From The Medical Letter on Drugs and Therapeutics

Influenza Vaccine for 2020-2021

There are several seasonal influenza vaccines available in the US for 2020-2021. Although most influenza vaccines are a single dose, children aged 6 months to 8 years who are being vaccinated for the first time, whose vaccination history is unknown, or who have not received at least 2 lifetime doses before July 1, 2020, should receive 2 doses that are administered at least 4 weeks apart. Fluad is an inactivated trivalent vaccine that is recommended for adults aged 65 years or older and contains 1 influenza B virus antigen. Fluad quadrivalent and Fluzone high-dose quadrivalent are specifically recommended for patients aged 65 years or older.

Table. Seasonal Influenza Vaccines for 2020-2021

Vaccine	Available formulations[a]	Mercury content[b]	Recommended age[c]	Cost[d]
Inactivated trivalent (IIV3)				
Fluad (Seqirus)[e-g]	0.5 mL syringe	None	≥65 y	$51.60
Inactivated quadrivalent (IIV4)				
Afluria quadrivalent (Seqirus)[e,h]	0.25 mL syringe	None	6-35 mo	17.90
	0.5 mL syringe	None	≥3 y	17.90
	5 mL multidose vial	24.5 µg/0.5 mL dose	≥6 mo[i,j]	15.90
Fluad quadrivalent (Seqirus)[e-g]	0.5 mL syringe	None	≥65 y	52.90
Fluarix quadrivalent (GSK)[e,k]	0.5 mL syringe	None	≥6 mo	16.60
FluLaval quadrivalent (GSK)[e]	0.5 mL syringe	None	≥6 mo	16.60
Fluzone quadrivalent (Sanofi Pasteur)[e,l]	0.5 mL syringe	None	≥6 mo[m]	17.40
	0.5 mL vial	None	≥6 mo[m]	17.40
	5 mL multidose vial	25 µg/0.5 mL dose	≥6 mo[m]	15.40
Fluzone high-dose quadrivalent (Sanofi Pasteur)[e,n]	0.7 mL syringe	None	≥65 y	52.90
Cell culture-based inactivated quadrivalent (ccIV4)				
Flucelvax quadrivalent (Seqirus)[o]	0.5 mL syringe	None	≥4 y	25.00
	5 mL multidose vial	25 µg/0.5 mL dose	≥4 y	22.00
Recombinant quadrivalent (RIV4)				
Flublok quadrivalent (Sanofi Pasteur)[p]	0.5 mL syringe	None	≥18 y	52.90
Live-attenuated quadrivalent (LAIV4)				
FluMist quadrivalent (AstraZeneca)[e,k,q,r]	0.2 mL intranasal sprayer[s]	None	2-49 y	23.00

[a] Single-dose vials and syringes are sold in boxes of 10. Multidose vials contain 10 doses.

[b] Strong evidence shows no increased risk from exposure to vaccines containing mercury.

[c] Children 6 months to 8 years old who are being vaccinated for the first time, whose vaccination history is not known, or who have not received at least 2 lifetime doses of the trivalent or quadrivalent vaccine before July 1, 2020 should receive 2 doses at least 4 weeks apart. The first dose should be given as soon as possible after the vaccine becomes available so that the second dose can be administered by the end of October. Children in this age group who received ≥2 doses of trivalent or quadrivalent vaccine at any time before July 1, 2020 require only 1 dose.

[d] Approximate WAC per dose. WAC = wholesaler acquisition cost or manufacturer's published price to wholesalers; WAC represents a published catalogue or list price and may not represent an actual transactional price. Source: AnalySource® Monthly. September 5, 2020. Reprinted with permission by First Databank, Inc. All rights reserved. ©2020. www.fdbhealth.com/drug-pricing-policy.

[e] Prepared by propagation of virus in embryonated hen's eggs.

[f] Standard-dose adjuvanted vaccine that contains MF59, an oil-in-water emulsion of squalene oil.

[g] May contain residual amounts of neomycin, kanamycin, and hydrocortisone.

[h] May contain residual amounts of neomycin sulfate, polymyxin B, and hydrocortisone.

[i] The dose for children 6-35 months old is 0.25 mL and for those ≥3 years old is 0.5 mL.

[j] Persons 18-64 years old can receive the vaccine via a needle and syringe or a needle-free jet injector (PharmaJet Stratis).

[k] May contain residual amounts of gentamicin sulfate and hydrocortisone.

[l] The 0.25-mL prefilled syringe is not expected to be available for the 2020-2021 influenza season.

[m] The dose for children 6-35 months old is either 0.25 mL or 0.5 mL (no preference for one volume over the other). The dose for those ≥3 years old is 0.5 mL.

[n] Contains 60 µg of hemagglutinin antigen from each strain, compared to 15 µg in standard-dose vaccines.

[o] Uses mammalian cells for replication rather than hen's eggs.

[p] Contains 45 µg of hemagglutinin antigen from each strain, compared to 15 µg in standard-dose vaccines. Contains no egg proteins.

[q] Each 0.2-mL dose contains $10^{6.5}$-$10^{7.5}$ FFU (fluorescent focus units) of live-attenuated influenza virus reassortants from each strain.

[r] Contraindicated for use in pregnant women, persons who are immunocompromised, persons with active communication between the CSF and oropharynx, nasopharynx, nose, or ear or any other cranial CSF leak, persons with cochlear implants, children 2-4 years old who have asthma or have had a wheezing episode within the previous 12 months, children or adolescents taking aspirin or salicylate-containing therapy, close contacts of severely immunocompromised persons who require a protected environment, or patients treated with oseltamivir or zanamivir within the previous 48 hours, peramivir within the previous 5 days, or baloxavir marboxil within the previous 17 days. Use of influenza antiviral drugs <2 weeks after administration of the intranasal live-attenuated vaccine could inhibit replication of the vaccine virus, reducing the vaccine's efficacy. Some medical conditions (eg, renal impairment) may require a longer interval between the antiviral drug regimen and administration of FluMist quadrivalent. Patients of any age with asthma may be at increased risk of wheezing after administration of FluMist quadrivalent.

[s] Each single-use sprayer delivers one 0.2-mL intranasal dose (given as 0.1 mL in each nostril). If nasal congestion that could impair vaccine delivery to the nasal mucosa is present, an injectable vaccine should be selected instead. If use of an injectable vaccine is unacceptable, influenza vaccination should be delayed.

Box. Choice of Vaccine[a]

Children 6 months-<2 years old[b]
Age-appropriate inactivated vaccine (Afluria quadrivalent, Fluarix quadrivalent, FluLaval quadrivalent, or Fluzone quadrivalent)

Children 2-17 years old[b]
Any age-appropriate inactivated or live-attenuated[c] vaccine

Adults <50 years old
Any age-appropriate inactivated, recombinant, or live-attenuated[c] vaccine

Adults ≥50 years old
Any age-appropriate inactivated or recombinant vaccine[d]

Pregnant women
Any age-appropriate inactivated or recombinant vaccine

Persons with egg allergy[e]
Any age-appropriate inactivated, recombinant, or live-attenuated[c] vaccine

Persons with needle aversion
Afluria quadrivalent with needle-free injector[f] or intranasal live-attenuated[c] vaccine

Immunocompromised persons
Any age-appropriate inactivated or recombinant vaccine

Abbreviation: ACIP, Advisory Committee on Immunization Practices.

[a] See Table for available vaccines in the US during the 2020-2021 influenza season and specific age recommendations.

[b] Children 6 months to 8 years old who are being vaccinated for the first time, whose vaccination history is unknown, or who have not received at least 2 lifetime doses of a trivalent or quadrivalent vaccine before July 1, 2020 should receive 2 doses at least 4 weeks apart. The first dose should be given as soon as possible after the vaccine becomes available so that the second dose can be administered by the end of October. Children in this age group who received ≥2 doses of a trivalent or quadrivalent vaccine at any time before July 1, 2020 require only 1 dose.

[c] FDA-approved only for use in persons 2-49 years old. Contraindicated for use in pregnant women, persons who are immunocompromised, persons with active communication between the CSF and oropharynx, nasopharynx, nose, or ear or any other cranial CSF leak, persons with cochlear implants, children 2-4 years old who have asthma or have had a wheezing episode within the previous 12 months, children or adolescents taking aspirin or salicylate-containing therapy, close contacts of severely immunocompromised persons who require a protected environment, or patients treated with oseltamivir or zanamivir within the previous 48 hours, peramivir within the previous 5 days, or baloxavir marboxil within the previous 17 days. Use of influenza antiviral drugs <2 weeks after administration of the intranasal live-attenuated vaccine could inhibit replication of the vaccine virus, reducing the vaccine's efficacy. Some medical conditions (eg, renal impairment) may require a longer interval between the antiviral drug regimen and administration of FluMist quadrivalent. Patients of any age with asthma may be at increased risk of wheezing after administration of FluMist quadrivalent.

[d] See Table 4 in the article. Fluad, Fluad quadrivalent, Fluzone high-dose, and Flublok quadrivalent have elicited greater antibody responses in older adults than nonadjuvanted standard-dose vaccines, but only the high-dose (in adults ≥65 years old) and recombinant vaccines (in adults ≥50 years old) have been shown to be more effective in preventing laboratory-confirmed influenza in randomized controlled trials. The ACIP has not preferentially recommended any vaccine for this age group and states that vaccination should not be delayed if a specific product is not readily available.

[e] A history of a severe allergic reaction to any component of the vaccine is a contraindication in the labeling of all influenza vaccines, but the ACIP states that any age-appropriate inactivated influenza vaccine, recombinant influenza vaccine, or live-attenuated vaccine may be administered to persons with egg allergy of any severity. Persons who have severe egg allergy should be vaccinated in a healthcare setting with supervision by a healthcare provider experienced in recognizing and managing severe allergic reactions. The recombinant vaccine (Flublok quadrivalent) and the cell culture-based inactivated vaccine (Flucelvax quadrivalent) are not prepared by propagation of virus in embryonated eggs and are not required to be administered under the supervision of a health care provider.

[f] Delivery of Afluria quadrivalent via the PharmaJet Stratis needle-free injection system is FDA-approved only for persons 18-64 years old.

Although any age-appropriate influenza vaccine can now be administered (under the supervision of a health care provider) to individuals who report hives or more severe egg allergy, the Flucelvax quadrivalent, a cell culture–based inactivated quadrivalent vaccine recommended for individuals aged 4 years or older, and the recombinant vaccine Flublok quadrivalent are not prepared using embryonated eggs and can also be used for those with an egg allergy. The recombinant vaccine can be administered to individuals aged 18 years or older. FluMist quadrivalent is an intranasal live-attenuated influenza vaccine that can be used in healthy, nonpregnant individuals aged 2 to 49 years. The live-attenuated vaccine should not be used in persons who are immunocompromised.

We have reprinted a **Table** and a **Box** summarizing information about influenza vaccines available in the US and their recommended patient populations. This Table and Box were originally published as part of a comprehensive review on the topic that appeared in the September 21, 2020, issue of *The Medical Letter on Drugs and Therapeutics*.

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