and who lack evidence of immunity (e.g., lack documentation of vaccination or have no evidence of prior infection)
	Recommended if some other risk factor is present (e.g., on the basis of medical, occupational, lifestyle, or other indications)

<sup>1</sup> Influenza vaccination

*Medical indications:* chronic disorders of the cardiovascular or pulmonary systems, including asthma; chronic metabolic diseases, including diabetes mellitus, renal or hepatic dysfunction, hemoglobinopathies, or immunosuppression (including immunosuppression caused by medications or human immunodeficiency virus [HIV]); any condition that compromises respiratory function or the handling of respiratory secretions or that can increase the risk of aspiration (e.g., cognitive dysfunction, spinal cord injury, or seizure disorder or other neuromuscular disorder); and pregnancy during the influenza season. No data exist on the risk for severe or complicated influenza disease among persons with asplenia; however, influenza is a risk factor for secondary bacterial infections that can cause severe disease among persons with asplenia. *Occupational indications:* health-care personnel and employees of long-term care and assisted-living facilities.

*Other indications:* residents of nursing homes and other long-term care and assisted-living facilities; persons likely to transmit influenza to persons at high risk (e.g., in-home household contacts and caregivers of children aged 0-59 months, or persons of all ages with high-risk conditions); and anyone who would like to be vaccinated. Healthy, nonpregnant adults aged ≤ 49 years without high-risk medical conditions who are not contacts of severely immunocompromised persons in special care units can receive either intranasally administered live, attenuated influenza vaccine (FluMist®) or inactivated vaccine. Other persons should receive the inactivated vaccine.

<sup>2</sup> Pneumococcal polysaccharide vaccination

*Medical indications:* chronic pulmonary disease (excluding asthma); chronic cardiovascular diseases; diabetes mellitus; chronic liver diseases, including liver disease as a result of alcohol abuse (e.g., cirrhosis); chronic alcoholism, chronic renal failure, or nephritic syndrome; function or anatomic asplenia (e.g., sickle cell disease or splenectomy [if elective splenectomy is planned, vaccinate at least 2 weeks before surgery]); immunosuppressive conditions; and cochlear implants and cerebrospinal fluid leaks. Vaccinate as close to HIV diagnosis as possible.

*Other indications:* Alaska Natives and certain American Indian populations and residents of nursing homes or other long-term care facilities.

<sup>3</sup> Revaccination with pneumococcal polysaccharide vaccine

One-time revaccination after 5 years for persons with chronic renal failure or nephritic syndrome; functional or anatomic asplenia (e.g. sickle cell disease or splenectomy); or immunosuppressive conditions. For persons aged ≥ 65 years, one-time revaccination if they were vaccinated ≥ 5 years previously and were aged > 65 years at the time of primary vaccination.

Table adapted from: Centers for Disease Control and Prevention. Recommended Adult Immunization Schedule – United States, October 2007-September 2008. *MMWR* 2007;56:Q1-Q4. Always check the [www.cdc.gov](http://www.cdc.gov) for the latest schedules as changes frequently occur.

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