



## Influenza Vaccines Available During the 2017–18 Season

### Background

Influenza vaccine options available in the United States this season include the following: Fluarix®, Flulaval®, Fluzone®, Fluzone Intradermal®, Fluzone High-Dose®, Flucelvax®, Afluria®, Fluvirin®, Fluad®, Flublok®, and FluMist®. It is important to note that FluMist® is not recommended by the Advisory Committee on Immunization Practices (ACIP), and will not be provided by the Alaska Immunization Program.

### 2017–18 Influenza Vaccine Composition

Trivalent vaccines in the United States will contain an A/Michigan/45/2015(H1N1)pdm09-like virus, an A/Hong Kong/4801/2014(H3N2)-like virus, and a B/Brisbane/60/2008-like virus (Victoria lineage). Quadrivalent vaccines will contain these three vaccine viruses as well as a B/Phuket/3073/2013-like virus (Yamagata lineage).<sup>1</sup> The 2017-18 vaccine differs from the 2016–17 vaccine in that the H1N1 component has been updated to more closely match the circulating strains.

### Influenza Vaccine Abbreviations<sup>1</sup>

- IIV: inactivated influenza vaccine
- RIV: recombinant hemagglutinin (HA) influenza vaccine
- LAIV: live-attenuated influenza vaccine
- cc: prefix indicating cell culture-based vaccine (e.g., ccIIV4)
- a: prefix indicating adjuvanted vaccine (e.g., aIIV3)
- Numeric suffix: specifies the number of antigens in the vaccine (e.g., IIV3=trivalent, and IIV4=quadrivalent)

### Inactivated Influenza Vaccines (IIV)

IIVs as a class will include:

- Egg-based, unadjuvanted, and adjuvanted trivalent influenza vaccines (IIV3s)
- Egg-based, or cell culture-based unadjuvanted quadrivalent influenza vaccines (IIV4s)
- Standard dose IIVs (15µg hemagglutinin) and high-dose IIV (60ug hemagglutinin)

Inactivated influenza vaccine contains inactivated viruses and thus cannot cause influenza. The composition varies according to manufacturer; therefore, package inserts should be consulted.<sup>2</sup> IIV formulations in multi-dose vials contain the preservative thimerosal; however, thimerosal-free single-dose preparations also are available. IIV should be stored at 36°–46°F (2°–8°C), and should not be frozen.

The most commonly reported adverse event following IIV vaccination is local soreness at the injection-site. Other less commonly reported adverse events include mild fever, muscle pain, and rash.

- IIV3 vaccines available this season: Afluria®, Fluvirin®, and Fluzone® High-Dose.<sup>1</sup>
- IIV4 vaccines available this season: Afluria®, Fluarix®, Flulaval®, Fluzone®, and Fluzone® Intradermal.<sup>1</sup>
- ccIIV4 vaccine available this season: Flucelvax®, approved for persons aged ≥4 years.<sup>2</sup> Vaccine virus strains are grown in mammalian cells; however, initial reference strains are passed through an egg and thus the vaccine should be administered following the Centers for Disease Control and Prevention’s egg-allergy guidelines.<sup>1</sup>
- aIIV3 vaccine available this season: Fluad®, approved for persons aged ≥65 years.<sup>2</sup> This vaccine contains an adjuvant called MF59, which increases the body’s immune response to the vaccine.<sup>1</sup>

### Recombinant Influenza Vaccine (RIV)

RIV3 and RIV4 (Flublok®) are made by using cell culture technology to produce the active ingredient needed for influenza vaccination (i.e., the hemagglutinin or HA protein). Both vaccines are considered *egg-free*, and may be used in persons aged 18–49 years. RIV3 and RIV4 should be stored at 36°–46°F (2°–8°C).<sup>2</sup>

**Live-Attenuated Influenza Vaccine**

The recommendation by ACIP that LAIV4 should not be used during the 2016–17 season continues to be made for the 2017–18 season. This decision was made due to the low effectiveness against influenza A(H1N1)pdm09 in the United States during the 2013–14 and 2015–16 seasons.

**State-Supplied Influenza Vaccines**

The Nebraska Immunization Program will supply the following four pediatric presentations of influenza vaccine this season:

- Fluzone® Pediatric IIV4: 0.25 ml prefilled syringe, preservative-free, latex-free, for children aged 6 through 35 months.
- Fluzone® Pediatric IIV4: 0.5ml prefilled syringe, preservative free, latex-free, for children aged 36 months and older.
- FluLaval® Pediatric IIV4: 0.5ml prefilled syringe, preservative-free, latex-free, for children aged 6 months and older.
- FluLaval® Pediatric IIV4: 0.5ml multi-dose vial, not preservative-free, contains thimerosal, latex-free, for children aged 6 months and older. Vial expires 28 days after first puncture/draw

The following two adult presentations of influenza vaccine will also be supplied:

- Fluzone Quad MDV contains a preservative, thimerosal
- Flurarix Quad 0.5ml syringe, preservative free

Influenza vaccine contraindications and precautions are summarized below (Table).

**Table 1. Contraindications and Precautions for Influenza Vaccine**

	Contraindications	Precautions
IIV	History of severe allergic reaction to any component of the vaccine or after a previous dose of any influenza vaccine.†	Moderate to severe illness with or without fever. History of Guillain-Barré syndrome within 6 weeks of receipt of influenza vaccine.
RIV	History of severe allergic reaction to any component of the vaccine.	Moderate to severe illness with or without fever. History of Guillain-Barré syndrome within 6 weeks of receipt of influenza vaccine.
LAIV	<i>ACIP recommends that FluMist® LAIV not be used during the 2017–18 season.</i>	

†History of severe allergic reaction (e.g., anaphylaxis) to egg is a labeled contraindication to the use of IIV and LAIV. However, ACIP recommends that any licensed, recommended, and appropriate IIV or RIV may be administered to persons with egg allergy of any severity.

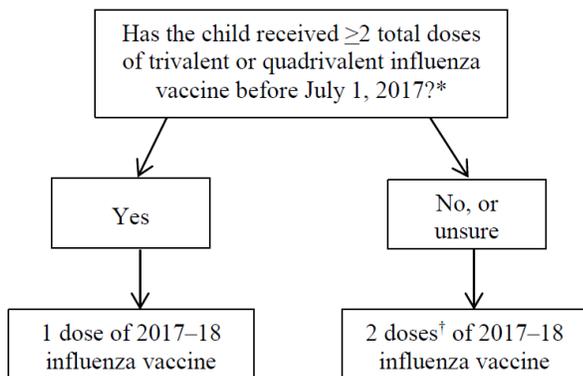
**Influenza Vaccine Recommendations and Administration for the 2017–18 Season**

**Recommendations for Vaccination**

Routine annual influenza vaccination is recommended for all persons aged ≥6 months who do not have contraindications. Vaccination should optimally occur before onset of influenza activity in the community to permit time for production of protective antibody levels. Health care providers should begin offering influenza vaccine as soon as it is available and throughout the influenza season.

Thirteen different influenza vaccines will be available for purchase during the 2017–18 influenza season.<sup>1</sup> The Nebraska Immunization Program will supply six presentations of quadrivalent inactivated influenza vaccine (IIV4) this season. Vaccine dosage guidelines for children aged 6 months through 8 years are the same as the 2016–17 influenza season and are provided below (Figure).

**Figure. Vaccine Dosing Algorithm for Children Aged 6 Months through 8 Years<sup>1</sup>**



\*The two doses need not have been received during the same season or during consecutive seasons.<sup>1</sup>  
 †Doses should be administered ≥4 weeks apart.<sup>1</sup>



### General Recommendations:

- All persons aged  $\geq 6$  months without contraindications should receive influenza vaccine.
- Influenza vaccination should not be delayed to procure a specific preparation if an appropriate one is available.
- Ideally, all vaccines should be administered in settings where personnel and equipment for rapid recognition and treatment of anaphylaxis are available.
- Health care providers should consider observing all patients for 15 minutes after vaccination to decrease the risk for injury should they experience syncope.<sup>1</sup>

### Recommendations for Persons with an Egg Allergy<sup>1</sup>

- Persons who have experienced only hives after egg exposure may receive any licensed and recommended influenza vaccine that is otherwise appropriate for their age and health status.<sup>1</sup>
- Persons who report having had reactions to eggs such as angioedema, respiratory distress, lightheadedness, or recurrent emesis within a short time after egg exposure may receive any age-appropriate IIV or recombinant influenza vaccine (RIV3 or RIV4) if they have no contraindications.<sup>1,2</sup> These persons should be vaccinated in an inpatient or an outpatient medical setting under the supervision of a health care provider who is able to recognize and manage severe allergic conditions.<sup>1</sup>

### References

1. CDC. Prevention and Control of Seasonal Influenza with Vaccines: Recommendations of the ACIP - United States, 2017–18 Influenza Season. *MMWR* 2017;66(2):1-20. Available at: [https://www.cdc.gov/mmwr/volumes/66/rr/rr6602a1.htm?s\\_cid=rr6602a1\\_e](https://www.cdc.gov/mmwr/volumes/66/rr/rr6602a1.htm?s_cid=rr6602a1_e)
2. U.S. Food and Drug Administration, Vaccines, Blood, and Biologics: Manufacturer Package Inserts. Available at: <http://www.fda.gov/BiologicsBloodVaccines/Vaccines/ApprovedProducts/UCM093833>