Diagnosis and Treatment of Unhealthy Alcohol Use in People with HIV

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Unhealthy alcohol use (UAU) can have a detrimental effect on people’s health and may pose a transmission risk. Rates of alcohol use among people with HIV (PWH) range from 54% to 67%, comparable to people who do not have HIV (53.5%).1,2 Approximately 30% to 50% of PWH who use alcohol suffer from UAU, which leads to reduced adherence to antiretroviral therapy (ART) and is associated with higher rates of condomless sex due to the lessening of inhibitions, the loss of viral suppression, and viral rebound.1-8 Clinicians need to understand how to identify and treat UAU to lessen its impact on the health of PWH. This article discusses UAU among PWH, describes the various forms of UAU, reviews the detrimental effects of alcohol on the health of PWH, and presents treatment options.

Types of Unhealthy Alcohol Use

The National Institute on Alcohol Abuse and Alcoholism (NIAAA) defines UAU as alcohol intake exceeding the recommended daily or weekly limits. Healthy adult men ages 21 to 64 should limit alcohol to four drinks a day or 14 drinks a week; healthy men ages 65 or older should not drink more than three drinks a day or more than seven drinks a week. Healthy adult women of all ages should not consume more than three drinks a day or more than seven drinks a week. Standard...
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Drinking measurements are 12 ounces [oz] of beer, 5 oz of wine, or 1.5 oz of 80-proof liquor (see Figure 1). Alcohol consumption beyond these limits increases the risk of physical, psychological, or social harm.\(^9\)

NIAAA defines binge or heavy drinking as a pattern of imbibing that brings blood alcohol concentration (BAC) levels to 0.08 g/dL, which occurs about two hours after four drinks for women and five drinks for men. The Substance Abuse and Mental Health Services Administration (SAMHSA) defines heavy drinking as five or more occasions in a month when an individual consumes five or more alcoholic drinks.\(^9\)

Alcohol dependence occurs\(^9\) when individuals need to drink significantly more alcohol to get the same effect and experience withdrawal symptoms after stopping alcohol use. Alcohol dependence affects physical and mental health and can cause problems with family, friends, and work (See Table 1).\(^10\)

### Table 1: Alcohol Dependence

<table>
<thead>
<tr>
<th>Criteria</th>
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<tbody>
<tr>
<td>A person endorses at least three of the following criteria within one year</td>
</tr>
<tr>
<td>1. <strong>A strong desire or sense of compulsion to drink alcohol</strong></td>
</tr>
<tr>
<td>2. Difficulties controlling drinking in terms of its onset, termination, or levels of use</td>
</tr>
<tr>
<td>3. <strong>A physiological withdrawal occurs when the person stops or reduces alcohol intake.</strong></td>
</tr>
<tr>
<td>4. The person drinks more to achieve the effects originally produced by lower doses.</td>
</tr>
<tr>
<td>5. Progressive neglect of alternative pleasures or interests and increased amount of time spent to obtain alcohol or to recover from its effects</td>
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<tr>
<td>6. Ongoing alcohol use despite clear evidence of overtly harmful consequences.</td>
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### Table 2: Alcohol Use Disorder

<table>
<thead>
<tr>
<th>Criteria</th>
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<tbody>
<tr>
<td>The patient endorses two or more of the following symptoms in one year.</td>
</tr>
<tr>
<td>1. The patient reports that they drank more or longer than intended.</td>
</tr>
<tr>
<td>2. The patient tried to cut down or stop more than once but could not.</td>
</tr>
<tr>
<td>3. Spends a lot of time drinking, sick from drinking, or recovering from the after-effects.</td>
</tr>
<tr>
<td>4. Reports wanting to drink so badly that they could not think of anything else.</td>
</tr>
<tr>
<td>5. Reports that drinking (or being sick from drinking) interferes with family responsibilities, causes problems at work, or causes problems at school.</td>
</tr>
<tr>
<td>6. The person continues to drink despite trouble with family and friends.</td>
</tr>
<tr>
<td>7. The person has given up or cuts back on important or enjoyable activities to drink.</td>
</tr>
<tr>
<td>8. More than once, the person has gotten into situations while or after drinking that increase the chances of getting hurt (e.g., driving, swimming, unsafe sexual behavior).</td>
</tr>
<tr>
<td>9. Although alcohol made the person depressed or anxious and caused other health problems or blackouts, the individual continued to drink.</td>
</tr>
<tr>
<td>10. Reports increased drinking to get the desired effect or finding that the usual number of drinks had much less impact than previously.</td>
</tr>
<tr>
<td>11. The person experiences withdrawal symptoms after the effects of alcohol wear off, such as insomnia, tremors, restlessness, nausea, sweating, racing heart, or seizure.</td>
</tr>
<tr>
<td>2-3 symptoms indicate mild AUD, 4-5 are moderate AUD, and 6 or more symptoms indicate severe AUD.</td>
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**Consequences of Unhealthy Alcohol Use in PWH**

Although there is no direct causal relationship, UAU is linked to poorer ART adherence and less health care use.\(^11\) In some cases, ART nonadherence results from the amount of alcohol consumed.\(^15\) Studies of alcohol use among men with HIV found that frequent or heavy drinking was not significantly different between gay and heterosexual men; however, for both groups, it was strongly associated with nonadherence.\(^6\) Research hints at a gender difference in the brain’s neurochemistry; regardless of the amount of alcohol consumed, men have a higher dopamine release than women, potentiating alcohol’s rewarding effect.\(^17\) As PWH age, UAU becomes more prevalent, and ART nonadherence worsens, resulting in reduced health care use and poor treatment outcomes.\(^18\)

Women of color living with HIV cope with unique forms of stigma, stress, and vulnerabilities, which may lead to consuming unsafe amounts of alcohol, negatively influencing adherence and HIV outcomes or resulting in adverse outcomes such as blackouts and body habitus changes.\(^19\)-\(^21\) Results of studies of African American women reported that their struggle to self-manage pain or distress led to UAU and, ultimately, nonadherence.\(^19\) A qualitative study of women identified psychological issues that led to UAU, such as poor coping, low self-esteem, getting through bad experiences, or social influences of friends and families.\(^20\) A study in Kenya of female sex workers with HIV found that feeling drunk was frequently associated with lower condom use. Compared with non-drinkers, women who drank heavily had a 4.1-fold higher risk of sexual violence and an 8.4-fold higher risk of physical violence.\(^21\)

Excessive alcohol consumption, notably binge drinking, is linked to risky sex- continued on next page
ual behaviors among PWH. A survey of sexual behavior in PWH conducted in Ethiopia indicated that 79.8% (CI: 75.3% - 83.9%) of the respondents had at least one risky sexual encounter within the previous three months, and multivariable analysis found that the odds of risky sexual practices were higher among individuals who consumed alcohol. A national survey of 8,012 MSM found that the prevalence of sexual risk behaviors was significantly higher among those who binge drank than among non-binge drinkers, including receptive and insertive condomless intercourse with a discordant partner, exchanging sex for drugs or money, and having concurrent partners. PWH of all genders who indulged in heavy drinking days were more likely to engage in unprotected sex, with increased unprotected sex frequency among women. Regardless of sexual identity, gender, or years of living with HIV, excessive alcohol consumption is consistent with adherence difficulty and ultimately results in poorer outcomes.

Alcohol and Comorbidities in People with HIV

PWH have heightened morbidity and mortality at lower levels of alcohol consumption compared with HIV-uninfected persons. Heavy alcohol use in PWH is associated with a risk of accelerated aging and fragility, increasing the risk for comorbidities and geriatric syndromes. Alcohol misuse increases the risk for the development of neuropathology, cardiovascular and metabolic diseases, geriatric syndrome, and mental health issues in PWH.

**Neurological.** MRI studies of PWH who use alcohol show abnormalities in brain structure and neurotransmitter deficits, which impaired working memory, decision-making ability, visuospatial abilities, and movement speed. Another neurological condition, neuropathic pain, contributes to alcohol misuse by PWH, which also contributes to neuropathic pain.

**Cardiovascular and Metabolic.** Although the combined effect of HIV disease and alcohol on cardiovascular disease has not been well researched, studies suggest that the risk for cardiovascular disease in PWH ranges from 37% to 78% with excessive alcohol use. With regard to diabetes and complications of metabolic disease, some studies suggest that moderate alcohol use may be protective, but heavy drinking increases the risk. Similarly, the results of the New Orleans Alcohol use in HIV (NOAH) study indicated that heavy alcohol use is a risk factor for the development of prediabetes and diabetes.

In a recent study, investigators found that PWH who use alcohol excessively were more likely to experience pancreatic dysfunction. As expected, Kahler et al. found significant effects of heavy drinking on liver fibrosis in PWH, as indicated by increased FIB-4 scores, which in turn, increased the five-year mortality risk for PWH, as measured by the VAC index (Veterans Aging Cohort Index), a measure of mortality in PWH.

**Mental Health.** There is limited research on the effects of unhealthy alcohol use on mental health. Research investigating alcohol use among PWH found that the severity of alcohol use is related to stress and HIV stigma and exacerbates anxiety and depressive symptoms. Results of one study found that limited consumption of alcohol did not prevent PWH from receiving treatment for depression; however, risky alcohol use was associated with less resolution of depressive symptoms.

**Screening for Unhealthy Alcohol Use**

The US Preventative Task Force recommends screening all patients for alcohol use. Clinicians can use brief questionnaires such as the abbreviated Alcohol Use Disorders Identification Test–Consumption (AUDIT-C) and the NIAAA-recommended Single Alcohol Screening Question (SASQ). The AUDIT-C is in the public domain; it screens for UAU and AUD. The AUDIT-C is in the public domain; it screens for UAU and AUD. The SASQ is a variation of the third question of the AUDIT-C, “How often do you have six or more drinks on one occasion?”
questionnaire, the CAGE (Cut Down, Annoyed, Guilty, Eye-Opener), screens for alcohol dependence but does not capture the full spectrum of UAU. Health care providers should avoid general questions such as, “How much do you drink?” which has less than a 50% sensitivity for uncovering UAU. An additional question may be helpful when screening for AUA:

- Have you ever had a drinking problem?
- When was your last drink? (Less than 24 hours is a red flag).
- Do you use alcohol to relieve pain, anxiety, or insomnia?
- Have you ever been arrested for drinking, such as driving under the influence?
- Have you ever lost friends or partners because of your drinking?
- Have you ever been to an Alcoholics Anonymous (AA) meeting?

There are screening instruments that target specific populations. Questionnaires for pregnant women include the TWEAK (Tolerance, Worried, Eye-Opener, Amnesia, Kut Down); the T-ACE (Tolerance, Annoyed, Cut Down, Eye-Opener); Parents, the 4Ps Plus (Partner, Past, Present Pregnancy); and the NET (Normal Drinker, Eye-Opener, Tolerance). The CRAFFT (Car, Relax, Alone, Forget, Family, Friends, Trouble) is a questionnaire for identifying risky substance use in adolescents. For older adults, ask if their drinking increased after someone close to them died or if alcohol made them so sleepy that they often fall asleep sitting in a chair. For adolescents, consider asking them if they ever drink alcohol alone, missed school to go drinking, or because they had a hangover. Tables 3 and 4 list common complaints and presentations suggestive of unhealthy alcohol use.

Clinically, laboratory abnormalities such as elevated gamma-glutamyl transpeptidase (GGT), mean corpuscular volume (MCV), aminotransferases, low platelet count, and carbohydrate-deficient transferrin (CDT) may indicate excessive alcohol use but have a sensitivity of approximately 50%. GGT is the most widely used test, but other conditions, such as nonalcoholic liver disease, hyperthyroidism, and the use of anticonvulsants, can elevate GGT levels. MCV is less sensitive than the GGT level, but an elevated MCV level with an elevated GGT level should raise suspicion about heavy alcohol use. CDT tests are available but not often used; four to seven drinks per day for at least one week can significantly

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<tr>
<th>Signs of Unhealthy Alcohol Use</th>
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<tr>
<td>Mild tremor</td>
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<tr>
<td>The odor of alcohol on the breath</td>
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<tr>
<td>Enlarged or shrunken tender liver</td>
</tr>
<tr>
<td>Labile blood pressure</td>
</tr>
<tr>
<td>Tachycardia</td>
</tr>
<tr>
<td>“Aftershave/mouthwash” syndrome (to mask the odor of alcohol)</td>
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<tr>
<th>Signs of Alcohol Withdrawal</th>
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<tr>
<td>Nausea and vomiting</td>
</tr>
<tr>
<td>Diaphoresis</td>
</tr>
<tr>
<td>Headache</td>
</tr>
<tr>
<td>Tremor</td>
</tr>
<tr>
<td>Seizures</td>
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<td>Visual and auditory hallucinations</td>
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<tr>
<th>Signs of Delirium Tremens</th>
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<tr>
<td>Tachycardia</td>
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<tr>
<td>Hypertension</td>
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<tr>
<td>Temperature elevation</td>
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<tr>
<td>Delirium</td>
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<tr>
<td>Tactile Hallucinations of Itching, Burning, or Numbness</td>
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<th>Signs of Chronic Alcohol Use</th>
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<tbody>
<tr>
<td>Gynecomastia</td>
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<tr>
<td>Spider angiomas</td>
</tr>
<tr>
<td>Dupuytren contractures</td>
</tr>
<tr>
<td>Testicular atrophy</td>
</tr>
<tr>
<td>Enlarged or shrunken liver</td>
</tr>
<tr>
<td>Enlarged spleen</td>
</tr>
<tr>
<td>Ataxia</td>
</tr>
<tr>
<td>Asterisks and confusion: signs of hepatic encephalopathy</td>
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</tbody>
</table>

Table 4: Clinical Presentation Suggestive of Unhealthy Alcohol Use

Table 3: Complaints Suggestive of Unhealthy Alcohol Use

<table>
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<tr>
<th>Complaints Suggestive of Unhealthy Alcohol Use</th>
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</thead>
<tbody>
<tr>
<td>Frequent absences from school or work</td>
</tr>
<tr>
<td>History of recurring trauma or accidental injuries</td>
</tr>
<tr>
<td>Depression or anxiety</td>
</tr>
<tr>
<td>Labile hypertension</td>
</tr>
<tr>
<td>Gastrointestinal symptoms</td>
</tr>
<tr>
<td>Sexual dysfunction</td>
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<tr>
<td>Sleep disorders</td>
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Table 3 continued on next page
Pharmacotherapy for Alcohol Use

Pharmacotherapy for UAU in PWH demonstrates a reduction in alcohol use. The Food and Drug Administration (FDA) approved three pharmacotherapies for AUD: Naltrexone, Disulfiram, and Acamprosate. While there is limited research on the use of Naltrexone in PWH, data on the use of Disulfiram and Acamprosate among PWH are lacking. Table 5 presents a summary of pharmacological treatment for AUD.

**Naltrexone.** Naltrexone is an opioid antagonist that reduces the rewarding effect of alcohol. Because it is an opioid agonist, clinicians should not prescribe it to people on opioid analgesics for chronic pain or those on opioid agonist therapy for opioid misuse (e.g., methadone). Naltrexone appears to be safe to use in people with HIV. It is not associated with significant drug-drug interactions or irreversible hepatotoxicity. Clinicians should not use Naltrexone in patients with decompensated liver disease. Naltrexone is effective in reducing the number of heavy drinking days among PWH and AUD. In a randomized placebo-controlled trial of 100 prisoners with AUD who met the criteria for AUD, those provided with Naltrexone upon release from prison were more likely to achieve viral suppression at six months compared with a placebo group (56.7% vs. 30.3%). Patients start on an oral dose of 25mg daily for two days, then a standard dose of 50mg/day. Naltrexone is also formulated as an injectable that is administered monthly. Patients should start on oral Naltrexone for three to five days before the first injection. Patients should be free of opioid medication for at least seven to ten days before their first dose of Naltrexone to avoid precipitated withdrawal.

**Disulfiram.** Disulfiram creates an adverse reaction to alcohol within 10 minutes of drinking that may last several hours. The symptoms include flushing, headache, anxiety, nausea, vomiting, sweating, dizziness, palpitations, hyperventilation, and confusion. Disulfiram is contraindicated in patients with significant coronary artery disease or heart failure. Clinicians should educate patients to prevent a disulfiram alcohol reaction by avoiding preparations containing alcohol, such as sauces, cough mixtures, vinegar, and foods containing vinegar. Patients on metronidazole or paraldehyde should not take Disulfiram. Caution is necessary for patients with a history of liver disease.

**Acamprosate.** Acamprosate is safe and well-tolerated. It is as effective as Naltrexone but with fewer adverse reactions. Acamprosate modulates alcohol-related changes in the brain, reducing withdrawal symptoms that can lead to relapse, and may be more effective when combined with Naltrexone or Disulfiram. Acamprosate is safe for patients with liver disease because the liver does not metabolize it. Unlike Naltrexone, patients on opioid treatment for pain or opioid use disorder can safely use acamprosate. In addition, it does not interact with benzodiazepines and can be continued if a patient relapses and returns to drinking.

### Table 5: Pharmacological Treatment for Alcohol Use Disorder

<table>
<thead>
<tr>
<th>Medication</th>
<th>Dosage</th>
<th>Description</th>
</tr>
</thead>
</table>
| Naltrexone | 1 pill daily or monthly injection | - µ-opioid receptor antagonist  
- Decreases the reinforcing/pleasurable effects of alcohol  
- Helps prevent relapse and decreases current use  
- Can start if someone is still drinking  
- **DO NOT START if PATIENT IS ACTIVELY USING OPPIOIDS; the patient will experience withdrawal** |
| Acamprosate | 2 pills 3x daily | - Helps prevent relapse after detoxification  
- Relatively safe option with minimal side-effects  
- Can be used in combination with Naltrexone |
| Disulfiram | 1 pill daily | - Prevents the breakdown of alcohol in the body  
- With alcohol consumption causes an adverse reaction that includes nausea, vomiting, sweating, palpitations, hypotension, tachycardia  
- A patient needs to be highly motivated  
- PRN use in episodic high-risk situations |
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One drawback to Acamprosate is the required dosing of two capsules three times a day, which may reduce adherence by PWH, who may be taking numerous medications. Additionally, clinicians should not prescribe acamprosate for patients with a creatinine clearance of less than 30 mL per minute.

Non-Pharmacological Interventions

The United States Preventive Services Task Force recommends that all adults in primary care who screen positive for unhealthy alcohol use and have risky drinking behaviors receive a brief counseling intervention.39 Any treatment team member, such as physicians, PAs, NPs, RNs, and Social Workers, can administer brief interventions. Although research has demonstrated that brief interventions can reduce self-reported drinking for patients in primary care, brief interventions are not as effective in hospital or emergency room settings because of trauma, lack of a long-term relationship with providers, or the severity of the patient’s UAU. SAMHSA’s “Enhancing Motivation for Change in Substance Use Disorder Treatment” is a protocol for brief interventions based on Prochaska’s five stages of change and motivational interviewing (https://www.ncbi.nlm.nih.gov/books/NBK571071/).

For patients who recognize a problem and want to consider an alternative to medication or support in remaining sober, the most accessible option is Alcoholics Anonymous (AA). This 12-step approach involves psychosocial techniques to change behavior. Each new person is assigned an AA sponsor, a person recovering from alcohol use, which supports the recovery of the new member. Other sources of treatment include FindTreatment.gov (https://findtreatment.gov/), sponsored by SAMHSA.

Conclusion

Excessive drinking disinhibits people, and its use can lead to risky behaviors, increasing the possibility of HIV transmission and infection. When a patient’s complaints suggest excessive alcohol use, screening tools such as the AUDIT-C or the CAGE can help confirm the diagnosis. If excessive alcohol use is suspected, examination of the patient may reveal signs of alcohol misuse, such as tremors, enlarged liver, tactile hallucinations of itchiness, or spider angiomas. SAMHSA recommends that the treatment team address excessive alcohol with brief interventions based on the five stages of change. Pharmacological treatment for alcohol use includes Naltrexone, Disulfiram, and Acamprosate. AA is an accessible and low-cost support system for patients with alcohol use disorder who choose not to use medications. Alternatively, clinicians can refer patients for short or long-term detoxification and rehabilitation treatment. Recognition and treatment of alcohol use disorder may be another way to address the HIV epidemic.

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Mersey, D. J. Recognition of Alcohol and Substance Abuse. Am Fam Physician 2003; 67 (7).


Mental health disorders—which include substance use disorders—are persistent barriers to reducing HIV incidence and sustaining viral suppression (VS). The combination of improved health care data systems and a shift in focus to treating the whole person has led to greater awareness of untreated mental health conditions as major challenges to optimal HIV continuum outcomes. Disorders common among people with HIV (PWH) include major depression, anxiety disorders, posttraumatic stress disorder, psychotic disorders, and alcohol or other substance use disorders. Collectively referred to as behavioral health (BH) disorders, they can interfere with all steps along the HIV prevention and care continuum. Unless we focus on addressing these undertreated comorbidities, the Ending the HIV Epidemic (EHE) initiative, launched in 2019 by the U.S. Department of Health and Human Services (HHS), is unlikely to reach its goal of reducing new HIV infections in the U.S. by 90% by 2030 through scaling up key HIV prevention and treatment strategies.

Incorporating BH into EHE efforts can be accomplished using three approaches New Jersey pioneered: implementing a combined BH and HIV continuum, using collaborative planning and resource development processes focused on BH and HIV, and building a workforce that can ably address BH and HIV.

### Barriers to integrating BH and HIV care

Optimal HIV service delivery includes screening for undiagnosed BH disorders. HIV care team members are not routinely trained to screen and effectively refer clients to appropriate BH services. The shortage of BH specialists compounds long wait lists for BH services. Communities of color are the leading population affected by HIV and implicit bias. A lack of robust cultural humility training can challenge delivering BH services to PWH in communities of color. Insufficient standardization of whether and how BH services are offered, delivered, and monitored creates systemic gaps. This accumulation of barriers creates a care disparity among PWH who have comorbid BH disorders and are disadvantaged in navigating services for their multiple complex conditions.

New Jersey is a leader in helping HIV care teams integrate BH services. The HIV care continuum places a combined care continuum to improve access and quality of care (Figure 1).

The New Jersey Behavioral Health and Primary Care HIV Integration Project (NJ-BHIP) was a four-year Learning Collaborative (LC) to support Ryan White-funded health care sites throughout New Jersey to implement a model for providing or referring clients to BH services. NJ-BHIP introduced a framework that enabled organizations to identify multiple ways to achieve integration through provider- and system-level changes. It created a forum for diverse HIV care sites to learn from their peers how to improve their care systems, better manage workflows, expand referral networks, and achieve better patient outcomes.
Education and Training Center (NECA AETC) supported the LC with training, technical assistance, and practice facilitation coaching.

NJ-BHIP sites completed tools such as an organizational readiness self-assessment\(^1\) (Figure 2 shows a sample page) to identify gaps in service delivery for those with BH needs and to evaluate the site’s preparedness for BH service integration.

Quality improvement in NJ-BHIP was evaluated through performance measures that included depression and substance use disorder screening using validated tools; tracking referrals of positive screens; BH care retention; and VS rates of clients with both HIV and BH disorders. Other jurisdictions seeking to end the HIV epidemic look to New Jersey as a model for innovative approaches to meeting their EHE goals.

**Setting priorities for ending the HIV epidemic**

The Health Resources Services Administration has invested some of its EHE initiative funding in the AETCs across the U.S. NECA AETC serves HHS Region II, comprised of New Jersey, New York, Puerto Rico, and the U.S. Virgin Islands. This region is home to over 31.6 million people and nearly one in five PWH\(^12\) and contains seven priority EHE jurisdictions, two of which are in New Jersey: Hudson and Essex counties. With EHE funding, NECA AETC expanded its infrastructure and scope of work to strengthen the capacity of the HIV workforce to address EHE goals in these jurisdictions: increase HIV testing and linkage to care; increase the number of providers who can administer prevention strategies such as pre-exposure prophylaxis; and increase the capacity of providers to deliver structurally and culturally competent care and treatment along the HIV care continuum to achieve sustained VS.

The Hudson and Essex counties’ EHE...
plans prioritize BH by calling for funding to train providers to ensure they can conduct BH assessments using a trauma-informed approach to care. Additional priorities include facilitating routine HIV testing in priority populations most vulnerable to HIV, including those with BH conditions, and engaging with relevant partners so that priority populations can access services.

Additional priorities include facilitating routine HIV testing in priority populations most vulnerable to HIV, including those with BH conditions, and engaging with relevant partners so that priority populations can access services known to prevent HIV acquisition, including housing and BH services.

To address BH and HIV, NECA AETC engaged in an extensive collaborative process to co-plan and co-create resources and training opportunities that increased capacity in a diverse and expansive workforce of providers and peers in many roles.

NECA AETC created working groups comprised of NECA AETC training partners and people with lived experience who identified regional training needs, key informants, and resources highlighting training gaps and barriers to care. Findings provided insight into previously underserved communities, including those needing integrated BH and HIV services, allowing NECA AETC to tailor EHE training sessions further. By conducting strategic webinars, hosting panel discussions, and producing toolkits and podcast episodes, NECA AETC centered its efforts on new topics as a way to support and contribute to EHE efforts, including:

- Social determinants of health, including homelessness, housing instability, and food insecurity
- Multiple intersecting stigmas
- Language biases effects on quality of care and engagement in care

Using this community-driven approach to mitigate health inequities, NECA AETC has increased the number of health care workers who can effectively provide HIV care and prevention in a culturally and structurally competent manner and ease the BH burden of PWH and those at risk for HIV.

Building a workforce to end the HIV epidemic

First-generation HIV service providers are retiring in large numbers. Understanding who will take their place and how newer and, likely, a less specialized workforce will fill their decades of experience is a focus of the recently completed HIV Workforce Survey. NECA AETC assessed health care providers’ attitudes and plans toward being part of the HIV workforce. The survey captured the needs, challenges, and gaps in providing high-quality HIV care, including BH care, in HHS Region II.

Of the 3133 survey respondents, 521 (17%) worked in New Jersey. Among them, 41% indicated that a better understanding of population-specific needs and resources would make providing optimal HIV services less challenging. Additionally, 56% of New Jersey respondents identified mental health as the most significant unmet need and challenge for the PWH they serve. Related challenges and unmet needs were substance use (40%) and social support (27%). The survey also revealed a need for increased training on mental health, substance use counseling, and trauma-informed care.

Regarding existing provider competencies, 41% of respondents reported being comfortable conducting a mental health screening, though only 20% felt they were experts in providing this service. While only 2% of the respondents worked in mental health clinics, social workers or case managers were the second largest group of respondents (13%).

Figure 4 shows respondents’ perceptions of what the biggest unmet needs and challenges are among people with HIV (PWH) they work with.
their patients’ most significant unmet needs and challenges.

Integrating BH services into HIV care is a challenging but critical step to providing optimal care for PWH. Increasing access to evidence-based interventions that address BH, cultural competence, and trauma-informed care is crucial, as is the use of data to promote person-centered services that tailor treatment and care to the specific needs of individual patients. By increasing the effective use of standardized screening and assessment tools, providers can identify patients likely to have BH needs and then develop individualized treatment plans. This approach can improve adherence to antiretroviral therapy, reduce viral load and onward transmission, and ultimately improve health outcomes.

**Conclusion**

New Jersey has taken many necessary steps toward ending the HIV epidemic and has been a leader in addressing BH as part of those efforts. From implementing a combined BH and HIV continuum to engaging in multiple community-driven processes designed to bring diverse perspectives to EHE planning to actively building a workforce that can ably meet both BH and HIV needs when providing services, concerted activities have put the state in a strong position to meet both federal and local jurisdictional EHE goals. Continued partnerships across city, county, tribal, and state health departments, local clinics and health care facilities, health care providers, providers of medication-assisted treatment for opioid use disorder, professional associations, advocates, community- and faith-based organizations, and academic and research institutions will allow for continued progress in achieving EHE goals.

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Polypharmacy is associated with an increased risk of negative health outcomes, including adverse medication-related events, hospitalizations, and mortality. Understanding how polypharmacy affects persons with HIV (PWH) and mitigating its impact on their health should be a top priority for caregivers. In this article, we explore the drivers of polypharmacy, evaluate the literature on the effects of polypharmacy in PWH, and discuss current strategies health professionals can implement to ensure the right balance of risk versus benefit for each treatment.

**Definition**

Polypharmacy describes the coadministration of multiple medications, usually as a measure of overprescribing. The method for quantitatively defining polypharmacy can differ regarding the number of agents needed to qualify and the technique for counting medications. Studies apply various definitions, with most defining polypharmacy as the number of medications above a certain threshold. The threshold of five or more medications per day is the most common criterion for quantitative definitions of polypharmacy, although some studies use a threshold of 10 or 15 drugs per day. Studies evaluating polypharmacy in PWH generally only include non-antiretroviral drugs. Early in the combination antiretroviral (ART) era, challenges with the burden of medications were linked to ART and agents used to treat or prevent opportunistic infections (OI). For many PWH in that era, the high pill burden and frequency (as well as pill size) of ART and OI therapy were more impactful to their quality of life and adherence than medications used to treat other conditions. Fortunately for PWH, this is no longer the case for several reasons: a dramatic increase in co-formulated products, improvements in the pharmacokinetic and pharmacodynamic profiles of ART, and the growing body of data supporting two-drug (dual) therapy. Although pill burden has historically been an important issue, especially for PWH, polypharmacy usually accounts for all active medications a patient takes and administration routes. Nonetheless, health professionals should not overlook co-formulated products' advantages for patient satisfaction and adherence. Another approach to defining polypharmacy is to consider whether a drug is clinically appropriate, focusing on identifying medications where risks may outweigh benefits. It is logical to favor defining polypharmacy around the burden of inappropriate medications, particularly as the prevalence of polypharmacy continues to increase in older adults with HIV. This qualitative viewpoint is more relevant when polypharmacy is a consequence of having multiple comorbid conditions (or multimorbidity), which could lead to investigations into the root causes of increased comorbidities. Also, polypharmacy could be a symptom of comorbidity. Measuring polypharmacy based on appropriateness is inherently more difficult and time-consuming, especially when retrospectively analyzing records. In practice, an understanding of both quantitative and qualitative (inappropriate) polypharmacy can be helpful for clinicians in efforts to optimize patient care.

**Drivers of Polypharmacy**

**Chronic comorbidities and PLWH**

There is a complex interplay of factors behind the greater burden of comorbidities earlier in life in this patient
Polypharmacy and Older Adults with HIV: More Medications, More Problems

Inequities across numerous determinants of health and stigmatization have historically contributed to the burden PWH deal with, along with their diagnosis. Additionally, rates of mental health disorders are higher in persons living with HIV compared to the general patient population. These two comorbidities are just a sliver of what one patient may deal with; both comorbidities are treated with multiple medications to prevent further complications, such as heart attacks or strokes or, on the side of mental health, suicidal ideation, or other depressive thoughts.

**Fragmentation of Health care**

PWH regularly receive care from multiple clinicians, which can increase the risk of polypharmacy. When the person managing the HIV care is not the primary care provider, there may be the potential to defer treatment decisions for non-HIV conditions to the other practitioner. Lack of medication review occurs more frequently as patients are increasingly referred to specialists to evaluate and manage multiple comorbidities. These patients are often most at risk for contraindicated medications or those with substantial evidence of interactions. Although the propensity and consequences are lower with other regimens without PK-boosters, potential interactions with select vitamins or minerals (i.e. magnesium, calcium) or acid suppressants remain a risk for serious drug-drug interactions. Thus, adding new drugs can lead to harm, especially by a provider that may not be aware of a person’s whole medication list. Patients are also more likely to need clarification regarding dosing instructions as the number of prescriptions increase.

Numerous studies have associated polypharmacy with increases in morbidity and mortality. In the general population, there is a potential association between increased use of medications and functional limitations, limitations with activities of daily living, confusion, and memory problems. In PWH specifically, a higher prevalence of comorbidities and more medications show an increased risk of falls. There is also evidence to suggest that polypharmacy may lead to an increased hospitalizations. Fukuba and colleagues studied the association between polypharmacy and time during hospitalization. In patients prescribed at least five medications at admission, results indicated an increased length of stay for patients prescribed more medications. Although some study samples were people without HIV, regardless of the patient population,

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results emphasized the potentially severe consequences of polypharmacy. These consequences include an increased risk of mortality, with progressively escalating risk among individuals taking five or more medications. 19

More research is needed to determine if polypharmacy reduces virologic control or if other factors drive it. Some studies found that polypharmacy negatively affects viral load suppression, suggesting the more medications a patient takes, the less in control of their HIV they may be. Not only do patients have the responsibility to manage their HIV, but have to manage their HIV along with other comorbidities, which poses a challenge. 2,22 On the other hand, a recent study suggested that patient frailty status, not polypharmacy, was associated with ART nonadherence. 23 Another cross-sectional review found high virologic control (95.9%) despite significant polypharmacy (46.6%) among PWH age 50 or older, although investigators did not analyze whether polypharmacy was an independent predictor. 24

Reduced medication adherence related to pill fatigue is another potential consequence of polypharmacy. Pill fatigue, when a person becomes less motivated to take their medications based on the number of tablets or medications they must take, can occur with or without other exacerbating factors, such as toxicities or confusing dosing instructions. Decreased medication adherence often exacerbates their medical conditions, including HIV, requiring more frequent and higher levels of care. Krentz et al. found a strong association between polypharmacy and non-continuous ART, defined as discontinuing or switching ART, among PWH at their clinic. 7 More studies are needed to confirm these findings.

Drug costs may also contribute to the consequences of polypharmacy. For some patients, adherence may be impacted by prescription costs. With every increasing cost of living, the buildup of copays or high deductibles can leave patients with difficult choices, such as paying for medications or covering basic living costs. A report by AARP cited the HHS’ Office of Health Policy’s finding that more than 3,000 drugs increased in price between January and July 2022. The average increase in price was $150 per drug. Federal and state programs, specifically for PWH, such as AIDS Drug Assistance Program (ADAP), have provided patients with optimal coverage of ART regimens. Other resources, such as case managers and pharmacists, assist with drug costs or access should PWH need it. With the aging population of PWH and more variability in drug cost and drug coverage based on insurance, the uncertainty of prices may deter a patient from adhering to their medications.

EVALUATING PHARMACOLOGIC TREATMENT, REDUCING POLYPHARMACY

Regardless of the criteria set for polypharmacy, assessing each patient’s medication profile at regular intervals should be incorporated into the standard of care. Although significant reductions in polypharmacy across society will likely require system-wide changes, health professionals have a vital role in this process. Changing our approach to patient care is increasingly critical as PWH age with a disproportionately greater comorbidity burden, placing them at risk of geriatric syndromes (e.g., frailty, dementia) earlier in life. As polypharmacy is often hard to disentangle from multimorbidity, providers should carefully weigh risks versus benefits when adding a medication, ensuring that the complaint(s) a patient is experiencing, or the symptoms are not due to another medication. Providers should also discontinue medications deemed ineffective for the prescribed indication before starting another agent and ensure that nonpharmacologic options are not preferable. Medication reviews should be ongoing rather than a discrete one-off activity. Clinicians can make small, incremental, carefully supported changes to decrease polypharmacy.

Medication reconciliation is an essential first step for addressing polypharmacy and involves using various resources to create a medication list that is as accurate and comprehensive as possible. Information should include over-the-counter medications, vitamins, and supplements. Medication reconciliation can be time-consuming, especially when there are multiple prescribers, recent hospitalizations, or when the patient is not a reliable source. Clinical teams can undertake an interdisciplinary approach to share the burden of conducting accurate medication reconciliation. Some facilities embed medication reconciliation software (e.g., Care Everywhere, Sure Scripts) within their electronic health records. Pharmacists can provide prescription fill records via fax or verbally. Clinicians should always confirm pharmacy records with patients as they may not be taking the dispensed medications. Once clinicians account for every medicine, they should ensure optimal use by checking the following:

- Clinical indication for each medication
- Drug-drug interactions
- Drug-disease interactions
- Duplications
- Recommended duration of use
- The risk-to-benefit ratio for the medication’s indication (compared to alternative options) 25

There are several approaches clinicians can use to reduce polypharmacy, with the overwhelming majority intended for use in older adults. Tools to address polypharmacy are often implicit- or explicit-based. Implicit-based approaches rely more heavily on
clinical judgment. In contrast, explicit-based tools aim to provide objective criteria to define the appropriateness of therapy to minimize the extent of clinical assessment needed by clinicians.

The design of implicit-based tools streamlines the medication review process for clinicians (see table 1). These protocols or algorithms can vary in their aim, with some explicitly emphasizing deprescribing while others provide general guidance toward judicious medication prescribing. Use of the ARMOR (Assess, Review, Minimize, Optimize, Reassess) protocol, created for use in long-term care facilities, maintains or restores functional capacity. General practitioners can use the Prescribing Optimization Method (POM), a series of six questions, to quickly assess medication use among older adults in the community. The Medication Appropriateness Index, another widely used tool comprised of 10 criteria, categorizes medications as appropriate, marginally appropriate, or inappropriate by assessing the drug effectiveness, dosing instructions, duplicative therapy, and relative costs. A clinician’s decision to use one of the approaches or another implicit-based option involves evaluating doses, drug-drug, drug-disease interactions, and the medication’s risk-to-benefit ratio for the patient.

Explicit-based approaches are more common in practice than implicit-based ones due to their relative ease and objective criteria. These consensus guidelines are updated every few years, with recommendations based on the quality and strength of evidence to support it. The American Geriatric Society’s (AGS) Beers Criteria lists potentially inappropriate medications (PIMs) for older adults. It focuses on agents that could have more harm than benefit in this population, such as increasing fall risk, worsening cognitive impairment, bleeding, and hypoglycemia, to name a few. It also aims to limit drug-drug interactions and to ensure optimal dosing in persons with kidney impairment. The straightforward criteria set by this tool helped quantify the prevalence of PIMs, not just the extent of polypharmacy, in PWH. Using the AGS Beers Criteria, investigators with the Swiss HIV Cohort Study found that from January 2017 through December 2018, 31% of participants aged 65 or older had PIMs. Another study found much higher rates of PIMs (63%) based on the same criteria among patients receiving care at San Francisco General Hospital (Ward 86).

The STOPP/START (Screening Tool of Older Person’s Prescriptions/Screening Tool to Alert to Right Treatment) criteria is another explicit-based tool that assesses the appropriateness of medication use in older adults. This tool guides medication use for various organ systems (i.e., cardiovascular, nervous, endocrine, etc.). The tool has two sections, one that provides which medications to stop (highlighted in red) and which medications to start (highlighted in green) and provides a rationale for each recommendation. After each organ system, they also reference the National Institute for Health and Care Excellence (NICE) guidelines, providing additional context for the recommendations offered to manage conditions in older adults. McNicholl and colleagues used the Beers and STOPP criteria to discontinue at least one medication in 69% of patients. In one of 10 patients, this pharmacist-led initiative led to a discontinuation of at least six medications. These explicit-based criteria have inherent limitations, and thus treatment decisions must be made as part of a more comprehensive approach. Moreover, most tools have a discrepancy in the age cut-off. Criteria for PIMs in select situations are established for individuals 65 or older. Much literature on polypharmacy and multimorbidity in PWH focuses on those 50 and older. Clinicians should use judgment and consider comorbidity burden, functional status, years since HIV diagnosis, and other factors to guide decision-making.

Deprescribing is the planned and supervised process of dose reduction or stopping of a medication that may be causing harm or no longer is a benefit for the patient. Deprescribing is common in palliative care, with increasing uptake in the older adult patient population. Several healthcare organizations have called for more widespread integration of deprescribing into routine practice, with some providing guidelines to streamline the evaluation of drug classes that are commonly scrutinized. These guidelines include recommendations for proton pump inhibitors, antihyperglycemics, antipsychotics, benzodiazepine receptor agonists, cholinesterase inhibitors, and memantine. Although most drugs on a patient profile will have an indication, it remains important to continually evaluate each drug’s risks compared to other treatment options, the consequences of not treating the condition, and patient input into their care. The evidence around some therapies varies in weight (i.e., randomized controlled trial versus expert opinion), as can their risk-to-benefit ratio (i.e., improved survival but reduced quality of life of select treatment for prostate cancer). Patient education and shared decision-making in this process are crucial. Discontinuation of medication may lead to a return of a symptom or may cause withdrawal. Discussions with patients about the benefits and risks of continuing or stopping a medication can strengthen provider trust and increase patient agency over their health. Discussions may include changes in treatment and reasons why a medication may no longer be indicated. Conversation with other specialists involved in the patient’s care is often necessary. A plan should be agreed upon, with dose reductions or weaning when discontinuing select medications. Changes should be incremental, involve one medication at a time, and include close follow-up and monitoring. The plan should be continued on next page.
well documented and communicated to other providers and the patient’s pharmacy. Navigating through the deprescribing process can be a challenge. Many of the same drivers of polypharmacy, such as incomplete records and inheriting care from a previous provider, can be a relative deterrent. Patients may be unaware of the indication for a medication, especially if a medication started years prior. Awareness of the side-effect profiles of medications and a low threshold to consider a patient’s clinical picture to be drug-induced can greatly aid practitioners during this process. It is essential to consider that appropriate indications for some medications may have changed based on a person’s age, functional status, co-administered medications, or new literature supporting a change in the standard of care. For example, the literature supporting using low-dose aspirin as primary prophylaxis for cardiovascular events has shifted over the years. The risk of bleeding is now well described, leading to recommendations against use without a specific indication (i.e., previous cardiovascular event). Clinicians should consider re-evaluating the need for continued therapy as patients’ health status improves or declines, or prescribing guidelines are updated. For example, previous hypertriglyceridemia guidelines and the prevalence of PI-containing regimens led to fibrates or omega-3 fatty acids prescribed for PWH. Clinicians should re-evaluate the need for continued therapy with these agents, particularly if the ART regimen no longer includes PIs and triglycerides are within normal limits. Clinicians may hesitate to discontinue therapy when the patient is stable, often not wanting to “rock the boat.” Moreover, patients may be leery of these changes regardless of whether they understood the reason for select medications.

### Conclusion

Time and resources are significant hurdles to addressing polypharmacy. Thoroughly collecting and evaluating each patient’s history, the temporal relationship between the onset of symptoms and/or diagnoses with the start of current medications is time-consuming and laborious. It usually includes communication with other providers, who may have differing opinions on a patient’s care or be unable to provide a timely response. Clinicians should discuss treatment histories with patients, determine their understanding of why a medication was prescribed, and explain indications for stopping medications no longer needed. This type of comprehensive care is increasingly difficult as the demand for health professionals that provide HIV care continues to grow. The shortage of geriatric care specialists exacerbates these needs as PWH age. Awareness of the polypharmacy crisis,

### Table 1: Resources Used in Deprescribing and Mitigating Polypharmacy

<table>
<thead>
<tr>
<th>Resource / Tool</th>
<th>Benefits</th>
<th>Limitations</th>
</tr>
</thead>
</table>
| ARMOR: Assess, Review, Minimize, Optimize, Reassess | - Provides guidance on which medications to be mindful of in assessing side effects  
- A universal tool to be used by any healthcare professional (not limited to prescribers)  
- Is not a process to be used once, encouraged to use at multiple visits, not just initial or singular visit | • Does not list all medications that could be a potential risk in PWH  
• Does not list all possible effects or potential ways to optimize the medication list  
• Only tested in a nursing facility |
| POM (Prescribing Optimization Tool) | - Includes open-ended questions  
It also addresses adherence to medication  
Ability to make real-time interventions while using the tool | • Limited to prescribers in terms of making interventions in real-time |
| START/STOPP (Screening Tool of Older Person’s Prescriptions and Screening Tool to Alert Right Treatment) | - Provides guidance on what to potentially deprescribe and start  
- Can be administered by a provider and/or community pharmacist  
- Also is accompanied by the rationale behind proposed medication changes | • Limited to prescriber and community pharmacist  
A limited number of medications are included in the tool |
| AGS’ (American Geriatrics Society) Beers Criteria | - Can be used and referenced by prescribers and other healthcare professionals  
- Considers at risk medications, drug-drug/disease interactions risk, renal dose adjustments | • Limited to medications that may be at risk to the older adult population  
• Limited to guidance on certain medications, is not inclusive of all medications available |
| MAI (Medication Appropriate Index) | - Quick assessment (Y/N) questions about an indication of medication | • Limited to an indication of medication, does not necessarily provide guidance on discrepancies found  
• Given the questions provided, may be limited to prescribers |
| Deprescribing.org | - Provides resources outside of deprescribing algorithms (i.e., outside organizations, other programming)  
Can be used as a reference tool for other healthcare professionals (not limiting) | • Limited to deprescribing algorithms for certain medications (i.e., PPI’s) |
shifting our approach to patient care, and embedding tools and criteria into processes are essential to improve patient quality of life and outcomes.

References


There are currently three options for HIV Pre Exposure Prophylaxis (PrEP) approved by the Food and Drug Administration (FDA). Although initial studies for HIV PrEP were done with tenofovir disoproxil fumarate/emtricitabine (TDF/FTC), additional studies have expanded the available options for PrEP to include tenofovir alafenamide/emtricitabine (TAF/FTC) and long-acting injectable cabotegravir (LA-CAB). Recently updated guidelines for PrEP reflect the availability of these options, including appropriate patient selection and lab monitoring for each option. Providers who prescribe PrEP are encouraged to review these guidelines in detail.

The End the HIV Epidemic Plan (EHE), established in 2019, focused on four science-based strategies designed to significantly reverse trends in HIV infections by reducing new HIV infections by 90% by 2030 while scaling up HIV prevention efforts and improving treatment and care retention. The four strategies include HIV Diagnosis, Prevention, Treatment, and Response. As it relates to prevention, the use of PrEP for at-risk populations is the most important biomedical intervention available to reach the 2030 goals. However, despite widespread availability, recent data from CDC shows we are far below our goal of 50% of at-risk people on PrEP by 2030. Many populations, including Black/African American MSM, Hispanic/Latino MSM, and cisgender women, are less likely to receive PrEP compared to white MSM. Black and Hispanic/Latino account for the majority of people for whom PrEP is recommended yet still have the lowest rates of PrEP use compared to other racial and ethnic groups. To illustrate disparities in HIV prevention and care, CDC data estimates that only 9% of the over 450,000 Black individuals who could benefit from PrEP received a prescription in 2020; only 16% of 313,000 Hispanic/Latino individuals received a prescription. PrEP coverage is much lower for females as well. The CDC estimates that PrEP use was about three times higher in males (28%) compared to females (10%) in 2020.

PrEP Options for Patients
The three medications approved for PrEP allow for essentially four different PrEP options (see Table 1):

- TDF/FTC daily,
- TDF/FTC on-demand (2:1:1 or event driven dosing),
- TAF/FTC daily,
- LA-CAB injection every other month.

TDF/FTC Daily
TDF/FTC for PrEP, used across all at-risk populations for HIV, has been available since 2012. In March 2021, it became available in a generic formulation, which has led to substantial reductions in the cost of this intervention. Despite its broad use and availability, the chronic use of TDF/FTC, primarily when used to treat HIV infection, can potentially cause renal tubular dysfunction and decreased bone mineral density. Despite these concerns, a large metaanalysis demonstrated safety when used for PrEP. Clinicians should avoid prescribing TDF/FTC for patients with a confirmed Creatinine Clearance of less than 50ml/min. Studies also indicate that TDF is weight neutral and may cause small decreases in LDL cholesterol. For patients for whom cost is a consideration, generic TDF/FTC is currently one of the least expensive options for PrEP.
PrEP options.\textsuperscript{14}

### TDF/FTC on-demand

TDF/FTC on demand, is also known as 2:1:1 or event-driven dosing. The FDA and US Guidelines recommend daily dosing for TDF/FTC; however, there are off-label data supporting the use of on-demand dosing in MSM.\textsuperscript{8,15} A study in France comparing daily dosing to on-demand PrEP demonstrated equivalent efficacy with no increased risk of HIV infection.\textsuperscript{15} Despite the effectiveness of this strategy in MSM, on-demand dosing is NOT effective for cisgender females, should be used with caution in transgender women (TGW), and has not been studied in people who inject drugs (PWID).\textsuperscript{8,9} This strategy is also not FDA approved and is not the preferred administration method based on recent guideline recommendations from the US Public Health Service (USPHS).\textsuperscript{9} So, while patients should ideally take TDF/FTC for PrEP every day, event driven dosing provides flexibility for appropriate patients who may not be sexually active regularly and for PrEP candidates that may be concerned with ongoing toxicity of daily use of TDF/FTC (see a detailed description of on-demand dosing in Figure 1).

### TAF/FTC Daily

TAF/FTC has favorable bone and renal biomarker data compared with TDF/FTC. As a result, TAF/FTC is preferred in patients with underlying renal or bone disease, especially those with Stage 3 kidney disease (Creatinine Clearance 30-59 ml/min).\textsuperscript{1,2,8,9} TAF/FTC was approved by the FDA for MSM, cisgender men, and TGW only and NOT for cisgender women. Currently, clinicians should not prescribe TAF/FTC for cisgender women based on FDA labeling.\textsuperscript{2} The DISCOVER trial showed TAF/FTC to be non-inferior to TDF/FTC (DISCOVER); however, some participants experienced mild elevations in weight and small increases in LDL cholesterol.\textsuperscript{5,8,16} The cost of TAF/FTC is much greater than TDF/FTC because it is not available in generic forms to date.\textsuperscript{14}

### Table 1. Comparison of PrEP Options

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>TDF/FTC Daily</th>
<th>TAF/FTC Daily</th>
<th>LA-CAB q2mo</th>
<th>On-Demand TDF/FTC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Effectiveness</td>
<td>+++</td>
<td>+++</td>
<td>+++</td>
<td>+++</td>
</tr>
<tr>
<td>FDA Approved</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Populations</td>
<td>All</td>
<td>MSM and TGW</td>
<td>All</td>
<td>MSM and TGW only</td>
</tr>
<tr>
<td>Time to protection (based on PK modeling)</td>
<td>7 days or earlier for rectal exposure</td>
<td>Unknown, but likely within 7 days</td>
<td>Unknown, but likely within 7 days</td>
<td>24 hours with 2 tablet TDF/FTC loading dose</td>
</tr>
<tr>
<td>Renal Safety</td>
<td>Potential adverse effect on renal tubules</td>
<td>Favorable renal safety compared to TDF/FTC</td>
<td>No effect</td>
<td>Potential adverse effect on renal tubules</td>
</tr>
<tr>
<td>Bone Safety</td>
<td>Potential adverse effect on bone mineral density</td>
<td>Favorable bone safety compared to TDF/FTC</td>
<td>No effect</td>
<td>Potential effect on bone mineral density</td>
</tr>
<tr>
<td>Effect on Weight</td>
<td>Neutral</td>
<td>Small increase</td>
<td>No effect</td>
<td>Neutral</td>
</tr>
<tr>
<td>Effect on LDL Cholesterol</td>
<td>Neutral</td>
<td>Small increase</td>
<td>No effect</td>
<td>Neutral</td>
</tr>
<tr>
<td>Dosing</td>
<td>Once daily</td>
<td>Once daily</td>
<td>Every month X 2 doses, then every other month, gluteal IM injections</td>
<td>2:1:1 see Figure 1</td>
</tr>
<tr>
<td>Dosing if higher BMI</td>
<td>No change</td>
<td>No change</td>
<td>No change; however, use a bariatric (2 inch) needle for IM dose if BMI&gt;30</td>
<td>No change</td>
</tr>
<tr>
<td>Relative Cost</td>
<td>+</td>
<td>+++</td>
<td>++++</td>
<td>+</td>
</tr>
<tr>
<td>HIV Monitoring (Ag/Ab and HIV Viral Load)</td>
<td>Baseline and Q3 months</td>
<td>Baseline and Q3 months</td>
<td>TBaseline and Q2 months</td>
<td>Baseline and Q3 months</td>
</tr>
<tr>
<td>STI Monitoring</td>
<td>Baseline and Q3 months</td>
<td>Baseline and Q3 months</td>
<td>Baseline and Q4 months for most patients</td>
<td>Baseline and Q3 months</td>
</tr>
<tr>
<td>Renal Monitoring</td>
<td>Baseline and Q12 months if under 50 and CrCl over 90ml/min. Every six months for all other patients</td>
<td>Baseline and Q12 months if under 50 years of age and CrCl over 90ml/min. Every six months for all other patients</td>
<td>Not required</td>
<td>Baseline and Q12 months if under 50 years of age and CrCl over 90ml/min. Every six months for all other patients</td>
</tr>
<tr>
<td>LDL Monitoring</td>
<td>Not required</td>
<td>Baseline and Q12 months</td>
<td>Not required</td>
<td>Not required</td>
</tr>
<tr>
<td>Weight Monitoring</td>
<td>Not required</td>
<td>Baseline and Q12 months</td>
<td>Not required</td>
<td>Not required</td>
</tr>
<tr>
<td>Risk of Drug Interactions</td>
<td>+</td>
<td>+</td>
<td>++</td>
<td>+</td>
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</table>

**LA-CAB (long-acting cabotegravir) or Injectable PrEP**

LA-CAB or injectable PrEP is an continued on next page

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attractive option for people who prefer every other month injections to oral tablets. Data from two large studies, HPTN-083 and HPTN-084, supported FDA approval for using LA-CAB in all populations, including MSM, TGW, and cisgender women.6,7 Both studies showed LA-CAB superior to daily TDF/FTC, and it was added to guidelines upon FDA approval.8,9 Despite the superior efficacy, there were rare cases of breakthrough HIV infections with the use of LA-CAB injections, despite on time administration.17 Since LA-CAB has such a long elimination half-life, there is a risk of integrase resistance in these breakthrough cases. As a result, the guidelines highlight the importance of 4th generation HIV Ag/Ab testing and viral load testing when monitoring patients on LA-CAB for PrEP.8,9,18 Providers are encouraged to review recent data that provides evidence based on comparisons of acute HIV infection (AHI) and Long Acting Early Viral Inhibition Syndrome (LEVI) described in detail elsewhere.19

Selecting PrEP Regimen for Patients

When selecting the appropriate PrEP regimen for patients, the most important principle is to provide all options for patients and to be sure to highlight the advantages and disadvantages of each option, understanding that most patients (especially MSM and TGW) will have multiple options for HIV prevention. Key factors that play into shared decision making when selecting an appropriate strategy include factors such as patient age, sexual activity, substance use issues (i.e., ane versus vaginal sex versus PWID), current renal and bone health, desire for oral versus injectable, willingness to take tablets on a daily, ongoing basis, and ability to pay for brand versus generic versions of PrEP. Insurance coverage for medications, associated tests, and PREP monitoring visits may determine the ultimate decision about the most appropriate option. For patients with limited financial resources, the USPHS Guidelines provide pathways for patients to obtain PrEP from various sources.8

Conclusion

In summary, although in the US, there are three excellent FDA-approved options for PrEP that provide protection for all of our at-risk populations, individuals at the highest risk for HIV often do not receive PrEP prescriptions. These data highlight the importance of ongoing and expanding HIV prevention efforts for all those involved with HIV care, including primary care settings.

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My PrEP Story: Jardel A.

Interview conducted by Michelle Thompson, Program Manager, New Jersey HIV Links Assistant Editor, Rutgers School of Nursing, FXB Center

Jardel is a 21-year-old cisgender white Mexican American male. He currently works as a Harm Reduction counselor. He has been on PrEP for four months. We discussed his experience.

How did you first hear or learn about PrEP?
The first time was about three years ago. I had a close friend who was an HIV counselor.

How did you decide that PrEP was the right choice for you?
When my friend initially educated me about the basics of HIV, I had an assessment of my sexual behavior that also evaluated my risk factors. When I tested negative for HIV, I decided PrEP was the right thing for me.

Tell me about your experience with finding a provider and how the provider discussed your sexual history with you.
I saw a PrEP counselor at Proceed, Inc. in Elizabeth and was referred to a provider in Newark. She is very professional when it comes to talking about sexual risks and behaviors, asking about the types of sex you have and if you use protection. She never tells you that you “need” to do something. It creates a non-judgmental environment. You get all the information and make your own decisions.

Is not being judged or feeling judged by a provider something that is important to you and why?
Yes, it is extremely important for me to feel comfortable with the health care provider. To be able to open myself up and honestly talk about my sexual behaviors without feeling judged or feeling ashamed is important. It creates a safe space. You have to trust a provider to get the service you need.

What method/drug/form of PrEP are you taking?
Apretude injections. I didn’t think I could remember to take a pill every day when I have a lot of things going on in my life. I want to stay protected, and the shot was just better for me and my lifestyle.

What side effects, if any, have you experienced and how long did they last?
I never really had any side effects. The most I have experienced is pain at the injection site. It’s not really bad and the pain is gone in a couple of days. I have been treated with penicillin before and that shot was more painful to me. I have heard stories from other people about different side effects, but that didn’t happen to me.

Tell me about adherence. How did you make a decision on how and when to take PrEP?
I received my first and second shots back-to-back in February and March, then every two months for future shots. I had no trouble with taking my shots. I would schedule the time between my school and work to make sure I kept my appointments. I want to stay protected. I know I couldn’t depend on taking that pill every day. I am also in the Army Reserves, and it is important to me that I minimize the risk of HIV transmission in my personal life.

How do you pay for your medication?
I have private insurance that covers the cost of my medicine with no co-pay.

Do you have a message for someone considering PrEP?
Anyone considering PrEP should first be educated about the basics of HIV and how a positive diagnosis can change your life. PrEP minimizes the risk of HIV transmission.

My doctor explained a lot to me. You need a health care provider who makes you feel comfortable.

There needs to be more education to stop the stigma, misinformation and myths surrounding PrEP. It’s not just for gay men.

**(Authors note: Apretude is generically known as cabotegravir extended-release injectable suspension)**
Tuberculosis (TB), a dreaded scourge of humanity since prehistoric times, has been known by many names throughout recorded history. The oldest recognized case of TB was found in human remains dating to before 9000 BCE. In 1882, when Robert Koch isolated Mycobacterium tuberculosis, tuberculosis diseases were responsible for one in seven deaths worldwide. Public health and the advent of effective antibiotics led to moderate control of this plague in the early and mid-20th century. However, the HIV pandemic synergically fueled the TB pandemic, leading to a worldwide increase in infections, morbidity, and mortality, primarily concentrated in sub-Saharan Africa. In the early 1990s, over eight million people worldwide suffered from tuberculosis, and one to two million died yearly. In response, the World Health Organization (WHO) declared TB a global emergency. By 2020, there were advances in the war against HIV-associated TB, but an estimated 215,000 deaths occurred that year alone. Unfortunately, the COVID-19 pandemic further diminished these gains as multiple TB-related services were disrupted.

Clinical tuberculosis diseases range from asymptomatic latent infection (LTBI) to severe illness, also called TB. Clinicians diagnose latent infection through targeted testing with a purified protein derivative test (PPD) or Interferon Gamma release assays (IGRA). Immunosuppression can compromise the sensitivity of these tests. For this reason, the "cut off" for a positive PPD test is lowered to 5mm of induration in a person with HIV. Many experts prefer to use IGRA tests because the positive and negative controls allow recognition of a test compromised by insufficient immune responses. Patients with no additional risk factors with latent tuberculosis infection have a 10% risk of progression to active tuberculosis diseases. People with HIV (PWH) experience a 10% per year risk of reactivation. PWH are approximately 26 times more likely to develop active tuberculosis if infected. HIV immunosuppression and HIV stage 3 (AIDS) dramatically increase the virulence of TB infection leading to more aggressive and earlier disease manifestations. Conversely, effective antiretroviral therapy (ART) can partially mitigate the risk of active tuberculosis by 50%-80%. However, the risks relative to HIV uninfected patients remain elevated even in those who have good CD4 counts (>700 cells/mL) on ART. The immune dysregulation caused by HIV infection leads to ineffective clearance of the bacilli by macrophages, failure of cytokine production, and inability to clear the infection, leading to rapid progression of TB infection to disease or reactivation of latent tuberculosis infection.

Finding and treating all latent tuberculosis is imperative to end this dual pandemic. Current guidelines stress all people living with HIV should be screened for tuberculosis regardless of risk factors. More frequent screening is needed if the clinician identifies specific risk factors. Anyone found to have a positive screening and no suspicion of active TB disease (no signs or symptoms such as prolonged cough, fever, weight loss, night sweats, negative physical exam, or negative chest x-ray) should receive treatment for latent tuberculosis. Currently, the recommended treatments for LTBI are 12 once-weekly doses of isoniazid and rifapentine (3HP) supported with directly observed therapy, or four months of rifampin daily, or three months of daily isoniazid and rifampin. If taken as prescribed, the cure rates are greater than 90%, illustrating the need to support adherence. The treatments of LTBI are highly effective but are sometimes challenging for PWH because of medication interactions. If unfavorable drug interactions are present, an older treatment regimen of nine months of daily isoniazid is favored. Isoniazid is a highly efficacious regimen but is limited by potential decreased adherence over nine months. All current HIV medications can be used with isoniazid, and the patient should receive prophylactic B6 to prevent neuropathy.

Rifapentine
The 3HP regimen can be administered without dose adjustments to patients receiving efavirenz, twice-daily...
data demonstrate high intracellular tenofovir levels despite using rifampin or rifapentine. TAF’s antiviral effect depends on the intracellular drug concentration, so coadministration should not adversely affect it. This is a significant benefit as TAF has become a workhorse in ARV coformulation.

### Medication Interactions

Medication interactions similarly influence the treatment of active tuberculosis disease in the setting of HIV. Multiple studies have confirmed the importance of aggressively treating tuberculosis while not delaying the initiation of HIV therapy. Ideally, HIV treatment should begin as soon as tolerance to the anti-tuberculosis drugs is confirmed. The lower the CD4 count, the more urgent is ART initiation.\(^6\) Drug susceptible tuberculosis is treated with a three or four drug "cocktail" for a two-month "intensive phase" followed by four to seven months of two drugs in continuation. The initial drugs should include isoniazid, rifampicin, pyrazinamide, and ethambutol. Isoniazid, pyrazinamide, and ethambutol have no significant interactions with antiretroviral drugs. This article outlined the myriad interactions with rifamycins. Despite these challenges with the use of rifamycins, it is essential for successful TB treatment and allows for a shortened length of therapy. PWH should be treated with a rifamycin unless the TB isolate is resistant, even if that means altering their HIV treatment.\(^6\)

Fortunately, rifabutin is an available alternative to rifampin that maintains \textit{M. tuberculosis} killing with fewer, albeit not entirely, drug-drug interactions. The usual rifabutin dose is 300mg daily and can be used with dolutegravir and raltegravir. Oral rifampicin may need an increased dose to 50mg daily, and intramuscular rifampicin is not recommended. Rifabutin at a lower dose of 150 mg daily can be used with ritonavir boosted PIs. It cannot be used with cobicistat boosted antiretrovirals. The dose of rifabutin must be increased if used with efavirenz. Rifabutin is not recommended with bictegravir or cabotegravir IM.\(^6\) As with the addition of any new medication, it may be advisable to reassess HIV viral load to ensure that suppression is maintained.

### Conclusion

The treatment of HIV and tuberculosis coinfection is complex but vital to the health and well-being of our patients. Through the diligent diagnosis and treatment of all TB infections, we can improve the health of our patients and communities. Multiple TB information resources and expert consultation are available to guide individualized therapy.

### References


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CROI 2023 update

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It is challenging to summarize a gigantic meeting in one page, but I'll try to concisely give my take-home messages for practical patient care. As usual, this year’s conference was rich with new data but richer in emotions since we had three years of in-person interruption due to the COVID-19 pandemic. Attendees seemed excited to be able to finally reconnect in person and assess the damage of the pandemic on the goal of HIV elimination.

Undoubtedly the biggest disappointment was doxycycline post-exposure prophylaxis failure to protect cisgender women in Kenya from sexually transmitted infections, mainly chlamydia trachomatis and Neisseria gonorrhoea (Stewart J., et al., Abstract 121LB).

There was a lot of excitement regarding long-acting agents, the most notable presentations were the following:

1- Long-Acting Cabotegravir + Rilpivirine (LA CAB + RPV) in a Safety Net Clinic Population in San Francisco described the proof of concept of a directly observed therapy in 133 persons living with HIV (PWH) followed at the Ward 86 HIV Clinic with a high prevalence of drug use, mental health disorders, and unstable housing. At the median point of 33 days, 55 out of 57 participants previously without virologic suppression achieved virologic suppression. The authors concluded that starting LA CAB + RPV demonstrated highly successful...
CROI 2023 update

Virologic outcomes in a population of PWH with high adherence barriers. The overall virologic failure rate of 1.5% in this population with and without virologic suppression at baseline was similar to the 1.4% rate in phase III trials of PWH who were switched to LA CAB + RPV while virologically suppressed (Gandhi, Abstract 518).

2-SOLAR (Switch Onto Long-Acting Regimen) 12-Month Results – This study was a randomized switch trial of LA CAB + RPV vs. oral Biktarvy® (B/F/TAF). The results showed that patients stable on B/F/TAF who have Integrase inhibitors (INI) as their first regimen have a low risk of virologic failure (VF) if they switch to LA CAB + RPV. Still, VF is often associated with HIV resistance to NNRTI and INI (Ramgopal MN, CROI 2023, Abs. 191).

3-Another exciting phase 2b study with 20 patients evaluated the effectiveness of a LA regimen of injectable Lenacapavir in combination with two broadly neutralizing antibodies (bNAbs), GS-5423 and GS-2872, which found that with one exception, all participants remained virally suppressed at week 26. The one virologic failure at week 16 achieved virological suppression when they resumed their baseline oral ART (Eron J, CROI 2023, Abs. 193).

A notable switch study of Biktarvy® to Doravirine 100 mg + Islatravir 0.75mg (DOR/ISL) caught the attention of conference participants because of the FDA hold on Islatravir development at high dose due to lymphopenia. This was a large blind, randomized trial of patients without a diagnosis of Hepatitis B, no prior virologic failure, and no known resistance to DOR, currently receiving Biktarvy® with VL<50 c/ml for at least three months. Out of the 641 participants, 321 were randomized to DOR/ISL. There was only one virologic failure at week 48 with no evidence of resistance to DOR or ISL. In conclusion, this one pill combination was virologically non-inferior to Biktarvy®, however, the mean CD4 changes at week 48 was - 19.7cell/mm3 for DOR/ISL, and + 40.5cell/mm3 for those who continued Biktarvy® ( Mills AM, CROI 2023, Abs. 197). The currently designed naïve and switch phase 3 trials of ISL will be using 0.25 mg/day.

One of the multiple weight change-related abstracts was a follow-up of the ADVANCE study. This study of ART-naïve patients with three arms demonstrated higher weight gain in the Dolutegravir (DTG) + TAF/FTC arm compared to DTG+TDF/FTC, while patients in the third arm who received Efavirenz (EFV) + TDF/FTC gained the least weight. After 192 weeks, all participants were switched to open-label TDF/3TC/DTG, and 52 weeks later, those who switched from TAF/FTC + DTG had significant reductions in weight, total cholesterol, LDL, triglycerides, fasting glucose, and HbA1C; those who switched from TDF/FTC/EFV had a significant rise in weight and reductions in total cholesterol, LDL, triglycerides, fasting glucose and HbA1C (Bosch B, CROI 2023, Abs. 671).
The U.S. Department of Agriculture defines food insecurity as “a lack of access to enough food for every person in a household to live an active, healthy life.” The United Nations defines it more specifically as “the limited or uncertain availability of nutritionally adequate, safe foods or the inability to acquire personally acceptable foods in socially acceptable ways.” Regardless of the definition, food insecurity is distinct from hunger, defined as an "individual-level physiological condition that may result from food insecurity" because of prolonged involuntary lack of food. According to the nonprofit organization Feeding America, 34 million Americans experience food insecurity, including an estimated 775,000 New Jersey residents.

Food insecurity appears to be more common among people with HIV (PWH) in the U.S. compared with the general population. Up to 25%-80% of PWH may be food insecure compared with 14% of the general population. While beyond the scope of this article, globally, the intersection of HIV and food insecurity is an enormous problem in sub-Saharan Africa and other resource-limited regions of the world with a high prevalence of HIV.

Why is food insecurity more common among PWH, and what are the implications? Food insecurity is associated with behaviors linked to increased rates of HIV transmission, including injection drug use and transactional sex. Furthermore, some of the factors associated with food insecurity intersect with demographic groups that are disproportionally affected by HIV; these factors include poverty, other chronic diseases, and systemic racism. Often, PWH who experience food insecurity have decreased access to HIV care and treatment. Food insecurity is also associated with decreased adherence to antiretroviral therapy and clinic appointments, lower CD4 cell counts, and lower rates of virologic suppression. Other consequences of food insecurity among PWH are worse physical health status, increased use of acute medical care, and increased mortality.

Lack of access to nutritionally adequate food can cause weight loss and poor nutritional status. Food insecurity may contribute to obesity and diabetes when people consume less expensive, energy-dense foods, such as meals from fast food restaurants. While data on PWH are not yet available, we know that food insecurity contributes to metabolic and cardiovascular disease and mortality in the general population. Women with HIV who experience food insecurity have higher markers of inflammation, even after accounting for HIV suppression, which raises concern about increased cardiovascular risk.

Older PWH are particularly vulnerable to food insecurity and its consequences. One of the first studies to address this, conducted at the University of California San Francisco Silver Project, was a demonstration project focused on PWH aged 50 and older. Among 230 participants (89% men), 15% had low food security, and 17% had very low food security, defined as food insecurity with hunger. The authors estimated that these rates were three to four times the general population’s rate. The authors also found that food insecurity was associated with risky alcohol or drug use, being sedentary, having depressive symptoms, and being dependent on
instrumental activities of daily living, meaning that the individual could not perform some complex tasks such as shopping, managing medications, and housework without assistance. Our research group at Weill Cornell Medicine in New York recently investigated food insecurity in a study of 162 PWH age 55 and older, one-third of whom were women and half of whom were Black. We found that 36% experienced food insecurity within the prior year, and as expected, financial insecurity was more common in the food-insecure group. Surprisingly, only 16% of those with food insecurity reported using a meal or nutrition program, a rate similar to those without food insecurity. Food insecurity was associated with depression and several key functional limitations, including the ability to shop, walk across a small room, and handle money. There was also a trend for food insecurity to be associated with frailty, defined as a state of increased vulnerability resulting from an aging-associated decline in reserve. As commonly done, we assessed frailty using the Fried frailty phenotype based on low grip strength, low energy, slowed walking speed, low physical activity, or unintentional weight loss.

San Francisco and New York data support the importance of screening PWH—especially older adults—for food insecurity. One simple method is the two question Food Insecurity Screener (see box). Once identified, providers can refer patients with food insecurity to community-based resources, such as food pantries, congregate meal programs, or meal delivery programs. Older PWH can access nutrition assistance through County Area Agencies on Aging, State Aging and Disability Resource Centers, and the Agency for Community Living’s Eldercare Locator (https://eldercare.acl.gov/ or 1-800-677-1116) sponsored by the U.S. Administration on Aging.

### Food Insecurity Screener

This two-item screening tool, based on the U.S. Household Food Security Survey, is a validated screening tool in healthcare settings.

"I’m going to read you two statements that people have made about their food situation.

For each statement, please tell me whether the statement was often true, sometimes true, or never true for your household in the last 12 months."

1. "We worried whether our food would run out before we got money to buy more."
2. "The food that we bought just didn’t last, and we didn’t have money to get more"

A response of "often true" or "sometimes true" to either question equals a positive screen for food insecurity.

### References


Mary Jo Hoyt, the former Director for Capacity Development at the François Xavier Bagnoud Center (FXB Center), Rutgers School of Nursing, sadly, and unexpectedly, died on November 7, 2022 at St. Luke’s Hospital in Kansas City. We had the great fortune to work with Mary Jo at FXB Center and are honored to share with our readership how her work contributed to advancing HIV prevention and care at multiple levels, with a focus on women and children affected by HIV. In life, Mary Jo would have discouraged this tribute, but we are compelled to tell some of her professional story as she is truly among the unsung heroes of HIV prevention and care.

Mary Jo’s career as a nurse and family nurse practitioner involved in HIV care encompassed a range of diverse experiences beginning in 1990 as a staff nurse at the Bailey House Center for People Living with AIDS and in 1993 becoming the Director of the Women’s Health Program within the Section of HIV Medicine at St. Vincent’s Hospital in New York. Saint Vincent’s Hospital and Bailey House were among the first clinics and supportive housing resource centers for persons with HIV on the East Coast. Mary Jo was a pioneer committed to both patient care and early nursing leadership. She was active in the Association of Nurses in AIDS Care (ANAC) and was president of ANAC in 1993-1994.

In 1999, Mary Jo relocated to New Jersey where she became the Research Program Manager for the Pediatric AIDS Clinical Trials Unit (PACTU) at New Jersey Medical School, Division of Pediatric Allergy, Immunology, and Infectious Diseases (then University of Medicine and Dentistry of New Jersey) in Newark under the direction of Dr. James Oleske. In this role, she was a key part of the team implementing clinical trials that over time have revolutionized the care and outcomes of treatment for children living with HIV and the prevention of perinatal HIV transmission.

Mary Jo transitioned to a position at FXB Center in 2003 to manage the Global Education and Training Program for the International Maternal, Pediatric and Adolescent Clinical Trials (IMPAACT) Group. This training program helped to support the implementation of pediatric and perinatal HIV clinical trial protocols in newly established research settings in sub-Saharan Africa. Mary Jo understood the crucial importance of translating research into practice. From 2007-2011, she directed the FXB Center’s Global HIV Program, providing technical assistance and training related to prevention of perinatal transmission in several countries with funding from the President’s Emergency Plan.

Mary Jo Hoyt: Celebrating the life of a nursing leader who impacted the care of women and children affected by HIV

Andrea Norberg, DNP, MS, RN Executive Director François Xavier Bagnoud Center
Deborah Storm, PhD, RN Director for Research and Evaluation François Xavier Bagnoud Center (retired 2016)
Mary Jo Hoyt: Celebrating the life of nursing leader who impacted the care of women and children affected by HIV

for AIDS Relief (PEPFAR). She was remarkably effective leading FXB Center personnel and working with partners in Tanzania, Botswana, and other countries developing national clinical guidelines and curricula that were instrumental to these countries’ abilities to advance clinical services for perinatal HIV prevention and improve the care and clinical outcomes of women and children affected by HIV.

Beginning in 2011 as the FXB Center Director for Education and Capacity Development, Mary Jo focused on projects funded by the Centers for Disease Control and Prevention (CDC) to implement a national framework and comprehensive services to eliminate perinatal HIV transmission in the United States (U.S.). As principal investigator for this program at FXB, she worked with CDC to bring multidisciplinary experts together and create resources to implement the newest recommendations and interventions that have now reduced the rate of perinatal HIV transmission to 1% or less in the U.S. She worked actively to promote and participate in collaborations with colleagues across the country that resulted in the development of publications addressing preconception care, HIV preexposure prophylaxis, perinatal HIV service coordination, and other topics with an emphasis on dissemination into practice.

Mary Jo was able to bridge divides and bring people together for common purposes. She was a strong, kind leader who provided mentorship to many. It brings a smile recalling how she was able to marshal staff and resources to get things done. Although most of our time was work-focused, we enjoyed the times we were able to have a cup of coffee or a meal and share information about our lives, families, home renovations, etc. After Mary Jo left FXB Center in 2018 to return home to Kansas City, MO, we remained in touch intermittently or heard news though others. However, learning of her death prompted us to reflect that while she was no longer with us, she was not forgotten and the impact of her work lives on.

We also learned things about Mary Jo that we hadn’t known. The initial phase of her career took her from Kansas City to Central and South America where she provided nursing care in poverty-stricken areas of St. Lucia and Venezuela. In Venezuela, she provided medical care to people living in unimaginable poverty. Without resources and with very little physician support, she tended to the many sick and dying people that she encountered. She once carried a severely malnourished baby—in a box on her head—across a riverbed that had filled with raging flood water caused by heavy rain. That sounds just like the Mary Jo that we knew and further illustrates the impact that she had on the people and communities she served.

Mary Jo’s life ended too soon, but her memory lives on. May she rest in peace.