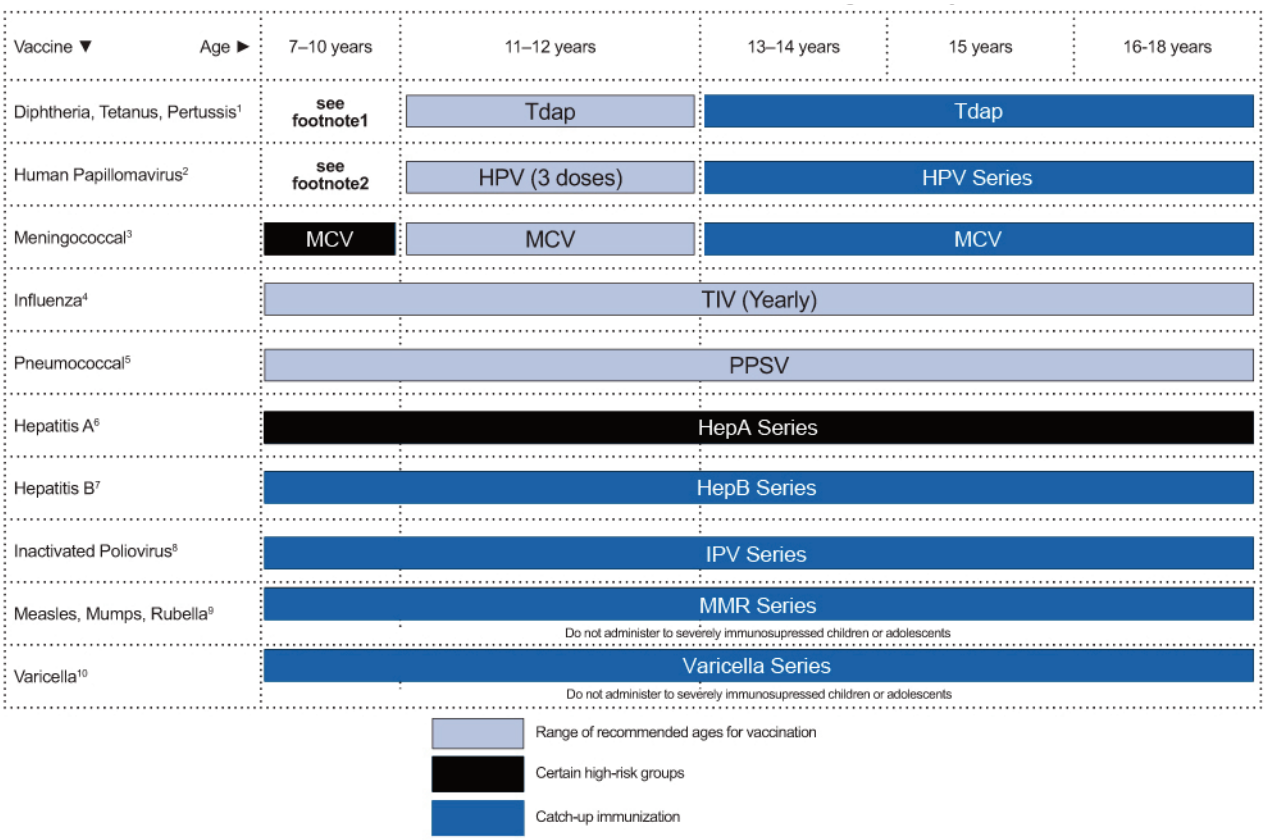
Guidelines for the Prevention and Treatment of Opportunistic Infections Among HIV-Exposed and HIV-Infected Children

Downloaded from https://aidsinfo.nih.gov/guidelines on 9/13/2019

Figure 2. Recommended Immunization Schedule for HIV-Infected Children Aged 7–18 Years; United States 2013 (Last updated November 6, 2013; last reviewed November 6, 2013)



This schedule summarizes recommendations for routine administration of vaccines for HIV-infected children and adolescents aged 7 through 18 years and indicates the recommended ages for vaccine administration for vaccines licensed in the United States in 2013. Licensed combination vaccines may be used whenever a component of the combination is indicated and other components of the vaccine are not contraindicated and if approved by the Food and Drug Administration for that dose of the series, unless otherwise specified. Clinically significant adverse events that follow immunization should be reported to the Vaccine Adverse Event Reporting System (VAERS). Guidance about how to obtain and complete a VAERS form is available at http://www.vaers.hhs.gov or telephone 800-822-7967.

Tetanus And Diphtheria Toxoids And Acellular Pertussis Vaccine (Tdap)

Minimum age: 7 years

- Individuals aged 11 through 18 years who have not received Tdap should receive a dose followed by Tetanus Diphtheria (Td) booster doses every 10 years thereafter.
- Individuals aged 7 through 10 years who are not fully immunized against pertussis (including those never vaccinated or with unknown pertussis status) should receive a single dose of Tdap. Refer to the catch-up schedule if additional doses of tetanus and diphtheria toxoid-containing vaccine are needed.
- Tdap can be administered regardless of the interval since the last tetanus dose.

Human Papillomavirus Vaccine (HPV)

Minimum age: 9 years

Note: Two HPV vaccines are licensed. A quadrivalent vaccine (HPV4) is licensed for use in females and males; a bivalent vaccine (HPV2) is licensed for use in females. Because these are not live virus vaccines, they can be administered to individuals who are immunosuppressed because of disease or medication, including those who are HIV-infected. However, the immune response and vaccine efficacy may be less than in immunocompetent individuals.

- HPV vaccines are most effective for both males and females when given before exposure to HPV through sexual contact.
- Administer the first dose at ages 11 or 12 years.
- Administer the second dose 1 to 2 months after the first dose and the third dose 6 months after the first dose (at least 24 weeks after the first dose).
- Administer the series at ages 13 through 18 years if not previously vaccinated.
- HPV4 can be administered in a 3-dose series to individuals aged 9 through 10 years.

Meningococcal Vaccine (Meningococcal Conjugate Vaccine [MCV4])

- Individuals who receive the second dose of the primary series at or before age 11-12 years should receive a booster dose at age 16 years. Although the efficacy of MCV4 among HIV-infected patients is unknown, HIV-infected patients aged 7 through 10 years may elect vaccination.

Influenza Vaccine (Trivalent Inactivated Influenza Vaccine [TIV])

- Administer annually to HIV-infected children and adolescents. Only TIV should be used in HIV-infected individuals. For healthy non-pregnant close contacts aged 2 through 49 years, either live, attenuated influenza vaccine (LAIV) or TIV can be used.
- Administer 2 doses (separated by at least 4 weeks) to children aged younger than 9 years who are receiving influenza vaccine for the first time or based on previous influenza vaccine history, per current influenza vaccine recommendations.

Pneumococcal Vaccine (Pneumococcal Conjugate Vaccine [PCV]; Pneumococcal Polysaccharide Vaccine [PPSV])

- A single dose of 13-valent pneumococcal conjugate vaccine (PCV13) should be routinely administered to HIV-infected children aged 6 through 18 years who did not previously receive a dose of PCV13 before age 6 years. The dose should be administered at least 8 weeks after the previous dose of PCV.
- Administer 23-valent pneumococcal polysaccharide vaccine (PPSV23) at least 8 weeks after the last dose of PCV13 to children aged ≥2 years. A single revaccination dose should be administered 5 years thereafter.
- HIV-infected children who have already received a dose or doses of PPSV23 should receive a dose of PCV13 a minimum of 8 weeks after the dose of PPSV23. A second dose of PPSV23 is recommended 5 years later.

Hepatitis A Vaccine (HepA)

- HepA is recommended for children older than age 23 months who live in areas where vaccination programs target older children, who are at increased risk of infection, or for whom immunity against Hepatitis A is desired. See *MMWR* 2006;55(No. RR-7).

Hepatitis B Vaccine (HepB)

- Administer the 3-dose series to those who were not previously vaccinated.
- Post-vaccination testing is recommended for HIV-infected individuals. Testing should be performed 1 to 2 months after administration of the final dose. Individuals found to have anti-HBs levels of <10

mIU/mL after the primary series should be revaccinated. Administration of 3 doses on an appropriate schedule, followed by anti-HBs testing 1 to 2 months after the third dose, is usually more practical than serologic testing after 1 or 2 doses of vaccine. Modified dosing regimens, including doubling of the standard antigen dose, may increase response rates. However, data are limited on response to these alternative vaccination schedules.

- In HIV-infected individuals, the need for booster doses has not been determined. Annual anti-HBs testing and booster doses when anti-HBs levels decline to <10 mIU/mL should be considered in individuals with ongoing risk of exposure. See *MMWR* 2005:54(No. RR-16).

Inactivated Poliovirus Vaccine (IPV)

- The final dose in the series should be administered on or after the fourth birthday and at least 6 months after the previous dose.
- For children who received an all-IPV or all-oral poliovirus (OPV) series, a fourth dose is not necessary if the third dose was administered at age ≥4 years.
- If both OPV and IPV were administered as part of a series, a total of 4 doses should be administered, regardless of a child's current age.

Measles, Mumps, and Rubella Vaccine (MMR)

- If eligible and not previously vaccinated, administer 2 doses with the second dose at least 28 days after the first dose, or administer the second dose for those who received only 1 dose, with at least 28 days between doses.
- Two doses of MMR vaccine are recommended for all HIV-infected individuals aged ≥12 months who do not have evidence of current severe immunosuppression (i.e., individuals aged >5 years must have CD4 T lymphocyte [CD4] percentages ≥15% and CD4 ≥200 lymphocytes/mm^3 for ≥6 months) or other current evidence of measles, rubella, and mumps immunity. In cases when only CD4 counts or only CD4 percentages are available for those older than age 5 years, assessment of severe immunosuppression can be based on the CD4 values (count or percentage) that are available.
- Individuals with perinatal HIV infection who were vaccinated prior to establishment of effective combination antiretroviral therapy (cART) should receive two appropriately spaced doses of MMR vaccine once effective cART has been established (individuals aged >5 years: must have CD4 percentages ≥15% and CD4 ≥200 lymphocytes/mm^3 for ≥6 months) unless they have other acceptable current evidence of measles, rubella, and mumps immunity.

Varicella Vaccine

- Limited data are available on safety and immunogenicity of varicella vaccine in HIV-infected children aged 1 through 8 years in Centers for Disease Control and Prevention immunologic categories 1 and 2 (CD4 percentages ≥15%) and clinical categories N, A, and B. Varicella vaccine should be considered for HIV-infected children aged 1 through 8 years with CD4 percentages ≥15%. Eligible children should receive 2 doses at least 3 months apart.
- Data are lacking on use of varicella vaccine in HIV-infected children older than age 8 years. However, on the basis of expert opinion, the safety of varicella vaccine in HIV-infected individuals older than age 8 years with similar levels of immune function (CD4 age-specific percentages ≥15% or count ≥200 cells/mm^3) is likely to be similar to that for children aged ≤8 years. Immunogenicity may be lower in HIV-infected adolescents (and adults). However, weighing the risk of severe disease from wild varicella zoster virus and the potential benefit of vaccination, vaccination (2 doses administered 3 months apart) can be considered for children and adolescents aged 9 through 18 years who lack evidence of immunity.

- Varicella vaccine is not recommended for HIV-infected children or adolescents who have evidence of severe immunosuppression (CD4 percentage <15% at any age; for those older than age 5 years, CD4 count <200 cells/mm^3).
- MMRV vaccine has not been studied in HIV-infected children and should not be substituted for single-antigen varicella vaccine.
- For evidence of immunity guidance and other details, see *MMWR* 2007;56(No.RR-4).

Note: Haemophilus Influenzae Type B Conjugate Vaccine (Hib)

- Hib conjugate vaccines are available in single- or combined-antigen preparations. Hib is recommended routinely for all children through age 59 months. One dose of Hib vaccine should be administered to unvaccinated or partially vaccinated individuals aged 5 years or older who have leukemia, malignant neoplasms, anatomic or functional asplenia (including sickle cell disease), are HIV-infected, or who have other immunocompromising conditions.