



Influenza vaccination- A brief review of CDC advisory committee on immunization practices (ACIP) recommendations

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Abstract

Influenza is one of the most important vaccine preventable infections and influenza disease and vaccination are one of the most frequent challenges faced by clinicians. According to the Centers for Disease Control and prevention (CDC) and American Academy of Pediatrics (AAP), influenza activity is presently increasing in the United States and there have already been eight pediatric deaths due to influenza this season, hence there is need to heighten awareness to immunize against influenza. This article briefly reviews the highlights of CDC-ACIP recommendations on influenza vaccination for the present season (2017-2018).

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Introduction

Influenza is a highly contagious viral infection, and spreads by respiratory droplets from person to person [1]. Clinical manifestations include sudden onset of fever, often accompanied by chills or rigors, headache, malaise, generalized myalgia, and nonproductive cough, subsequently, followed by respiratory tract symptoms like sore throat and nasal congestion/rhinitis. Influenza may have serious manifestations with high morbidity and mortality, like pneumonia, bronchitis, croup, myocarditis, encephalitis and secondary bacterial infections. Viral shedding occurs 24 hours before onset of symptoms and lasts for about 7 days in immunocompetent hosts, but can be prolonged for 10 days or more in young children and immunocompromised patients.

In the United States, influenza activity usually peaks between January and March, but can occur anytime from November to

May [1,2].

Influenza viruses are orthomyxoviruses and include 3 types- A, B and C. Influenza A viruses are further classified into subtypes by 2 surface antigens: Hemagglutinin (HA) and Neuraminidase (NA). Minor antigenic changes within the same type of influenza virus is called antigenic drift, and that leads to seasonal epidemics, while major changes in influenza A viruses that result in new subtypes containing a new HA alone or with a new NA are called antigenic shifts and these can lead to influenza pandemics. There have been four influenza pandemics in the present and the previous century- 1918 (H1N1), 1957 (H2N2), 1968 (H3N2), and April 2009 to August 2010 (H1N1) pandemic [1-3].

Influenza A and B virus antigens are included in influenza vaccines, while Type C influenza viruses which cause sporadic mild illness in children are not included in influenza vaccines [1].



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CDC-ACIP influenza vaccine recommendations for the 2017–18 season

According to the CDC, the recommended influenza vaccines include the Inactivated Influenza Vaccines (IIVs) available in trivalent (IIV3) and quadrivalent (IIV4) formulations, and Recombinant influenza vaccine (RIV) available in trivalent (RIV3) and quadrivalent (RIV4) formulations. Live Attenuated Influenza Vaccine (LAIV4) is not recommended during the 2017–18 influenza season due to low effectiveness against 2009 H1N1 viruses during the 2013–14 and 2015–16 seasons [2].

Vaccine viruses included in the 2017–18 U.S. trivalent influenza vaccines include an A/Michigan/45/2015 (H1N1) pdm 09–like virus, an A/Hong Kong/4801/2014 (H3N2)–like virus, and a B/Brisbane/60/2008–like virus (Victoria lineage). Quadrivalent influenza vaccines contain an additional influenza B vaccine virus, a B/Phuket/3073/2013–like virus (Yamagata lineage) [2]. The influenza vaccine composition for 2017–2018 demonstrates a change in the influenza A H1N1 composition from the previous season.

The CDC-ACIP has recommended routine influenza vaccination annually, for persons aged ≥ 6 months without any contraindications to the vaccine, since 2010 [2,3]. Children 9 years and older require only 1 dose of influenza vaccine annually, regardless of their influenza immunization history, however, all children aged 6 months–8 years who previously have not received influenza vaccine need 2 doses of influenza vaccine administered at an interval of at least 4 weeks.

The American Academy of Pediatrics Committee on Infectious Diseases, AAP Red Book Schedule for Inactivated Influenza Vaccine (IIV) dosage by age is shown in **Table 1**.

Timing of vaccination

According to the CDC, vaccination should occur before onset of influenza activity in the community, so influenza vaccination by the end of October is recommended, however, providers should offer influenza vaccine routinely, and vaccination campaigns should continue throughout the influenza season, including after influenza activity has begun in the community. Per the CDC, although vaccination by the end of October is recommended, vaccine administered in December or later, even if influenza activity has already begun, is stated to be beneficial.

Children 6 months–8 years old who need 2 doses of vaccines ≥ 4 weeks apart, should receive their first dose as soon as possible after vaccine becomes available, so that the second dose may be received by October end.

CDC Guidance for specific populations and situations people at increased risk for medical complications attributable to severe influenza

According to CDC guidelines, all people aged ≥ 6 months without contraindications should be vaccinated annually. However, when vaccine supply is limited, vaccination efforts should focus on populations at increased risk for medical complications attributable to severe influenza, as follows:

- Children 6–59 months of age
- People aged ≥ 50 years
- Adults and children who have chronic pulmonary or cardiovascular (except isolated hypertension), renal, hepatic, neurologic, hematologic, or metabolic disorders including dia-

betes mellitus

- Immunocompromised population, including HIV infected
- Pregnant women
- Children and adolescents (6 months through 18 years old) who are receiving aspirin- or salicylate-containing medications and are at risk for experiencing Reye syndrome after influenza virus infection
- Residents of nursing homes/long-term care facilities
- American Indians/Alaska Natives; and
- Extremely obese people with a BMI ≥ 40 .

Persons who Live With or Care for Persons at Higher Risk for Influenza-related complications that include:

-health care personnel like physicians, nurses, and other workers in inpatient and outpatient-care settings, medical emergency-response workers, employees of nursing home and long-term care facilities who have contact with patients or residents, and students in these professions who will have contact with patients;

-household contacts and care givers of children aged ≤ 59 months (i.e., aged < 5 years) and adults aged ≥ 50 years, particularly contacts of children aged < 6 months; and

-household contacts (including children) and caregivers of persons with medical conditions that put them at high risk for severe complications from influenza.

Pregnant women

Pregnant and postpartum women are at higher risk of influenza related complications. According to the CDC/ACIP, all pregnant women should receive the influenza vaccine, at any time of pregnancy, in order to protect themselves as well as their infants during the first 6 months of life [2,4]. Any licensed, recommended, and age-appropriate influenza vaccine can be given, except live influenza vaccine, since it is a live virus vaccine. Moreover, ACIP recommends that LAIV4 not be used in any population for the 2017–18 season. Influenza vaccine can be administered at any time during pregnancy [2].

People with history of egg allergy

Of the currently available influenza vaccines, only RIV3 and RIV4 are considered egg-free. The CDC - ACIP recommend the following regarding egg allergy:

- Persons with a history of egg allergy who have history of only urticaria (hives) after exposure to egg should receive influenza vaccine. Any licensed and recommended influenza vaccine (i.e., any IIV or RIV) that is otherwise appropriate according to age and health status may be used.

- Persons with history of reactions to egg involving symptoms other than urticaria (hives), such as angioedema, respiratory distress, lightheadedness, or recurrent emesis; or who required epinephrine or another emergency medical intervention, may similarly receive any licensed and recommended influenza vaccine (i.e., any IIV or RIV) appropriate for the recipient's age and health status. The selected vaccine should be administered in a medical setting (including, but not necessarily limited to, hospitals, clinics, health departments, and phy-

sician offices). Vaccine administration should be supervised by a health-care provider who can recognize and manage severe allergic conditions.

- A previous severe allergic reaction to influenza vaccine, regardless of the component suspected of being responsible for the reaction, is a contraindication to future receipt of the vaccine. Contraindications and precautions to the influenza vaccine are shown in **Table 2**.

According to the current CDC recommendations, no period of postvaccination observation period is recommended specifically for egg-allergic persons. However, the CDC-ACIP generally recommends that vaccine providers consider observing patients for 15 minutes following administration of any vaccine to decrease the risk for injury from syncope, if it occurs [2].

History of Guillain-Barré Syndrome (GBS) following Influenza Vaccination

According to CDC-ACIP, a previous history of GBS is a precaution for influenza vaccination [2]. The CDC recommends that those not at high risk for severe influenza complications, with a previous history of developing GBS within 6 weeks of influenza vaccination generally should not be vaccinated. Instead, influenza antiviral chemoprophylaxis may be considered by physicians.

Vaccination for travelers

In temperate climates, influenza activity is seasonal, usually occurring during October- May in the Northern Hemisphere and April- September in the Southern Hemisphere. Influenza occurs throughout the year in the tropics. According to the CDC, travelers should consider influenza vaccination, preferably at least 2 weeks before departure, if they plan to travel to the tropics; with organized tourist groups; on cruise ships; to the Southern Hemisphere during the Southern Hemisphere influenza season (April–September).

Tables

Table 1: AAP Schedule for Inactivated Influenza Vaccine (IIV) Dosage by Age [1].

Age	Dose, mL	No. of Doses	Route
6 through 35 mo	0.25	1–2	Intramuscular
3 through 8 y	0.5	1–2	Intramuscular
9 y or older	0.5	1	Intramuscular
18 y or older (Intradermal)	0.1	1	Intradermal
18 y or older (Non-egg-based)	0.5	1	Intramuscular

Table 2: Contraindications and precautions to the influenza vaccine per CDC [2,3].

Influenza Vaccine type	Contraindications	Precautions
Inactivated Influenza vaccine (IIV)	History of severe allergic reaction to any component of the vaccine or after previous dose of any influenza vaccine	Moderate-to-severe acute illness with or without fever History of Guillain-Barré syndrome within 6 weeks of receipt of influenza vaccine
Recombinant Influenza vaccine (RIV)	History of severe allergic reaction to any component of the vaccine	Moderate-to-severe acute illness with or without fever History of Guillain-Barré syndrome within 6 weeks of receipt of influenza vaccine
Live Attenuated Influenza vaccine (LAIV) ACIP recommends that LAIV not be used for the 2017–18 season. This content is provided by the CDC only for information.	History of severe allergic reaction to any component of the vaccine or after a previous dose of any influenza vaccine Concomitant aspirin or salicylate-containing therapy in children and adolescents Children aged 2–4 years who have received a diagnosis of asthma or whose parents or caregivers report that a health care provider has told them during the preceding 12 months that their child had wheezing or asthma or whose medical record indicates a wheezing episode has occurred during the preceding 12 months Children and adults who are immunocompromised due to any cause (including immunosuppression caused by medications or by HIV infection) Close contacts and caregivers of severely immunosuppressed persons who require a protected environment Pregnancy Receipt of influenza antiviral medication within the previous 48 hours	Moderate-to-severe acute illness with or without fever History of Guillain-Barré syndrome within 6 weeks of receipt of influenza vaccine Asthma in persons aged ≥5 years Other underlying medical conditions that might predispose to complications after influenza infection e.g., chronic pulmonary, cardiovascular [except isolated hypertension], renal, hepatic, neurologic, hematologic, or metabolic disorders including diabetes mellitus

Conclusion

The CDC and AAP recommend influenza vaccination of all persons aged over 6 months, if they have no contraindications. LAIV is not recommended for use in any population, during this season.

References

1. Kimberlin DW, Brady MT, Jackson MA, Long SS, Eds. Influenza. In: American Academy of Pediatrics Red Book: 2015 Report of the Committee on Infectious Diseases. 30th ed. Elk Grove Village: IL. 2015: 476-493.
2. Grohskopf LA, Sokolow LZ, Broder KR, et al. Prevention and Control of Seasonal Influenza with Vaccines: Recommendations of the Advisory Committee on Immunization Practices — United States. 2017–18 Influenza Season. *MMWR Recomm Rep*. 2017; 66: 1–20.
3. CDC recommendations for influenza vaccination. 2016.
4. AAP Recommendations for Prevention and Control of Influenza in Children. 2017.