HIV 2024 Update

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Disclosures

Dr. Spach has no financial disclosures.

NOTE: vaccines do NOT have generic names so trade names are used in the vaccine section to effectively communicate about different vaccines.
Outline

• Antiretroviral Therapy Recommendations
• 2-Drug Antiretroviral Medications
• Immunization Update
• Treatment of HCV in People with HIV
• Recognition of Skin and Oral Lesions
Antiretroviral Therapy Recommendations
A 31-year-old woman is newly diagnosed with HIV 2 days ago. She was taking TDF-FTC for HIV PrEP (off and on) for the past 18 months. The plan is to start antiretroviral therapy now.

What antiretroviral regimens would be recommended in this situation?
Initial Antiretroviral Therapy

No Prior Cabotegravir

- Order Standard Genotype
- Start INSTI-Based Regimen

Prior Cabotegravir

- Order Standard and Integrase Genotype
- Start PI-Boosted Regimen (pending genotype)
- Start INSTI-Based Regimen (after genotype)

Source: HHS Guidelines for Use of Antiretroviral Agents in Adults and Adolescents with HIV. Sept 21, 2022.
No Prior Injectable Cabotegravir for HIV PrEP

**Anchor Drug**

- INSTI

**Backbone**

- 2 NRTIs
- OR
- 1 NRTI

Source: HHS Antiretroviral Therapy Guidelines (June 3, 221). Clinical Info (clinicalinfo.hiv.gov)
## No History of Taking Injectable Cabotegravir for HIV PrEP

<table>
<thead>
<tr>
<th>INSTI + 2NRTIs</th>
<th>Abbreviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bictegravir-tenofovir alafenamide-emtricitabine</td>
<td>BIC-TAF-FTC</td>
</tr>
<tr>
<td>Dolutegravir-abacavir-lamivudine <em>(if HLA-B</em>5701 negative and no HBV)*</td>
<td>DTG-ABC-3TC</td>
</tr>
<tr>
<td>Dolutegravir + Tenofovir alafenamide-emtricitabine</td>
<td>DTG + TAF-FTC</td>
</tr>
<tr>
<td>Dolutegravir + [Tenofovir DF-emtricitabine <em>or</em> Tenofovir DF-lamivudine]</td>
<td>DTG + [TDF-FTC <em>or</em> TDF-3TC]</td>
</tr>
</tbody>
</table>

<table>
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<tr>
<th>INSTI + 1NRTI</th>
<th>Abbreviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dolutegravir-lamivudine <em>(except: HIV &gt;500,000 copies/mL, HBV, no genotype)</em></td>
<td>DTG-3TC</td>
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</tbody>
</table>

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<th>No History of Taking Injectable Cabotegravir for HIV PrEP</th>
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Potency and Genetic Barrier to Resistance

Two-Drug Regimens
FDA-Approved Antiretroviral 2-Drug Regimens

- **Initial Therapy**
  - Dolutegravir-lamivudine

- **Maintenance Therapy**
  - Dolutegravir-lamivudine
  - Dolutegravir-rilpivirine
  - Cabotegravir-rilpivirine (long-acting injectable)
Dolutegravir-Lamivudine
2-Drug Initial Antiretroviral Therapy

Initial 2-Drug Therapy
Dolutegravir-Lamivudine

- HIV RNA <500,00 copies/mL
- HBsAg negative
- Results from genotype known
Dolutegravir-Lamivudine 2-Drug Maintenance Antiretroviral Therapy

<table>
<thead>
<tr>
<th>Antiretroviral Therapy (3-Drug Therapy)</th>
<th>Dolutegravir-Lamivudine Maintenance (2-Drug Therapy)</th>
</tr>
</thead>
<tbody>
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</tr>
</tbody>
</table>

- HIV RNA <50 copies/mL on stable regimen
- No prior virologic failure
- No resistance to either maintenance drug
- HBsAg negative
Dolutegravir-Rilpivirine 2-Drug Maintenance Antiretroviral Therapy

Antiretroviral Therapy (3-Drug Therapy) | Dolutegravir-Rilpivirine Maintenance (2-Drug Therapy)

- HIV RNA <50 copies/mL for ≥6 months
- No prior virologic failure
- No resistance to either maintenance drug
- HBsAg negative
<table>
<thead>
<tr>
<th>Antiretroviral Therapy (3-Drug Therapy)</th>
<th>Cabotegravir plus Rilpivirine Maintenance (2-Drug Therapy given every 1-2 months)</th>
</tr>
</thead>
</table>

- HIV RNA <50 copies/mL on stable regimen
- No prior virologic failure
- No resistance to either drug
- HBsAg negative
Cabotegravir and Rilpivirine
Oral and Injectable Preparations

Optional Lead-In Oral Components

Cabotegravir + Rilpivirine
30 mg
25 mg
INSTI
NNRTI

Intramuscular Injection Components

Cabotegravir + Rilpivirine
200 mg/mL
300 mg/mL
INSTI
NNRTI

Source: Cabotegravir-Rilpivirine Prescribing Information
Cabotegravir plus Rilpivirine Long-Acting Injections

Preferred Injection Site (Ventrogluteal)

- Injection site: Gluteus medius m.
- Anterior superior iliac spine
- Greater trochanter of femur

Longer needle (not included in the dosing kit) may be required for people with higher BMI (example: >30 kg/m²)
Alternative Injection Site (Dorsoglabuteal)

- Iliac crest
- Injection site: Upper outside quadrant
- Posterior superior iliac spine
- Greater trochanter of the femur
- Sciatic n.

- Injection site: superior and lateral to the line
- Posterior superior iliac spine
- Greater trochanter of the femur

Longer needle (not included in the dosing kit) may be required for people with higher BMI (example: >30 kg/m²)
Vaccine Updates
CDC advisers vote to recommend routine use of the mpox vaccine to protect people at high risk of infection

By Brenda Goodman, CNN

October 26, 2023
Monkeypox / Smallpox Vaccines in United States

**JYNNEOS**

Live, Attenuated, **Nonreplicating** Vaccine

**ACAM2000**

Live, Attenuated, **Replicating** Vaccine
Vaccination with JYNNEOS is considered safe for people with HIV

Mpx Vaccine (JYNNEOS) Delivery

Subcutaneous Injection
0.5 mL per dose

Intradermal Injection
0.1 mL per dose

Pneumococcal Immunization
Pneumococcal Vaccines

Polysaccharide Vaccine

PPSV23 (*Pneumovax* 23)

Conjugate Vaccines

PCV13 (*Prevnar*-13)
PCV15 (*Vaxneuvance*)
PCV20 (*Prevnar*-20)
Pneumococcal Immunization in Adults with HIV

Pneumococcal Vaccine-Naïve Adults

**PCV20** *(Prevnar 20)*

Optionally, PCV15 *(Vaxneuvance)* can be used in conjunction with PCV20, with a minimum of 8 weeks between doses.

PPSV23* *(Pneumovax)* can be given if CD4 count <200 cells/mm³ *(CIII)*, but preferably deferred until CD4 count >200 cells/mm³ while on ART *(BIII)*.

What do you do if a person with HIV has already started the Pneumococcal Series?
Prior Receipt of PCV13 without Completing Vaccine Schedule

PCV13 → PPSV23
- ≥ 1 Year
- ≥ 8 weeks

PCV20 → PPSV23
- ≥ 5 years

PCV20 → PPSV23
- ≥ 5 years

PCV20 → PPSV23
- ≥ 5 years

PCV20
- ≥ 5 years

≥ Age 65

Prior Receipt of PCV13 without Completing Vaccine Schedule

- PCV13
  - ≥ 8 weeks
- PPSV23
  - ≥ 5 years
- PPSV23
  - ≥ 5 years
- PPSV23

Complete OLD Schedule

Meningococcal Vaccines
Quadrivalent Meningococcal Vaccine Dosing Schedule

- Which one of the following is the recommended dosing schedule for the quadrivalent conjugate meningococcal vaccine in people with HIV?

1. Give 1 dose now and give one booster dose in 5 years
2. Give 1 dose now and give booster doses every 5 years
3. Given 2 doses now ≥8 weeks apart and give booster doses every 5 years
Which one of the following is the recommended dosing schedule for the quadrivalent conjugate meningococcal vaccine in people with HIV?

<table>
<thead>
<tr>
<th>Percentage</th>
<th>Schedule</th>
</tr>
</thead>
<tbody>
<tr>
<td>50%</td>
<td>Give 1 dose now and give one booster dose in 5 years</td>
</tr>
<tr>
<td>50%</td>
<td>Give 1 dose now and give booster doses every 5 years</td>
</tr>
<tr>
<td></td>
<td>Given 2 doses now ≥8 weeks apart and give booster doses every 5 years</td>
</tr>
</tbody>
</table>
Quadrivalent Meningococcal Conjugate (MenACWY) Vaccine in Adults

Primary Vaccination (2 Doses) | Boosters (repeat every 5 years)

MenACWY ≥ 8 wks → MenACWY 5 Years → MenACWY 5 Years → MenACWY 5 Years

Meningococcal Vaccines

- **Meningococcal Conjugate Quadrivalent Vaccines**
  - MenACWY-CRM (*Menveo*)
  - MenACWY-TT (*MenQuadfi*)
  - MenACWY-D (*Menatra*) [Discontinued]

- **Meningococcal B Vaccines**
  - MenB-4C (*Bexero*)
  - MenB-FHbp (*Trumemba*)

- **Meningococcal Pentavalent Vaccine**
  - MenABCWY (*Penbraya*)
Conjugate Quadrivalent Meningococcal Vaccines

Illustration: David H. Spach, MD

A

B

C

W-135

Y

Poor immunogenicity
Mimics human neural tissue

Polysaccharide capsule
Conjugate Protein

Menveo
MenQuadfi
Pentavalent Meningococcal Vaccine (*Penbraya*)

- **A**: Polysaccharide capsule
- **B**: Tetanus toxoid protein
- **C**: Factor H binding protein (fHbp)
- **W-135**: Polysaccharide capsule
- **Y**: Tetanus toxoid protein

*Penbraya*
Hepatitis B Vaccines
Hepatitis B Virus Surface Antigen Proteins

- PreS1 protein
- PreS2 protein
- S protein

Illustration: Peter E. Harrison, MPH and David H. Spach, MD
Recombinant Hepatitis B Vaccine

**Old (Single Antigen)**
- Aluminum Adjuvant
- HbsAg
- rHBsAg *(Recombivax)*
- rHBsAg *(Engerix-B)*

**Newer (Single Antigen)**
- CpG1018 Adjuvant
- HbsAg
- HBsAg-CpG1018 *(Heplisav-B)*

**New (Triple Antigen)**
- Aluminum Adjuvant
- HbsAg
- pre S1
- pre S2
- 3-AgHB *(PreHevbrio)*

Illustration: David H. Spach, MD
Hepatitis B Vaccine: Question

- For initial hepatitis B immunization in persons with HIV, which one of the following hepatitis B vaccines has the highest (most preferred) rating in the 2023 Opportunistic Infections Guidelines?

1. Three doses of “standard-dose” Engerix-B vaccine
2. Two doses of “standard-dose” Heplisav B vaccine
3. Four doses of “double-dose” Recombivax-B vaccine
**Hepatitis B Vaccine Question**

For initial hep B immunization in PWH which one of the following hep B vaccines has the highest rating in the 2023 Opp Infections Guidelines?

<table>
<thead>
<tr>
<th>Three doses of “standard-dose” Engerix-B vaccine</th>
<th>Two doses of “standard-dose” Heplisav B vaccine</th>
<th>Four doses of “double-dose” Recombivax- B vaccine</th>
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Hepatitis B Immunization In Persons with HIV

**Engerix-B**
- (40 μg HBsAg/dose)
- Month 0: 1st dose
  - Month 1: 2nd dose
  - Month 3: 3rd dose
- **DD** = double dose

**Recombivax-HB**
- (20 μg HBsAg/dose)
- Month 0: 1st dose
  - Month 1: 2nd dose
  - Month 3: 3rd dose
- **DD** = double dose

**Heplisav-B**
- (20 μg HBsAg/dose)
- Month 0: 1st dose
  - Month 2: 2nd dose
- **SD** = standard dose

**Source:** Opportunistic Infections Guidelines. September 7, 2023.
## Hepatitis B Immunization In Persons with HIV

<table>
<thead>
<tr>
<th>Month</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>DD</td>
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<td>All</td>
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<tr>
<td><em>Twinrix</em>&lt;sup&gt;*&lt;/sup&gt;</td>
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<td>All</td>
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<td>SD</td>
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<td>All</td>
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</tbody>
</table>

**DD** = double dose; **SD** = standard dose

*Combined hepatitis A and B vaccine, with same components used in Havrix (HAV vaccine) and Engerix-B (Hepatitis B vaccine)

Why is HBsAg-CpG1018 (*Heplisav-B*) now a recommended vaccine for people with HIV?
Heplisav-B Vaccine in HBV Vaccine-naive 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)
- Negative HBsAg, anti-HBs, and anti-HBc
- Not pregnant

**Arm A (Vaccine Non-Responders)**
- Serum Hep B sAb <10 mIU/mL
- HBV vaccination (>168 days prior)

**Arm B (Vaccine Naïve)**
- Hep B sAb negative (<45 days)

*96% with HIV RNA <60 copies/mL

Heplisav-B Vaccine in HBV Vaccine-naive People With HIV ACTG 5379 (BEe-HIVe): Study Design

<table>
<thead>
<tr>
<th>Week</th>
<th>0</th>
<th>4</th>
<th>8</th>
<th>12</th>
<th>16</th>
<th>20</th>
<th>24</th>
<th>28</th>
<th>72</th>
</tr>
</thead>
</table>

HepB-CpG Doses

1 2 3 SPR

Delay in vaccination administration up to 4 weeks permitted

68 of 74 PWH* in Arm B completed 3 doses of HepB-CpG vaccine and had an HBsAb measurement

SPR = seroprotective response

**Heplisav-B Vaccine in HBV Vaccine-naive People With HIV ACTG 5379 (BEe-HIVe): Seroprotection Response by Study Week**

- **HepB-CpG Doses**: 1, 2, 3

<table>
<thead>
<tr>
<th>Study Week</th>
<th>Percentage of Patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Entry</td>
<td>0%</td>
</tr>
<tr>
<td>Week 4</td>
<td>30.2%</td>
</tr>
<tr>
<td>Week 8</td>
<td>87.0%</td>
</tr>
<tr>
<td>Week 12</td>
<td>94.5%</td>
</tr>
<tr>
<td>Week 24</td>
<td>98.5% (Star)</td>
</tr>
<tr>
<td>Week 28</td>
<td>100%</td>
</tr>
</tbody>
</table>

What do you do if a person with HIV does not respond to a HBV vaccine series with *Recombivax* or *Engerix B*?
**Adult Opportunistic Infections Guidelines**

**Recommendations for Hepatitis B Vaccine Non-Responders In Persons with HIV**

*If CD4 count <200 cells/mm³ at first vaccine series, some experts would delay revaccination until CD4 count ≥200 cells/mm³*

**Source:** Opportunistic Infections Guidelines. September 7, 2023.
Heplisav-B Vaccine in HBV Vaccine-naive People With HIV ACTG 5379 (BEe-HIVe): Study Design

**Entry Criteria Arm A and B**
- Person with HIV age 18-70 years
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- CD4 >100 cells/mm³ (median 625)
- Negative HBsAg, anti-HBs, and anti-HBc
- Not pregnant

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- HBV vaccination (>168 days prior)

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- Hep B sAb negative (<45 days)

*96% with HIV RNA <60 copies/mL

**Data not yet published**

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<th>Arm A: HBV Vaccine Non-Responders</th>
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<tbody>
<tr>
<td>HepB (CpG)</td>
</tr>
<tr>
<td>HepB (CpG)</td>
</tr>
<tr>
<td>HepB (Eng-B)</td>
</tr>
</tbody>
</table>

Arm B: HBV Vaccine Naïve

| HepB (CpG) | 3 doses: 0, 4, and 24 weeks |

Zoster Vaccine
Zoster Vaccines

Zoster Vaccine Live (ZVL): Zostavax

Recombinant Zoster Vaccine (RZV): Shingrix

Attenuated VZV

Discontinued November 2020

Varicella-Zoster Virus

Glycoprotein E

AS01B Adjuvant
Recombinant Zoster Vaccine (RZV) in Persons with HIV

Give 2 Doses to Persons with HIV Age ≥18 Years

2 to 6 months
HHS Opportunistic Infections Guidelines

Recombinant Zoster Vaccine (RZV) 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

Avoid if:
- Acute episode of zoster
Treatment of Hepatitis C with HIV Coinfection
A 41-Year-Old with HIV and HCV Coinfection

• A 41-year-old cisgender man who has sex with men has HIV and has been taking dolutegravir plus TAF-FTC for 2 years and he consistently has suppressed HIV RNA levels and most recent a CD4 count of 562 cells/mm³.

• Testing for HCV at a regular clinic visit shows a new positive HCV antibody test and a positive quantitative HCV RNA 920,000 IU/mL. He had a negative HCV antibody test 2 years prior.

• Additional Labs
  – HBsAg (negative); HBsAb (positive)
  – CBC normal; INR normal; PLT normal; AST and ALT slightly elevated
A 41-Year-Old with HIV and HCV Coinfection

- You are planning to treat the HCV as soon as possible.
- What should you do next?
FIB-4: Laboratory Assessment for Cirrhosis

**Normal Liver**

**Cirrhosis**

\[ \text{Fib-4} > 3.25 \]

**Fibrosis-4 (FIB-4) Calculator**

The Fibrosis-4 score helps to estimate the amount of scarring in the liver. Enter the required values to calculate the FIB-4 value. It will appear in the oval on the far right (highlighted in yellow).

\[
\text{FIB-4} = \frac{\text{Age (years)} \times \text{AST Level (U/L)} \times \sqrt{\text{Platelet Count} \times 10^9/\text{L}}}{\text{ALT (U/L)}}
\]
Fibroscan (Liver Stiffness) Assessment for Cirrhosis

- **Normal Liver**
- **Cirrhosis**

Liver Stiffness

- Fibroscan >12.5
- 7.0
- 9.5
- 12.5
- 75kPa
A 41-Year-Old with HIV and HCV Coinfection

• The Fib-4 and Fibroscan show no evidence of cirrhosis. Can this man with HIV get the HCV “Simplified Treatment”?

1. Yes
2. No
A 41-Year-Old with HIV and HCV Coinfection

The Fib-4 and Fibroscan show no evidence of cirrhosis. Can this man with HIV get the HCV “Simplified Treatment”? 
HHS Opportunistic Infections Guidelines

HCV Simplified Treatment: EXCLUSIONS for People with HIV

- Prior HCV treatment (reinfection after prior cure OK)
- Decompensated cirrhosis
- On Tenofovir DF with eGFR ≤60 mL/min
- On an ART that includes efavirenz, etravirine, or boosted PI
- Untreated chronic HBV infection
- Pregnancy

AASLD/IDSA  Simplified HCV Treatment (without Cirrhosis)

Glecaprevir-Pibrentasvir (Mavyret)
- 3 pills once daily x 8 weeks (with food)
- 8 weeks

Sofosbuvir-Velpatasvir (Epclusa)
- 1 pill once daily x 12 weeks (+/- food)
- 12 weeks
AASLD/IDSA Simplified HCV Treatment (with Cirrhosis)

Glecaprevir-Pibrentasvir (Mavyret)

Sofosbuvir-Velpatasvir (Epclusa)

8 weeks

3 pills once daily x 8 weeks (with food)

ORDER HCV Genotype

Source: AASLD/IDSA Hepatitis C Guidance; OI Guidelines
AASLD/IDSA Simplified HCV Treatment (with Cirrhosis)

Glecaprevir-Pibrentasvir (Mavyret)

- 8 weeks
- 3 pills once daily x 8 weeks (with food)

Sofosbuvir-Velpatasvir (Epclusa)

- HCV GT 1, 2, 4, 5, 6
- 12 weeks
- 1 pill once daily x 12 weeks (+/- food)

HCV GT3

Guided by resistance testing

Source: AASLD/IDSA Hepatitis C Guidance; OI Guidelines
Recognition of Clinical Manifestations of HIV
Clinical Manifestations

- CD4 cell count = 36 cells/mm$^3$
- Not on ART
- “Burn on face”

Diagnosis?
Clinical Manifestations

- CD4 cell count = 56
- Lesions present >3 months
- Just newly diagnosed with HIV
- Not on ART yet

Diagnosis?
Clinical Manifestations

- CD4 count <20
- In hospice care
- Lesions developed over 10-14 days
- Would want to place a gown on before examining this man

Diagnosis?
Treatment?
Clinical Manifestations

- CD4 cell count >700
- Suppressed HIV RNA
- Urgent visit for spider bite
- Temp 38.0°, WBC elevated

Diagnosis?
Clinical Manifestations

IS IT A SPIDER BITE?

IF YOU THINK YOU HAVE A SPIDER BITE, IT MIGHT ACTUALLY BE AN INFECTION THAT NEEDS MEDICAL ATTENTION.

WHEN IN DOUBT, CHECK IT OUT.

www.cdc.gov/mrsa

National HIV Curriculum
Clinical Manifestations

- New lesion on gums
- CD4 count 282 cells/mm$^3$
- Pathogen for this disorder also causes multicentric Castleman’s Disease

Diagnosis?
Clinical Manifestations

- CD4 cell count = 126 86 cells/mm³
- Mouth burns when eating spicy food or drinking orange juice

Diagnosis?
Clinical Manifestations

- CD4 cell count = 86 cells/mm$^3$
- What is the preferred treatment based on OI guidelines

Preferred Treatment?
Questions