**Preventing influenza and pneumonia during the COVID-19 pandemic: Vaccination is your best shot!**

Gloria Adepiti, PharmD Candidate1; Diep Tran, PharmD Candidate1; Elizabeth Sherman, PharmD, AAHIVP1,2

Affiliations:

1. College of Pharmacy, Nova Southeastern University
2. South Florida, Southeast AIDS Education and Training Center

Interim guidance for COVID-19 and persons with HIV include recommendations for preventative measures such as lifestyle modifications, antiretroviral therapy, and keeping patients up to date on influenza and pneumococcal vaccinations.1 In 2018, CDC documented 59,120 people living with HIV died of influenza and pneumonia, ranking it the 8th leading cause of death that year.2 Since information and data are quickly changing, healthcare providers should stay updated with current vaccination schedules for patients with HIV. Opportunistic infection guidelines provide straightforward recommendations for influenza and pneumococcal vaccination schedules.3 In this article, we will review recommendations for influenza and pneumococcal vaccinations in patients with HIV so that you can protect your patients from other respiratory illnesses during the COVID-19 pandemic.

**Influenza Vaccination in Patients with HIV**

There are three available types of influenza vaccines:

1. Inactivated influenza vaccine (IIV)
2. Recombinant influenza vaccine (RIV)
3. Live attenuated influenza vaccine (LAIV)

Most influenza vaccines in the United States protect against four different influenza viruses (“quadrivalent”): two influenza A viruses and two influenza B viruses.4 In contrast, “trivalent” vaccines protect against only three different influenza viruses (two influenza A viruses and one influenza B virus).4 CDC recommends all people living with HIV receive either IIV or RIV.3 LAIV is contraindicated in patients with HIV.3 This is because LAIV suppresses an already compromised immune system creating an avenue for opportunistic infections. A high-dose influenza vaccine, containing four times the antigen, has been approved for patients ≥65 years old.3 All high-dose influenza vaccines are available as IIVs. Use of a high-dose influenza vaccine has not been studied extensively in patients ≥65 years old with HIV.3 Providers can still recommend the high-dose vaccine for patients ≥65 years with HIV, however, the data are limited on the efficacy of the vaccine for this specific patient population.3 Influenza vaccination is an annual requirement for patients aged 6 months and above, to provide a yearly defense against influenza.3 Patients should stay up to date with their vaccine since influenza comes with symptoms such as cough, fever, sore throat, runny nose, body aches, other respiratory symptoms that can lead to exacerbation of chronic conditions and mimic COVID-19 infection. It’s pertinent to keep in mind that preventing influenza will also decrease the risk of bacterial pneumonia.

**Pneumococcal Vaccination in Patients with HIV**

There are two available types of pneumococcal vaccines:

1. Pneumococcal conjugate vaccine (PCV13)
2. Pneumococcal polysaccharide vaccine (PPSV23)

Patients with HIV require both pneumococcal vaccines, however the timing of the vaccines may differ based on individual patient characteristics. Some of the importance of the pneumococcal vaccine lies in the fact that PVC13 is a 13 valent conjugate vaccine active against 13 *Streptococcus pneumoniae* capsular serotypes, while PPSV23 is a polyvalent pneumococcal vaccine, preventing pneumococcal disease caused by 23 serotypes of *Streptococcus pneumoniae*.5 Because each vaccine will not prevent disease caused by capsular types of pneumococcus other than those contained in their vaccine, it is imperative to understand how to and when to administer them.6

It is recommended that pneumococcal vaccine naive adults or adolescents with HIV receive a single dose of PCV13 regardless of their CD4 count.3 After which, patients with a CD4 count > 200 cells/mm3 be administered PPSV23 at least 8 weeks after receiving PCV13.3 If the patient’s CD4 count is < 200 cells/mm3, it is advisable to wait until the CD4 is > 200cells/mm3. This is because the immunologic response to PPSV23 is impaired in patients with a CD4 count < 200 cells/mm3.7 However, clinical evidence exists affirming that PPSV23 can still be effective in patients with < 200 cells/mm3, if their viral load is < 100,000 copies/mL.3

It is also recommended that patients who have already received a PPSV23 vaccine still receive PCV13, but only after one year from the PPSV23 vaccination.3 Although the lifespan of effectiveness of the pneumococcal vaccines is unknown, PPSV23 revaccination is required if the first dose of PPSV23 was received more than five years prior.3 A final dose of PPSV23 is also recommended for patients > 65 years old.3 Patients typically should not receive more than three doses of PPSV23 within their lifetime.3

**Conclusion**

In conclusion, all patients with HIV are recommended to stay up to date with their influenza and pneumococcal vaccines.3 This is particularly important during the COVID-19 pandemic. The IIV or RIV influenza vaccine should be administered annually to all patients with HIV.3 The use of a LAIV is contraindicated in all individuals with HIV.3  Several studies have documented an association between pneumococcal vaccination and a reduced risk of pneumococcal bacteremia and that pneumococcal vaccination provides people with HIV moderate protection against pneumococcal disease.3 Pneumococcal vaccine naive adults or adolescents with HIV are recommended to receive a single dose of PCV13 regardless of their CD4 count.3 Eight weeks after receiving the PCV13 vaccine, patients with a CD4 > 200 cells/mm3 should receive a single dose of PPSV23.3 If the patient’s CD4 count is < 200 cells/mm3, the PPSV23 vaccine should be deferred until the patient’s CD4 count is > 200 cells/mm3.3  A single dose of PPSV23 should be revaccinated if the last dose was more than 5 years prior, with a final dose given after age 65. Within a lifetime, a patient typically should not exceed three doses of PPSV23. During the COVID-19 pandemic, patients with HIV should receive their influenza and pneumococcal vaccines according to the schedule listed to prevent exacerbation of other chronic conditions and to reduce mortality rates in the case of any respiratory co-infections.

**References**

1. Office of AIDS Research Advisory Council. (2020, June 19). *Interim guidance for COVID-19 and Persons with HIV*. U.S. Department of Health & Human Services, Office of AIDS Research. https://clinicalinfo.hiv.gov/en/guidelines/covid-19-and-persons-hiv-interim-guidance/interim-guidance-covid-19-and-persons-hiv?view=full

2. National center for statistics (2020, October 30), *Influenza*. U.S. Department of Health & Human Services, Centers for Disease Control and Prevention.https://www.cdc.gov/nchs/fastats/flu.htm

3. Panel on Opportunistic Infections in Adults and Adolescents with HIV. (2019, October 10). Community-acquired pneumonia. In *Guidelines for the prevention and treatment of opportunistic infections in adults and adolescents with HIV: Recommendations from the Centers for Disease Control and Prevention, the National Institutes of Health, and the HIV Medicine Association of the Infectious Diseases Society of America.* U.S. Department of Health & Human Services, Office of AIDS Research. https://clinicalinfo.hiv.gov/en/guidelines/adult-and-adolescent-opportunistic-infection/community-acquired-pneumonia-cap?view=full

 4. Centers for Disease Control and Prevention, National Center for Immunization and Respiratory Diseases. (2020, October 22). Key facts about seasonal flu vaccine. U.S. Department of Health & Human Services, Centers for Disease Control and Prevention.https://www.cdc.gov/flu/prevent/keyfacts.htm

5. U.S. Food & Drug Administration. (2019, December 11). Prevnar 13. U.S. Department of Health & Human Services.https://www.fda.gov/vaccines-blood-biologics/vaccines/prevnar-13

6. U.S. Food & Drug Administration. (2020, September 25). PNEUMOVAX 23 - Pneumococcal Vaccine, Polyvalent. U.S. Department of Health & Human Services.https://www.fda.gov/vaccines-blood-biologics/vaccines/pneumovax-23-pneumococcal-vaccine-polyvalent

 7. Spach, DH (2006). Immunizations for HIV-infected adults: Indications, timing, and response. Topics in HIV medicine: a publication of the International AIDS Society, USA, 14(5), 154–158.