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Vaccine update for the 2022-23 influenza season

Any one of the HD-IIV4, aIIV4, or RIV4 vaccines is recommended over the SD-IIV4 options for those ages ≥ 65 years. Flucelvax is now approved for those ages ≥ 6 months.

In the 2020-2021 influenza season, there was practically no influenza circulating in the United States. This decline from seasonal expectations, described in a previous Practice Alert, was probably due to the interventions aimed at limiting the spread of COVID-19: masking, social distancing, working from home, and cancellation of large, crowded events.[1] In 2021-2022 influenza returned, but only in moderation.

The Centers for Disease Control and Prevention (CDC) estimates there were between 82,000 to 170,000 hospitalizations and 5000 to 14,000 deaths attributed to influenza.[2] In addition, US virologic surveillance indicates that 98.6% of specimens tested positive for influenza A.[2] While the vaccine's effectiveness in 2021-2022 was far below what was desired, it still prevented a great deal of flu morbidity and mortality and reduced acute respiratory illness due to influenza A(H3N2) virus by 35% (**TABLE 1**).[3] All vaccines for the upcoming flu season are quadrivalent, containing 2 influenza A antigens and 2 influenza B antigens (**TABLES 2**[4] and **3**[5]).

Vaccine effectiveness in older adults (≥ 65 years) has been very low. **TABLE 4**[6] shows vaccine effectiveness in the elderly for 10 influenza seasons between 2011 and 2020.[6] In nearly half of those seasons, the estimated vaccine effectiveness was possibly nil. All influenza vaccines licensed for use in the United States are approved for use in those ≥ 65 years of age, except live attenuated influenza vaccine (LAIV).

Three products were developed to address the issue of low vaccine effectiveness in the elderly. The Advisory Committee on Immunization Practices (ACIP) has not expressed a preference for any specific vaccine for this age group. The high-dose qudrivalent vaccine (HD-IIV4), Fluzone, contains 4 times the antigen level of the standard-dose vaccines (SD-IIV4)—60 µg vs 15 µg. Fluzone was initially approved in 2014 as a trivalent vaccine and was approved as a quadrivalent vaccine in 2019. The adjuvanted quadrivalent influenza vaccine (aIIV4), Fluad, was also inititally approved as a trivalent vaccine in 2015 and as quadrivalent in 2021. Both HD-IIV4 and aIIV4 are approved only for those ≥ 65 years of age. Recombinant quadrivalent influenza vaccine (RIV4), Flublok, is approved for ages ≥ 18 years and is produced by a process that does not involve eggs. It contains 3 times the antigen level as SD-IIV4 vaccines.

All 3 of these vaccines (HD-IIV4, aIIV4, and RIV4) have been compared with SD-IIV4 for effectiveness in the elderly and have yielded better outcomes. However, direct comparisons among the 3 vaccines have not shown robust evidence of superiority, and ACIP is unwilling to preferentially recommend one of them at this time. At its June 2022 meeting, ACIP voted to recommend any of these 3 options over the SD-IIV 4 options for those ≥ 65 years of age, with the caveat that if only an SD-IIV4 option is available it should

TABLE 1

Preliminary vaccine effectiveness against medically attended influenza A (H3N2) by age group, 2021-2022[3a]

					Vaccine effectiveness			
	Influenza positive		Influenza negative[b]		Unadjusted		Adjusted[c]	
	N vaccinated/total	**%**	**N vaccinated/total**	**%**	**VE %**	**95% CI**	**VE %**	**95% CI**
All ages ≥ 6 mo	191/456	42	2501/4249	59	50	39-59	35	19-47
6 mo-17 y	76/221	34	650/1266	51	50	33-63	44	22-60
18-49 y	71/168	42	998/1815	55	40	17-56	27	–3 to 48
≥ 50 y	44/67	66	853/1168	73	29	–19 to 58	–	–

CI, confidence interval; VE, vaccine effectiveness.
[a] Data compiled from 7 US Flu Vaccine Effectiveness Network sites.
[b] Individuals testing negative for both influenza and SARS-CoV-2 using molecular assays.
[c] Multivariable logistic regression models adjusted for site, age, month of onset, self-rated general health status, and race/ethnicity.

TABLE 2

Vaccines approved for the 2022-2023 influenza season[4a]

Trade name (manufacturer)	Presentations	Age indication	µg HA (IIV4s and RIV4) or virus count (LAIV4) for each vaccine virus (per dose)	Route	Mercury (from thimerosal, if present), µg/0.5 mL
IIV4 (standard-dose, egg-based vaccines)					
Afluria Quadrivalent (Seqirus)	0.5 mL PFS	≥ 3 y	15 µg/0.5 mL	IM	—
	5 mL MDV	≥ 6 mo (needle/syringe) 18-64 y (jet injector)	7.5 µg/0.25 mL 15 µg/0.5 mL	IM	24.5
Fluarix Quadrivalent (GlaxoSmithKline)	0.5 mL PFS	≥ 6 mo	15 µg/0.5 mL	IM	—
FluLaval Quadrivalent (GlaxoSmithKline)	0.5 mL PFS	≥ 6 mo	15 µg/0.5 mL	IM	—
Fluzone Quadrivalent (Sanofi Pasteur)	0.5 mL PFS	≥ 6 mo	15 µg/0.5 mL	IM	—
	0.5 mL SDV	≥ 6 mo	15 µg/0.5 mL	IM	—
	5 mL MDV	≥ 6 mo	7.5 µg/0.25 mL 15 µg/0.5 mL	IM	25
ccIIV4 (standard-dose, cell culture–based vaccine)					
Flucelvax Quadrivalent (Seqirus)	0.5 mL PFS	≥ 6 mo	15 µg/0.5 mL	IM	—
	5 mL MDV	≥ 6 mo	15 µg/0.5 mL	IM	25
HD-IIV4 (high-dose, egg-based vaccine)					
Fluzone High-Dose Quadrivalent (Sanofi Pasteur)	0.7 mL PFS	≥ 65 y	60 µg/0.7 mL	IM	—
aIIV4 (standard-dose, egg-based vaccine with MF59 adjuvant)					
Fluad Quadrivalent (Seqirus)	0.5 mL PFS	≥ 65 y	15 µg/0.5 mL	IM	—

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be administered in preference to delaying vaccination.

One other vaccine change for the upcoming season involves the cell culture–based quadrivalent inactivated influenza vaccine (ccIIV4), Flucelvax, which is now

TABLE 2

Vaccines approved for the 2022-2023 influenza season[4a] (*cont'd*)

Trade name (manufacturer)	Presentations	Age indication	µg HA (IIV4s and RIV4) or virus count (LAIV4) for each vaccine virus (per dose)	Route	Mercury (from thimerosal, if present), µg/0.5 mL
RIV4 (recombinant HA vaccine)					
Flublok Quadrivalent (Sanofi Pasteur)	0.5 mL PFS	≥ 18 y	45 µg/0.5 mL	IM	—
LAIV4 (egg-based vaccine)					
FluMist Quadrivalent (AstraZeneca)	0.2 mL prefilled single-use intranasal sprayer	2-49 y	$10^{6.5–7.5}$ fluorescent focus units/0.2 mL	NAS	—

FDA, Food and Drug Administration; HA, hemagglutinin; IIV4, inactivated influenza vaccine, quadrivalent; IM, intramuscular; LAIV4, live attenuated influenza vaccine, quadrivalent; MDV, multidose vial; NAS, intranasal; PFS, prefilled syringe; RIV4, recombinant influenza vaccine, quadrivalent; SDV, single-dose vial.

[a] Consult FDA-approved prescribing information for 2022–23 influenza vaccines for the most complete and updated information, including (but not limited to) indications, contraindications, warnings, and precautions. Availability and characteristics of specific products and presentations might change or differ from what is described in this table and in the text of this report.

TABLE 3

United States influenza vaccine composition for 2022-2023[5]

Egg-based IIV4 and LAIV4
A/Victoria/2570/2019 (H1N1)pdm09-like virus
A/Darwin/9/2021 (H3N2)-like virus
B/Austria/1359417/2021-like virus
B/Phuket/3073/2013-like virus
Cell culture–based IIV4 and RIV4
A/Wisconsin/588/2019 (H1N1)pdm09-like virus
A/Darwin/6/2021 (H3N2)-like virus
B/Austria/1359417/2021-like virus
B/Phuket/3073/2013-like virus

IIV4, inactivated influenza vaccine, quadrivalent; LAIV4, live attenuated influenza vaccine, quadrivalent; RIV4, recombinant influenza vaccine, quadrivalent.

TABLE 4

Influenza vaccine effectiveness in adults ≥ 65 years of age[6]

Season	**Overall VE % (95% CI)** All ages, viruses, and vaccine types	**VE %, ≥ 65 y (95% CI)** All viruses and vaccine types
2019-20	39 (32-44)	39 (9-59)
2018-19	29 (21-35)	12 (–31 to 40)[a]
2017-18	38 (31-43)	17 (–14 to 39)[a]
2016-17	40 (32-46)	20 (–11 to 43)[a]
2015-16	48 (41-55)	42 (6-64)
2014-15	19 (10-27)	32 (3-52)
2013-14	52 (44-59)	50 (16-71)
2012-13	49 (43-55)	26 (–10 to 50)[a]
2011-12	47 (36-56)	43 (–18 to 72)

VE, vaccine effectiveness.

[a] Influenza vaccines are often less effective in older populations than in younger populations.

approved for those ages ≥ 6 months. It previously was approved only for ages ≥ 2 years. All unadjuvanted SD-IIV4 vaccines as well as ccIIV4 are now approved for everyone ≥ 6 months of age. LAIV continues to be approved for ages 2 through 49 years. The only influenza vaccine products that contain thimerosal are those in multidose vials (**TABLE 2**[4]).

Promote vaccination and infection-control practices. ACIP continues to recommend influenza vaccine for all those ages ≥ 6 months, with 2 doses for those < 9 years old not previously vaccinated with an influenza vaccine. In addition to encouraging and offering influenza vaccine to patients and staff, we can minimize the spread of influenza in the community by robust infection-control practices in the clinical setting: masking and isolation of patients with respiratory symptoms, encouraging those with symptoms to stay at home and mask when around family members, advising frequent hand washing and respiratory hygiene, and using pre- and post-

exposure chemoprophylaxis as appropriate. All recommendations regarding influenza for 2022-2023 can be found on the CDC website.[4] JFP

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