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AT PRESS TIME

The US Food and Drug Administration issued an Emergency Use Authorization for a third COVID-19 vaccine. The single-dose vaccine was developed by the Janssen Pharmaceutical Companies of Johnson & Johnson. For more information, go to www.mdedge.com/familymedicine

ACIP recommendations for COVID-19 vaccines—and more

Prioritized immunization is advised with the 2 COVID-19 vaccines. A third meningococcal ACWY vaccine is now the only one approved for those > 55 years.

The year 2020 was challenging for public health agencies and especially for the Centers for Disease Control and Prevention (CDC) and its Advisory Committee on Immunization Practices (ACIP). In a normal year, the ACIP meets in person 3 times for a total of 6 days of deliberations. In 2020, there were 10 meetings (all but 1 using Zoom) covering 14 days. Much of the time was dedicated to the COVID-19 pandemic, the vaccines being developed to prevent COVID-19, and the prioritization of those who should receive the vaccines first.

The ACIP also made recommendations for the use of influenza vaccines in the 2020-2021 season, approved the adult and pediatric immunization schedules for 2021, and approved the use of 2 new vaccines, one to protect against meningococcal meningitis and the other to prevent Ebola virus disease. The influenza recommendations were covered in the October 2020 Practice Alert,[1] and the immunization schedules can be found on the CDC website at www.cdc.gov/vaccines/schedules/hcp/index.html.

COVID-19 vaccines

Two COVID-19 vaccines have been approved for use in the United States. The first was the Pfizer-BioNTech COVID-19 vaccine, approved by the Food and Drug Administration (FDA) on December 11 and recommended for use by the ACIP on December 12.[2] The second vaccine, from Moderna, was approved by the FDA on December 18 and recommended by the ACIP on December 19.[3] Both were approved by the FDA under an Emergency Use Authorization (EUA) and were approved by the ACIP for use while the EUA is in effect. Both vaccines must eventually undergo regular approval by the FDA and will be reconsidered by the ACIP regarding use in non–public health emergency conditions. A description of the EUA process and measures taken to assure efficacy and safety, before and after approval, were discussed in the September 2020 audiocast (www.mdedge.com/familymedicine/article/227333/coronavirus-updates/coronavirus-vaccine-contenders-potential).

Both COVID-19 vaccines consist of nucleoside-modified mRNA encapsulated with lipid nanoparticles, which encode for a spike glycoprotein of SARS-CoV-2, the virus that causes COVID-19. Both vaccines require 2 doses (separated by 3 weeks for the Pfizer vaccine and 4 weeks for the Moderna vaccine) and are approved for use only in adults and older adolescents (ages ≥ 16 years for the Pfizer vaccine and ≥ 18 years for the Moderna vaccine) (**TABLE 1**[2-5]).

In anticipation of vaccine shortages immediately after approval for use and a high demand for the vaccine, the ACIP developed a list of high-priority groups who should receive the vaccine in ranked order.[6] States are encouraged, but not required, to follow this priority list (**TABLE 2**[6]).

Caveats with usage. Both COVID-19 vaccines are very reactogenic, causing lo-

TABLE 1

How the COVID-19 vaccines compare

Details	Pfizer-BioNTech[2,4]	Moderna[3,5]
Approved recipients	≥ 16 years	≥ 18 years
Dose schedule	2 doses, at Days 0 and 21	2 doses, at Days 0 and 28
Storage temperature	–112 to –76 °F	–13 to 5 °F
Efficacy[a]	95%	95%
Clinical trial completion	> 18,000 vaccinated; > 18,000 received placebo	> 13,000 vaccinated; > 13,000 received placebo

[a] Against symptomatic, laboratory-confirmed COVID.

TABLE 2

COVID-19 vaccine recipient priorities[6]

Phase	Groups recommended	Total number (millions)
1A	Health care personnel[a]	21
	Long-term care residents	3
1B	Frontline essential workers[b]	30
	Those ages ≥ 75 y	21
1C	Those ages 65-74 y	32
	Those ages 16-64 y with high-risk medical conditions[c]	110
	Other essential workers[d]	57
2	All those ≥ 16 y not included in the previous groups	All remaining

[a] All paid and unpaid individuals serving in health care settings who have the potential for direct or indirect exposure to patients or infectious materials, including body substances (blood, tissue, and specific body fluids); contaminated medical supplies, devices, and equipment; contaminated environmental surfaces; or contaminated air. These health care personnel may include, but are not limited to, emergency medical service personnel, nurses, nursing assistants, physicians, technicians, therapists, phlebotomists, pharmacists, students and trainees, contractual staff not employed by the health care facility, and individuals not directly involved in patient care but potentially exposed to infectious agents that can be transmitted among/from health care personnel and patients (eg, clerical, dietary, environmental services, laundry, security, maintenance, engineering and facilities management, administrative, billing, and volunteers).
[b] First responders (firefighters, police); workers in education (teachers, support staff), daycare, food and agriculture, manufacturing, correctional institutions, public transit, and grocery stores; and postal workers.
[c] Adults of any age with the following conditions are at increased risk for severe COVID-19–associated illness: cancer; chronic kidney disease; chronic obstructive pulmonary disease; heart conditions, such as heart failure, coronary artery disease, or cardiomyopathies; immunocompromised state (weakened immune system) from solid organ transplant; obesity (body mass index [BMI] ≥ 30 but < 40); severe obesity (BMI ≥ 40 kg/m^2); sickle cell disease; smoking; and type 2 diabetes.
[d] Those who work in transportation, food service, shelter and housing (construction), finance, information technology and communications, energy, media, legal, public safety (engineers), and water and wastewater management.

cal and systemic adverse effects that patients should be warned about (**TABLE 3**[7,8]). These reactions are usually mild to moderate and last 24 hours or less. Acetaminophen can alleviate these symptoms but should not be used to prevent them. In addition, both vaccines have stringent cold-storage requirements; once the vaccines are thawed, they must be used within a defined time-period.

Neither vaccine is listed as preferred. And they are not interchangeable; both recommended doses should be completed with the same vaccine. More details about the use of these vaccines were discussed in the January 2021 audiocast (www.mdedge.com/familymedicine/article/234239/coronavirus-updates/covid-19-vaccines-rollout-risks-and-reason-still) and can be located on the CDC website (www.cdc.gov/vaccines/covid-19/info-by-product/pfizer/reactogenicity.html;

TABLE 3
Most common adverse effects of COVID-19 vaccines

	Pfizer-BioNTech[7] (%)	Moderna[8] (%)
Injection site reaction, including pain	84.1	92
Fatigue	62.9	70
Headache	55.1	64.7
Muscle pain	38.3	61.5
Chills	31.9	45.4
Joint pain	23.6	46.4
Fever	14.2	15.5

www.cdc.gov/vaccines/covid-19/info-by-product/moderna/reactogenicity.html).

Much remains unknown regarding the use of these COVID-19 vaccines:

- What is their duration of protection, and will booster doses be needed?
- Will they protect against asymptomatic infection and carrier states, and thereby prevent transmission?
- Can they be co-administered with other vaccines?
- Will they be efficacious and safe to use during pregnancy and breastfeeding?

These issues will need to be addressed before they are recommended for non–public health emergency use.

MenQuadfi, approved for those ≥ 2 years including those > 55, will likely be approved for individuals ≥ 6 months and replace Menactra.

Quadrivalent meningococcal conjugate vaccine (MenACWY)

In June 2020, the ACIP added a third quadrivalent meningococcal conjugate vaccine to its recommended list of vaccines that are FDA-approved for meningococcal disease (**TABLE 4**[9]). The new vaccine fills a void left by the meningococcal polysaccharide vaccine (MPSV4), which is no longer marketed in the United States. MPSV4 was previously the only meningococcal vaccine approved for individuals 55 years and older.

The new vaccine, MenACWY-TT (MenQuadfi), is approved for those ages 2 years and older, including those > 55 years. It is anticipated that MenQuadfi will, in the near future, be licensed and approved for individuals 6 months and older and will replace MenACWY-D (Menactra). (Both are manufactured by Sanofi Pasteur.)

Groups for whom a MenACWY vaccine is recommended are listed in **TABLE 5**.[9] A full description of current, updated recommendations for the prevention of meningococcal disease is also available.[9]

Ebola virus (EBOV) vaccine

A vaccine to prevent Ebola virus disease (EVD) is available by special request in the United States. Recombinant vesicular stomatitis virus-based Ebola virus vaccine, abbreviated as rVSVΔG-ZEBOV-GP (brand name, ERVBO) is manufactured by Merck and received approval by the FDA on December 19, 2019, for use in those ages 18 years and older. It is a live, attenuated vaccine.

The ACIP has recommended pre-exposure vaccination with rVSVΔG-ZEBOV-GP for adults 18 years or older who are at risk of exposure to EBOV while responding to an outbreak of EVD; while working as health care personnel at a federally designated Ebola Treatment Center; or while working at biosafety-level 4 facilities.[10] The vaccine is protective against just 1 of 4 EBOV species, *Zaire ebolavirus*, which has been the cause of most reported EVD outbreaks, including the 2 largest EVD outbreaks in history that occurred in West Africa and the Republic of Congo.

It is estimated that EBOV outbreaks have infected more than 31,000 people and resulted in more than 12,000 deaths worldwide.[11] Only 11 people infected with EBOV have been treated in the United States, all related to the 2014-2016 large outbreaks in West Africa. Nine of these cases were imported and only 1 resulted in transmission, to 2 people.[10] The mammalian species that are suspected as intermediate hosts for EBOV are not present in the United States, which prevents EBOV from becoming endemic here.

TABLE 4

Vaccines for meningococcal serogroup A, C, W, and Y[9]

Product (manufacturer)	Trade name	Licensed for ages	Year licensed
MenACWY-D (Sanofi Pasteur)	Menactra	9 mo-55 y	2005
MenACWY-CRM (GlaxoSmithKline)	Menveo	2 mo-55 y	2010
MenACWY-TT (Sanofi Pasteur)	MenQuadfi	≥ 2 y	2020

MenACWY-CRM, meningococcal groups A, C, W, and Y oligosaccharide diphtheria CRM_{197} conjugate vaccine; MenACWY-D, meningococcal groups A, C, W, and Y polysaccharide diphtheria toxoid conjugate vaccine; MenACWY-TT, meningococcal groups A, C, W, and Y polysaccharide tetanus toxoid conjugate vaccine.

TABLE 5

Who should receive MenACWY vaccine in the United States?[9]

Population	Dosing recommendation
Adolescents ages 11-18 y	1 dose at age 11 or 12 y; booster at age 16 y
Individuals with complement component deficiency, including patients taking a complement inhibitor	2 dose primary series; booster every 5 y[a]
Individuals with functional or anatomic asplenia (including sickle cell disease)	
Individuals with HIV infection	
Microbiologists routinely exposed to *Nisseria meningitidis*	1 dose; booster every 5 y
Individuals at increased risk during an outbreak	1 dose (booster if previously vaccinated ≥ 5 y earlier)
Individuals who travel to, or reside in, countries where meningococcal disease is endemic or hyperendemic	1 dose; booster if remaining at increased risk at 5 y
Unvaccinated or under-vaccinated college freshmen living in residence halls	1 dose
Military recruits	1 dose; booster every 5 y on basis of assignment

[a] For children < 7 y who receive the vaccine, give the first booster at 3 y and every 5 y thereafter.

The rVSVΔG-ZEBOV-GP vaccine was tested in a large trial in Africa during the 2014 outbreak. Its effectiveness was 100% (95% confidence interval, 63.5%-100%). The most common adverse effects were injection site pain, swelling, and redness. Mild-to-moderate systemic symptoms can occur within the first 2 days following vaccination, and include headache (37%), fever (34%), muscle pain (33%), fatigue (19%), joint pain (18%), nausea (8%), arthritis (5%), rash (4%), and sweating (3%).[10] Data are not available to assess the safety of the vaccine during pregnancy; vaccinating pregnant women should probably be avoided unless the risk of exposure to EBOV is high.

Since the vaccine contains a live virus that causes stomatitis in animals, it is possible that the virus could be transmitted to humans and other animals through close contact. Accordingly, the CDC has published some precautions including, but not limited to, not donating blood and, for 6 weeks after vaccination, avoiding contact with those who are immunosuppressed.[10] The vaccine is not commercially available in the United States and must be obtained from the CDC. Information on requesting the vaccine is available at www.cdc.gov/vhf/ebola/clinicians/vaccine/. JFP

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