

Immunizations in People with HIV: Update

David H. Spach, MD
Editor-in-Chief, National HIV Curriculum
Professor of Medicine
Division of Allergy and Infectious Diseases
University of Washington

Last Updated: February 13, 2026



Disclosures

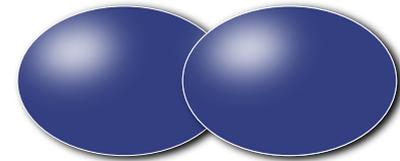
No conflicts or pharmaceutical funding/honoraria

Speaker Note: Most vaccines do not have an established unique generic name and thus Brand names are used in some places in this talk to ensure clear identification of the vaccine under discussion.

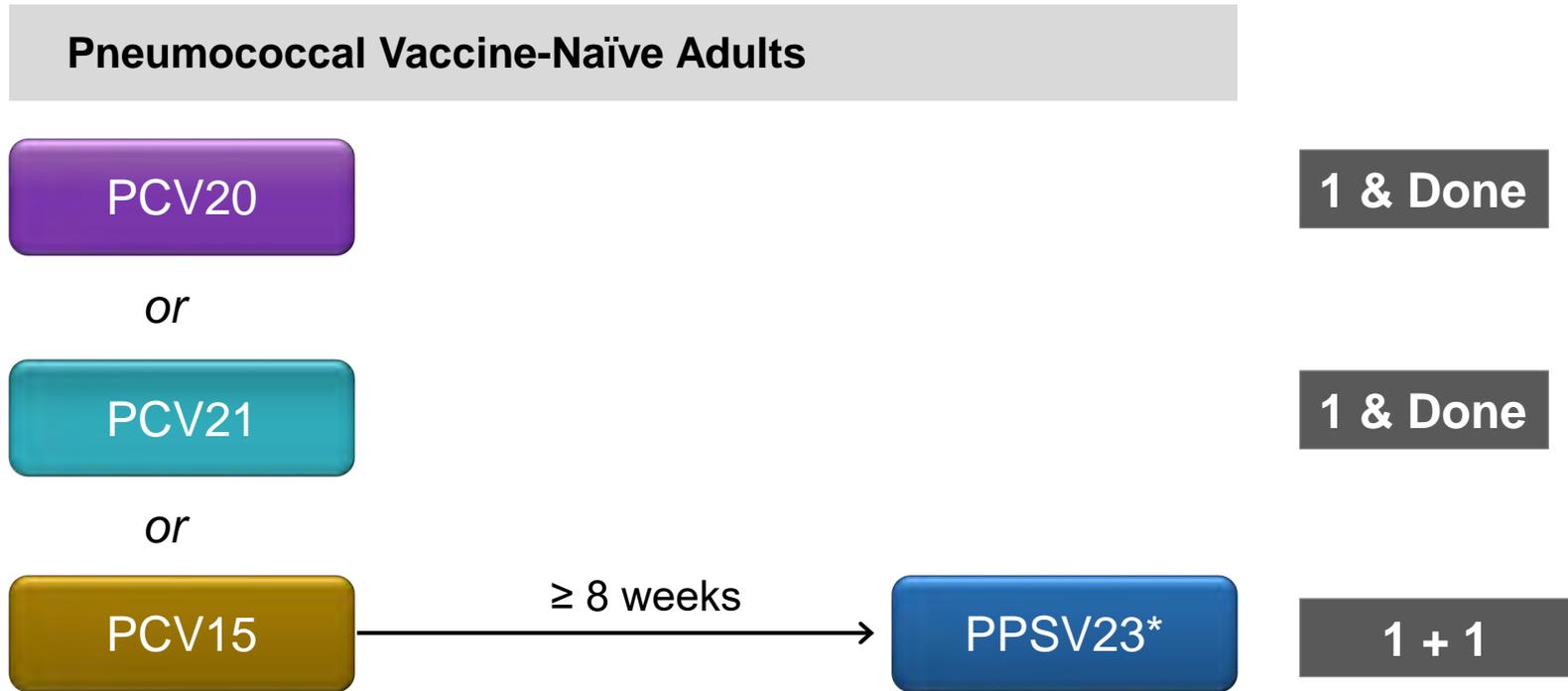
Immunizations in People with HIV: Outline

- Pneumococcal vaccines
- Meningococcal vaccines
- Hepatitis B vaccines
- Zoster vaccine
- Mpox vaccines
- RSV vaccines
- Live vaccines

Pneumococcal Vaccines



Pneumococcal Immunization in Adults with HIV



What clinically-relevant serotype is ABSENT in PCV21?

PCV21

Pneumococcal Conjugate Vaccine Serotypes

Vaccine	Pneumococcal Vaccine Serotypes																														
	1	3	4	5	6A	6B	7F	8	9N	9V	10A	11A	12F	14	15A	15B	15C	16F	17F	18C	19A	19F	20	22F	23A	23B	23F	24F	31	33F	35B
PCV15	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Grey	Grey	Blue	Grey	Grey	Grey	Blue	Grey	Grey	Grey	Grey	Grey	Blue	Blue	Blue	Grey	Blue	Grey	Grey	Blue	Grey	Grey	Blue	Grey
PCV20	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Grey	Grey	Blue	Blue	Blue	Blue	Blue	Grey	Blue	Grey	Grey	Grey	Blue	Blue	Blue	Grey	Blue	Grey	Grey	Blue	Grey	Grey	Blue	Grey

Source: Kobayashi M, et al. MWR Morb Mortal Wkly Rep. 2024;73:793-8.

Pneumococcal Conjugate Vaccine Serotypes

Vaccine	Pneumococcal Vaccine Serotypes																														
	1	3	4	5	6A	6B	7F	8	9N	9V	10A	11A	12F	14	15A	15B	15C	16F	17F	18C	19A	19F	20	22F	23A	23B	23F	24F	31	33F	35B
PCV15	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
PCV20	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
PCV21	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Source: Kobayashi M, et al. MWR Morb Mortal Wkly Rep. 2024;73:793-8.

Pneumococcal Conjugate Vaccine Serotypes

Vaccine	Pneumococcal Vaccine Serotypes																																
	1	3	4	5	6A	6B	7F	8	9N	9V	10A	11A	12F	14	15A	15B	15C	16F	17F	18C	19A	19F	20	22F	23A	23B	23F	24F	31	33F	35B		
PCV15	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Grey	Grey	Blue	Grey	Grey	Grey	Blue	Grey	Grey	Grey	Grey	Grey	Blue	Blue	Blue	Grey	Blue	Grey	Grey	Blue	Grey	Grey	Blue	Grey	Blue	Grey
PCV20	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Grey	Grey	Blue	Blue	Blue	Blue	Blue	Grey	Blue	Grey	Grey	Grey	Blue	Blue	Blue	Grey	Blue	Grey	Grey	Blue	Grey	Grey	Blue	Grey	Blue	Grey
PCV21	Grey	Blue	Blue*	Grey	Blue	Grey	Blue	Blue	Blue	Blue	Grey	Blue	Blue	Blue	Blue	Grey	Blue	Blue	Blue	Grey	Blue	Grey	Blue										

Source: Kobayashi M, et al. MWR Morb Mortal Wkly Rep. 2024;73:793-8.

Adult Populations in Western U.S. with High Percentage ($\geq 30\%$) of Invasive Pneumococcal Disease Caused by Pneumococcal Serotype 4

- **Geographic Risk**

- Alaska
- Oregon
- Colorado
- Navajo Nation
- New Mexico

Navajo Nation



Pneumococcal Immunization in Adults with HIV

Pneumococcal Vaccine-Naïve Adults

PCV21

PCV21 NOT recommended if prevalence of pneumococcal serotype 4 greater than 30% in the region

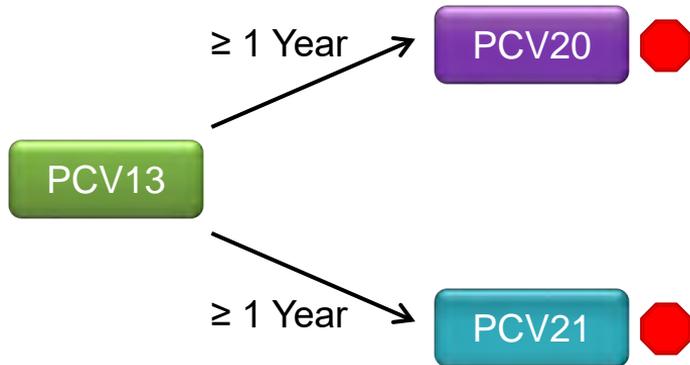
What do you do when patient has received older pneumococcal vaccine doses (PCV13 +/- PPSV23)?

Adult Opportunistic Infections Guidelines

Pneumococcal Immunization in Adults with HIV

Prior Receipt of PCV13 ONLY

Complete with 1 Dose PCV20 or PCV21

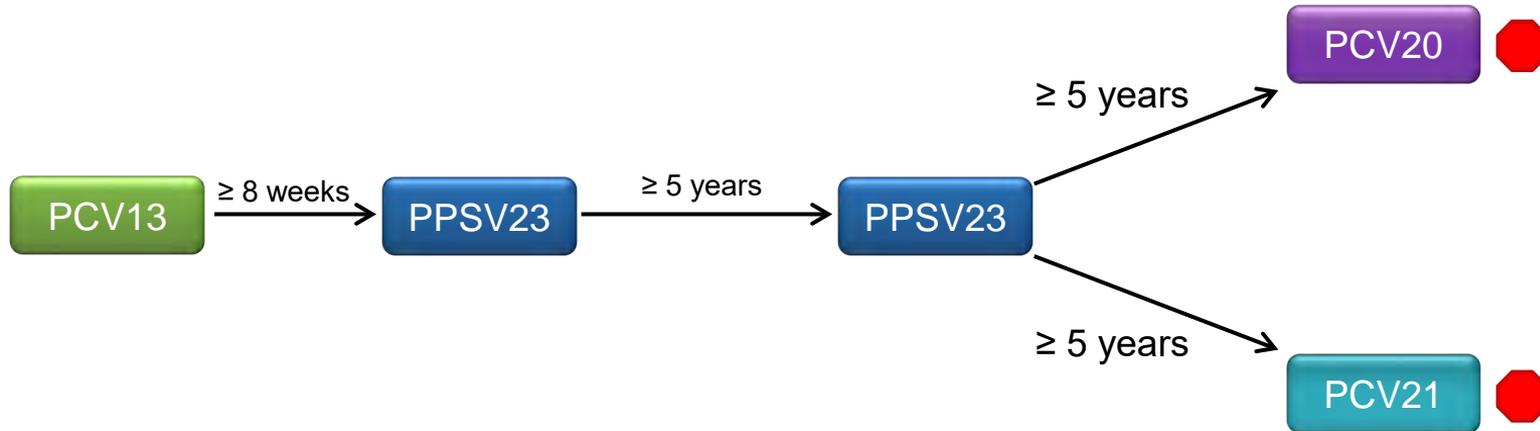


Adult Opportunistic Infections Guidelines

Pneumococcal Immunization in Adults with HIV

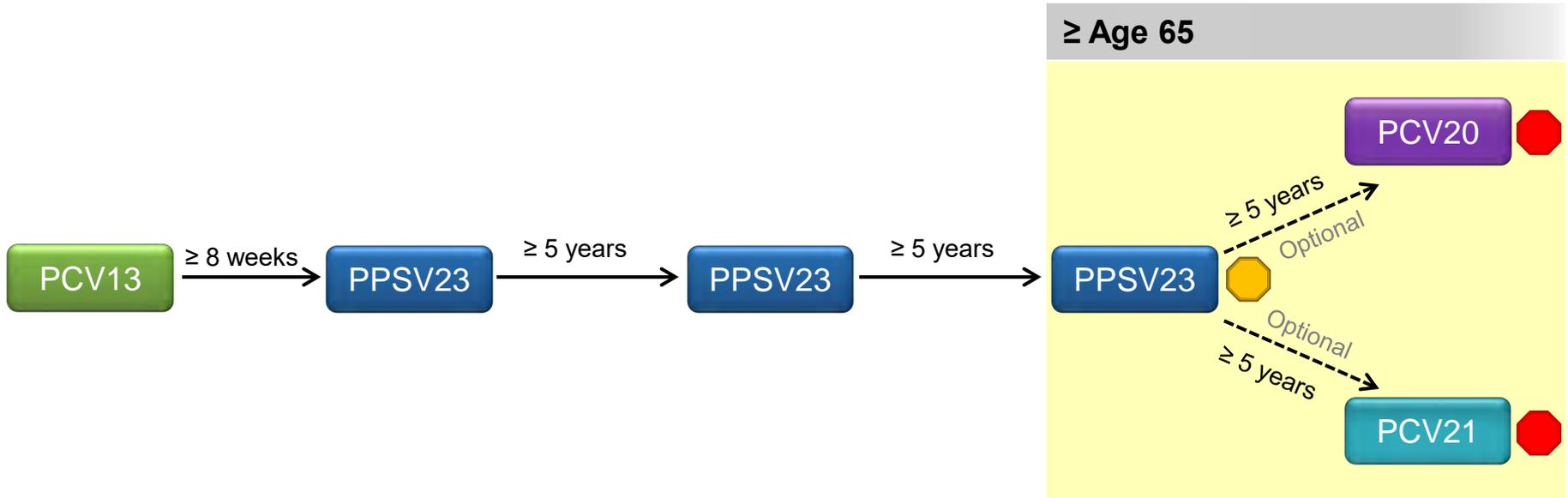
Prior Receipt of PCV13 *and* ≥ 1 Dose PPSV23 *and* Age < 65 Years

Complete with 1 Dose PCV20 or PCV21

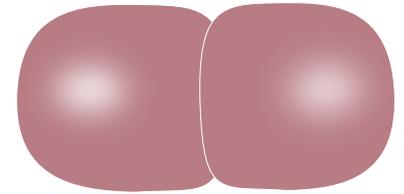


Completed Vaccine Series and Age 65 Years

Shared Decision Making and Consider 1 Dose PCV20 or PCV21



Meningococcal Vaccine



Meningococcal Vaccines

FDA Approval

- **Meningococcal Conjugate Quadrivalent Vaccines***

- MenACWY-CRM (*Menveo*)
- MenACWY-TT (*MenQuadfi*)

2 months to 55 years of age

6 weeks of age and older

- **Meningococcal B Vaccines**

- MenB-4C (*Bexero*)
- MenB-FHbp (*Trumemba*)

10-25 years of age

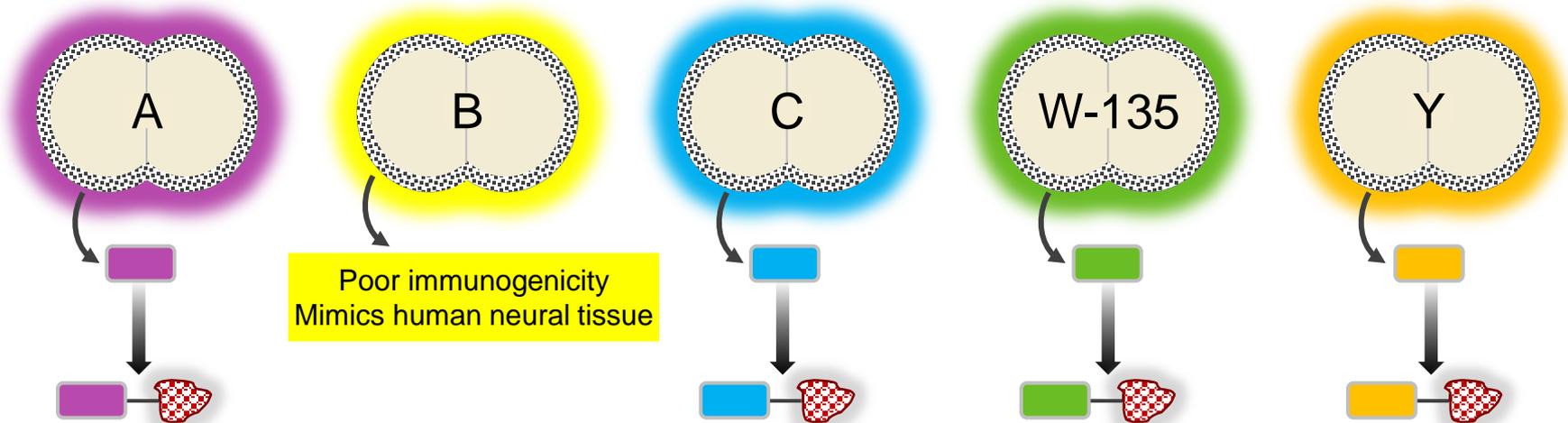
- **Meningococcal Pentavalent Vaccines**

- MenABCWY [MenACWY-TT + MenB-FHbp] (*Penbraya*)
- MenABCWY [MenACWY-CRM + MenB-4C] (*Penmenvy*)

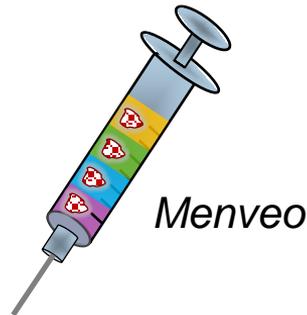
10-25 years of age

*MenACWY-D (*Menactra*) no longer manufactured in U.S.

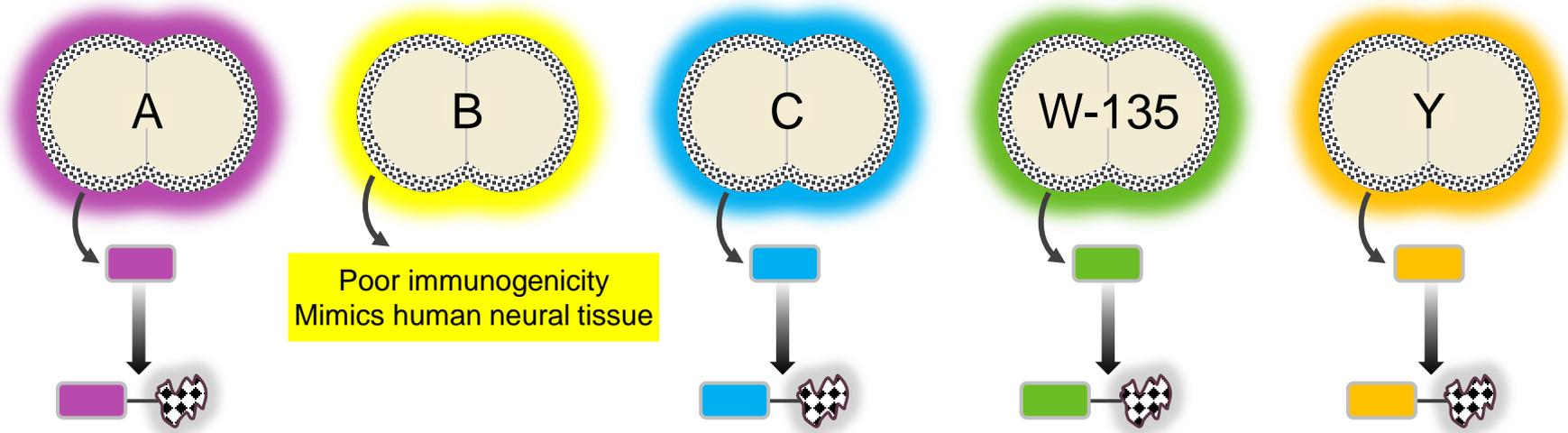
Conjugate Quadrivalent Meningococcal Vaccine (*Menveo*)



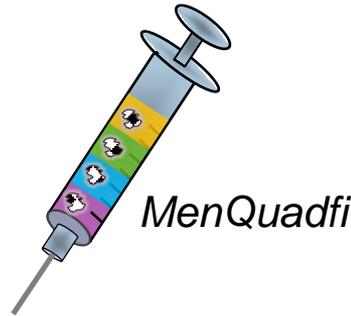
	Polysaccharide capsule
	Diphtheria CRM ₁₉₇ Protein



Conjugate Quadrivalent Meningococcal Vaccine (*MenQuadfi*)



	Polysaccharide capsule
	Tetanus toxoid protein

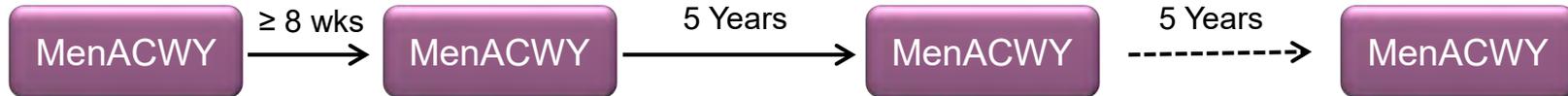


Quadrivalent Meningococcal Conjugate (MenACWY) Vaccine in Adults

Primary Vaccination (2 Doses)

Boosters (repeat every 5 years)*

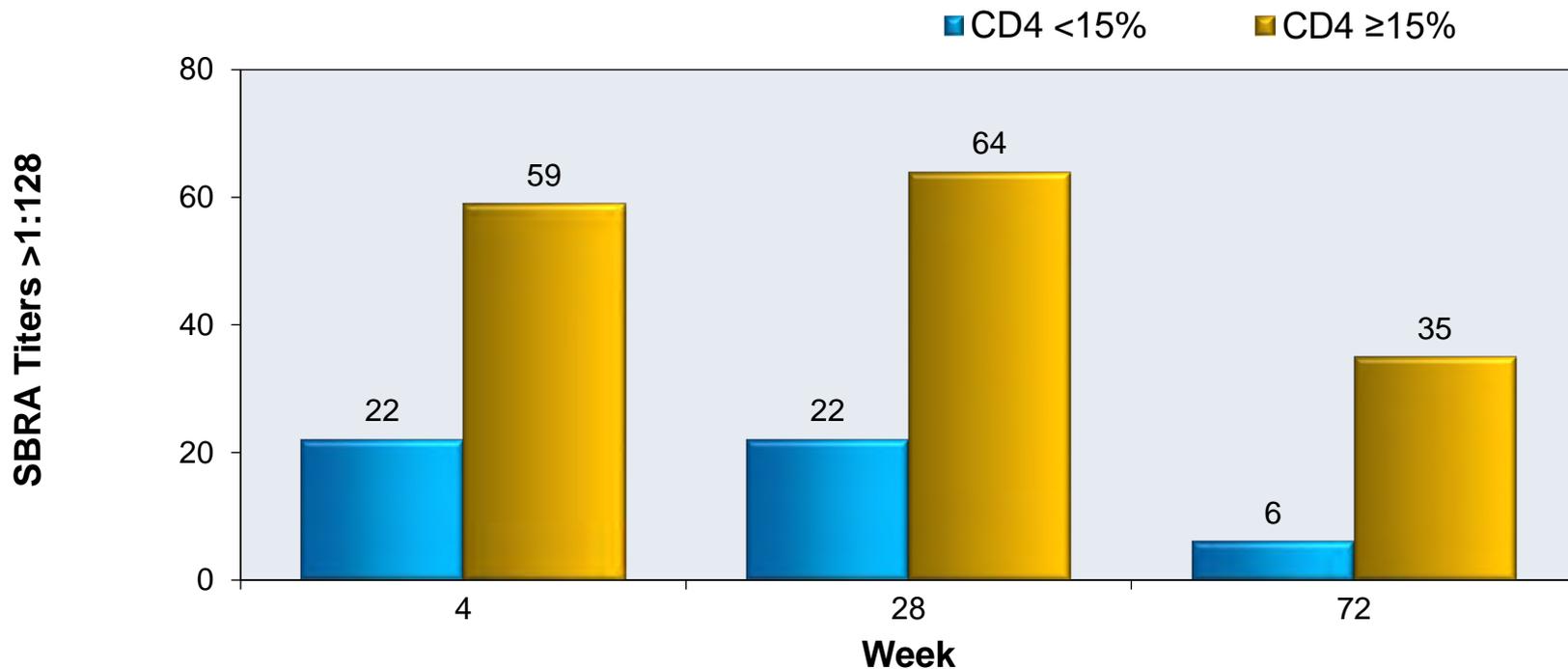
*Multiple booster doses off-label recommendation



Should you wait until CD4 >200 cells/mm³ to give the initial meningococcal conjugate vaccine series?

Immunogenicity of MenACWY-D (*Menactra*) in Adolescents and Young Adults with HIV (Doses 0, 24 weeks): Results

Immunogenicity Against Serogroup C with 2 Doses of MenACWY-D: By CD4 Percentage

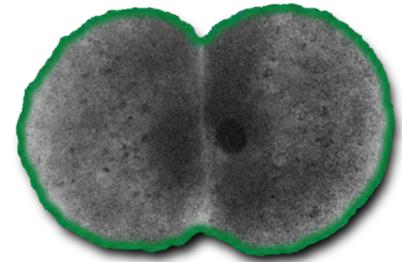


Would you expect the meningococcal vaccines to have some protection against *Neisseria gonorrhoeae*?

Protection of MenB-4C (*Bexero*) Against *N. gonorrhoeae*

- MenB-4C has 4 recombinant antigens
 - Factor H-binding protein (FHbp)
 - Neisserial adhesin A (NadA)
 - Neisserial Heparin-Binding Antigen (NHBA)
 - Outer Membrane Vesicles (OMV)
- NHBA antigens and OMV have 80-90% genetic sequence homology with *N. gonorrhoeae* outer membrane proteins

Neisseria gonorrhoeae



MenB-4C Estimated to provide 33-47% protection against gonorrhea

Meningococcal Vaccines

- **Meningococcal Conjugate Quadrivalent Vaccines***

- X – MenACWY-CRM (*Menveo*)
- X – MenACWY-TT (*MenQuadfi*)

- **Meningococcal B Vaccines**

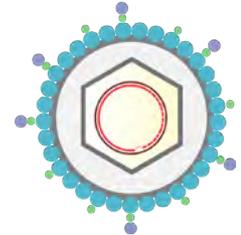
- ✓ – MenB-4C (*Bexero*) Some protection against gonorrhea
- X – MenB-FHbp (*Trumemba*)

- **Meningococcal Pentavalent Vaccines**

- X – MenABCWY [MenACWY-TT + MenB-FHbp] (*Penbraya*)
- ✓ – MenABCWY [MenACWY-CRM + MenB-4C] (*Penmenvy*) Some protection against gonorrhea

*MenACWY-D (*Menactra*) no longer manufactured in U.S.

Hepatitis B Vaccine



Recombinant Hepatitis B Vaccine

HepB (*Engerix-B*)
HepB (*Recombivax HB*)

Aluminum Adjuvant



HBsAg

Antigen



Aluminum

Adjuvant

HepB-CpG (*Heplisav-B*)

CpG1018 Adjuvant



HBsAg

Antigen



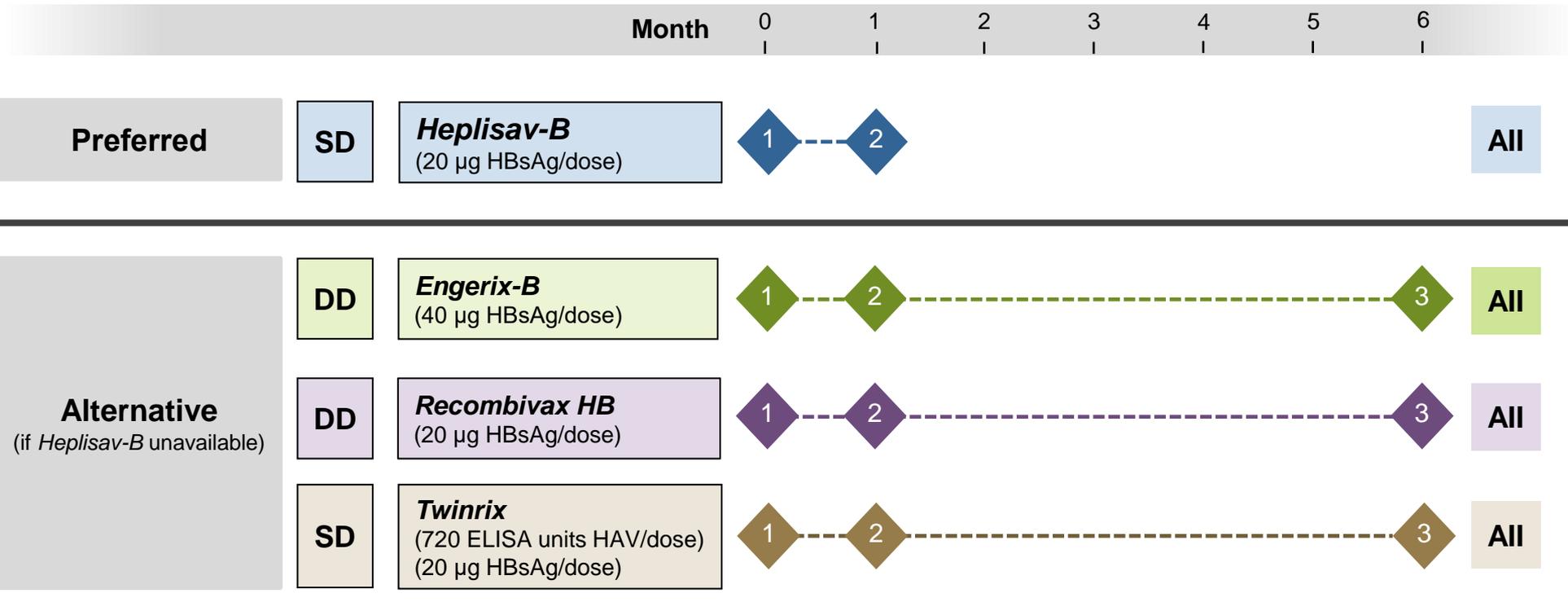
CpG1018

TLR-9 agonist

Adjuvant

Adult Opportunistic Infections Guidelines

Recommendations for Hepatitis B Vaccine In People with HIV*



SD = standard dose; DD = double dose

HepB Vaccine in HBV Vaccine-naïve People With HIV

ACTG 5379 (BEE-HIVE): Study Design

- **Entry Criteria Arm A and B**

- Person with HIV age 18-70 years
- On ART & HIV-1 RNA <1,000 copies/mL*
- CD4 >100 cells/mm³ (median 625 cells/mm³)
- Negative HBsAg, anti-HBs, and anti-HBc
- Not pregnant

- **Arm B (Vaccine Naïve)**

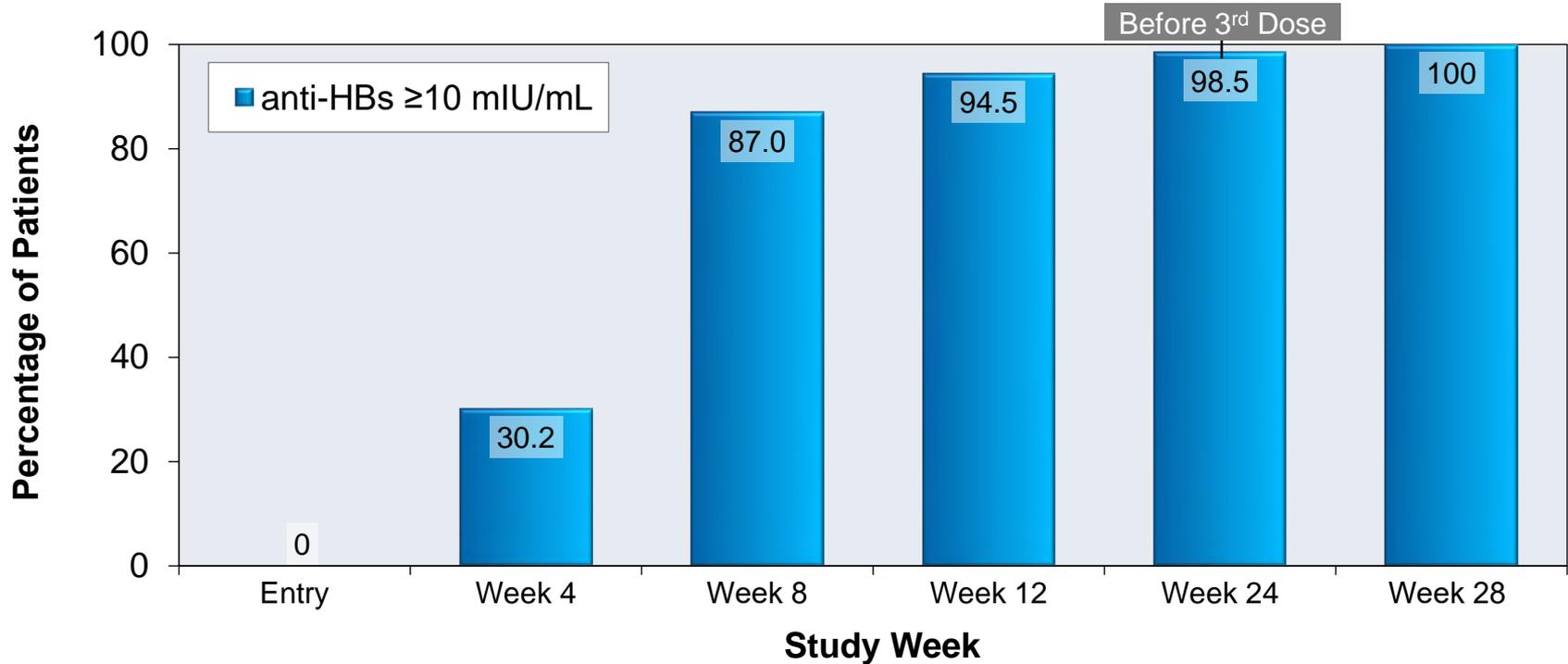
- Hep B sAb negative (<45 days)

Arm B: HBV Vaccine Naive

HepB (CpG)

3 doses: 0, 4, and 24 weeks

HepB-CpG Vaccine in HBV Vaccine-naïve People With HIV ACTG 5379 (BEE-HIVE): Seroprotection Rate by Study Week



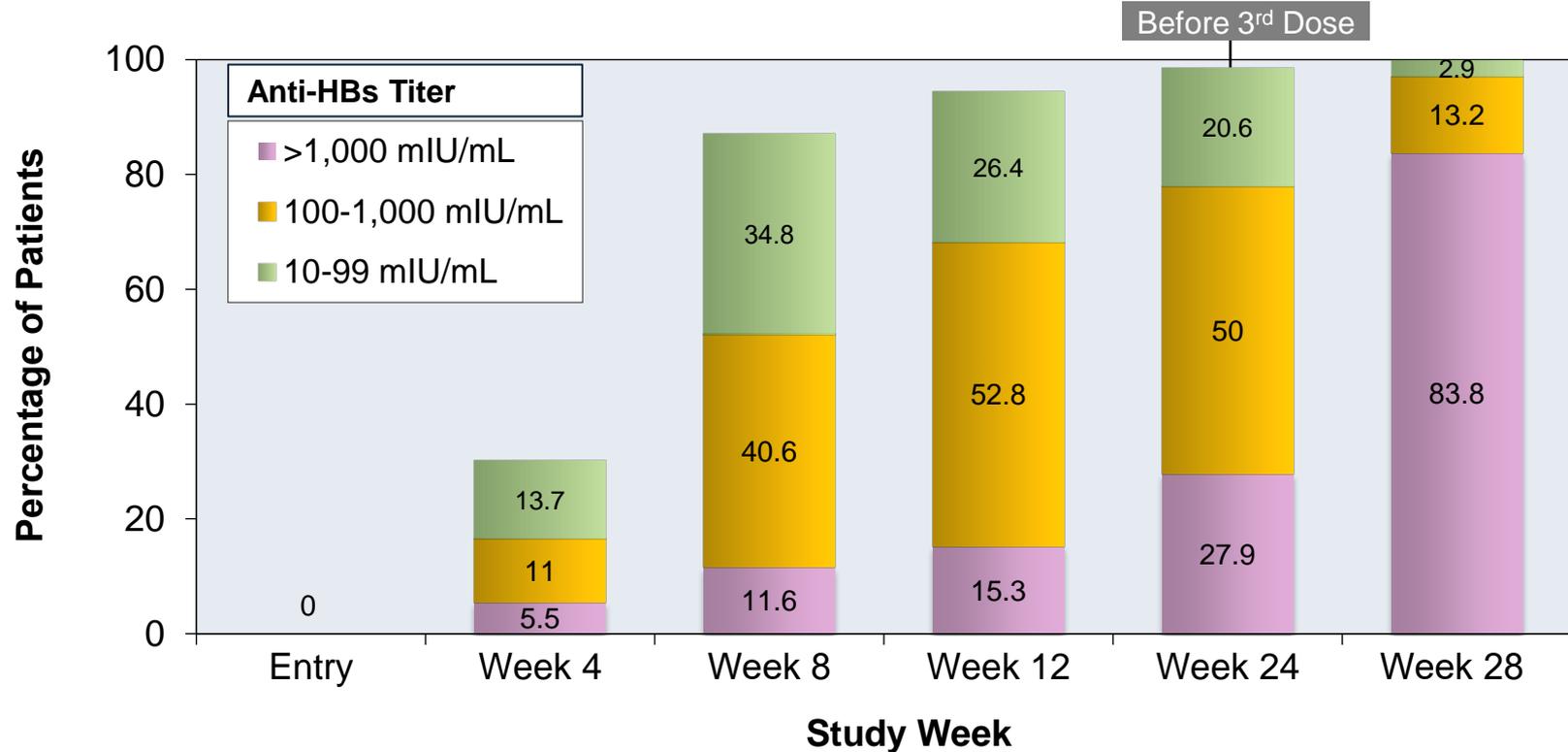
HepB-CpG Doses

1

2

3

HEPLISAV-B Vaccine in HBV Vaccine-naïve People With HIV ACTG 5379 (BEe-HIVe): Seroprotection Rate by Study Week

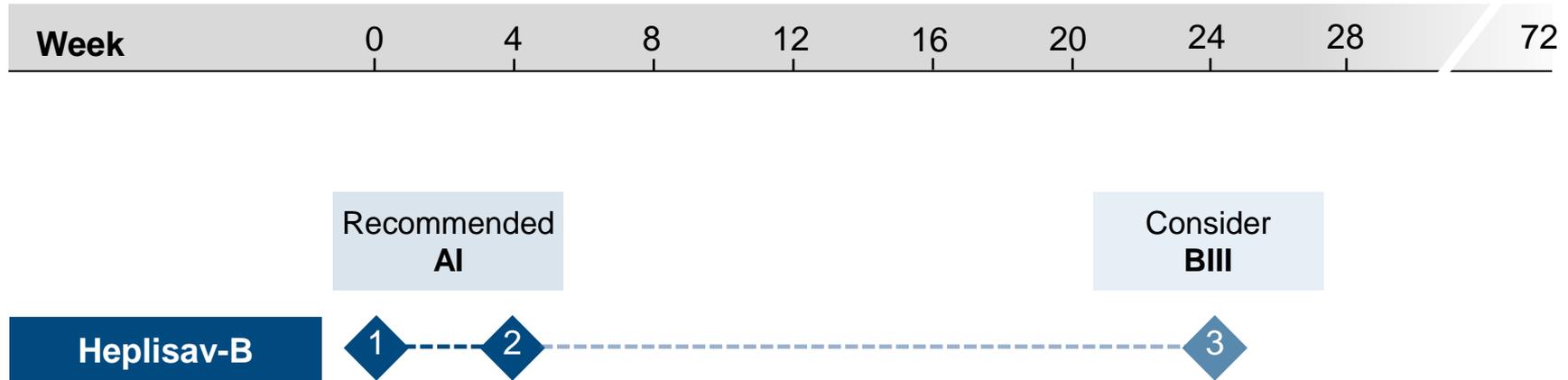


What should you do if your patient did not respond to hepatitis B vaccine*?

Vaccine nonresponder = anti-HBs <10 mIU/mL after Hep B vaccine series

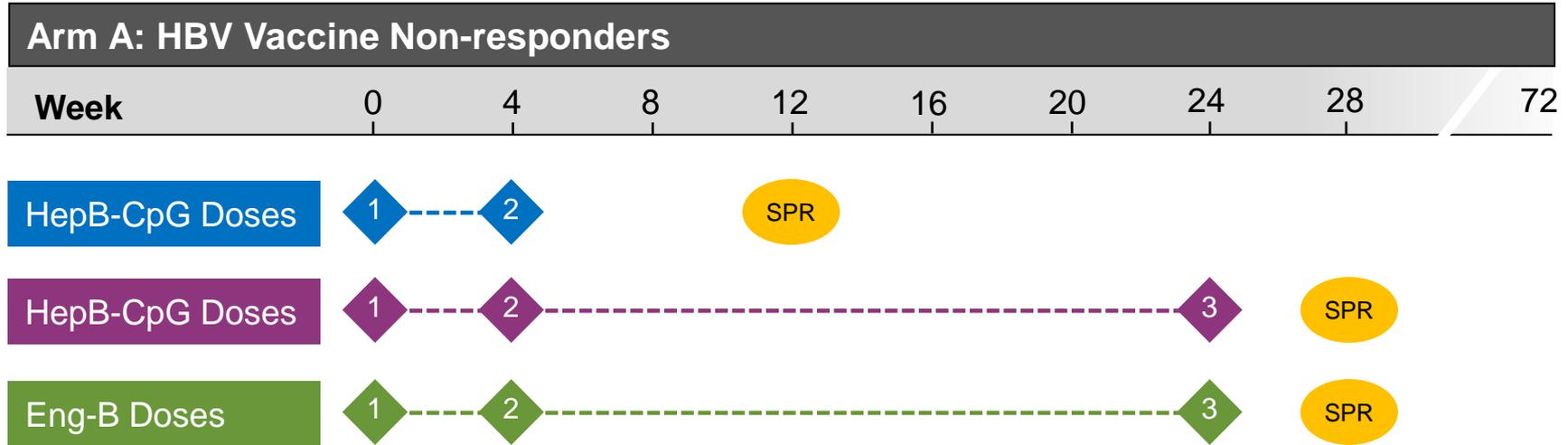
Recommendations for Hepatitis B Vaccine Non-Responders* In PWH

*If prior **Engerix-B** or **Recombivax HB** vaccination failed:



HepB-CpG Vaccine in PWH who are Vaccine Non-Responders

ACTG 5379 (BEe-HIVe): Study Design



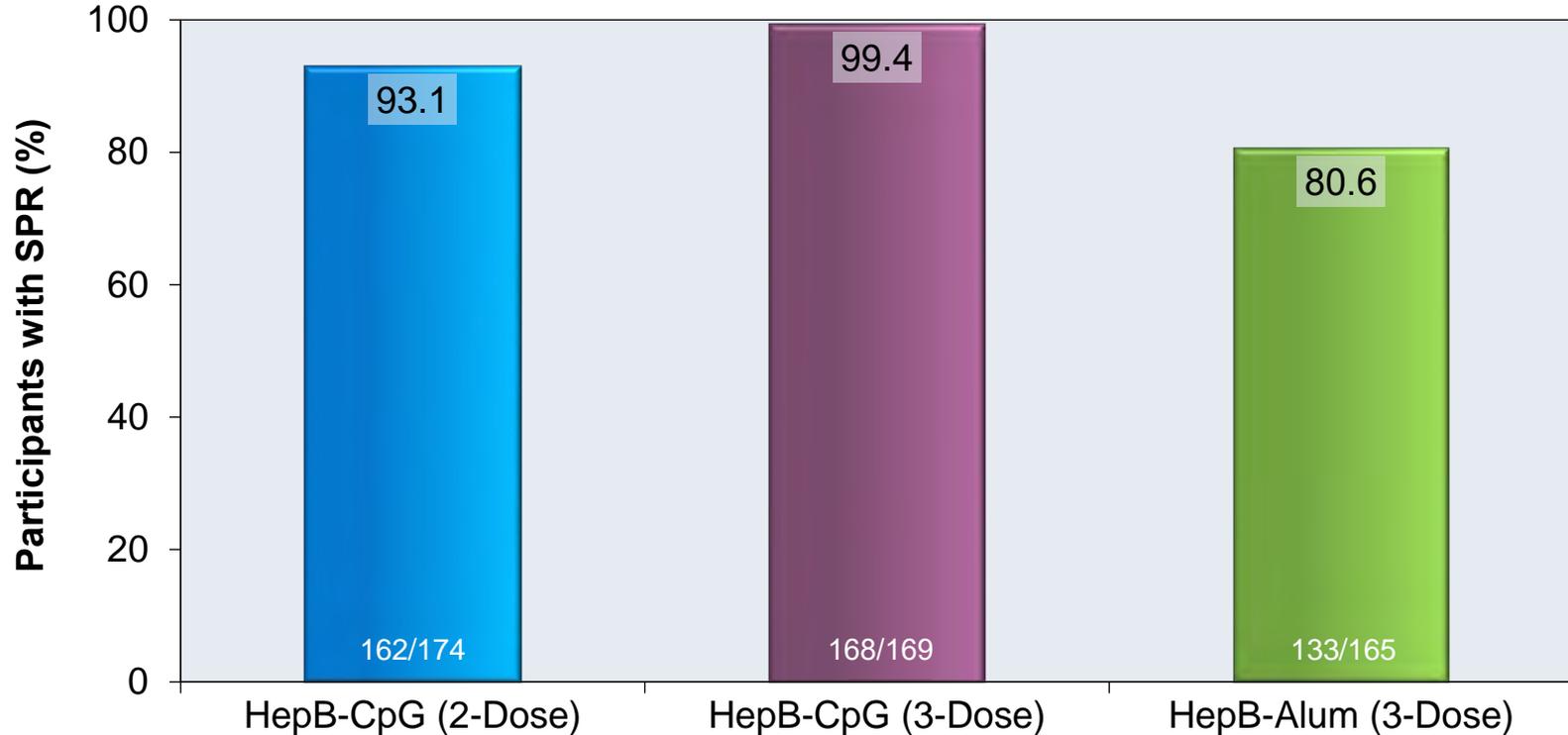
SPR = seroprotective response defined as HBs ≥ 10 mIU/mL

Participant Median CD4 Count = 638 cells/mm³

Source: Marks KM, et al. JAMA. 2025;333:295-306.

HepB-CpG Vaccine in PWH who are Vaccine Non-Responders

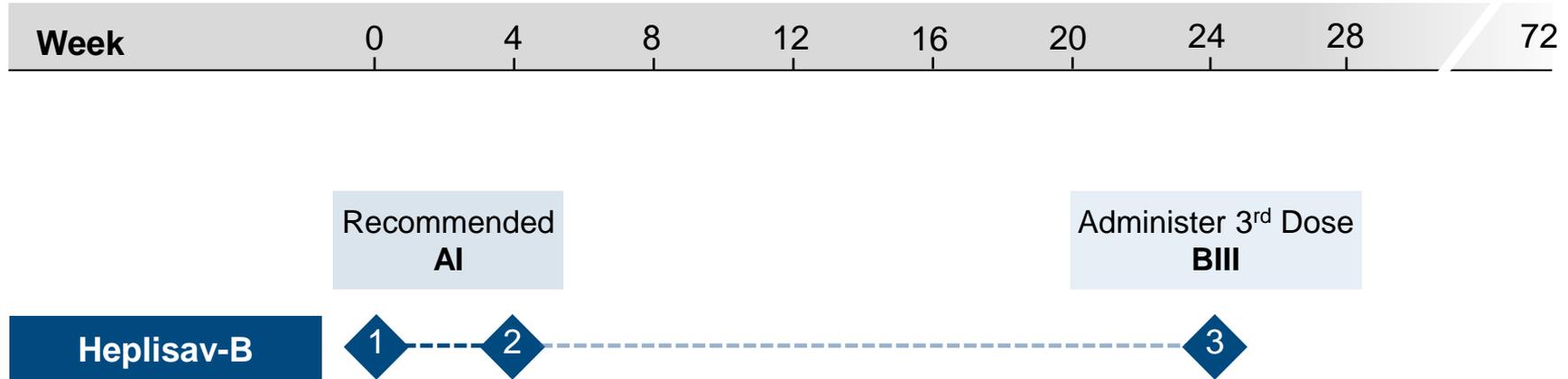
ACTG 5379 (BEe-HIVe): Seroprotective Response (SPR)



Source: Marks KM, et al. JAMA. 2025;333:295-306.

Recommendations for Hepatitis B Vaccine Non-Responders* In PWH

*If prior **2-Dose Series of Heplisav B** vaccination failed:



How to manage isolated Hep B core Ab?

(HBsAg-negative, HBsAb-negative, HBcAb-positive)

HBV Resolved Infection

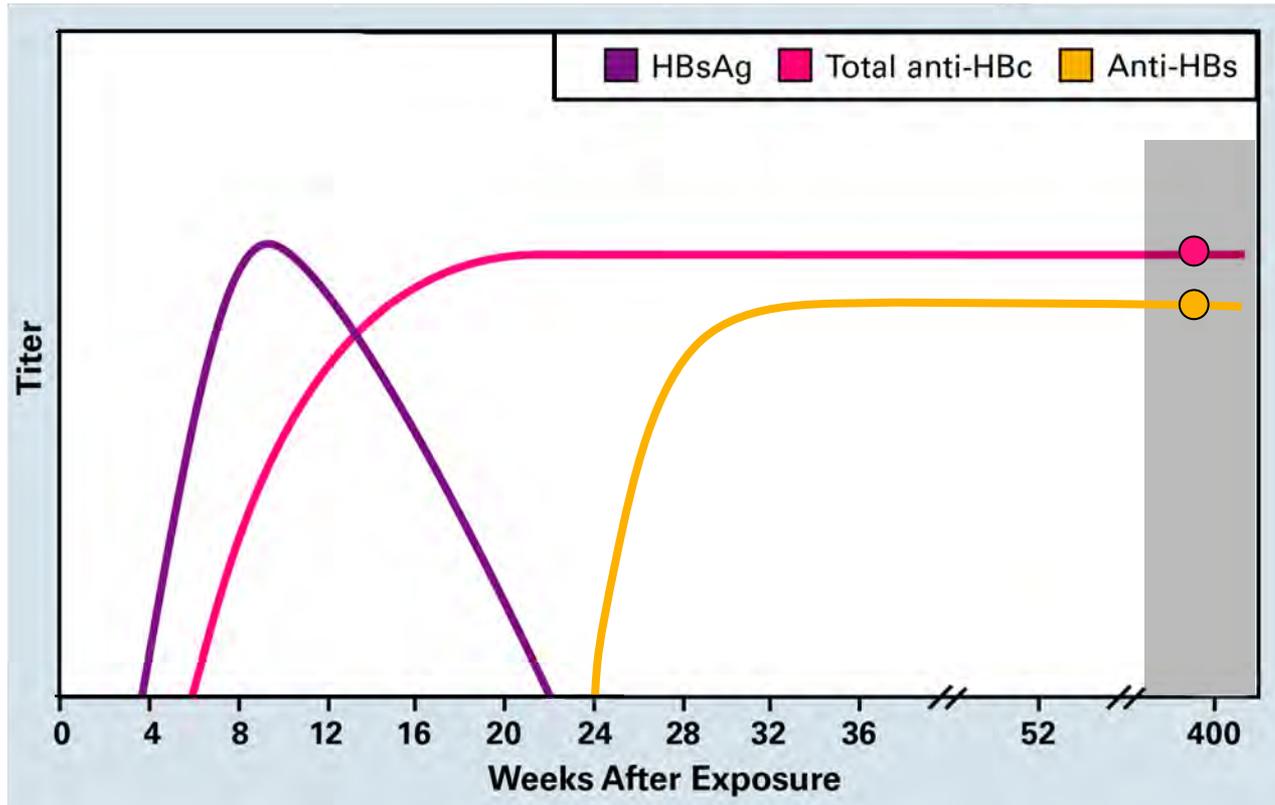
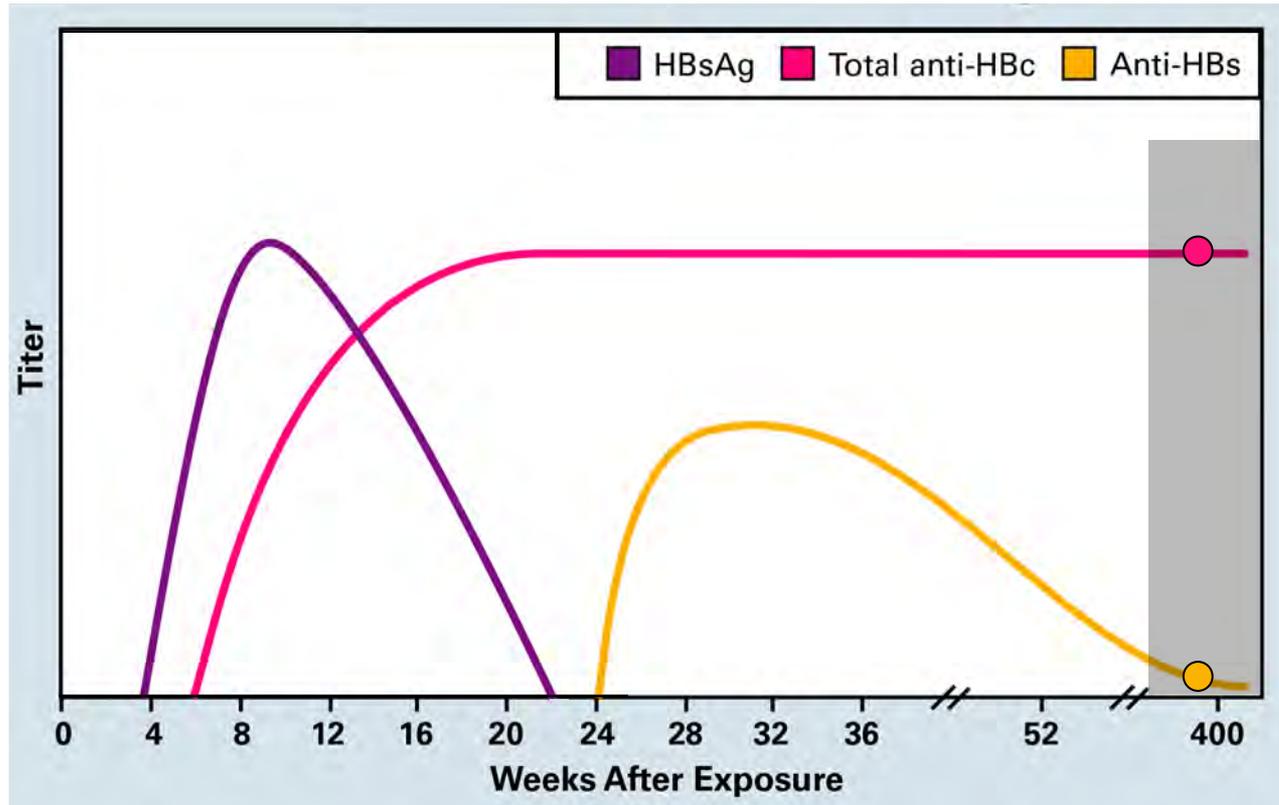


Illustration: David H. Spach, MD and David Ehler, CMI

Isolated Anti-HBc with Prior HBV Infection



Isolated Anti-HBc Persistent Low-Level HBV Infection with Non-Detectable HBsAg

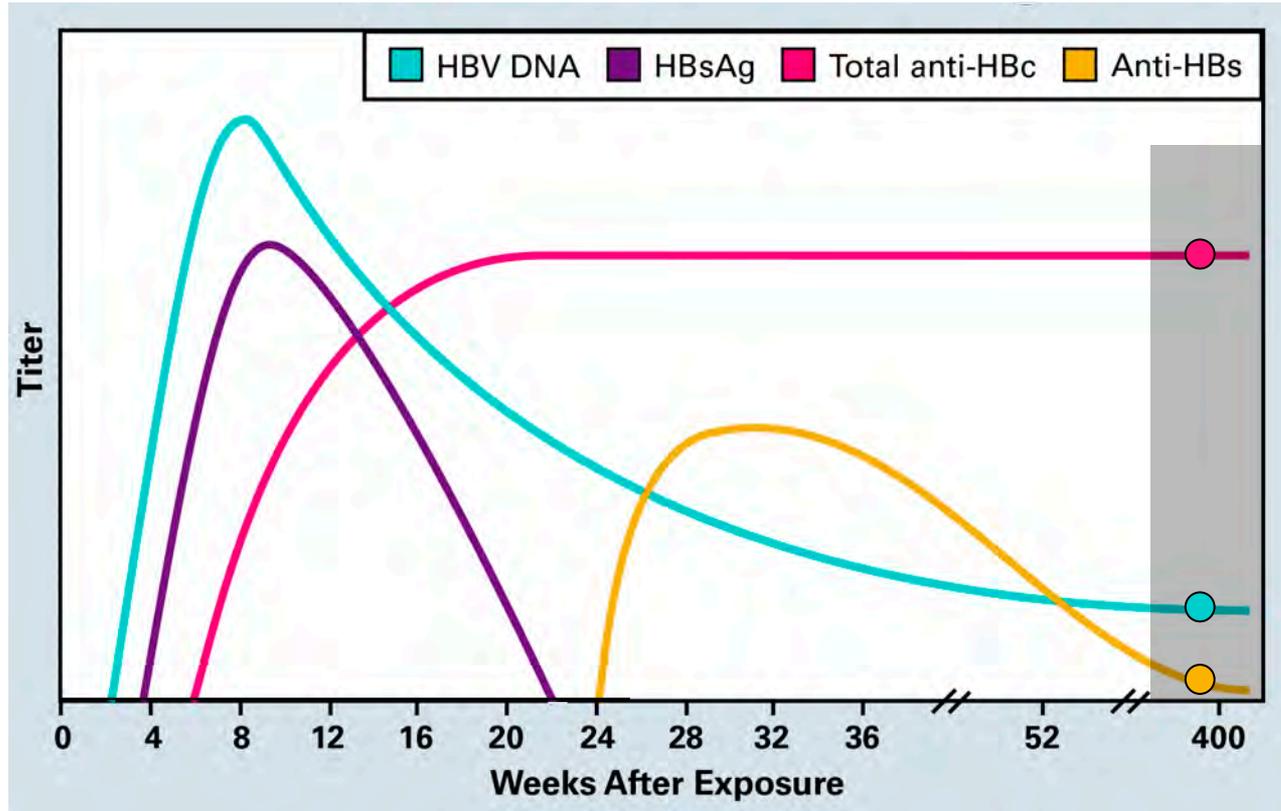
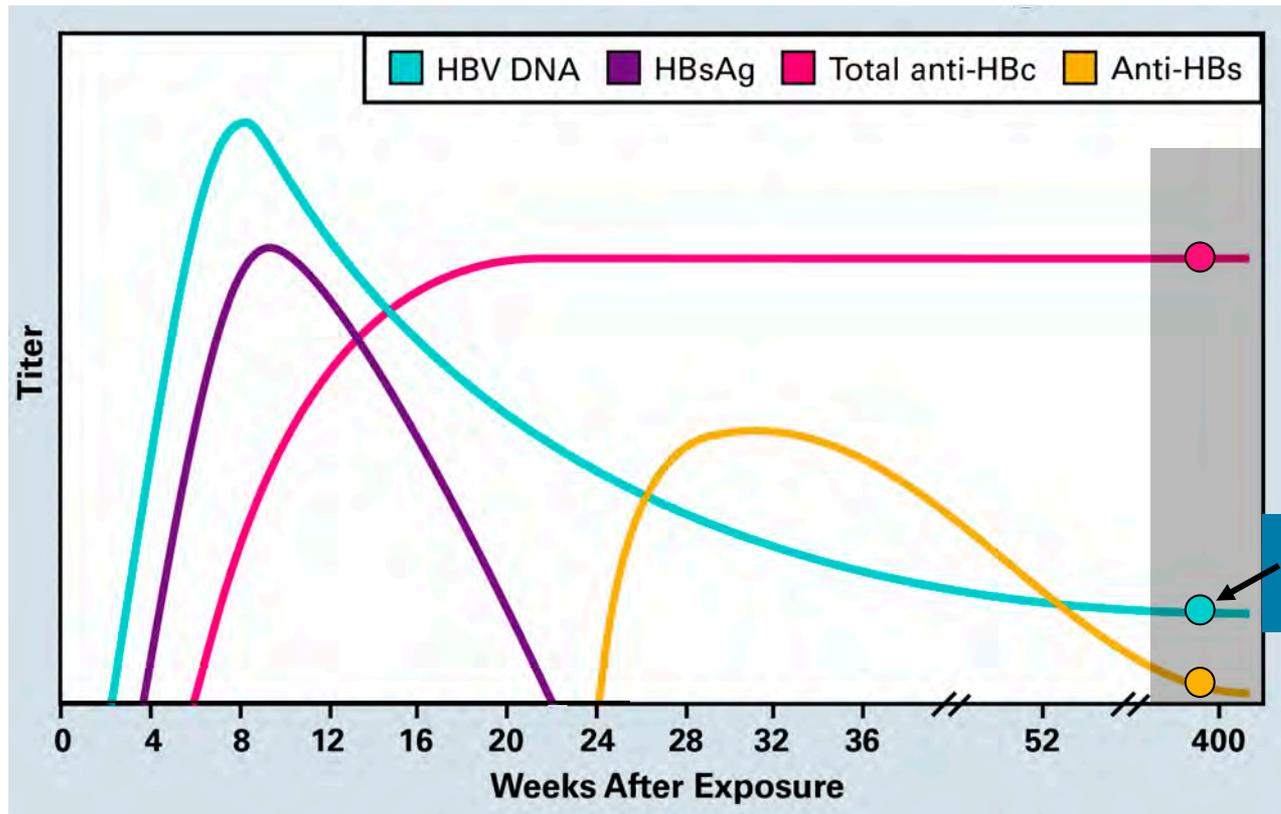


Illustration: David H. Spach, MD and David Ehlert, CMI

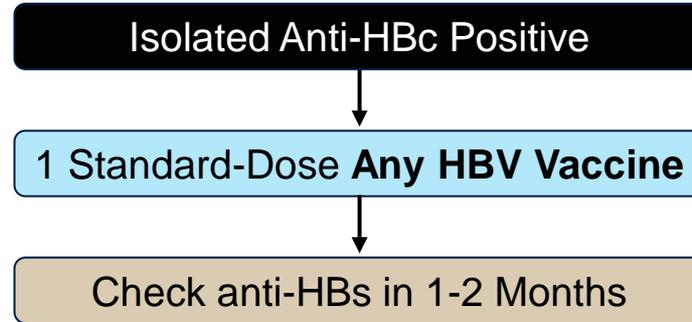
Isolated Anti-HBc

Persistent Low-Level HBV Infection with Non-Detectable HBsAg

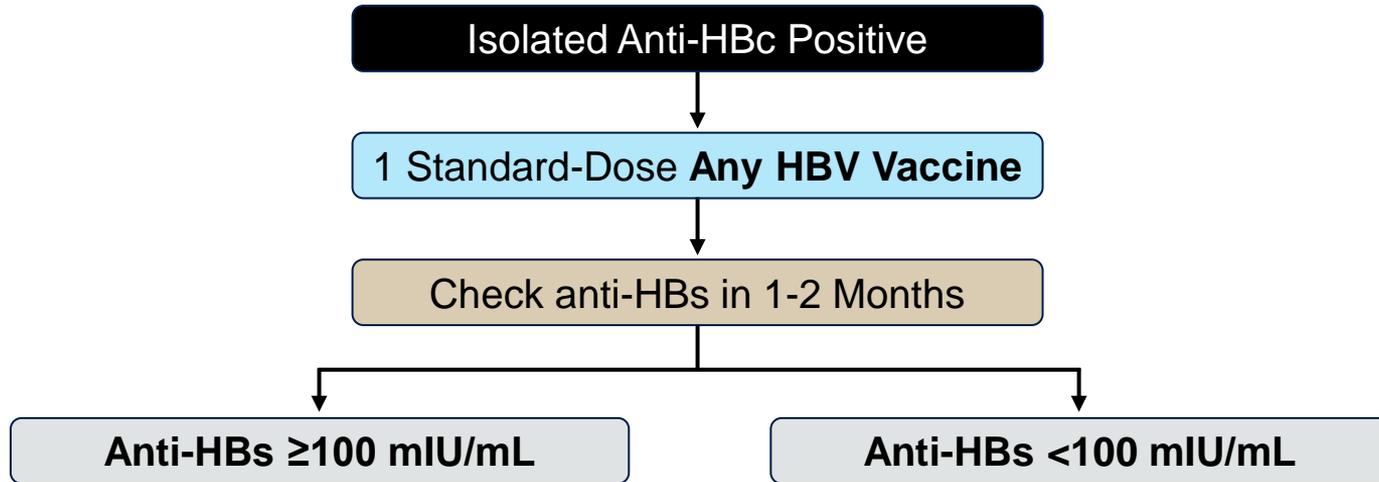


Unlikely Positive if taking TDF-FTC or TAF-FTC

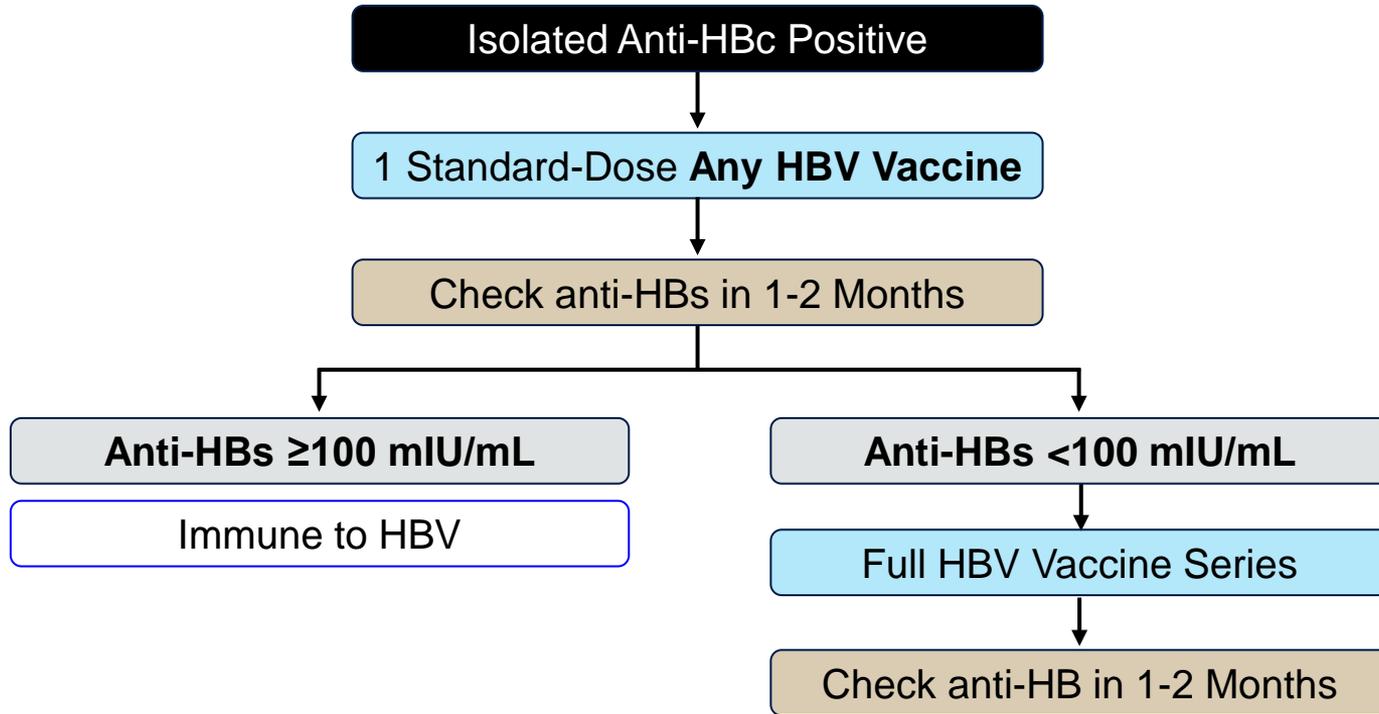
Approach to Isolated Anti-HBc in Persons with HIV



Approach to Isolated Anti-HBc in Persons with HIV



Approach to Isolated Anti-HBc in Persons with HIV



Why is **100 IU/mL** goal with isolated anti-HBc?

Approach to Isolated Anti-HBc in Persons with HIV

- “... **100%** of patients with isolated anti-HBc who achieved a titer of **100 IU/mL** after a booster dose maintained an anti-HBs response for >18 months as compared to **only 23%** of those who achieved a titer of **10 to 100 IU/mL** .”

Piroth L, Launay O, Michel ML, et al. J Infect Dis. 2016;213:1735-42.

Practical Approach to Isolated Anti-HBc in Persons with HIV

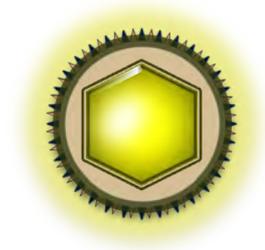
Speaker
Opinion

Isolated Anti-HBc Positive



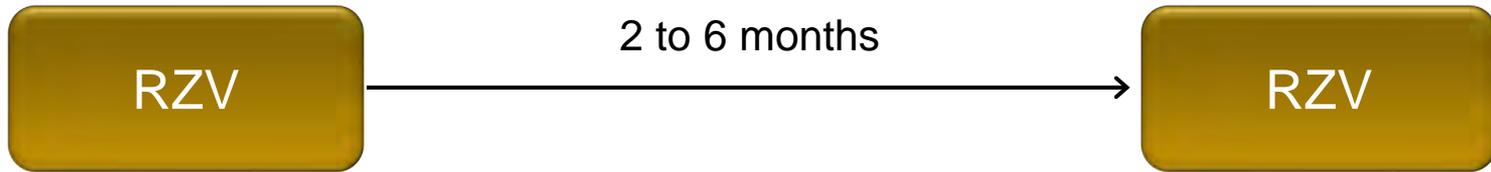
2 Doses Heplisav-B

Zoster Vaccine



Recombinant Zoster Vaccine (RZV) in Persons with HIV

Zoster Vaccine in Persons with HIV



Give 2 Doses to Persons with HIV **Age ≥18 Years**

Give Regardless of:

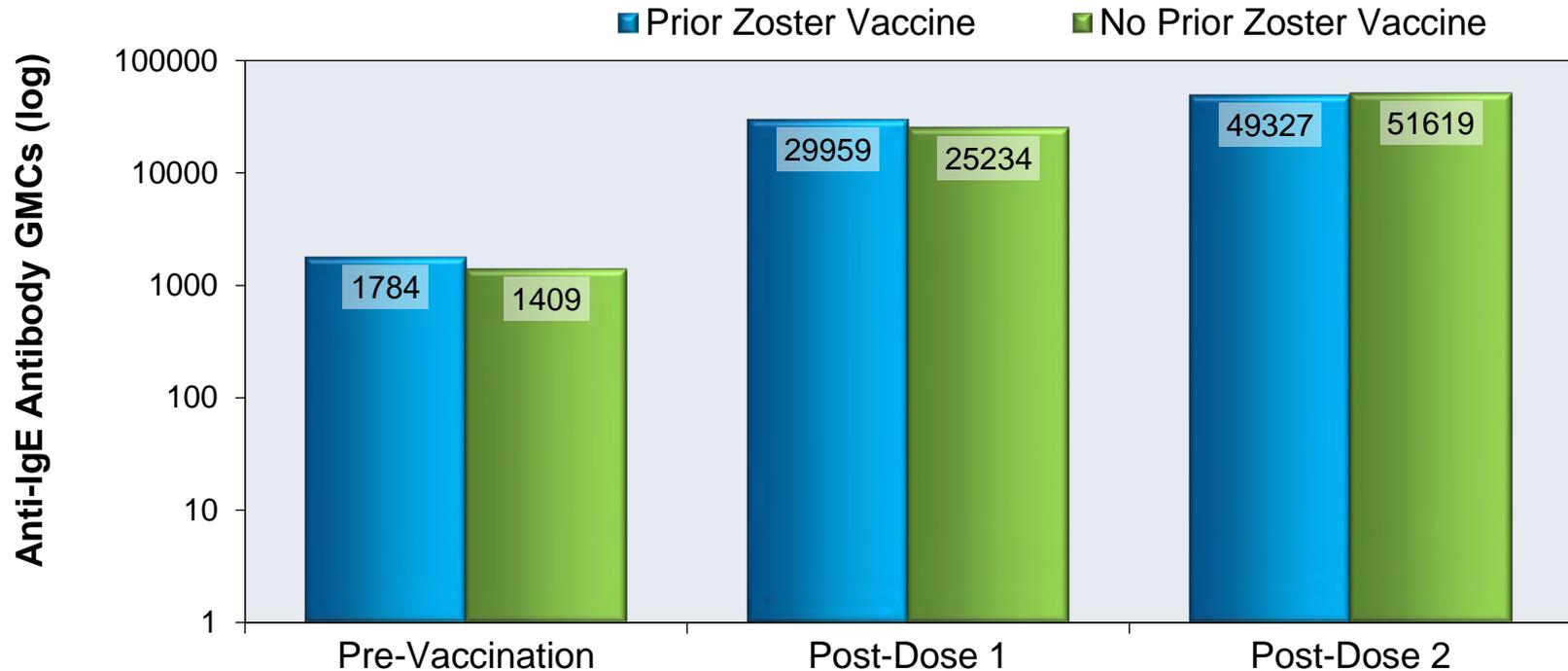
- Past episode of zoster
- Prior receipt of ZVL (*Zostavax*)
- CD4 cell count

Defer/Delay if:

- Acute episode of zoster

Immunogenicity and Safety of RZV (*Shingrex*) in Adults Previously Vaccinated with ZVL (*Zostavax*)

Zoster-048 Trial: Immunogenicity after 2 Vaccine Doses



MIND & MOOD

Can a routine vaccine prevent dementia?

Shingles vaccination may come with unexpected benefits.

April 29, 2025

By **Robert H. Shmerling, MD**, Senior Faculty Editor, Harvard Health Publishing; Editorial Advisory Board Member, Harvard Health Publishing

SHARE    

PRINT THIS PAGE 



ID Topics  Practice Resources  Education & Training  Policy & 

Shingles Vaccine Lowers Risk of Dementia, Major Cardiovascular Events

 Last Updated
October 19, 2025

Explore content  About the journal  Publish with us 

[nature](#) > [nature medicine](#) > [brief communications](#) > article

Brief Communication [Open access](#) Published: 25 July 2024

The recombinant shingles vaccine is associated with lower risk of dementia

[Maxime Taquet](#) , [Quentin Dercon](#), [John A. Todd](#) & [Paul J. Harrison](#) 

[Nature Medicine](#) 30, 2777–2781 | 

223k Accesses | 81 Citation:



For those living with dementia, new study suggests shingles vaccine could slow the disease

By [Nina Bai](#)

A new analysis of a vaccination program in Wales found that the shingles vaccine not only appeared to lower new dementia diagnoses by 20%, it also helped those who already have the disease.

Vaccines | April 02, 2025 | Updated on December 02, 2025

Recombinant Zoster Vaccine (RZV) in PWH: 2 Questions

1. Would you recommend zoster vaccine for a 30-year-old with HIV and CD4 count >500 cells/mm³ who received varicella vaccine as a child? They have no h/o chickenpox or zoster.

Recombinant Zoster Vaccine (RZV) in PWH

1. Would you recommend zoster vaccine for a 28-year-old with HIV and CD4 count >500 cells/mm³ who received varicella vaccine as a child? They have no h/o chickenpox or zoster.
Yes, some risk of zoster, but probably less than people who had chickenpox)

Recombinant Zoster Vaccine (RZV) in PWH: 2 Questions

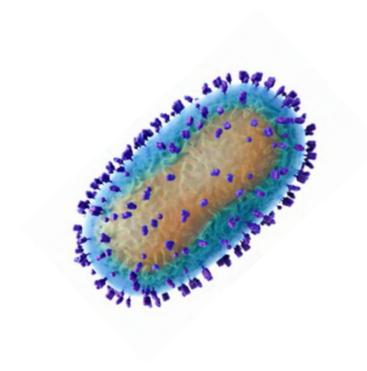
2. Would you recommend zoster vaccine for a 35-year-old with HIV and CD4 count >500 cells/mm³ who has **NOT** had varicella vaccine, chickenpox, or zoster? Varicella titers are **negative**.

Recombinant Zoster Vaccine (RZV) in PWH: 2 Questions

2. Would you recommend zoster vaccine for 30-year-old with HIV and CD4 count >500 cells/mm³ who has not had varicella vaccine, chickenpox, or zoster? Varicella titers are negative.

No. Would give varicella vaccine—2 doses ≥ 3 months apart

Mpox Vaccine



Is JYNNEOS vaccine contraindicated
if CD4 count <200 cells/mm³?

Mpox Vaccines or People with HIV



MVA (*JYNNEOS*)

Live, Attenuated,
Nonreplicating Vaccine

Safe regardless of CD4 cell count



ACAM2000

Live, Attenuated,
Replicating Vaccine

Contraindicated in People with HIV

Adult Opportunistic Infections Guidelines

Mpox Vaccine (JYNNEOS)

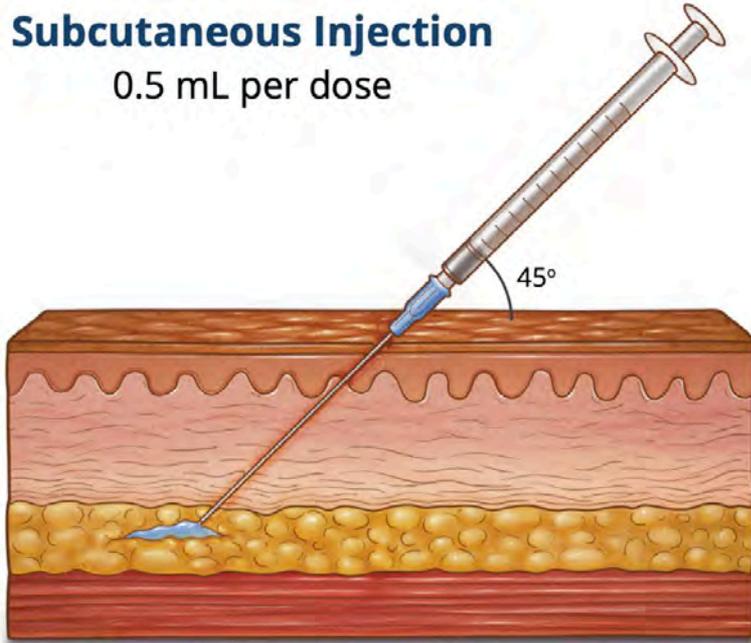


Efficacy = 66-89% with 2 doses

Mpox Vaccine (JYNNEO) Delivery

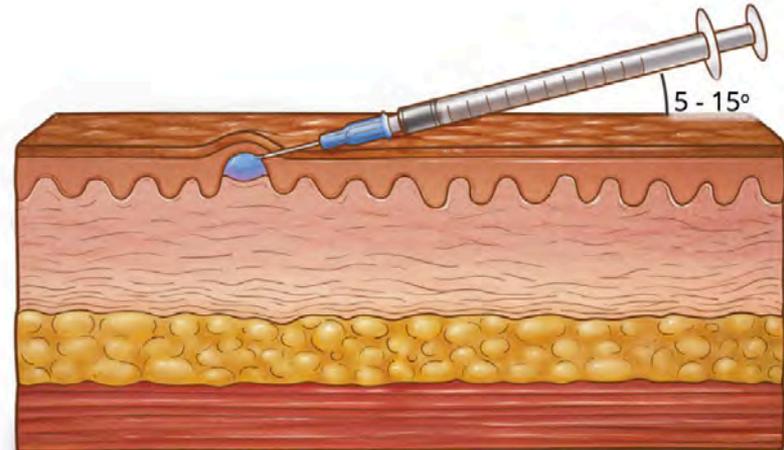
Subcutaneous Injection

0.5 mL per dose



Intradermal Injection

0.1 mL per dose



For persons Age ≥ 18 Years

Mpox JYNNEOS Vaccination: 3 Questions

1. In U.S, is JYNNEOS recommended for someone who was previously diagnosed with mpox?
2. In U.S, are JYNNEOS booster doses recommended?

Mpox JYNNEOS Vaccination

1. In U.S, is JYNNEOS recommended for someone who was previously diagnosed with mpox?

NO

2. In U.S, are JYNNEOS booster doses recommended?

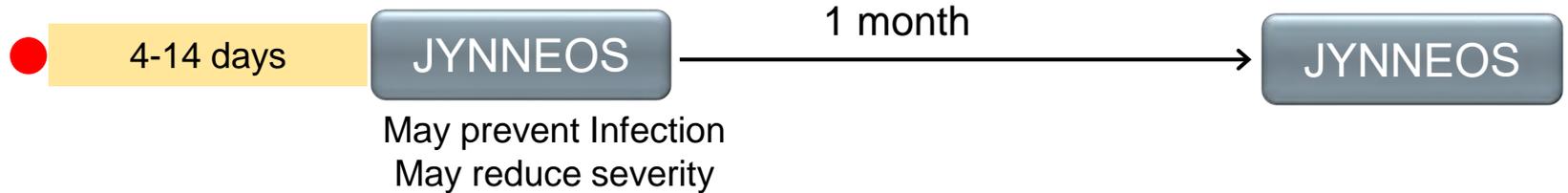
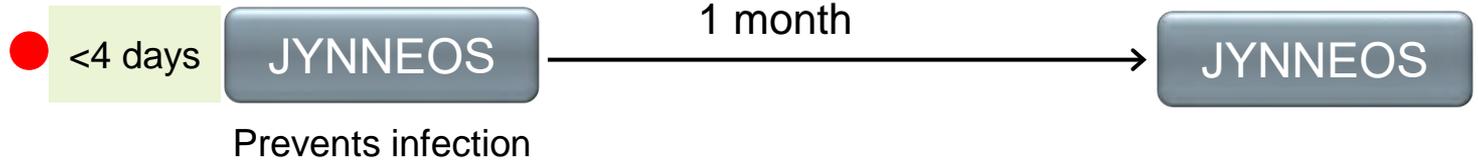
NO (not at this time based on recommendations)

Can you use *JYNNEOS* Mpox vaccine as postexposure prophylaxis to a nonimmune person?

Mpox Postexposure Prophylaxis

● Exposure

Mpox Postexposure Prophylaxis



Dosing: 0.5 mL subcutaneous or 0.1 mL intradermal

RSV Vaccine

RSV Vaccines

- **RSVPreF3 (Arexvy)**
 - Adjuvanted prefusion F protein subunit vaccine
 - Administer single dose
- **RSVPreF (Abrysvo)**
 - Bivalent prefusion F protein subunit vaccine
 - Administer single dose
- **mRNA-1345 (mRESVIA)**
 - Encodes for prefusion F protein
 - Administer single dose

- Age ≥ 60 years
- Age 50-59 years and increased risk of LRTD caused by RSV

- Age ≥ 60 years
- Age 18-59 years and increased risk of LRTD caused by RSV
- Pregnancy (weeks 32-36)

- Age ≥ 60 years
- Age 18-59 years and increased risk of LRTD caused by RSV

LRTD = lower respiratory tract disease

**What is recommended for RSV vaccine
in people with HIV?**

RSV Vaccine Recommendations in Adults with HIV

- **Age >75 Years**
- **Age 60-74 Years AND**
 - CD4 count ≤ 200 cells/mm
 - or*
 - Comorbid medical condition that increases risk of severe RSV
- **Pregnant Women**
 - Administer at gestation week 32-36 if during September through January

Live Vaccines

Live Vaccines Contraindicated in Adults with HIV

- **Contraindicated if CD4 <200 cells/mm³**
 - Varicella/Chickenpox Vaccine (*Varivax*)
 - MMR/MMRV Vaccines
 - Yellow Fever Vaccine
- **Contraindicated in All People with HIV**
 - Live Attenuated Influenza Vaccine (*Flumist*)
 - Vaccinia/Smallpox Vaccine (ACAM 2000)
 - Live Oral Polio Vaccine (not available in US)
 - Live Attenuated Oral Typhoid/Ty21a (*Vivotif*)

Immunizations in People with HIV: Challenges

- Prioritizing multiple vaccines
- Keeping up with frequent changes in recommendations
- Obtaining records of immunization for new patients
- Vaccine hesitancy

Recommended Immunization Schedule for Adults and Adolescents with HIV

Vaccine	All People with HIV	Where Varies by Age	Where Varies by Pregnancy Status	Where Varies by CD4 Cell Count (cells/mm ³)	
				<200	≥200
COVID-19	For current COVID-19 vaccination recommendations, please visit the CDC's COVID-19 Vaccines website.			Recommendations differ with advanced or untreated HIV infection	
Hepatitis A (HepA, HepA-HepB)	Two to three doses (varies by formulation)				
Hepatitis B (HepB, HepB, HepA-HepB)	Two to three doses (varies by formulation and indication)				
Human Papillomavirus (HPV)		Three doses for ages 18–26 years Consider for ages 27–45 years with shared decision-making	Not recommended during pregnancy		
Influenza (Multiple Vaccines)	One dose annually				
Measles, Mumps, Rubella (MMR)			Not recommended during pregnancy	Contraindicated	Two doses if born after 1956 and no history of vaccination or positive antibody titer
Meningococcal A,C,IVY Conjugate (MenACWY)	Three doses				
Meningococcal B (MenB)	Three doses		Not recommended during pregnancy		
Mpox (MVA-BN, Attenuated)	Two doses	Subcutaneous route preferred for people aged <18 years	Shared decision-making		
Pneumococcal Conjugate (PCV15, PCV20, PCV21)	One dose				

Recommended Adult Immunization Schedule by Medical Condition and Other Factors

Vaccine Preventable Infection	Indication	Recommendations	Additional Comments	ACIP Recommendations
COVID-19	All people regardless of CD4 count or viral load (AII)	People with HIV should receive a complete COVID-19 vaccine series regardless of their CD4 count or HIV viral load or their pregnancy or breastfeeding status (AII).	People with advanced or untreated HIV are considered moderately or severely immunocompromised and may get a second dose of the updated vaccine at least 8 weeks after the first (AII).	No difference in recommendations
Hepatitis A Virus (HAV)	HAV nonimmune (AII) Post exposure prophylaxis	Two-dose series of either single-antigen vaccine: • Havrix: 1.0 mL IM (0, 6–12 months) (AII); or • Vaxta: 1.0 mL IM (0, 6–18 months) (AII) Alternative for individuals susceptible to both HAV and HBV: • Twinrix: 1.0 mL IM in three-dose series (0, 1, 6 months) (AII) Administer HAV vaccine and HepA IgG (0.1 mg/kg) simultaneously in different anatomical sites as soon as possible within 2 weeks of exposure to HMV to people who are nonimmune. Complete the HAV vaccine series following the dosing intervals for the selected vaccine.	Assess total antibody response (IgG and IgM) 4 weeks after completion of the series, and if negative, revaccinate, preferably after the CD4 count is >200 cells/mm ³ (BII). For travelers, some clinicians recommend: • Twinrix four-dose series (0, 7, 21–30 days, 12 months) (BII) One study showed lower seroresponse to Hep A vaccine when co-administered with pneumococcal conjugate vaccine. For patients who need both, clinicians may choose to separate by 1 month.	No difference in recommendations
Hepatitis B Virus (HBV)	HBV nonimmune and no active HBV (i.e., negative for HBeAg, anti-HBe, and anti-HBc)	Preferred: • Hepatitis B IM at 0 and 4 weeks (AII) Alternative (if Hepatitis B is unavailable): • Engerix-B (40 mcg): three-dose series (0, 1, 6 months) (AII); or	Anti-HBs should be obtained 4 weeks after completion of the vaccine series to document response to HepB vaccination, defined as anti-HBs ≥10 mIU/mL (AII). Vaccinate individuals with isolated anti-HBc with one standard dose with or without four doses.	ACIP does not recommend the use of double-dose Engerix-B or Recombivax HB high-dose for people with HIV. ACIP includes a four-dose series of Engerix-B 40 mcg at 0, 1, 2, and 6 months. This series is not

OI Guidelines Summary Tables

<https://clinicalinfo.hiv.gov/en/guidelines>



Acknowledgment

This Mountain West AIDS Education and Training (MWAETC) program is supported by the Health Resources and Services Administration (HRSA) of the U.S. Department of Health and Human Services (HHS) as part of award totaling \$2,820,772 with 0% financed with non-governmental sources.

The content in this presentation are those of the author(s) and do not necessarily represent the official views of, nor an endorsement, by HRSA, HHS, or the U.S. Government.



Questions?