



Influenza Vaccine

Influenza Illness

The influenza viruses cause 15-60 million cases of influenza each year in the US. These illnesses result in about 25,000,000 physician visits, 302,000 hospital days, and an average of 22,600 deaths each year. The elderly suffer most of the deaths and hospitalizations, but children less than 2 years of age have rates of influenza hospitalization similar to the elderly and deaths also occur in the pediatric age group.

Types of vaccines

- **Flu Shot:** An inactivated vaccine (containing purified components of the virus, hemagglutinin) given by intramuscular (IM) injection into the deltoid. (IIV for “inactivated influenza vaccine”). Depending on the formulation, flu shots can be given as young as 6 months. Children less than 6-months of age should not receive any influenza vaccine. (See chart on page 3 for age indications for the various formulations).
- **Nasal-spray Flu vaccine:** A vaccine made with live, attenuated (weakened) influenza viruses that do not cause influenza (LAIV for “live attenuated influenza vaccine,” or FluMist®). LAIV can be used in healthy individuals aged 2-49 years and women who are not pregnant.
- **Specialized Influenza vaccines:** Vaccines with a single type of influenza virus may be provided for new influenza viruses capable of causing widespread illness (e.g., “pandemic”) due to a new or novel type of virus. Currently such vaccines may be provided as an injectable vaccine or nasal spray (e.g., novel H1N1, H5N2 “bird flu”).

Variations in Influenza vaccines

- **Trivalent/Quadrivalent.** Trivalent vaccines (IIV3) contain two influenza A strains (one H1N1 and one H3N2) and one B vaccine; quadrivalent vaccines (IIV4 or LAIV4) contain a second B strain.
- **High dose/standard dose.** Fluzone-HD contains more of each antigen and elicits a higher antibody response in patients 65 years of age and above.
- **Intramuscular/intranasal/intradermal.** IM vaccines have been standard for many years. Intranasal live attenuated vaccine (LAIV) has been available for several years. Intradermal vaccine may be used in those 18-64 years who prefer to avoid IM injections.
- **Cell culture/recombinant/egg-grown vaccines.** Egg-grown vaccines have been standard for many years. The amount of egg protein has declined to very low levels in the last several years. LAIV is also egg-grown. Cell culture (Flucelvax®) and recombinant (FluBlok®) vaccines are newer and may be used in anyone of the indicated ages (see table on page 3) and may be preferred for those very allergic to eggs.

Influenza vaccine is recommended annually for everyone over 6 months of age

Certain individuals are especially vulnerable to influenza and should be targeted for yearly vaccination. These are individuals who are at high risk of having serious complications or individuals who live with or care for those at high risk for serious complications:

- Children 6-months through age 18. Children under 9 should receive 2 doses of vaccine if they have not been vaccinated previously; children under 9 who have received 2 dose in the past only need one dose this year.
- Pregnant women.
- Individuals 50 years of age and older.
- Individuals of any age with certain chronic medical conditions, such as asthma and other respiratory and cardiac conditions.
- Individuals who live in nursing homes and other long-term care facilities.
- Individuals who live with or care for those at high risk for complications from influenza including health care workers, household contacts of individuals at high risk for complications from influenza, and household contacts and caregivers of children less than 6-months of age.

Who needs consultation before being vaccinated?

Some individuals should not be vaccinated without first consulting a physician. These include:

- Individuals who have a severe allergy to chicken eggs (for these persons the egg-free product, FluBlok® or Flucelvax®, is recommended).
- Individuals who have had a severe reaction to a prior influenza vaccination.

- Individuals who developed Guillain-Barré syndrome within six weeks of getting an influenza vaccine.
- Individuals with a moderate-to-severe illness with a fever should wait until they recover to get vaccinated.

When to vaccinate

Because the timing and duration of influenza seasons vary, yearly influenza vaccination should begin in August or September or as soon as vaccine is available and continue throughout the influenza season. While influenza outbreaks can begin as early as October, most often influenza activity peaks in January or later. It takes about two weeks after vaccination for antibodies to develop to protect against influenza infection.

Side effects

Flu Shot: Inactivated vaccines (IIV3, IIV4, and RIV) contain partially purified surface components of the influenza virus and are standardized by the amount of hemagglutinin in the vaccine. Since neither whole nor live viruses are in these vaccines, a person cannot get influenza from these vaccines. Some minor side effects that could occur are soreness, redness, or swelling at the site of the injection, low-grade fever, and generalized aches. If these problems occur, they begin soon after the shot and usually last one to two days. Almost all individuals who receive influenza vaccine have no serious problems from it; however, on rare occasions, influenza vaccination can cause allergic reactions.

LAIV: The viruses in the nasal spray vaccine are weakened and do not cause symptoms like those associated with influenza illness. Side effects from LAIV vary between children and adults. For children, side effects can include runny nose, wheezing, headache, vomiting, muscle aches, and fever. For adults, side effects can include runny nose, headache, sore throat, and cough. Individuals with asthma may experience severe wheezing and should not be given LAIV.

How to store the vaccine—IIV3, IIV4 and LAIV

- Refrigerate immediately upon arrival – do not use if frozen.
- Refrigerate opened or unopened at 2-8°C (35-46°F).
- Do not use after expiration date.
- Shake vial vigorously before each dose (IIV only).

Administering Influenza Vaccine (IIV3, IIV4 and RIV3)

- Adults: 0.5 ml given intramuscularly, IM deltoid (22-25 gauge, 1-1½" needle) or intradermal in deltoid area, see package insert.
- Youths: IM deltoid with 22-25 gauge needle. Choose needle length appropriate to child's age and body mass (2-10 years, 1-1¼"; 11 years and older, 1-1½").
- Infants and young children: IM only, all ages, with 22-25 gauge needle. Choose needle length appropriate to child's age and body mass (7-11 months, 7/8 –1"; 12 months-5 years, 7/8–1 ¼" length). Children 6-35 months receive 0.25 ml.
- Multiple vaccines and vaccine preparations are used and approved in the U.S. Standard adult doses are 0.5 ml given intramuscularly for IIV
- Some practitioners prefer that young children and pregnant women receive vaccines that are thimerosal free; however thimerosal has not been shown to cause any disease or problem and is not contraindicated at any age. Children 6-35 months receive 0.25 ml IM for IIV. Multidose vials contain thimerosal. Vaccines in pre-filled syringes or single dose vials do not contain thimerosal and are therefore targeted for use in young children and pregnant women. Other indications and FDA approval vary by age as indicated below.

Administering influenza vaccine (LAIV or FluMist)

- FluMist is sprayed into the nose, 0.1 ml in each nostril. Patients may use a tissue to dab the drips, but should not blow the nose for 30 minutes after receiving FluMist.
- Pregnant women, those with asthma or recent wheezing, or those with severe immune compromising conditions should not receive FluMist.

Summary of licensed U.S. Influenza vaccines, 2014

Trade name	Manufacturer	Presentation	Vaccine Type	Age indications	Route
Afluria®	bioCSL	0.5 mL single-dose prefilled syringe or 5.0 mL multi-dose vial	IIV3	≥9 yrs.	IM
Fluarix®	GlaxoSmithKline	0.5 mL single-dose prefilled syringe	IIV3, IIV4	≥3 yrs.	IM
FluLaval®	ID Biomedical Corporation of Quebec (distributed by GlaxoSmithKline)	0.5 mL single-dose prefilled syringe or 5.0 mL multi-dose vial	IIV3	≥3 yrs.	IM
Fluvirin®	Novartis Vaccines and Diagnostics	0.5 mL single-dose prefilled syringe or 5.0 mL multi-dose vial	IIV3	≥4 yrs.	IM
Fluzone®	Sanofi Pasteur	0.25 mL (all IIV4) and 0.5 mL single-dose prefilled syringe, single dose vials (IIV3 and IIV4) or 5.0 mL multi-dose vial	IIV3, IIV4	6-35 mos. (0.25 ml).	IM
				≥36 mos. (0.5 ml)	IM
Fluzone® Intradermal	Sanofi Pasteur	0.1 mL prefilled microinjection system	IIV3	18-64 yrs.	ID
Flucelvax®	Novartis Vaccines and Diagnostics	0.5 mL single-dose prefilled syringe	IIV3	≥18 yrs.	IM
Fluzone® High-Dose	Sanofi Pasteur	0.5 mL single-dose prefilled syringe	IIV3	≥65 yrs.	IM
FluBlok®	Protein Sciences	0.5 mL single-dose vial	RIV3	18-49 yrs.	IM
FluMist® Quadrivalent	MedImmune	0.2 mL prefilled intranasal sprayer, (0.1 mL into each nostril)	LAIV4	2-49 yrs.	IN

For additional information

New Mexico Department of Health, <http://www.immunizenm.org>

Center for Disease Control, www.cdc.gov/vaccines/

Centers for Disease Control and Prevention Vaccination Information Statements, <http://www.cdc.gov/vaccines/hcp/vis/index.html>