



**Department of Health and Social Services**

William J. Streur, Commissioner  
Ward B. Hurlburt, MD, MPH, CMO

3601 C Street, Suite 540  
Anchorage, Alaska 99503

<http://www.epi.Alaska.gov>

**Division of Public Health**

Kerre Shelton, Director

Local (907) 269-8000  
24 Hour Emergency (800) 478-0084

**Editors:**

Joe McLaughlin, MD, MPH  
Louisa Castrodale, DVM, MPH

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## Influenza Vaccines Available during the 2013–14 Season

### Background

Thirteen influenza vaccines from seven different vaccine manufacturers will be available on the U.S. market this fall; five of the vaccines are newly approved.<sup>1</sup> Influenza vaccine contraindications and precautions are summarized below (Table).

### Influenza Vaccine Composition

- Trivalent vaccines will contain an A/California/7/2009 (H1N1)-like virus, an H3N2-like A/Victoria/361/2011, and a B/Massachusetts/2/2012-like virus.
- Quadrivalent vaccines will include an additional vaccine virus, a B/Brisbane/60/2008-like virus.<sup>1</sup>

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

- IIV: inactivated influenza vaccine, which is replacing trivalent inactivated influenza vaccine (TIV) this year
- LAIV: live-attenuated influenza vaccine
- RIV: recombinant hemagglutinin influenza vaccine
- cc: a prefix indicating cell culture-based vaccine (e.g., ccIIV)
- Numeric suffix: specifies the number of antigens in the vaccine (e.g., IIV3=trivalent, and IIV4=quadrivalent)

### Inactivated Influenza Vaccines

- Inactivated influenza vaccines contain inactivated viruses and thus *cannot cause influenza*.
- Vaccine composition varies according to the manufacturer (refer to package inserts).
- Single-dose preparations are thimerosal-free.
- Multi-dose vials contain the preservative thimerosal.
- Store at 35–46°F (2–8°C); do not freeze.<sup>2</sup>
- Commonly reported adverse events: local redness and soreness at the injection-site.
- Less commonly reported adverse events: mild fever, muscle pain, and rash.
- IIV3 vaccines available this season: Afluria®, Fluarix®, FluLaval®, Fluvirin®, Fluzone®, Fluzone® Intradermal, Fluzone® High Dose.<sup>1</sup>
- ccIIV3 vaccine available this season: Flucelvax® is a cell culture-based vaccine; it is approved for persons aged ≥18 years.<sup>2</sup> Vaccine virus strains are grown in mammalian cells instead of in eggs; however, initial reference strains are passed through an egg and thus the vaccine should be administered following CDC's egg-allergy guidelines.<sup>1</sup>
- IIV4 vaccines available this season: Fluarix® Quadrivalent, FluLaval® Quadrivalent, Fluzone® Quadrivalent.<sup>1</sup>

### Live-Attenuated Influenza Vaccine

- Contains live, attenuated (weakened), temperature-sensitive (cold-adapted) viruses that are able to replicate efficiently only at temperatures present in the nasal mucosa.

- FluMist® Quadrivalent is the only LAIV available this season; it is thimerosal-free and available for healthy, non-pregnant persons aged 2–49 years.<sup>1</sup>
- FluMist® Quadrivalent is for intranasal administration only, and is supplied in a prefilled, single-use sprayer containing 0.2 mL of vaccine; an attached dose-divider clip is removed from the sprayer to administer the second half of the dose into the other nostril. An illustration and a video showing the appropriate administration technique are available on the manufacturer's website.<sup>3</sup>
- Store at 35–46°F (2–8°C); do not freeze.<sup>2</sup>
- The most commonly reported adverse events following use of LAIV include nasal congestion, cough, headache, and sore throat.

### Recombinant Influenza Vaccine

- RIV3 is made by using DNA and cell culture technology to produce the hemagglutinin (HA) protein that induces immunization; the recombinant HA is produced in an insect line using a baculovirus, thus *the vaccine is egg-free*.<sup>2</sup>
- FluBlok® is the only RIV3 available this season; it may be used in persons aged 18–49 years.<sup>2</sup>
- Store at 35–46°F (2–8°C), do not freeze, and protect from light.<sup>2</sup>

### State-Supplied Influenza Vaccines

Three presentations of state-supplied influenza vaccine will be offered by the Alaska Immunization Program this season:<sup>4</sup>

- Fluzone® Pediatric IIV3: prefilled syringe, preservative free, latex free, available for children aged 6–35 months.
- Fluarix® IIV4: prefilled syringe, preservative free, available for persons aged ≥3 years.<sup>2</sup>
- FluMist® LAIV: prefilled sprayer, preservative free, latex free, available for persons aged 2–49 years.<sup>3</sup>

### References

1. CDC. Summary Recommendations: Prevention and Control of Influenza with Vaccines: Recommendations of the ACIP – United States, 2013–14 Influenza Season. Available at: <http://www.cdc.gov/flu/professionals/acip/2013-summary-recommendations.htm>
2. U.S. Food and Drug Administration, Vaccines, Blood, and Biologics: Manufacturer Package Inserts. Available at: <http://www.fda.gov/BiologicsBloodVaccines/Vaccines/ApprovedProducts/UCM093833>
3. MedImmune Vaccines, Inc. Information for Healthcare Professionals: Dosing and Administration. Available at: <https://www.flumistquadrivalent.com/hcp/>
4. Alaska Section of Epidemiology. Influenza Vaccine Recommendations and Administration for the 2013-14 Season. *Bulletin* No. 23. Available at: [http://www.epi.alaska.gov/bulletins/docs/b2013\\_23.pdf](http://www.epi.alaska.gov/bulletins/docs/b2013_23.pdf)

**Table. Contraindications and Precautions for Influenza Vaccines, 2013–14 Season<sup>1</sup>**

Contraindications for LAIV and IIV	Do not administer if person has:	<ul style="list-style-type: none"> <li>• anaphylaxis or life-threatening reaction to a previous influenza vaccine</li> <li>• severe allergy (e.g., anaphylaxis) to egg protein or to any component of the vaccine</li> </ul>
Additional contraindications for LAIV  (Note: persons with contraindications for LAIV may be candidates for IIV or RIV.)	Do not administer if person:	<ul style="list-style-type: none"> <li>• is aged &lt;2 years or ≥50 years</li> <li>• is pregnant</li> <li>• has chronic medical conditions*</li> <li>• has asthma</li> <li>• is a child aged 2–4 years with a history of wheezing in past 12 months</li> <li>• is a close contact of a patient with severe immunosuppression requiring protective isolation</li> <li>• is a child aged ≤18 years receiving long-term aspirin or other salicylates therapy</li> <li>• who received live virus (LAIV, MMR, varicella) vaccine within the last 4 weeks</li> <li>• who received influenza antiviral medication within the last 48 hours</li> </ul>
Contraindications for RIV	Do not administer if person:	<ul style="list-style-type: none"> <li>• is aged &lt;18 years or ≥50 years</li> <li>• has a history of severe allergic reaction to any component of the vaccine</li> </ul>
Precautions for ALL influenza vaccines	Do not administer if person:	<ul style="list-style-type: none"> <li>• has a moderate or severe illness with or without a fever (a person with a mild illness, such as a mild cold, may be vaccinated)</li> <li>• developed Guillain Barré syndrome within 6 weeks of a previous influenza vaccination</li> </ul>

\*Chronic pulmonary (including asthma), cardiovascular (excluding hypertension), renal, hepatic, cognitive, neurologic/neuromuscular (e.g., cerebral palsy), hematologic or metabolic disorders (e.g., diabetes), immunosuppression including that caused by medications or HIV, and children (through 18 years of age) on long-term aspirin therapy.