IMMUNIZING AGENT

INFLUENZA VIRUS VACCINES (not live)

Introduction

Five types of influenza vaccine are available including four types of inactivated vaccine and one live vaccine. The four types of inactivated vaccine include trivalent inactivated influenza vaccine (IIV3), quadrivalent IIV (IIV4), trivalent recombinant hemagglutinin influenza vaccine (RIV3) and cell culture-based trivalent IIV (ccIIV3). Trivalent IIV contains two influenza A strains and one influenza B strain while quadrivalent IIV contains two influenza A strains and two influenza B strains. The live vaccine is quadrivalent live-attenuated influenza vaccine (LAIV4) which contains two influenza A strains and two influenza B strains. The following table pertains to the inactivated (not live) vaccines.

Influenza vaccine (not live) information and recommended age group.

Vaccine	Trade name	Manufacturer	Age group*
IIV3 IIV4	Fluzone®	Sanofi Pasteur	≥6 months
IIV4	FluLaval®	ID Biomedical Corporation of Quebec (distributed by GlaxoSmithKline)	≥3 years
IIV4	Fluarix®	GlaxoSmithKline	≥3 years
IIV3	Fluvirin®	Novartis Vaccines and Diagnostics	≥4 years
IIV3	Afluria®	bioCSL	≥9 years via needle; 18-64 years via jet injector
IIV4	Fluzone Intradermal®	Sanofi Pasteur	18-64 years
IIV3	Fluzone High-Dose®	Sanofi Pasteur	≥65 years
RIV3	FluBlok®	Protein Sciences	≥18 years
ccIIV3	Flucelvax®	Novartis Vaccines and Diagnostics	≥18 years

*Age group varies by presentation.

Schedule

Influenza occurrence generally peaks in temperate areas during late December to early March. Influenza vaccine should be offered as soon as it becomes available and should continue to be offered as long as influenza viruses are circulating.

The following table includes the dosing for the inactivated vaccines. Note that the number of doses recommended may vary. See the current ACIP immunization schedule for the specific dosing algorithm.

Age Group	Dosage	Number of Doses	Route
6-35 months no previous influenza vaccine	0.25 mL	2 (separated by 4 weeks)	IM
6-35 months previous influenza* vaccine	0.25 mL	1 or 2[a]	IM
3-8 years no previous influenza vaccine	0.50 mL	2 (separated by 4 weeks)	IM
3-8 years previous influenza vaccine*	0.50 mL	1 or 2[a]	IM
≥9 years	0.50 mL	1	IM[b]

*LAIV or inactivated vaccine

[a]Only one dose is needed if the child received two total doses of influenza vaccine during a previous influenza season. The two doses need not have been received during the same season or consecutive seasons.

[b]With the exception of Fluzone Intradermal

Contraindications

1. Severe allergic reaction (e.g., anaphylaxis) after a previous dose or to a vaccine component, including egg protein

Precautions

1. Guillain-Barré syndrome (GBS) <6 weeks after a previous dose of influenza vaccine
2. Moderate or severe acute illness with oral (or equivalent) temperature ≥100.4°F

Reactions

1. Local reactions are the most common and include soreness, erythema and induration at the site of injection.
2. Nonspecific systemic symptoms, including fever, chills, malaise and myalgia are less common.

Potential Allergy

When in doubt about the contents of a particular vaccine, check the current package insert.

Vaccine	Latex	Neomycin	Polymyxin B	Thimerosal	Gelatin	Gentamicin	Egg[a]
Fluarix	No	No	No	No	No	Yes	Yes
Afluria	No	Yes	Yes	Yes (multidose vials)	No	No	Yes
Fluzone	No	No	No	Yes (multidose vials)	Yes	No	Yes

Vaccine	Latex	Neomycin	Polymyxin B	Thimerosal	Gelatin	Gentamicin	Egg[a]
Fluvirin	Yes – syringe tip cap	Yes	Yes	Yes (multidose vials)	No	No	Yes
FluLaval	No	No	No	Yes (multidose vials)	No	No	Yes
Fluzone High-Dose	No	No	No	No	No	No	Yes
Fluzone Intradermal	No	No	No	No	No	No	Yes
FluBlok	No	No	No	No	No	No	No
Flucelvax	Yes – syringe tip cap	No	No	No	No	No	No

[a]Refer persons with egg allergy to their provider for evaluation.

Administration

Dosage, route and site: 0.25 mL or 0.5 mL intramuscularly (except for Fluzone Intradermal) into the anterolateral aspect of the upper thigh for infants and younger children, or into the deltoid for older children and adults.

Cleansing Agent: alcohol

Storage

Refrigerate at 35° to 46°F (2° to 8°C). DO NOT FREEZE.

Note that RIV has a shorter expiration date than IIV.

IMMUNIZING AGENT

Live Attenuated Influenza Vaccine (LAIV)

Introduction

LAIV4 is an intranasally administered, live, quadrivalent vaccine. It is licensed for use in healthy persons aged 2 through 49 years. If LAIV is contraindicated, IIV should be used.

1. FluMist™ – MedImmune

Schedule

Note that the number of doses recommended may vary. See the most current ACIP immunization schedule for the specific dosing algorithm.

Age Group	Number of Doses	Route
2-8 years no previous influenza vaccine	2 (separated by 4 weeks)	Intranasal
2-8 years previous influenza vaccine*	1[a] or 2	Intranasal
9-49 years	1	Intranasal

*LAIV or inactivated vaccine

[a]Only one dose is needed if the child received two total doses of influenza vaccine during a previous influenza season. The two doses need not have been received during the same season or consecutive seasons.

Contraindications

1. Severe allergic reaction (e.g., anaphylaxis) after previous dose or to a vaccine component, or to a previous dose of any influenza vaccine.
2. In addition, ACIP recommends against use in the following:
   - Persons aged <2 years or >49 years
   - Children aged 2 through 17 years who are receiving aspirin-containing products
   - Children aged 2 through 4 years who have asthma or who have had a wheezing episode noted in the medical record within the past 12 months, or for whom parents report that a health care provider stated that they had wheezing or asthma within the last 12 months (see the ACIP recommendations for screening guidance)
   - Persons who have immunosuppression (including immunosuppression caused by medications [a substantially immunosuppressive steroid dose is considered to be ≥2 weeks of daily receipt of 20 mg or 2 mg/kg body weight of prednisone or equivalent] or by HIV)
   - Persons with a history of egg allergy
   - Persons who have taken influenza antiviral medications during the past 48 hours
   - Pregnant women
3. Persons who care for severely immunosuppressed persons who require a protective environment should not receive LAIV, or should avoid contact with such persons for 7 days after receipt, given the theoretical risk for transmission of the live attenuated vaccine virus.

Breastfeeding is not a contraindication to receiving LAIV.

Precautions

1. Moderate or severe acute illness with oral (or equivalent) temperature ≥100.4°F
2. Guillain-Barré syndrome <6 weeks after a previous dose of influenza vaccine

3. Persons who have chronic pulmonary, cardiovascular (except isolated hypertension), renal, hepatic, neurologic, hematologic, or metabolic disorders (including diabetes mellitus)
4. Asthma in persons aged ≥5 years (see the ACIP recommendations for screening guidance)

Reactions

1. Signs and symptoms reported following LAIV use in children include runny nose and headache.
2. Among adults, cough, runny nose, nasal congestion, sore throat and chills have been reported following LAIV use.

Potential Allergy

*When in doubt about the contents of a particular vaccine, check the current package insert.

Vaccine	Latex	Gelatin	Gentamicin	Egg[a]
FluMist	No	Yes	Yes	Yes

[a]Refer persons with egg allergy to their provider for evaluation.

Transmission of vaccine virus to contacts

Available data indicate that both children and adults vaccinated with LAIV can shed vaccine viruses for ≥2 days after vaccination. Shedding should not be equated with person-to-person transmission of vaccine viruses; although, in rare instances, shed vaccine viruses can be transmitted from vaccinees to nonvaccinated persons.
Severely immunosuppressed persons should not administer LAIV.

Administration

Dosage, route and site: Half the dose (0.1 mL) is administered into each nostril while the recipient is in an upright position. Insert the tip of the sprayer just inside the nose and depress the plunger until the dose divider clip prevents you from going further. The dose-divider clip is removed from the sprayer to administer the second half of the dose (0.1 mL) into the other nostril. If the patient sneezes, the dose does not need to be readministered. However, if nasal congestion is present that might impede delivery of the vaccine to the nasopharyngeal mucosa, deferral of administration should be considered until resolution of the illness, or IIV should be administered instead.

How supplied

FluMist is supplied in a package of 10 pre-filled, single-dose (0.2 mL) intranasal sprayers.
Note that the expiration date of FluMist is shorter than that of other vaccines.

Storage

Refrigerate at 35° to 46°F (2° to 8°C). DO NOT FREEZE.