State of Alaska Epidemiology **Bulletin**

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TIV and LAIV Influenza Vaccines for 2010–11

Important Note: *All lots of Influenza A (H1N1) 2009 monovalent vaccine in multidose vials distributed by Sanofi Pasteur will expire on September 15, 2010, regardless of the 2011 dating printed on the box.* Alaska providers should appropriately dispose of this vaccine and ensure it is not mixed with influenza vaccine arriving for the 2010–11 season.

Background

Trivalent inactivated influenza vaccine (TIV) and live, attenuated influenza vaccine (LAIV) are widely available in the United States, and both vaccines contain three virus antigens that are matched to the main circulating strains of influenza each year. For the 2010–11 season, the trivalent vaccine virus strains are *A/California/7/2009(H1N1)-like* (the same strain as 2009 H1N1 monovalent vaccines), *A/Perth/16/2009 (H3N2)-like*, and *B/Brisbane/60/2008-like*. Both TIV and LAIV initially are grown in eggs. Although both types of vaccines are expected to be effective, they differ in several respects (Table).

TIV-specific Information

The composition of TIV varies according to manufacturer, and package inserts should be consulted. TIV formulations in multi-dose vials contain the preservative thimerosal; however, thimerosal-free single-dose preparations also are available. TIV contains inactivated viruses and thus cannot cause influenza. TIV should be stored at 35–46°F (2–8°C) and should not be frozen. The most commonly reported adverse event following TIV vaccination is local soreness at the injection-site. Other less commonly reported adverse events include mild fever, muscle pain, and rash.

LAIV-specific Information

There is only one formulation for LAIV, which contains live, attenuated, cold-adapted, temperature-sensitive viruses that are able to replicate efficiently only at temperatures present in the nasal mucosa. The vaccine does not contain thimerosal. The most commonly reported adverse events following use of LAIV include nasal congestion, cough, headache, and sore throat. Because the vaccine viruses are attenuated (weakened), LAIV cannot cause flu illness.

LAIV is for intranasal administration only. The vaccine 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 video providing the appropriate LAIV administration technique are available on the manufacturer's website.[1] LAIV should be stored at 35–46°F (2–8°C).

Persons Who Should *Not* Be Vaccinated

Both TIV and LAIV

- Persons known to have anaphylactic hypersensitivity to eggs or other components of influenza vaccine (see package inserts)

LAIV Only

- Persons aged <2 years or ≥50 years
- Persons with underlying medical conditions that serve as an indication for routine influenza vaccination
- Children aged 2–4 years with wheezing or asthma during the preceding 12 months
- Persons with asthma
- Pregnant women
- Children or adolescents aged 6 months through 18 years receiving aspirin or other salicylates
- Precaution: LAIV should not be administered to close contacts of immunosuppressed persons who require a protected environment.

Precautions for both TIV and LAIV

- Persons with moderate to severe acute illness with or without fever usually should not be vaccinated until their symptoms have abated.
- Guillain-Barré Syndrome (GBS) within 6 weeks of a previous influenza vaccine is a precaution for future receipt of influenza vaccine.

Note: This Epidemiology *Bulletin* and the companion *Bulletin* No. 24, *Influenza Vaccine Recommendations and Administration for 2010–11*[2] provide summary information only. For complete information, consult the appropriate manufacturer package inserts and the recommendations of the Advisory Committee on Immunization Practices (ACIP) for the *Prevention and Control of Influenza*.[3]

References

1. MedImmune Vaccines, Inc. Information for Healthcare Professionals: Dosing and Administration. Available at: http://www.flumist.com/Professional/Dosing-Administration/
2. Section of Epidemiology. Influenza Vaccine Recommendations and Administration for 2010-11. *Bulletin* No. 24, August 26, 2010. Available at: http://www.epi.alaska.gov/bulletins/docs/b2010_24.pdf
3. CDC. Prevention and Control of Influenza with Vaccines. *MMWR Morb Mort Wkly Rep* 2010;59(RR-8):1-62. Available at: http://www.cdc.gov/mmwr/pdf/rr/rr5908.pdf

Table. Live, Attenuated Influenza Vaccine (LAIV) Compared with Inactivated Influenza Vaccine (TIV) for Seasonal Influenza, US Formulations

Factor	LAIV	TIV
Route of administration	Intranasal spray	Intramuscular injection
Type of vaccine	Live virus	Killed virus
Number of virus strains included	Three (2 A/ 1 B)	Three (2 A/ 1 B)
Vaccine virus strains updated	Annually	Annually
Frequency of administration	Annually*	Annually*
Approved age	2–49 years† (State-supplied vaccine is limited to persons aged 2–18 years)	Persons aged ≥6 months§
Interval between 2 doses recommended for children aged 6 months–8 years who are receiving influenza vaccine for the first time	≥4 weeks	≥4 weeks
Can be administered to person with medical risk factors for influenza-related complications†	No	Yes
Can be administered to children with asthma or children aged 2–4 years with wheezing during the preceding year¶	No	Yes
Can be administered to family members or close contacts of immunosuppressed persons not requiring a protected environment	Yes	Yes
Can be administered to family members or close contacts of immunosuppressed persons requiring a protected environment (e.g., hematopoietic stem cell transplant recipient)	No	Yes
Can be administered to family members or close contacts of persons at higher risk, including pregnant women, but not severely immunosuppressed	Yes	Yes
Can be simultaneously administered with other vaccines	Yes**	Yes††
If not simultaneously administered, can be administered within 4 weeks of a live vaccine	Space ≥4 weeks apart	Yes
If not simultaneously administered, can be administered within 4 weeks of an inactivated vaccine	Yes	Yes

* Children aged 6 months–8 years who have never received a seasonal influenza vaccine before or who did not receive at least 1 dose of an influenza A (H1N1) 2009 monovalent vaccine should receive should receive 2 doses, spaced ≥4 weeks apart. Those children aged 6 months–8 years who were vaccinated for the first time in the 2009-10 season with the seasonal 2009-10 vaccine but who received only 1 dose of seasonal influenza vaccine should receive 2 doses in the following year, spaced ≥4 weeks apart (see Figure, Epidemiology *Bulletin* 24[2]).

† Persons at higher risk for complications of influenza infection due to underlying medical conditions (see Box, Epidemiology *Bulletin* 24[2]) should not receive LAIV.

§ Approval varies by formulation (see Table, Epidemiology *Bulletin* 24[2]).

¶ Clinicians should screen for possible reactive airway diseases when considering use of LAIV for children aged 2–4 years and should avoid use of this vaccine in children with asthma or a recent wheezing episode.

** LAIV co-administration has been evaluated systematically only among children aged 12–15 months who received MMR or varicella vaccine.

†† TIV co-administration has been evaluated systematically only among adults who received pneumococcal polysaccharide or zoster vaccine.