AETC AIDS Education & Training Center Program
Mountain West

Immunizations for Preventable Diseases in Adults with HIV

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Objectives

- Review current Advisory Committee on Immunization Practices (ACIP) recommendations for PWH
- Discuss updated HHS OI treatment guideline recommendations for immunization of PWH, particularly differences compared to ACIP recommendations
- Examine contraindications to immunization

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Case

42 year old man with HIV presents for care. He has sex with men and is unstably housed. Which of the following is most accurate regarding hepatitis A vaccination?

1. Check HAV Ab and vaccinate if negative
2. Vaccinate with 2-dose series of HAV vaccine

Hepatitis A Vaccination

- Administer a 2-dose series of hepatitis A vaccine (HepA) or a 3- or 4-dose series (0, 1, and 6 months or days 0, 7, and 21–30 and 12 months) of the combined hepatitis A and hepatitis B vaccine (HepA-HepB, Twinrix®) to any person without evidence of immunity to HAV (and for the combined vaccine, without evidence of immunity to HAV or HBV).(**AIII**)
- Assess antibody response 1-2 months after completion of the series. If negative, revaccinate when CD4 cell counts above 200 cells/µL. **(BIII)**
- PWH presenting with CD4 cell count < 200 cells/µL with ongoing risk for HAV should be immunized and assessed for antibody response 1-2 months after completion of the series. For PWH without risk factors, waiting for CD4 >200 is an option. Assess antibody response 1-2 months after completion of the series. If negative, revaccinate when CD4 cell counts above 200 cells/µL. **(BIII)**

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Hep A Vaccination Local Recommendations

Health Advisory: Hepatitis A among Persons Living with HIV (PLWH), King County– 8 July 2020

For PWH & illicit drug use, clinicians should vaccinate persons not previously vaccinated and for previously vaccinated persons may consider additional strategies including:

- Test for immunity (HAV IgG) and if not immune, repeat the 2-dose hepatitis A vaccine series (with option to repeat HAV IgG testing 1 month later to evaluate response)
- Administer one dose of hepatitis A vaccine to persons suspected of poor response or waning immunity (i.e., persons who were vaccinated with low CD4 count or who now have low CD4 count; persons with other chronic health conditions)

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Hep A Vaccination Madison Clinic Recommendations

Consider immunizing PWH who are experiencing homeless, sexually-active MSM with recent STI and/or have chronic HCV even if HAV IgG positive

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Case

42 year old man with HIV who is living homeless is notified by public health that 2 people living in is tent community were diagnosed with hepatitis A in the last week. He does not know if he has been vaccinated but he is not in routine medical care. He denies any symptoms. Which of the following is most appropriate regarding vaccination:

A. He does not need vaccine as he is asymptomatic

B. He should receive Hep A vaccine as soon as possible

C. He should receive combination Hep A and Hep B vaccine as he is likely non-immune to both

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Management of HAV Exposure

Pre-exposure prophylaxis (travel)

- For PWH who are non-immune and are traveling within 2 weeks to countries with endemic HAV, consider administering IgG 0.1 mL/kg if duration of travel is < 1 month. If duration of travel is 2 months or less, then administer IgG 0.2 mL/kg. If duration of travel is ≥2 months, then IgG should be repeated every 2 months.

Post-exposure prophylaxis

- For PWH who are non-immune, administer HAV vaccine and IgG 0.1mg/kg simultaneously in different anatomical sites as soon as possible, ideally within 2 weeks of exposure.

Case

42 year old man with HIV presents for care. He has sex with men and is unstably housed. He is HBsAb negative, HBcAb positive, and HBsAg negative. You decide to offer the following:

1. No vaccine as he has had past infection
2. Check HBV DNA PCR to evaluate for chronic infection
3. Vaccinate with 3-dose series of single-antigen hepatitis B vaccine (Recombivax® or Engerix®)
4. Vaccinate with 2-dose series of Heplisav-B®

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Case continued

You give a 3-dose series of HBV vaccine and check HBsAb 1 month later and it is < 10 IU/mL. What do you do next?

1. Give a 4th dose of same vaccine and repeat HBsAb in 1 month
2. Give 2 doses of Heplisav dosed 1 month apart

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Heplisav vaccine in PWH

- BEEHIVE study recruiting soon
  - Non responders
  - Naïve to HBV vaccine

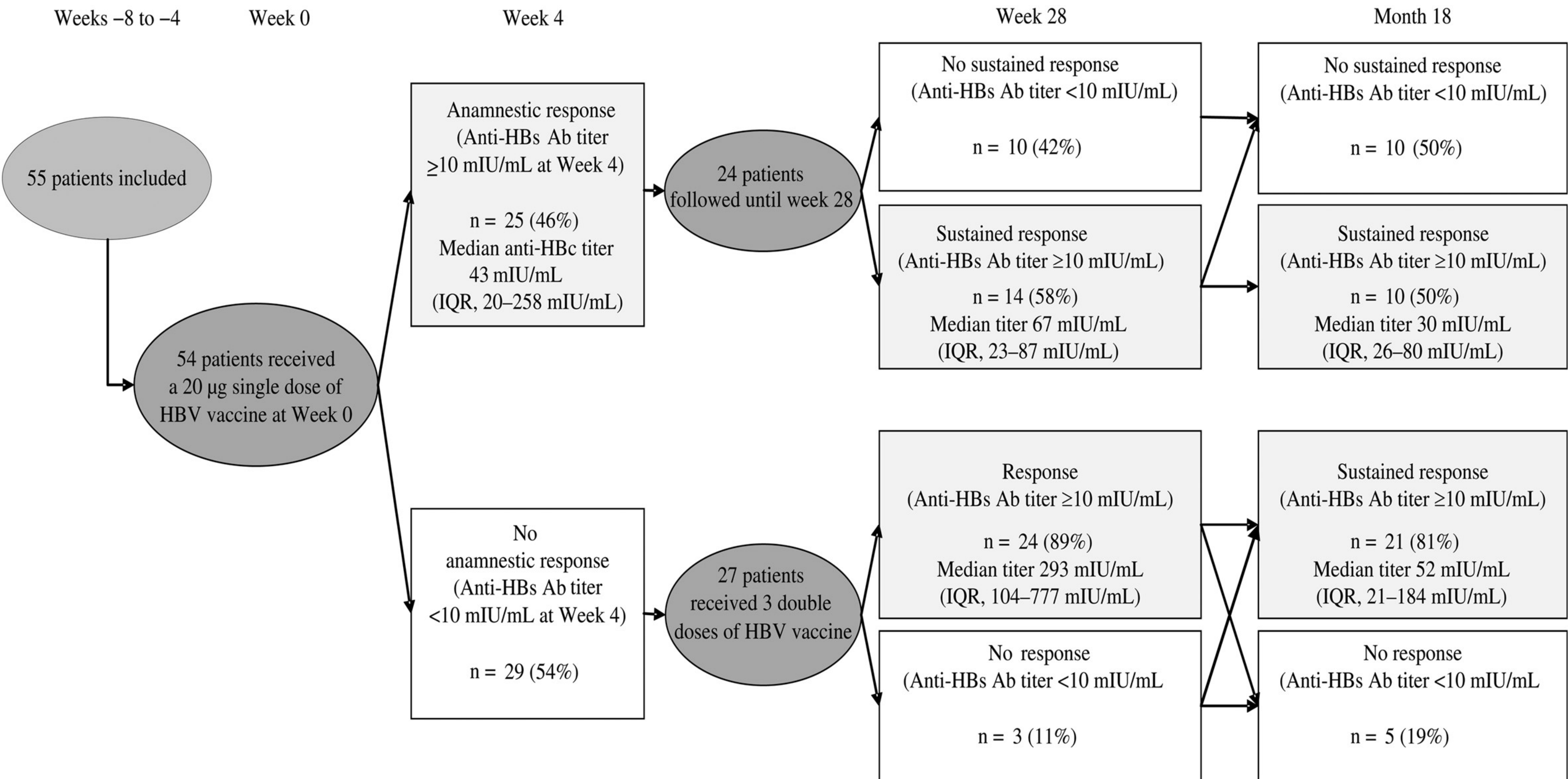
- Single center retrospective cohort study (UCSF)
  - 64 PWH 81% overall seroprotection rate; 84% in those with prior vaccine non response

Schnittman SR et al. J Acquir Immune Defic Syndr 2020

What level of protection is necessary?

- For individuals with isolated anti-HBc, vaccinate with one standard dose of HBV vaccine and check anti-HBs titers 1 to 2 months afterward. If the anti-HBs titer is ≥100 IU/mL, no further vaccination is needed.
- If the titer is <100 IU/mL, then complete another series of HBV vaccine (single-dose or double-dose) followed by anti-HBs testing. **(BII)**
- If titers are not available, then give a complete vaccine series followed by anti-HBs testing.

Why do we need a higher level of protection with isolated HBV cAb?



Piroth L et al. J Infect Dis 2016

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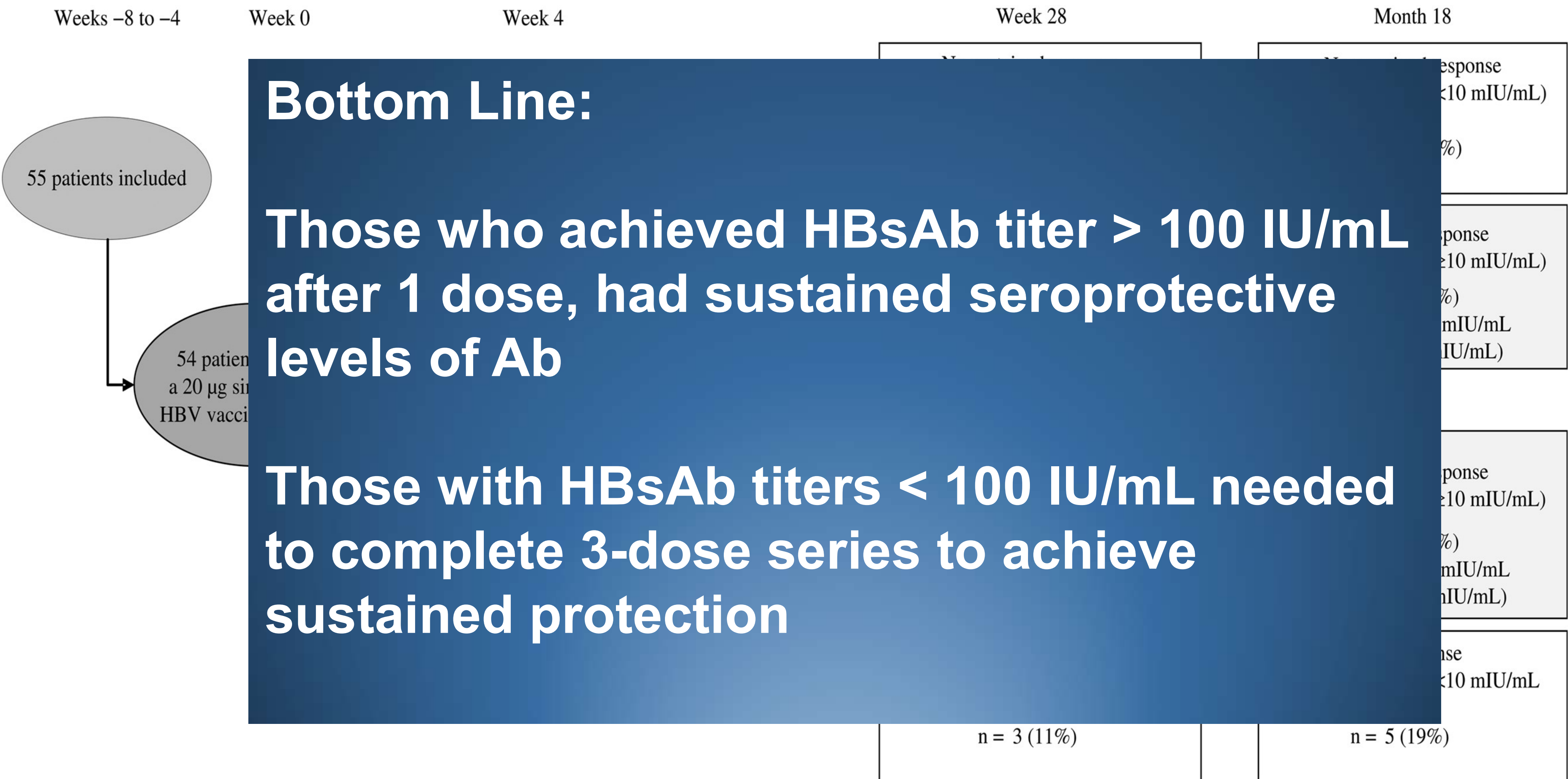

Bottom Line:

Those who achieved HBsAb titer > 100 IU/mL after 1 dose, had sustained seroprotective levels of Ab

Those with HBsAb titers < 100 IU/mL needed to complete 3-dose series to achieve sustained protection

Piroth L et al. J Infect Dis 2016

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Case

42 year old man with HIV presents for care. He has sex with men and is unstably housed. Would you offer HPV vaccine?

1. Yes
2. No
3. I don’t know

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HPV Vaccine ACIP Recommendations

- Routine HPV vaccination is recommended for PWH. Ideally the series should be initiated at age 11 or 12 years, but may be started as early as age 9 years.
- For all PWH aged 13-26 years who were not vaccinated previously, regardless of gender, administer 3 doses of the recombinant HPV nonavalent vaccine at 0, 1–2, and 6 months.
- The 2-dose series **is not recommended** in PWH. **(AIII)**
- For PWH aged 27-45 not adequately vaccinated previously, HPV vaccine is not routinely recommended; instead, shared clinical decision-making regarding HPV vaccination is recommended.

HPV Vaccine Additional Recommendations

- For pregnant persons, delay HPV vaccination until after delivery; pregnancy testing is not routinely recommended before administering HPV vaccine.
- For patients who have completed a vaccination series with the recombinant HPV bivalent or quadrivalent vaccine, some experts would consider additional vaccination with recombinant HPV nonavalent vaccine, but data are lacking to define the efficacy and cost-effectiveness of this approach. **(CIII)**

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Shared Decision Making For HPV Vaccine

- Most sexually active adults have already been exposed to HPV, although not necessarily all of the HPV types targeted by vaccination
- At any age, having a new sex partner is a risk factor for getting a new HPV infection
- People who are already in a long-term, mutually monogamous relationship are not likely to get a new HPV infection
- HPV vaccination prevents new HPV infections but does not treat existing infections or diseases

https://www.cdc.gov/hpv/hcp/schedules-recommendations.html

Case

56 year old woman with HIV VL UD and CD4 count 260 presents for pre-travel visit. She last received meningococcal vaccination 10 years ago. She plans to travel to Gondor in April. Which of the following is most accurate regarding meningococcal vaccination?

1. She should receive both the MenACWY and the MenB vaccines at least 10 days prior to travel and then another dose upon return at least 8 weeks after first doses
2. She should receive the MenACWY vaccine at least 10 days prior to travel and then another dose upon return at least 8 weeks after the first dose
3. Meningococcal vaccine is not needed

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Meningococcal Vaccination

- Administer quadrivalent meningococcal conjugate vaccine, either MenACWY-D (Menactra®) or MenACWY-CRM (Menveo®), to all PWH age ≥2 months. (**AIII**)
- For PWH receiving primary vaccination, administer 2 doses given at least 8 weeks apart.
- For individuals with HIV who have been previously vaccinated and are age ≥7 years, repeat vaccination every 5 years throughout life. (**BIII)**
- Serogroup B meningococcal vaccination (MenB) is not routinely indicated for adults and adolescents with HIV at this time.

Meningococcal B Vaccination

- Recommended for people 16-23 years of age at increased risk, preferred age 16-18:
  - Meningococcal B outbreak
  - Asplenia
  - Complement deficiency
  - On eculizumab (Soliris)
  - Microbiologist with potential exposure to *Neisseria meningitidis*
- Same vaccine should be used for all doses

CDC. MMWR. 2015;64:1171-6

Meningococcal B Vaccination

- MenB-4C (*Bexsero*)
  - Recombinant vaccine
  - For ages 10 to 25 years
  - 2 dose series ≥1 month apart

- MenB-FHbp (*Trumenba*)
  - Recombinant vaccine
  - For ages 10 to 25 years
  - Healthy adolescents and young adults: 2 doses at 0, 6 months
  - Adults at risk for meningococcal disease: 3 doses at 0, 1-2, 6 months
  - Vaccinated during serogroup B meningococcal disease outbreaks: 3 doses at 0, 1-2, 6 months

Meningococcal Vaccine & Travel

- Quadrivalent meningococcal vaccine recommended for travelers to the meningitis belt during dry season (Dec-June)
  - For ages 2 months – 55 years --> MenACWY (conjugate vaccine) recommended
  - For $\geq$ 56 years who have received conjugate vaccine before, Men ACWY recommended
- Meningitis B vaccine not recommended for travel
- Approx 7-10 after vaccine for the development of protective antibody levels

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Case

50 year old man with CD4 count 55 and undetectable HIV RNA presents with shingles and asks about the shingles vaccine. What do you recommend?

1. He doesn't need the vaccine as he has had shingles
2. He should not receive vaccine as his CD4 count is below 200
3. He should receive single dose live HZ vaccine after resolution of shingles
4. He should receive 2 doses (dosed at least 8 weeks apart) of recombinant HZ vaccine after resolution of shingles

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Herpes Zoster Vaccination

- For PWH aged ≥50 years, administer recombinant zoster vaccine (RZV, Shingrix), two doses at 0 and 2 months. **(AIII)**
- Consider delaying vaccination until the patient is virologically suppressed on ART **(CIII)** and CD4 count >200 cells/mm^3 to maximize response to vaccine. **(CIII)**
- RZV is not FDA-approved for persons aged <50 years.
- If PWH has already received ZVL, re-vaccination with an RZV 2-dose series should be given.
- ZVL is no longer available

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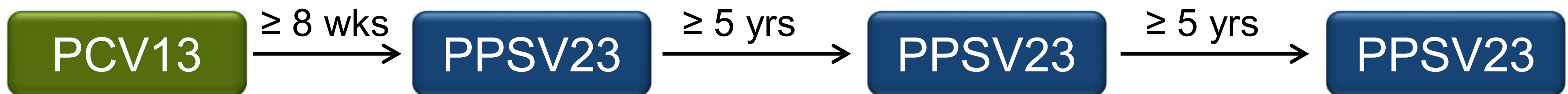
Case

- 65 year old woman with well-controlled HIV, smoker. She received PPSV23 at age 50 and at age 55. She has not received PCV13. You recommend which of the following?

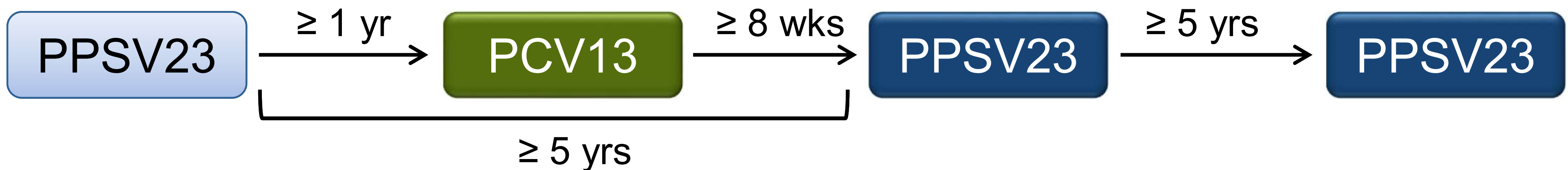
1. No further vaccination
2. Recommend PCV13 today
3. Shared decision making regarding PCV13

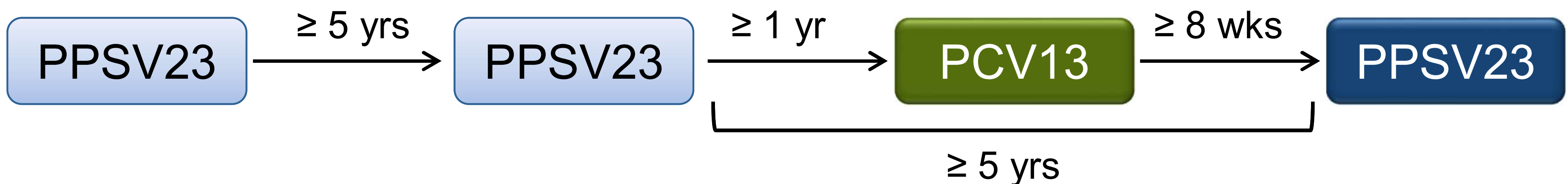
Pneumococcal Vaccination

Pneumococcal Vaccine-Naïve Adults ≥ Age 65



PPSV23-Immunized Adults ≥ Age 65





Slide Courtesy of David Spach

Source: CDC and Prevention. MMWR Morb Mortal Wkly Rep. 2012;61:816-9

Vaccine Principles in PWH

- **Live vaccines contraindicated if low CD4 (<200)**
  - MMR, varicella, oral polio, oral typhoid, yellow fever etc
- **Timing still important for inactivated vaccines**
  - HIV+ patients have ↓ immunologic response to most vaccines
  - Lower response if low CD4 or lack of virologic suppression
  - Vaccinating early (pro/con):
    - Earlier protection against common infections
    - Decreased likelihood of response if low CD4

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Vaccination Based on CD4 Count

If CD4 count > 200

Inactivated influenza

Tdap

Pneumococcal

Meningococcal

HBV

HPV

HAV

HZ

MMR

Varicella

If CD4 count < 200

Inactivated influenza

Tdap

Pneumococcal

Meningococcal

HBV

HPV

HAV

HZ

MMR

Varicella

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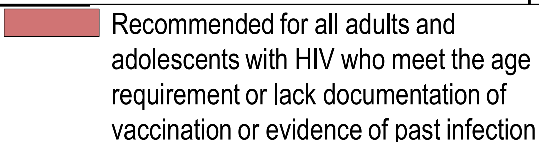
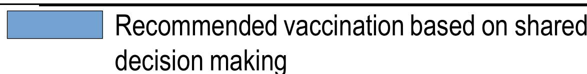
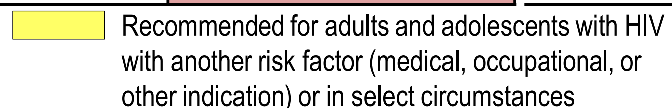
HIV OI Guidelines Immunization Table

VACCINE	All persons	Where varies by age				Where varies by CD4 cell count (cells/mm^3)	
		13–26 years	27–49 years	50–64 years	≥ 65 years	< 200	≥ 200
Hepatitis A	2–3 doses (varies by formulation)						
Hepatitis B	2–3 doses (varies by formulation)						
Human papillomavirus (HPV)		3 doses	3 doses				
Influenza	1 dose annually						
Measles, mumps, rubella (MMR)						Contraindicated	2 doses if born after 1956 or nonimmune
Meningococcal A,C,W,Y conjugate (MenACWY)	2 doses, booster every 5 years						
Meningococcal B (MenB)	2–3 doses (varies by formulation)						
Pneumococcal conjugate (PCV13)	1 dose						
Pneumococcal polysaccharide (PPSV23)		2 doses, 5 years apart			1 dose		
Tetanus, diphtheria, pertussis (Tdap/Td)	Tdap once, then Td or Tdap booster every 10 years						
Varicella (VAR)						Contraindicated	2 doses
Zoster recombinant (RZV)				2 doses			







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Contraindi

Vaccine	HIV infection CD4 count	
	<200[3]	≥200[3]
IIV or RIV4		
or LAIV4		
Tdap or Td		
MMR		
VAR		
RZV		
HPV		
PCV13		
PPSV23		
HepA		
HepB		
MenACWY		
MenB		
Hib		

*

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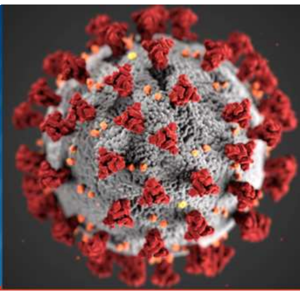
Special Recommendations in PWH

- HAV vaccine – check titer 1 month post vaccination
- HBV isolated cAb – one dose of HBV vaccine, then check Ab (goal titer > 100 IU/mL)
- Meningococcal vaccine
  - 0, 8 weeks; then q5 years thereafter
- Pneumococcal vaccine age 19-64
  - PCV13 once, then PPSV23 at least 8 weeks later
  - Repeat PPSV23 5 years later

COVID-19 Vaccine and HIV



- HIV is a potential risk factor for severe COVID-19 disease
- HIV is not a contraindication to COVID-19 vaccination
- Efficacy of vaccination in PWH unknown, but studies pending
  - Important to continue masking and physical distancing measures
- Remember: Do not give other vaccines within 2 weeks of COVID-19 vaccine

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Take Home Points

- Remember to review immunizations during routine medical visits
- PWH have potential for higher incidence of vaccine-preventable disease: The following have specific recommendations related to HIV status:
  - Hepatitis A
  - Hepatitis B
  - MenACWY
  - Pneumococcal vaccine
- Many live virus vaccines are contraindicated in PWH.
  - For any CD4 count
    - Live attenuated influenza (LAIV)
  - For CD4 count <200 cells/mm^3 or uncontrolled HIV
    - Measles
    - Mumps
    - Rubella
    - Varicella (VAR)
    - Live attenuated typhoid Ty21a
    - Yellow fever

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Vaccine Resources

- ACIP guidelines:
  - http://www.cdc.gov/mmwr/preview/mmwrhtml/su6201a2.htm
- OI prevention guidelines:
  - http://aidsinfo.nih.gov/contentfiles/lvguidelines/Adult_OI.pdf
- IDSA guidelines for vaccines in immunocompromised host:
  - http://cid.oxfordjournals.org/content/early/2013/11/26/cid.cit684.full.pdf+html

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