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Immunization update: This year's changes

The 9-valent formulation of HPV vaccine is now on the schedule, but don't delay starting or continuing the vaccine series just because HPV9 is not on hand. Give the 2 pneumococcal vaccines a year apart.

The annual update of immunization schedules by the Centers for Disease Control and Prevention (CDC)—one for adults and one for infants, children, and adolescents—was published recently in *Morbidity and Mortality Weekly Report*.^{1,2} The Advisory Committee on Immunization Practices (ACIP) made a few new recommendations in 2015 (although no major changes from the previous year), which are summarized in this Practice Alert.

HPV vaccine: 9-valent formulation available

While the recommended recipients of the human papillomavirus (HPV) vaccine have not changed (TABLE 1),³ the 9-valent human papillomavirus vaccine (HPV9) has been added to the immunization schedule. Licensed in December 2014, HPV9 added 5 high-risk HPV antigens to the quadrivalent HPV vaccine (HPV4). The antigen types in HPV4 cause 66% of cervical cancers, while those in HPV9 cause 81%.³

Three HPV vaccines are available for use in the United States (TABLE 2).³ All require 3 doses, given on a schedule of 0, 1 to 2, and 6 months, beginning at 11 through 12 years of age. HPV4 will likely become unavailable as its supply is used up in the transition to HPV9.

Although HPV9 offers wider protection than HPV4, the recommendation is to start or continue a series of HPV vaccine, as in-

dicated, without waiting for HPV9 if it is not immediately available. Those who are in the middle of a 3-dose HPV4 schedule can finish the remaining doses with HPV9. ACIP has not recommended that HPV9 be administered to those who have completed a series of HPV4 or HPV2.

Pneumococcal vaccines: Give one year apart, regardless of sequence

There are 2 pneumococcal vaccines in the United States: a 23-valent polysaccharide vaccine (PPSV23) and a 13-valent conjugate vaccine (PCV13). Adults ages 65 years or older should receive both vaccines. The preferred order of administration is PCV13 first, then PPSV23. The recommended interval between injections in this order had been 6 to 12 months. If the vaccines were given in the reverse order, PCV13 was to be administered at least one year later. Thus, the timing interval differed depending on the order of administration.⁴ However, to complicate matters, Medicare will pay for 2 pneumococcal vaccinations only if they are separated by a year.

ACIP reexamined the data and found little evidence to support any specific interval, regardless of the order of administration. Therefore, to simplify the schedule and reconcile with Medicare, the new recommendation states it is best to administer PCV13 first, but, regardless of the order, to separate the 2 vaccines by one year. If, for logistical reasons or

error, the interval is less than one year, neither vaccine needs to be repeated.

Meningococcal B vaccine

ACIP's immunization schedule now recommends giving meningococcal B vaccine to individuals in high-risk groups and those exposed to community outbreaks. It gives a "B" recommendation (can be provided if an individual wants it) for vaccine use in all adolescents. These recommendations were described in greater detail in a recent Practice Alert.⁵

Smallpox vaccine recommendations are reaffirmed

In June 2015, ACIP, having reviewed recent clinical data, reaffirmed the CDC's standing recommendations that the live vaccinia virus smallpox vaccine ACAM2000 (which replaced Dryvax in 2008) be administered routinely to those with occupational exposure to orthopox viruses (eg, laboratory personnel who work with monkeypox, variola, or smallpox viruses).⁶ Health care workers who administer the vaccine or care for someone who might be infected with an orthopox virus may be offered the vaccine.⁶ And some members of the Armed Forces are required to receive it.⁷

Information about smallpox vaccination, including potential adverse reactions to the vaccine and what to do about them, can be found on the CDC Web site at <http://www.emergency.cdc.gov/agent/smallpox/clinicians.asp>.

TABLE 1

HPV vaccine recommendations³

- Routine use in males and females ages 11-12 years (can start as early as age 9 years)
- Catch-up use (for those who have not been vaccinated previously) in females through age 26 years, and in males through age 21 years
- Men ages 22-26 years who are HIV positive
- Men ages 22-26 who have sex with other men

HIV, human immunodeficiency virus; HPV, human papillomavirus.

Yellow fever vaccine: Boosters needed only for some

Yellow fever vaccine is required for travelers who are visiting areas where the disease is endemic. After reviewing data on the duration of protection provided by the current vaccine, ACIP changed its recommendation in June 2015 to bring it in line with that of the World Health Organization, which states that one dose of vaccine provides long-lasting protection and that a booster is no longer recommended for most travelers.

Three exceptions to the booster exemption are noted: women who are pregnant when they receive their first dose of vaccine; those who undergo stem-cell transplantation following vaccination; and HIV-positive individuals, who should be vaccinated every 10 years.⁸

A "B" recommendation for the vaccine

TABLE 2

The 3 HPV vaccines at a glance³

| | Bivalent (HPV2) (Cervarix) | Quadrivalent (HPV4) (Gardasil) | 9-valent (HPV9) (Gardasil 9) |
|-----------------------|---|---|---|
| Manufacturer | GlaxoSmithKline | Merck & Co. | Merck & Co. |
| HPV antigens included | 16, 18 | 6, 11, 16, 18 | 6, 11, 16, 18, 31, 33, 45, 52, 58 |
| Adjuvant | 500 mcg aluminum hydroxide; 50 mcg 3-O-desacyl-4'-monophosphoryl lipid A | 225 mcg amorphous aluminum hydroxyphosphate sulfate | 500 mcg amorphous aluminum hydroxyphosphate sulfate |
| Licensed for | Females 9-25 years | Females 9-26 years Males 9-26 years | Females 9-26 years Males 9-15 years |

HPV, human papillomavirus.

TABLE 3

Comparison of combination vaccine schedules in the United States⁹

| Vaccines | 2 months | 4 months | 6 months | 15-18 months | Total shots |
|-------------------------|----------|----------|----------|--------------|-------------|
| DTaP–HepB–IPV* | X | X | X | DTaP† | 7 or 8 |
| Hib | X | X | (X) | X | |
| DTaP–IPV/Hib‡ | X | X | X | X | 6 |
| HepB | X | | X | | |
| Hexavalent vaccine (HV) | X | X | X | | 4 or 5 |
| DTaP–IPV/Hib‡ | | | | X | |
| DTaP§ + Hib | | | | X + X | |

DTaP, diphtheria-tetanus-pertussis; HepB, hepatitis B; Hib, *Haemophilus influenzae* B; IPV, inactivated polio vaccine.

* Pediarix (GlaxoSmithKline).

† Infanrix (GlaxoSmithKline).

‡ Pentacel (Sanofi Pasteur).

§ Daptacel (Sanofi Pasteur).

applies to those who were vaccinated 10 or more years previously and who will be traveling to highly endemic areas for prolonged periods. Laboratory personnel who work with yellow fever virus should have their antibody titers checked every 10 years and receive a booster dose if the titers are low.⁸

New vaccines coming soon

No cholera vaccine is licensed for use in the United States, but a new single-dose, live attenuated oral cholera vaccine will likely be licensed this year.

■ **A new adjuvanted herpes zoster vaccine** has completed a phase-3 study and the results were presented to ACIP in June 2015. It is expected to be approved sometime this year.

■ **Finally, a new combination vaccine** for infants is being developed cooperatively between Sanofi Pasteur and Merck & Co. It will offer protection against diphtheria, pertussis, tetanus, polio, *Haemophilus influenzae* type B, and hepatitis B. When available, it will offer an option that means fewer injections than current combination products (TABLE 3).⁹ **JFP**

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