State of Alaska Epidemiology Bulletin

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TIV and LAIV Influenza Vaccines for the 2012–13 Season

Background

Trivalent inactivated influenza vaccine (TIV) and live, attenuated influenza vaccine (LAIV) are widely available in the United States. Both vaccines contain three virus antigens that are matched to the main strains of influenza circulating the prior year. In the United States, trivalent influenza vaccines for the 2012–13 season will contain A/California/7/2009(H1N1)-like, A/Victoria/361/2011(H3N2)-like, and B/Wisconsin/1/2010-like (Yamagata lineage) antigens. Both TIV and LAIV are initially grown in eggs. Although both types of vaccines are expected to be effective, they differ in several respects (Table).

TIV

TIV contains inactivated viruses and thus cannot cause influenza. The composition of TIV varies according to manufacturer; therefore, 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 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

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

LAIV is for intranasal administration only, and is supplied in a prefilled, single-use sprayer containing 0.2 mL of vaccine, which does not contain thimerosal. 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).

Contraindication for Both LAIV and TIV

- Persons known to have had a severe allergic reaction (e.g., anaphylaxis) to egg protein, the influenza vaccine, or any component of the vaccine

Contraindications for 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

Precautions for Both LAIV and TIV

- Persons with moderate to severe acute illness with or without fever should not be vaccinated until symptoms have abated
- Persons who developed Guillain-Barré Syndrome (GBS) within 6 weeks of a previous influenza vaccine

Precaution for LAIV Only

- Persons who are close contacts of immunosuppressed persons who require a protected environment

References

1. MedImmune Vaccines, Inc. Information for Healthcare Professionals: Dosing and Administration. Available at: http://www.medimmune.com/pdf/products/flumist_pi.pdf
2. Alaska Section of Epidemiology. Influenza Vaccine Recommendations and Administration for 2012-13. *Bulletin* No. 16, August 29, 2012. Available at: http://www.epi.alaska.gov/bulletins/docs/b2012_16.pdf
3. CDC. Prevention and Control of Influenza with Vaccines. *MMWR* 2010;59(RR-8):1-62. Available at: http://www.cdc.gov/mmwr/pdf/rr/rr5908.pdf
4. CDC. Prevention and Control of Influenza with Vaccines: Recommendations of the Advisory Committee on Immunization Practices (ACIP) – United States, 2012-13 Influenza Season. *MMWR* 2012;61(32):613-18. Available at: http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6132a3.htm?s_cid=mm6132a3_e%0d%0a
5. Alaska Section of Epidemiology. State Funding Increases Vaccines Distributed by Alaska Immunization Program. *Bulletin* No. 8, May 22, 2012. Available at: http://www.epi.alaska.gov/bulletins/docs/b2012_08.pdf

Table. Comparison of Trivalent Inactivated Influenza Vaccine (TIV) and Live, Attenuated Influenza Vaccine (LAIV), US Formulations[2-5]

Factor	TIV	LAIV
Route of administration	Intramuscular or intradermal injection	Intranasal spray
Type of vaccine	Killed virus	Live, attenuated virus
Number of virus strains included	Three (2A/1B)	Three (2A/1B)
Vaccine virus strains updated	Annually	Annually
Frequency of administration	Annually*	Annually*
Approved age	≥6 months (State-supplied vaccine is limited to persons aged 6 mos–18 years, and under/uninsured adults)†	2–49 years (State-supplied vaccine is limited to persons aged 2–18 years)†
Interval between 2 doses recommended for children aged 6 months–8 years	≥4 weeks	≥4 weeks
Can be administered to person with medical risk factors for influenza-related complications§	Yes	No
Can be administered to children with asthma or children aged 2–4 years with wheezing during the preceding year	Yes	No¶
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)	Yes	No
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	Yes	No, space ≥4 weeks apart
If not simultaneously administered, can be administered within 4 weeks of an inactivated vaccine	Yes	Yes

**Children aged 6 mos–8 yrs that did not receive ≥2 doses of seasonal influenza vaccine since July 1, 2010 should receive 2 doses of 2012-13 influenza vaccine, spaced ≥4 weeks apart. Children aged 6 mos–8 yrs that received ≥2 doses of seasonal influenza vaccine since July 1, 2010; or ≥2 doses of seasonal influenza vaccine before July 1, 2010 and ≥1 dose of monovalent 2009 (H1N1) vaccine; or ≥1 dose of seasonal vaccine before July 1, 2010 and ≥1 doses of seasonal influenza vaccine since July 1, 2010 should receive 1 dose of 2012–13 influenza vaccine (see Table 1 of the companion Bulletin[2]).*

†Approval varies by formulation (see Table 2 of the companion Bulletin[2]); state-supplied TIV vaccine is available to under/uninsured adults.[5]

§Persons at higher risk for complications of influenza infection due to underlying medical conditions should not receive LAIV.

¶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 wheezing episode. If episode occurred within the preceding 12 months, child should not receive LAIV.

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

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

Note: This Epidemiology *Bulletin* provides **summary information only.** For complete information, consult the appropriate manufacturer package inserts (available at: http://www.fda.gov/BiologicsBloodVaccines/Vaccines/ApprovedProducts/UCM093833) and the ACIP.[2-5]