Immunizations for Adults With HIV: All Tables

April 2024

Table 1a: COVID-19 Vaccines	
Trade Names See FDA: COVID-19 Vaccines Authorized for Emergency Use or FDA-Approved	• Moderna COVID-19 Vaccine, Bivalent (mRNA vaccine) • Pfizer-BioNTech COVID-19 Vaccine, Bivalent (mRNA vaccine) • Novavax COVID-19 Vaccine, Adjuvanted (protein subunit vaccine) • Janssen (Johnson & Johnson) COVID-19 Vaccine (adenovirus vector vaccine) [a]
Indications	At least 1 bivalent mRNA COVID-19 vaccine for all individuals ≥6 months old
Administration	Administer according to CDC: COVID-19 Vaccination Schedule: • Table 1: Recommended COVID-19 vaccination schedule for people who are ***not*** moderately or severely immunocompromised by COVID-19 vaccination history, May 2023 • Table 2: Recommended COVID-19 vaccination schedule for people who are moderately or severely immunocompromised by COVID-19 vaccination history, May 2023
Comments	See CDC: COVID-19 Vaccination Schedule for the following additional information: • Description of moderate and severe immunocompromising conditions and treatments • Considerations for individuals ≥65 years old to receive an additional bivalent mRNA dose
Abbreviations: CDC, Centers for Disease Control and Prevention; FDA, U.S. Food and Drug Administration. **Note:** a. As of May 6, 2023, the J&J/Janssen viral vector COVID-19 vaccine is no longer available for use in the United States (see CDC: Overview of COVID-19 Vaccines).	

Table 1b: Recommended COVID-19 Vaccination Schedule for Individuals ≥12 Years Old Who Are NOT Moderately or Severely Immunocompromised, May 2023 (Adapted from CDC: COVID-19 Vaccination Schedule Table 1)		
COVID-19 Vaccination History	**Recommendation** [a]	**Optional**
Unvaccinated	1 dose of Moderna bivalent vaccine OR 1 dose of Pfizer-BioNTech bivalent vaccine	Individuals ≥65 years old have the option to receive 1 additional bivalent mRNA vaccine dose ≥4 months after first dose of a bivalent mRNA vaccine.
≥1 dose of monovalent mRNA vaccine; no previous doses of bivalent mRNA vaccine	• 1 dose of Moderna bivalent vaccine OR 1 dose of Pfizer-BioNTech bivalent vaccine • Administer bivalent vaccine ≥8 weeks [b] after last monovalent dose.	
Any previous dose(s) of bivalent mRNA vaccine, regardless of monovalent vaccine history	Vaccination is complete.	
≥1 dose of Novavax vaccine	• 1 dose of Moderna bivalent vaccine OR 1 dose of Pfizer-BioNTech bivalent vaccine • Administer bivalent vaccine ≥8 weeks [b] after last monovalent dose.	
≥1 dose of J&J/Janssen vaccine (individuals ≥18 years old) [c]	• 1 dose of Moderna bivalent vaccine OR 1 dose of Pfizer-BioNTech bivalent • **Note:** Administer bivalent vaccine ≥2 months after completion of the primary series dose (for people who have not previously received any booster doses) or ≥2 months after the last monovalent booster dose.	
Abbreviations: CDC, Centers for Disease Control and Prevention; J&J, Johnson & Johnson.		

Table 1b: Recommended COVID-19 Vaccination Schedule for Individuals ≥12 Years Old Who Are NOT Moderately or Severely Immunocompromised, May 2023 (Adapted from CDC: COVID-19 Vaccination Schedule Table 1)		
COVID-19 Vaccination History	**Recommendation** [a]	**Optional**

Notes:

a. COVID-19 vaccination is recommended regardless of history of SARS-CoV-2 infection. Defer any COVID-19 vaccination at least until recovery from the acute illness (if symptoms were present) and criteria to discontinue isolation have been met. If SARS-CoV-2 infection was recent, may consider delaying a COVID-19 vaccine dose by 3 months from symptom onset or positive test result (if infection was asymptomatic). Viral testing to assess for acute SARS-CoV-2 infection or serologic testing to assess for prior infection is not recommended for the purpose of vaccine decision-making (see CDC: Interim Clinical Considerations for Use of COVID-19 Vaccines in the United States > COVID-19 vaccination and SARS-CoV-2 infection).

b. An 8-week interval between the first and second doses of Moderna and Pfizer-BioNTech COVID-19 vaccines might be optimal for some people ages 6 months to 64 years, especially for males ages 12 to 39 years, as it might reduce the small risk of myocarditis and pericarditis associated with these vaccines.

c. As of May 6, 2023, the J&J/Janssen viral vector COVID-19 vaccine is no longer available for use in the United States (see CDC: Overview of COVID-19 Vaccines).

Table 1c: Recommended COVID-19 Vaccination Schedule for Individuals ≥12 Years Old Who ARE Moderately or Severely Immunocompromised [a], May 2023 (Adapted from CDC: COVID-19 Vaccination Schedule Table 2)		
COVID-19 Vaccination History	**Recommendation** [b]	**Interval Between Doses**
Unvaccinated	3 doses of Moderna bivalent vaccine OR 3 doses of Pfizer-BioNTech bivalent vaccine	• Moderna: 4 weeks between dose 1 and dose 2; ≥4 weeks between dose 2 and dose 3 • Pfizer-BioNTech: 3 weeks between dose 1 and dose 2; ≥4 weeks between dose 2 and dose 3
1 dose of monovalent Moderna vaccine	2 doses of Moderna bivalent vaccine	• Bivalent dose 1: 4 weeks after monovalent dose • Bivalent dose 2: ≥4 weeks after bivalent dose 1
2 doses of monovalent Moderna vaccine	1 dose of Moderna bivalent vaccine	≥4 weeks after last monovalent dose
3 doses of monovalent Moderna vaccine	1 dose of Moderna bivalent vaccine OR 1 dose of Pfizer-BioNTech bivalent vaccine	≥8 weeks after last monovalent dose
3 doses of monovalent Moderna vaccine and 1 dose of bivalent mRNA vaccine	Optional: 1 additional dose of Moderna bivalent vaccine OR Pfizer-BioNTech bivalent vaccine [c]	≥2 months after last bivalent mRNA vaccine dose
1 dose of monovalent Pfizer-BioNTech vaccine	2 doses of Pfizer-BioNTech bivalent vaccine	• Bivalent dose 1: 3 weeks after monovalent dose • Bivalent dose 2: ≥4 weeks after bivalent dose 1
2 doses of monovalent Pfizer-BioNTech vaccine	1 dose of Pfizer-BioNTech bivalent vaccine	≥4 weeks after last monovalent dose
3 doses of monovalent Pfizer-BioNTech vaccine	1 dose of Moderna bivalent vaccine OR 1 dose of Pfizer-BioNTech bivalent vaccine	≥8 weeks after last monovalent dose
3 doses of monovalent Pfizer-BioNTech vaccine and 1 dose of bivalent mRNA vaccine	Optional: 1 additional dose of Moderna bivalent vaccine OR Pfizer-BioNTech bivalent vaccine [c]	≥2 months after last bivalent mRNA vaccine dose
1 or 2 doses of Novavax vaccine	1 dose of Moderna bivalent vaccine OR 1 dose of Pfizer-BioNTech bivalent vaccine	≥8 weeks after last monovalent dose
1 dose of J&J/Janssen vaccine (individuals ≥18 years old) [d]	1 or 2 doses of Moderna bivalent vaccine OR Pfizer-BioNTech bivalent vaccine	• Dose 1: ≥4 weeks after last monovalent dose • Dose 2 (optional): ≥2 months after the recommended bivalent mRNA vaccine dose
1 dose of J&J/Janssen vaccine (individuals ≥18 years old) [d] and 1 dose of Moderna bivalent vaccine OR Pfizer-BioNTech bivalent vaccine	Optional: 1 dose of Moderna bivalent vaccine OR Pfizer-BioNTech bivalent vaccine [c]	≥2 months after the previous bivalent mRNA vaccine dose

Abbreviations: CDC, Centers for Disease Control and Prevention; J&J, Johnson & Johnson.

Table 1c: Recommended COVID-19 Vaccination Schedule for Individuals ≥12 Years Old Who ARE Moderately or Severely Immunocompromised [a], May 2023 (Adapted from CDC: COVID-19 Vaccination Schedule Table 2)		
COVID-19 Vaccination History	**Recommendation** [b]	**Interval Between Doses**
Notes: a. See CDC: Description of moderate and severe immunocompromising conditions and treatment. b. COVID-19 vaccination is recommended regardless of history of SARS-CoV-2 infection. Defer any COVID-19 vaccination at least until recovery from the acute illness (if symptoms were present) and criteria to discontinue isolation have been met. If SARS-CoV-2 infection was recent, may consider delaying a COVID-19 vaccine dose by 3 months from symptom onset or positive test result (if infection was asymptomatic). Viral testing to assess for acute SARS-CoV-2 infection or serologic testing to assess for prior infection is not recommended for the purpose of vaccine decision-making (see CDC: Interim Clinical Considerations for Use of COVID-19 Vaccines in the United States > COVID-19 vaccination and SARS-CoV-2 infection). c. Further additional dose(s) may be administered, informed by the clinical judgement of a healthcare provider and personal preference and circumstances of the patient. Any further additional doses should be administered ≥2 months after the last COVID-19 vaccine dose. d. As of May 6, 2023, the J&J/Janssen viral vector COVID-19 vaccine is no longer available for use in the United States (see CDC: Overview of COVID-19 Vaccines).		

Table 2: *Haemophilus influenzae* Type B Vaccine	
Trade Names	• Hiberix • ActHIB
Indications	Patients at risk of Hib infection
Administration	Administer according to CDC: Adult Immunization Schedule: • Recommendations for Ages 19 Years and Older, 2023: HTML | PDF (Table 1) • Recommendations by Medical Condition and Other Indication: HTML | PDF (Table 2)
Revaccination	None
Comments	Not routinely recommended for people with HIV in the absence of other risk factors
Abbreviations: CDC, Centers for Disease Control and Prevention; Hib, *Haemophilus influenzae* type B.	

Table 3: Hepatitis A Virus Vaccine	
Trade Names	• HAV: Havrix; Vaqta • HAV inactivated + HBV: Twinrix
Indications	All adults with HIV [CDC(a) 2022]
Administration	• Administer according to CDC: Adult Immunization Schedule: – Recommendations for Ages 19 Years and Older, 2023: HTML | PDF (Table 1) – Recommendations by Medical Condition and Other Indication: HTML | PDF (Table 2) • Notes: – Obtain HAV IgG testing ≥1 month after final dose of vaccination series to confirm immune response. – If immune reconstitution appears likely, consider deferring until patient's CD4 count ≥200 cells/mm^3 [DHHS 2022].
Revaccination	Patients who do not respond to the primary HAV vaccination series should be revaccinated [Thompson, et al. 2021] and counseled to avoid exposure.
Comments	• See NYSDOH AI guideline Prevention and Management of Hepatitis A Virus Infection in Adults With HIV. • Covered by HRSA: Vaccine Injury Compensation Program
Abbreviations: CDC, Centers for Disease Control and Prevention; HAV, hepatitis A virus; HBV, hepatitis B virus; HRSA, Health Resources and Services Administration; IgG, immunoglobulin G.	

Table 4: Hepatitis B Virus Vaccine	
Trade Names	• HBV 2-dose series: HEPLISAV-B (see comments) • HBV 3-dose series: Engerix-B; Recombivax HB; PreHevbrio (see comments) • HAV inactivated + HBV 3-dose series: Twinrix
Indications	Patients who are negative for anti-HBs and do not have chronic HBV infection
Administration	• Administer according to CDC: Adult Immunization Schedule: – Recommendations for Ages 19 Years and Older, 2023: HTML | PDF (Table 1) – Recommendations by Medical Condition and Other Indication: HTML | PDF (Table 2) • Notes: – Alternative administration strategies, such as a 3- or 4-injection double-dose vaccination series or an accelerated schedule of 0, 1, and 3 weeks, may be considered [DHHS 2022]. – Test for anti-HBs 4 to 16 weeks after administration of the last dose of the vaccination series.
Revaccination	Patients who do not respond to the primary HBV vaccination series (anti-HBs <10 IU/L) should be revaccinated with Heplisav-B or a double dose of the vaccine series previously administered.
Comments	• In patients at risk for HBV infection, initial vaccination should not be deferred if the CD4 count is <200 cells/mm^3 [DHHS 2022]. • If an accelerated schedule is used, a fourth booster dose should be administered ≥6 months after initiation of the series; the accelerated schedule is not recommended for patients with CD4 counts <500 cells/mm^3. • The HAV/HBV combined vaccine is not recommended for the double-dose or 4-injection HBV vaccination strategy. • PreHevbrio, a 3-antigen recombinant HBV vaccine, was approved in 2021 by the FDA for use for individuals ≥18 years old [FDA 2021], but experience regarding its use in patients with HIV is lacking at this time. • Heplisav-B and PreHevbrio are not recommended in pregnancy because of lack of safety data [CDC 2023]. • See NYSDOH AI guideline Prevention and Management of Hepatitis B Virus Infection in Adults With HIV. • Covered by HRSA: Vaccine Injury Compensation Program
Abbreviations: anti-HBs, hepatitis B surface antibody; CDC, Centers for Disease Control and Prevention; FDA, U.S. Food and Drug Administration; HAV, hepatitis A virus; HBV, hepatitis B virus; HRSA, Health Resources and Services Administration.	

Table 5: Human Papillomavirus Vaccine	
Trade Name	Gardasil 9
Indications	All patients 9 to 45 years old who were not previously vaccinated or did not receive a complete 3-dose series
Administration	Administer through age 45 years as a 3-dose series according to CDC: Adult Immunization Schedule: • Recommendations for Ages 19 Years and Older, 2023: HTML | PDF (Table 1) • Recommendations by Medical Condition and Other Indication: HTML | PDF (Table 2)
Revaccination	None
Comments	• A 2-dose schedule is not recommended [CDC(a) 2021]. • Because of the broader coverage offered by the 9-valent HPV vaccine, it is the only HPV vaccine currently available in the United States (see CDC: HPV Home > Information for Healthcare Professionals for more information). • Although the 9-valent vaccine has not been specifically studied in people with HIV, it is expected that the response will be the same in this population as with the quadrivalent vaccine. • Follow recommendations for cervical and anal cancer screening in NYSDOH AI guidelines Screening for Cervical Dysplasia and Cancer in Adults With HIV and Screening for Anal Dysplasia and Cancer in Adults With HIV. • Covered by HRSA: Vaccine Injury Compensation Program
Abbreviations: CDC, Centers for Disease Control and Prevention; HPV, human papillomavirus; HRSA, Health Resources and Services Administration.	

Table 6: Influenza Vaccine	
Trade Names	See CDC influenza vaccines table
Indications	All adults with HIV
Administration	Administer annually during flu season (October through May) according to CDC: Adult Immunization Schedule: • Recommendations for Ages 19 Years and Older, 2023: HTML | PDF (Table 1) • Recommendations by Medical Condition and Other Indication: HTML | PDF (Table 2)
Revaccination	None
Comments	Covered by HRSA: Vaccine Injury Compensation Program
Abbreviation: CDC, Centers for Disease Control and Prevention; HRSA, Health Resources and Services Administration.	

Table 7: Measles, Mumps, Rubella Vaccine	
Trade Name	M-M-R II
Indications	For patients with CD4 counts ≥200 cells/mm^3 for ≥6 months who do not have evidence of MMR immunity
Administration	Administer according to the CDC: Adult Immunization Schedule: • Recommendations for Ages 19 Years and Older, 2023: HTML | PDF (Table 1) • Recommendations by Medical Condition and Other Indication: HTML | PDF (Table 2)
Revaccination	Recommended only in the setting of an outbreak
Comments	• **Contraindicated** for patients with CD4 counts <200 cells/mm^3 • The MMR + varicella vaccine (ProQuad) should not be substituted for the MMR vaccine [McLean, et al. 2013]. • Those who previously received 2 doses of a mumps-containing vaccine and are at increased risk for mumps in the setting of an outbreak should receive a third dose to improve protection against mumps disease and related complications [Marin, et al. 2018]. • Covered by HRSA: Vaccine Injury Compensation Program
Abbreviations: CDC, Centers for Disease Control and Prevention; HRSA, Health Resources and Services Administration; MMR, measles, mumps, rubella.	

Table 8: Meningococcal Serotypes A, C, W, and Y Vaccine	
Trade Names	• Menactra (MenACWY-D) • Menveo (MenACWY-CRM) • MenQuadfi (MenACWY-TT)
Indications	All patients with HIV
Administration	• Administer 2 doses of MenACWY vaccine ≥8 weeks apart in those not previously vaccinated. • For those previously vaccinated with 1 dose of MenACWY vaccine, administer the second dose at the earliest opportunity ≥8 weeks after the previous dose. • See CDC: Adult Immunization Schedule: – Recommendations for Ages 19 Years and Older, 2023: HTML | PDF (Table 1) – Recommendations by Medical Condition and Other Indication: HTML | PDF (Table 2)
Revaccination	Administer 1 booster dose of MenACWY vaccine every 5 years.
Comments	• MenACWY-D should not be administered until ≥4 weeks after pneumococcal conjugate vaccine. • See Meningococcal Disease: NYSDOH Health Advisory and Vaccine Recommendations • Covered by HRSA: Vaccine Injury Compensation Program
Abbreviations: CDC, Centers for Disease Control and Prevention; HRSA, Health Resources and Services Administration; MenACWY, meningococcal serotypes A, C, W, and Y.	

Table 9: MenB Vaccine for Prevention of MenB Infection	
Trade Names	• Bexsero (4CMenB) • Trumenba (MenB-FHbp)
Indications	Patients at risk of MenB infection
Administration	Administer according to CDC: Adult Immunization Schedule, 2023: HTML | PDF
Revaccination	None
Comments	• Bexsero (4CMenB) and Trumenba (MenB-FHbp) are not interchangeable • Not routinely recommended for people with HIV in the absence of other risk factors • Covered by HRSA: Vaccine Injury Compensation Program
Abbreviations: CDC, Centers for Disease Control and Prevention; HRSA, Health Resources and Services Administration; MenB, meningococcal serotype B.	

Table 10: Mpox Vaccine [a]	
Trade name	JYNNEOS (also called Imvamune or Imvanex)
Type of vaccine	Live virus that does not replicate efficiently in human cells
Administration	Two subcutaneous injections 4 weeks apart
Indication	Individuals with HIV ≥18 years old who are at high risk of or who have been exposed to mpox within the past 14 days
Adverse reactions	Injection site reactions such as pain, swelling, and redness. Vaccination with JYNNEOS will not cause mpox infection.
Contraindications	Severe allergy to any component of the vaccine (gentamicin, ciprofloxacin, or egg protein)
Immune response	Maximal development of the immune response takes 2 weeks after second dose.
Pregnancy/ breastfeeding	No evidence of reproductive harm from animal data. Pregnancy and breastfeeding are not contraindications for vaccination.
Abbreviation: CDC, Centers for Disease Control and Prevention. **Note:** a. See package insert and CDC: Interim Clinical Considerations for Use of JYNNEOS and ACAM2000 Vaccines During the 2022 U.S. Monkeypox Outbreak.	

Table 11: Pneumococcal Vaccine (see also CDC: Adult Immunization Schedules: By Age [Table 1] and Medical Condition [Table 2] and CDC: PneumoRecs VaxAdvisor)	
Trade Names	• Vaxneuvance (PCV15; 15-valent pneumococcal conjugate vaccine) • Prevnar 20 (PCV20; 20-valent pneumococcal conjugate vaccine) • Pneumovax 23 (PPSV23; 23-valent pneumococcal polysaccharide vaccine)
Indications	All patients with HIV
Administration	**For patients who have not received a pneumococcal vaccine or whose vaccination status is unknown:** Vaccinate with 1 dose of PCV15 *or* 1 dose of PCV20. If PCV15 is used, follow with 1 dose of PPSV23, with a minimum interval of 8 weeks between the doses.
Revaccination	Consult CDC: PneumoRecs VaxAdvisor
Comments	• Pneumococcal vaccination should be not be deferred for patients with CD4 count <200 cells/mm^3 and/or detectable viral load; however, the follow-up secondary administration of the PPSV23 vaccine may be deferred until the patient's CD4 count is ≥200 cells/mm^3 and/or viral load is undetectable. • The Menactra (MenACWY-D) vaccine for meningococcal serotype groups A,C, W, and Y (MenACWY) should not be administered until ≥4 weeks after pneumococcal conjugate vaccine.
Abbreviation: CDC, Centers for Disease Control and Prevention.	

Table 12: Tdap and Td Vaccines	
Trade Names	• Tdap: Adacel; Boostrix • Td: Tenivac; TDVax
Indications	All adult patients
Administration	Administer according to CDC: Adult Immunization Schedule: • Recommendations for Ages 19 Years and Older, 2023: HTML | PDF (Table 1) • Recommendations by Medical Condition and Other Indication: HTML | PDF (Table 2)
Revaccination	Td is usually given as a booster dose every 10 years, but it can also be given earlier after a severe and dirty wound or burn.
Comments	Covered by HRSA: Vaccine Injury Compensation Program
Abbreviations: CDC, Centers for Disease Control and Prevention; HRSA, Health Resources and Services Administration; Tdap, tetanus, diphtheria, and pertussis; Td, tetanus-diphtheria.	

Table 13: Varicella Vaccine	
Trade Name	Varivax
Indications	For patients with CD4 counts ≥200 cells/mm^3 who do not have evidence of immunity to varicella
Administration	Administer according to CDC: Adult Immunization Schedule: • Recommendations for Ages 19 Years and Older, 2023: HTML | PDF (Table 1) • Recommendations by Medical Condition and Other Indication: HTML | PDF (Table 2)
Revaccination	None
Comments	• **Contraindicated** for patients with CD4 counts <200 cells/mm^3 (see CDC: Adult Immunization Schedule) • Anti-varicella IgG screening should be performed in patients with no known history of chickenpox or shingles [Marin, et al. 2007]. • MMR + varicella (ProQuad) vaccine should not be used [McLean, et al. 2013]. • Antiherpetic agents should be avoided ≥24 hours before and for 14 days after administration [ACIP 2022; CDC(b) 2021]. • An interval of ≥5 months is recommended between administration of post-exposure VariZIG and varicella vaccination [ACIP 2022; DHHS 2022; CDC 2006]. • Clinical disease due to varicella after vaccination, a very rare event, should be treated with acyclovir [DHHS 2022]. • Covered by HRSA: Vaccine Injury Compensation Program
Abbreviations: CDC, Centers for Disease Control and Prevention; HRSA, Health Resources and Services Administration; IgG, immunoglobulin G; MMR, measles, mumps, rubella; VariZIG, varicella zoster immune globulin.	

Table 14: Zoster Vaccine	
Trade Names	Shingrix: RZV, adjuvanted
Indications	MCCC recommendation: Patients with HIV ≥18 years old (A2)
Administration	• Two intramuscular doses, given 2 to 6 months apart, regardless of past receipt of ZVL (brand name Zostavax) • Perform anti-varicella IgG screening in patients with no known history of chickenpox or shingles [Marin, et al. 2007]. • See CDC: Adult Immunization Schedule: – Recommendations for Ages 19 Years and Older, 2023: HTML | PDF (Table 1) – Recommendations by Medical Condition and Other Indication: HTML | PDF (Table 2)
Comments	• RZV provides strong protection against shingles and post-herpetic neuralgia. Currently, there are no data on immunogenicity specific to people with HIV; however, superior efficacy and longer duration of protection have been demonstrated among the elderly, and a recombinant vaccine is preferred for people with HIV [Anderson, et al. 2022; Dooling, et al. 2018]. • As of November 2020, ZVL is no longer available for use in the United States.
Abbreviations: CDC, Centers for Disease Control and Prevention; IgG, immunoglobulin G; MCCC, Medical Care Criteria Committee; RZV, recombinant zoster vaccine; ZVL, zoster vaccine live.	

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