

# CONTAGIOUS COMMENTS

## Department of Epidemiology

### Influenza Vaccination

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New influenza vaccines have arrived. It is important to vaccinate all children 6 months of age and older against influenza before the start of the flu season, which can be highly unpredictable. Annual influenza vaccination remains the most effective strategy against influenza.

Annual recommendations are updated for each influenza season. The composition of the new 2018-2019 seasonal influenza vaccine has changed for both the trivalent and quadrivalent vaccines. Trivalent vaccines contain two influenza A strains and one B strain, and the quadrivalent vaccines contain the same strains as the trivalent vaccine, plus an additional B strain.

A reminder of the nomenclature follows:

- ❖ IIV=Inactivated Influenza Vaccine
- ❖ IIV<sub>3</sub>=Inactivated Influenza Vaccine, Trivalent
- ❖ IIV<sub>4</sub>=Inactivated Influenza Vaccine, Quadrivalent
- ❖ RIV=Recombinant Influenza Vaccine
- ❖ LAIV=Live-Attenuated Influenza Vaccine (FluMist®)

#### Frequently asked questions:

##### What are the recommendations for influenza vaccination for 2018-2019?

1. Annual influenza vaccination is recommended for **all** individuals 6 months of age and older.
2. Vaccination by the end of October is preferable, before the onset of influenza activity in the community. Vaccination should continue for the duration of the influenza season, while unexpired vaccine stock is available.
3. For the 2018-2019 season, the CDC recommends any licensed, age-appropriate vaccine, including LAIV.
4. The American Academy of Pediatrics recommends inactivated influenza vaccine (IIV3/4) as the primary choice and that LAIV be offered for children who would not otherwise receive an influenza vaccine.

##### What is the composition of flu vaccines for the upcoming season?

The U.S. influenza vaccine composition for the 2018-19 season is as follows:

##### Trivalent vaccines:

- an A/Michigan/45/2015 (H1N1)pdm09-like virus;
- an A/Singapore/INFIMH-16-0019/2016 (H3N2)-like virus; and
- a B/Colorado/06/2017-like virus (B/Victoria/2/87 lineage).

##### Quadrivalent vaccines:

- contain the three used in the trivalent vaccines, plus B/Phuket/3073/2013-like virus (Yamagata lineage)

##### Influenza Vaccination Formulations for Children, 2018-2019

There are many different vaccine formulations available. Some are licensed for specific age groups or are more appropriate than others for persons with certain medical conditions. The influenza vaccines currently available are as follows:

**Table 1. Influenza Vaccination Formulations for Children, 2018-2019**

Ages	Trade Name	Manufacturer	Presentation
6-35 mo ≥36 mo	Fluzone® IIV4	Sanofi Pasteur	0.25mL single dose syringe 0.5mL single-dose syringe 5 mL multi-dose vial
2-49 yrs	FluMist® quadrivalent	AstraZeneca	0.2mL intranasal sprayer
≥6 mos	Fluarix® IIV4	GSK	0.5mL single dose syringe
≥ 5yrs	Afluria® IIV3	Seqirus	0.5mL single dose syringe 5.0mL multidose vial
≥ 6mos	FluLaval IIV4	ID Biomedical	0.5mL single-dose syringe 5.0mL multidose vial
≥4 yrs	Flucelvax® IIV4 <sup>a</sup>	Seqirus	0.5mL single-dose syringe 5.0mL multidose vial

**Table 2. Additional Influenza Vaccination Formulations for Adults, 2018-2019<sup>a</sup>**

Ages	Trade Name	Manufacturer	Presentation
≥18- yrs	FluBlok® Recombinant IV4	Sanofi Pasteur	0.5mL single-dose syringe
≥65 yrs	Fluzone® High Dose IIV3	Sanofi Pasteur	0.5mL single-dose syringe
≥65 yrs	Fluad IIV3®	Seqirus	0.5mL single-dose syringe

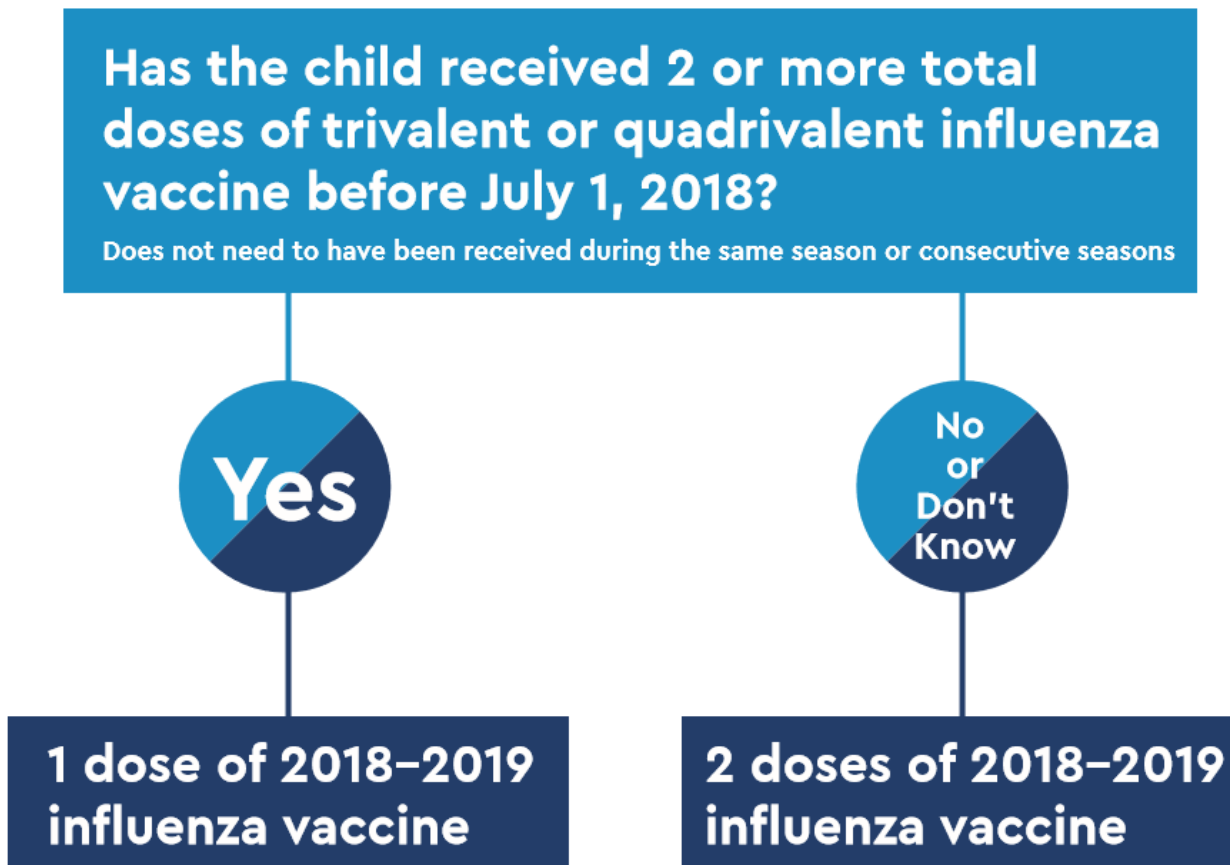
a) in addition to formulations also available for children

**Which pediatric patients will need two doses of influenza vaccine for the 2018-19 influenza season?**

The number of recommended doses depends on the child's age at the time he or she received the first dose and their influenza vaccination history.

Children aged 6 months through 8 years will need 2 doses of vaccine administered at least 4 weeks apart during their first season of vaccination. Children aged 6 months through 8 years who have received at least 2 doses of influenza vaccine previously only require 1 dose for the 2018-2019 season (Figure 1). The two previous doses do not need to have been given during the same season or consecutive seasons.

**Figure 1. Number of 2018-2019 seasonal influenza vaccine doses for children 6 months to 8 years of age.**



**What if a child has an egg allergy, can they still receive the influenza vaccine?**

1. Individuals with a history of egg allergy who have experienced only hives after exposure to egg can receive influenza vaccine of any formulation (Figure 2).

For those who experience severe allergic reactions/anaphylaxis (angioedema, respiratory distress, lightheadedness, or recurrent emesis; or who required epinephrine or another emergency medical intervention), any vaccine formulation may be used, with the following additional safety measures:

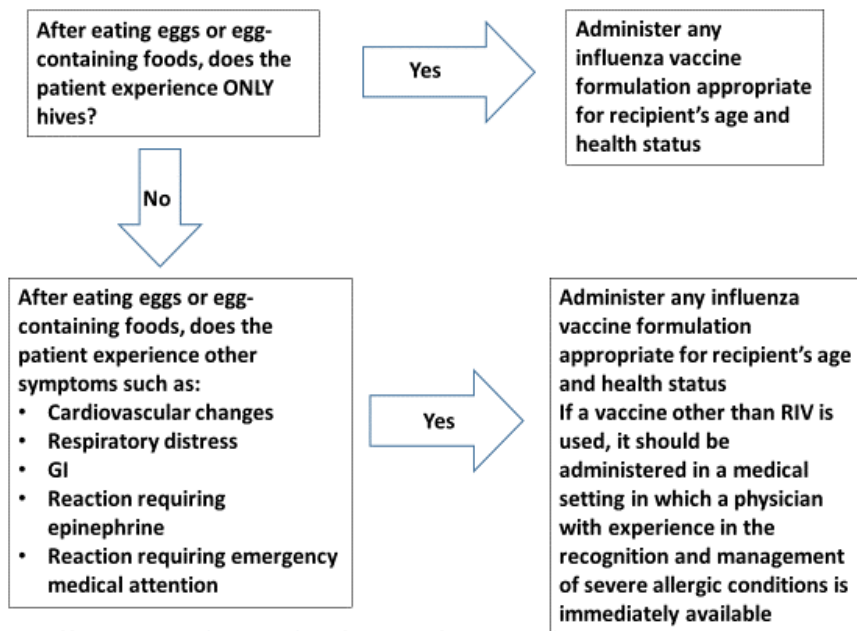
Vaccine should be administered in a medical setting in which a physician with experience in the recognition and management of severe allergic conditions is immediately available. The vaccine recipients no longer need to be observed for at least 30 minutes for signs of a reaction after administration of each vaccine dose; a 15-minute period of observation will suffice (1).

Recombinant Influenza Vaccine (RIV) is the only truly egg-free formulation and may be used for persons aged 18-49 years who have no other contraindications.

2. Some persons who report allergy to egg might not be egg-allergic. Those who are able to eat lightly cooked egg (e.g., scrambled egg) without reaction are unlikely to be allergic. Egg-allergic persons might tolerate egg in baked products (e.g., bread or cake). Tolerance to egg-containing foods does not exclude the possibility of egg allergy (2). Egg allergy can be confirmed by a consistent medical history of adverse reactions to eggs and egg-containing foods, plus skin and/or blood testing for immunoglobulin E antibodies to egg proteins.

A previous severe allergic reaction to influenza vaccine, regardless of the component suspected to be responsible for the reaction, remains the only true contraindication to future receipt of the vaccine.

**Figure 2. Algorithm for children with egg allergy**



Ref: <http://www.cdc.gov/vaccines/acip/meetings/downloads/>

### **Why is the intranasal influenza vaccine recommended again for this season?**

The Advisory Committee for Immunization Practices of the Centers for Disease Control and Prevention (CDC) again reviewed data regarding the effectiveness of LAIV over the past several seasons, which showed decreased vaccine effectiveness for the H1N1 component of the vaccine. The new LAIV4 formulation has a new H1N1 strain (A/Slovenia/2903/2015), which induces similar antibody responses to an earlier LAIV vaccine that had high vaccine effectiveness. The American Academy of Pediatrics (AAP) reviewed the same data, but due to inferior vaccine effectiveness of LAIV in prior seasons (2013-14 and 2015-16), and the unknown vaccine effectiveness with the new formulation, for this season, the AAP recommend IIV as the primary choice and to consider use of LAIV4 for children who are at least 2 years old and healthy without any underlying chronic medical condition who would not otherwise receive an influenza vaccine.

### **If quadrivalent vaccine includes one additional strain, why isn't it preferred for use over trivalent vaccine?**

Even though both influenza B viruses are likely to cause disease during an influenza season, traditionally experts needed to choose between the two very different B viruses to include with the two A viruses based on what B virus is expected to predominate. This can be difficult to predict. The quadrivalent vaccine that will be available for the 2018-19 season includes both B viruses. Quadrivalent vaccines provide broader protection against circulating influenza B viruses. However, trivalent formulations provide some cross protection if the circulating B strain is different from the vaccine strain. Currently, the ACIP does not express a preference for quadrivalent over trivalent for persons for whom more than one type of vaccine is indicated and available. Vaccination should not be delayed to obtain a specific product.

### **Which influenza vaccines are available at Children's Hospital Colorado?**

Vaccines are ordered every spring from our distributor to ensure an adequate supply for patients, families and staff. At CHCO, we are taking measures to increase influenza vaccination among inpatients and outpatients. We have individual syringes of FluLaval® quadrivalent injectable vaccine for patients 6 months of age and older. This formulation allows a single dose of 0.5mL for all ages, even for those aged 6 months to 36 months of age.

For the reasons outlined above, we do not have LAIV4 (FluMist®) for the 2018-2019 season available for patients, family or staff.

A grant from the Association of Volunteers and a generous Children's Hospital Colorado Foundation donation has enabled us to vaccinate 3500 family members against influenza without cost. Our family influenza vaccine vials are also FluLaval® quadrivalent influenza vaccine.

Team members at CHCO will receive the Flucelvax quadrivalent® vaccine, which is approved for individuals 4 years of age and older.

**References:**

1. Committee on Infectious Diseases. Recommendations for Prevention and Control of Influenza in Children, 2018-2019. Pediatrics, Volume 140 (4) October 2018 e20182367.
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, 2018–19 Influenza Season. MMWR August 24, 2018 / 67(3);1–20.

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