HIV PrEP for People Who Inject Drugs

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Module 2: HIV PrEP In-Depth Topics
Lesson 3: HIV PrEP for People Who Inject Drugs

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Background

Among all people currently living with HIV in the United States, about 1 in 10 acquired HIV through injection drug use.[1,2] People who inject drugs (PWID) continue to be disproportionately affected by HIV and account for an estimated 7% of new HIV infections in the United States each year.[1,2,3] As a consequence of the ongoing opioid epidemic, HIV outbreaks have increased among populations of PWID across the United States and highlight the significant risk of acquiring HIV in this population.[4,5,6,7] The use of HIV preexposure prophylaxis (PrEP) has been shown to be safe and effective for PWID, but it is underutilized in this population.[8,9] Furthermore, many PWID lack access to evidence-based harm reduction and HIV prevention interventions, including syringe service programs and medications for opioid use disorder (MOUD). Expansion of HIV PrEP services for PWID has the potential to markedly reduce new HIV infections among this population, but increased efforts are needed to promote uptake and sustained use of HIV PrEP among PWID. A key component of this process will require expanding the number of health care professionals who are willing to and capable of providing HIV PrEP for PWID. In this lesson, we review the epidemiology of HIV among PWID, discuss evidence and guidance supporting the use of HIV PrEP for PWID, and discuss the implementation of HIV PrEP among PWID.

Prevalence of Injection-Drug Use in the United States

An estimated 3.7 million people in the United States, or 1.5% of the adult population, injected drugs during 2018 (Figure 1).[10] Of the estimated 3.7 million PWID in the United States in 2018, more than 70% were male, 50% were 18-39 years of age, and 80% were non-Hispanic White persons.[10] In 2018, the estimated prevalence of injection drug use among non-Hispanic White adults (1.8%) was nearly double that of Hispanic adults (0.93%) and non-Hispanic Black adults (0.92%).[10]

Epidemiology of HIV among PWID

Epidemiology of HIV Among People Who Inject Drugs

In the United States in 2022, the Centers for Disease Control and Prevention (CDC) estimated that 10% of persons living with HIV acquired HIV through injection drug use.[1] In addition, in 2022, there were an estimated 2,300 new HIV infections that were acquired through injection drug use, accounting for an estimated 7% of new HIV infections that year in the United States.[1] More robust data is available from the CDC for new HIV diagnoses. Note that reported new HIV diagnoses in a year do not equate to the number of new HIV infections in that year (which are estimated), since persons diagnosed with HIV in a given year could have acquired HIV several years earlier and not had HIV testing for several years after HIV acquisition. Nevertheless, HIV diagnosis data provide insight into HIV infections that have likely occurred in recent years in the United States. The following summarizes detailed information about new HIV diagnoses in the year 2021 among PWID in the United States (Figure 2).[11]

- **Total Number of New HIV Diagnoses**: Among the 37,663 total new HIV diagnoses, 2,621 (7%) were among persons who reported injection drug use as their HIV risk acquisition transmission category. An additional 1,323 (3.5%) of the new HIV diagnoses had male-male sexual contact and injection drug use as their reported HIV transmission category.
- **Sex**: For new HIV diagnoses in PWID, 56% were male and 44% female.
- **Age Group**: Among PWID newly diagnosed with HIV, the highest number of diagnoses were in adults 25–34 years of age; persons in this age range accounted for approximately 32% of new HIV diagnoses among PWID.
- **Race/Ethnicity**: Among PWID newly diagnosed with HIV, White people accounted for the highest number, making up almost 50% of the new diagnoses.
- **Region**: When reporting the residence of PWID at the time of HIV diagnosis, the highest number were living in the South.

Outbreaks of HIV Among People Who Inject Drugs

Owing to the opioid epidemic, there has been an increase in HIV outbreaks among PWID in the United States.[5,12] The following summarizes major HIV outbreaks that have occurred among communities of PWID throughout the United States, including among communities with robust HIV and harm reduction services (Figure 3).[7,12]

- **Scott County, Indiana**: In 2014 and 2015, an HIV outbreak among PWID occurred in Scott County, Indiana, and this outbreak highlighted the vulnerability of PWID communities to new HIV infections.[7] During this outbreak, public health officials diagnosed 181 new cases of HIV among PWID, with 88% (159/181) of the cases involving persons who reported injecting oxymorphone.[7]
- **Lawrence/Lowell, Massachusetts**: Between 2015 and 2018, public health officials diagnosed 159 epidemiologically and/or molecularly linked HIV infections among PWID, most of whom were unhoused and used fentanyl.[4,12] An additional 25 people diagnosed prior to 2015 had epidemiologically and/or molecularly linked HIV infections, resulting in a total of 184 cases.[13]
- **Northern Kentucky/Hamilton County, Ohio**: Between January 2017 and December 2018, 157 cases of HIV were diagnosed among PWID in northern Kentucky and Hamilton County, Ohio, a stark increase from the less than 20 new cases of HIV that typically occurred among PWID in that area.[12] Among the 157 PWID in this outbreak, 84% were White people, and 49% reported sharing syringes.[12]
- **Seattle and King County, Washington**: In Seattle and King County, Washington, the prevalence of HIV among PWID (excluding MSM who inject drugs) has historically been low, estimated to be 1 to 3%.[6] In 2018, however, public health officials identified a cluster of epidemiologically and/or molecularly linked HIV infections among heterosexual persons living homeless, most of whom injected drugs and used both heroin and methamphetamine.[6] In total, 22 cases were diagnosed from

February 2018 through July 2019, with an additional 9 molecularly linked cases being diagnosed between 2008 and 2017.[6]

- **Philadelphia, Pennsylvania**: Between 2016 and 2018, public health officials in Philadelphia observed a 115% increase in new HIV diagnoses (from 33 to 71) among PWIDs.[12,14] When compared to those with other attributed risk factors for HIV, PWID diagnosed with HIV from 2016 to 2018 in Philadelphia were more likely to be female, White, and have hepatitis B virus (HBV) or hepatitis C virus (HCV) coinfection.[14] Similarly, PWID were more likely to receive their HIV diagnosis in correctional, inpatient, or community-based settings.[14]
- **Cabell County and Kanawha County, West Virginia**: From January 2018 through November 2019, there were 82 new diagnoses of HIV in Cabell County, West Virginia.[15] This represented a substantial increase from an annual average of 2 cases per year between 2015 and 2017.[15] Of the 82 cases identified, 92% were PWID, 74% of the persons 20 to 39 years of age, 92% were White, and 73% had unstable housing.[15] Similarly, between January 1, 2019, and October 27, 2021, a total of 85 PWID were diagnosed with HIV in Kanawha County, West Virginia, which is located near Cabell County. Molecular sequencing data were available for 25 individuals, and 19 (76%) of cases were molecularly clustered, indicating recent transmission.[16] Of these 19 individuals, 15 (79%) were in a unique molecular cluster, unrelated to cases on Cabell County.[16]
- **Portland and Multnomah County, Oregon**: From January 2018 through June 2019, health officials in Multnomah County, Oregon, identified 42 new cases of HIV among people who reported drug use, specifically among those who injected drugs and/or used methamphetamine in any form.[12] These 42 cases represented a major increase from a combined total of 25 new cases of HIV among PWID in 2016 and 2017.

Factors Associated with Increased Risk for HIV Among PWID

People who inject drugs often experience a multitude of risk factors for acquiring HIV, including risks directly associated with injection drug practices and risks through sexual activity. Indeed, data from recent HIV outbreaks among PWID indicate that most individuals newly diagnosed with HIV reported either needle sharing or needle sharing and sexual risk factors.[4,6,7] The following summarizes the major risks for HIV acquisition among PWID.

- Receptive syringe/needle sharing
- Sharing of injection works
- Receipt of syringes and injection supplies from non-sterile sources
- Multiple sex partners
- Condomless sex
- Exchanging sex for money or drugs

HIV Risk Factors Directly Associated with Injection Drug Use

Data from the CDC's National HIV Behavioral Surveillance (NHBS) survey of PWID suggest that injection-related risk factors for HIV are frequent among PWID.[17] Among 7,095 HIV-negative PWID surveyed in 20 United States cities as part of the 2022 NHBS cycle, 21% reported receptive syringe sharing (i.e., used a syringe or needle that had already been used by someone else for injection), and 30% reported distributive syringe sharing (e.g., gave their needle and syringe to someone else after use).[17] The proportion of respondents who reported receptive syringe sharing was highest among participants aged 18-24 years of age.[17] In addition, in the prior 12 months, 53% of the respondents had received syringes from a syringe service program (SSP), and 22% had received syringes from a pharmacy.[17] This same survey reported that only 35% of the HIV-seronegative participants had ever heard of HIV PrEP, and only 1% had taken HIV PrEP in the prior 12 months.[17] Increased injection frequency, living unhoused, and limited access to syringe exchange services were other risk factors identified in recent outbreaks among PWID.[4,6,7,14,15]

[Q] Receptive Syringe or Needle Sharing Among PWID

Risk Factors for Sexual Acquisition of HIV among PWID

In addition to risk factors directly related to injection drug use, PWID often also experience risk for HIV acquisition through sexual activity.[17,18,19] Women who inject drugs are particularly vulnerable to HIV due to a combination of injection drug use and sexual activity—they comprise many of the new HIV diagnoses in recent HIV outbreaks associated with injection drug use.[6,20] The following summarizes data from the 2022 NHBS survey, which included 7,095 HIV-seronegative PWID who were interviewed regarding their sexual activity.[17]

- Among men who inject drugs and who reported on their sexual activity in the prior 12 months, 63% reported condomless vaginal sex with a female partner, and 5% reported condomless anal sex with a male partner.[17] Overall, 26% of men reported unprotected sex with an HIV-serodifferent partner (e.g., partner of different or unknown HIV status), and 23% reported exchange sex in the prior 12 months.[17]
- Among HIV-seronegative women who inject drugs and who reported their sexual activity in the prior 12 months, 72% reported condomless vaginal sex and 25% reported condomless anal sex with a male partner.[17] In addition, 31% of female respondents reported condomless sex with an HIV-serodifferent partner, and 31% reported exchange sex in the prior 12 months.[17]

Evidence for HIV PrEP Among PWID

Bangkok Tenofovir Study

The strongest (and only major) evidence supporting the use of HIV PrEP for PWID comes from the Bangkok Tenofovir Study, a double-blind, randomized, control trial of tenofovir DF (TDF) versus placebo in 2,413 PWID in Bangkok, Thailand (Figure 5).[21]

- **Conclusion**: Daily oral TDF reduced the risk of HIV infection in PWID by 49% in the setting of receipt of active prevention services. Adherence had an important impact on the effectiveness of TDF.
- **Study Design**: This HIV PrEP study was a randomized phase 3 study conducted in Bangkok, Thailand, that enrolled persons between 20 and 60 years of age who had injected drugs in the past year. Throughout the study, which ran from June 2005 through July 2010, investigators enrolled a total of 2,413 participants from 17 drug treatment clinics in Thailand.
- **Participants**: Among the two groups, the baseline characteristics were similar. Approximately 80% of the study participants were male, and 81% were between 20 and 39 years of age. Sixty-three percent had injected drugs in the past 12 weeks, with 32% reporting at least weekly injection drug use over the past 3 months. Sexual risk factors were also common, with 22% of study participants reporting more than 1 sex partner in the past 12 weeks, and 38% reporting sexual intercourse with a casual partner in the past 12 weeks. Only 5% of male participants reported sexual intercourse with a male partner in the prior 12 weeks.
- **Intervention**: Eligible participants were randomized in a 1 to 1 double-blind fashion to receive either daily oral TDF (300 mg) or placebo. A total of 1,204 participants were enrolled in the TDF arm and 1,209 in the placebo arm. Both groups received prevention services at drug treatment centers.
- **Results**: Based on participant drug diaries, participants took the study drug an average of 84% of the time. There was no difference in serious adverse effects or adherence between the TDF and placebo groups, but adherence was higher in persons 40 years of age and older and in women. During the 9,665 person-years of follow-up (average 4 years per person), there were 50 new HIV infections: 33 in the placebo group and 17 in the TDF group, representing a 49% reduction in HIV incidence in the modified intention-to-treat analysis. In a secondary case-control analysis evaluating tenofovir levels in plasma among 46 participants with incident HIV infection and 282 HIV-negative participants, the relative risk of acquiring HIV was 70% lower among those with detectable plasma tenofovir levels compared to those with undetectable plasma tenofovir levels.

PURPOSE 4

- In the phase 2, open-label, randomized PURPOSE-4 trial, the safety and efficacy of subcutaneous lenacapavir (LEN-SQ) administered every 6 months in PWID is being evaluated and compared with oral TDF-FTC. Results are anticipated in late 2026 or early 2027.

[Q] Bangkok Tenofofovir Study

Assessing Indications for HIV PrEP Among PWID

The CDC and the U.S. Preventive Services Task Force (USPSTF) have outlined recommendations for the use of HIV PrEP among PWID.[22] It is important that all PWID undergo an assessment of their risk of acquiring HIV through injection drug use, as well as through sexual activity.[18,22,23,24]

CDC Recommendations for HIV PrEP Assessment for PWID

- **PWID Risk Index Screening Tool**: The CDC provides a screening tool for clinicians to use to determine which persons who inject drugs have a substantial risk of acquiring HIV.[25] This 7-question screening tool was developed by Smith and colleagues in 2015.[26] Based on these answers, a standardized scoring system is used to determine the PWID risk index, with a total score of 46 or greater suggesting a need to evaluate for HIV PrEP or other intensive HIV prevention services.[25]
- **Assessing Indication for HIV PrEP in PWID**: The CDC has a brief assessment tool for decision-making to help identify adults who inject drugs who may benefit from HIV PrEP.[22] The CDC recommends prescribing HIV PrEP for adults without HIV who have injected drugs in the past 6 months if they have shared injection equipment, or they had an injection partner with known HIV.[22] In addition, HIV PrEP is indicated for any PWID that have an indication for HIV PrEP based on sexual activity (Figure 6).[22]

USPSTF Recommendations for HIV PrEP in PWID

In 2023, the USPSTF recommended that clinicians prescribe HIV PrEP to persons at risk of HIV acquisition.[27] The USPSTF rated this as a "Grade A" recommendation.[27] In this recommendation, persons at risk for HIV acquisition include PWID who have an injecting partner that has HIV or a PWID who shares injection equipment.[27]

Recommended HIV PrEP Medications for PWID

There are no medications that have an FDA indication for preventing HIV acquisition through injection drug use, but the CDC currently recommends two potential options for HIV PrEP in PWID who weigh at least 35 kg (77 pounds): daily oral TDF-FTC and every 6 months LEN-SQ.[22,27,28] The use of daily oral TDF-FTC is extrapolated from the oral daily TDF data from the Bangkok Tenofovir Study that showed substantial HIV risk reduction with TDF alone when used for HIV PrEP among PWID.[21] The recommendation to use TDF-FTC instead of TDF alone is based on enhanced activity of TDF-FTC over TDF alone, minimal side effects associated with FTC, and widespread availability of inexpensive generic TDF-FTC. The CDC recommendation for LEN-SQ as HIV PrEP in PWID who share needles is based on the extremely high efficacy in populations studied and expert opinion. Note that if a PWID is not sharing needles or works and HIV PrEP is being used exclusively for preventing sexual acquisition of HIV, then medication options and recommendations for sexual HIV PrEP should be followed.[25] The following summarizes medication recommendations from the CDC for HIV PrEP for PWID to prevent HIV acquisition via shared needles or works.[22,28]

- **Tenofovir DF-Emtricitabine (TDF-FTC)**: All adolescent and adult PWID who have a risk of HIV acquisition and weigh at least 35 kg (77 lb) should be offered HIV PrEP, using one tablet daily of oral TDF-FTC, taken with or without food. Note that TDF-FTC is not recommended for HIV PrEP in persons with a creatinine clearance (CrCL) of less than 60 mL/min.
- **Tenofovir alafenamide-Emtricitabine (TAF-FTC)**: There are no studies that have evaluated the use of oral TAF-FTC for prevention of HIV in PWID, and therefore, this regimen is not currently recommended for HIV PrEP in PWID.
- **Long-Acting Injectable Cabotegravir (CAB-LA)**: There are no data that support the use of CAB-LA as HIV PrEP in PWID. Thus, CAB-LA is not recommended for HIV PrEP in PWID.
- **Lenacapavir Subcutaneous Injection (LEN-SQ)**: Although there are no published data on the efficacy of LEN-SQ for prevention of HIV in PWID, the CDC recommendations include LEN-SQ as an option for HIV PrEP in PWID who share needles. The dosing for LEN-SQ is every 6 months, with an oral loading dose on days 1 and 2.
- **On-demand (2-1-1) Oral HIV PrEP**: There have been no studies of any HIV PrEP regimens for on-demand (2-1-1) HIV PrEP for PWID. Thus, on-demand (2-1-1) HIV PrEP for PWID is not recommended in PWID.

[Q] HIV PrEP Medication for PWID

Special Circumstances

- **PWID with Renal Insufficiency**: Although daily oral TDF-FTC is the most commonly used medication for HIV PrEP in PWID, it should not be used for HIV PrEP in persons who have a creatinine clearance less than 60 mL/min). In the setting of renal insufficiency, LEN-SQ can be considered, as this medication requires no dose adjustment for CrCl ≥15 mL/min. Currently, there are no data on the use of LEN-SQ in persons with CrCl

Baseline Laboratory Evaluation

For PWID, the recommendations in the 2021 CDC HIV PrEP Guidelines and 2025 CDC LEN-SQ HIV PrEP Guidelines for baseline evaluation and baseline laboratory studies are the same as outlined for other persons starting on and receiving HIV PrEP.[22,28] It is particularly important to assess for HCV infection in PWID and to offer treatment for all individuals who have a positive HCV RNA test. The routinely recommended baseline evaluation and laboratory studies are summarized and discussed in detail in the *HIV PrEP Fundamentals* module lesson on Baseline Evaluation and Starting HIV PrEP. In addition, summary tables for initial and follow-up laboratory studies are available in the Laboratory Monitoring Guide on this website.

Time to Achieve Protection

The exact duration between initiating HIV PrEP and achieving protection against HIV via injection drug use is unknown. This determination is complicated by the lack of consensus on the tissue-specific drug concentration required to provide protection against HIV infection and the significant variation in the pharmacokinetics of TDF and FTC in different tissues.[30,31] For these reasons, the CDC does not provide specific recommendations on how long a person must be taking daily HIV PrEP to achieve protection against HIV. Although there is no clear guidance on the number of days PWID should take oral TDF-FTC for PrEP before it is effective, our recommendation is to counsel PWID that it may take up to 1 week for some protection and 3 weeks before this drug offers maximum protection against HIV. There are similarly no data on time to protection for LEN-SQ in PWID; however, limited data for time to protection in sexual acquisition suggests that protective levels are achieved 2 hours after the 2nd oral loading dose on day 2.[28] If the oral loading doses are missed, then time to protection is estimated to be 21 – 28 days.[28]

- **Tenofovir DF-Emtricitabine (TDF-FTC)**: Data from pharmacokinetic studies performed among individuals without HIV suggest that maximum intracellular concentrations of tenofovir diphosphate are achieved in peripheral blood mononuclear cells after approximately 7 days, in rectal tissue at approximately 7 days, and in cervicovaginal tissues at approximately 20 days.[22,30,31]
- **Tenofovir alafenamide-Emtricitabine (TAF-FTC))**: There are insufficient data on the time to achieve maximal tissue concentrations after initiating TAF-FTC. Note that TAF-FTC has not been studied for the prevention of HIV acquisition through injection drug use, and it is not recommended for HIV PrEP in PWID.
- **Long-Acting Injectable Cabotegravir (CAB-LA)**: There are no data that provide any estimates for the time to achieve maximal tissue concentrations after initiating oral cabotegravir or CAB-LA for HIV PrEP. Note that CAB-LA has not been studied for the prevention of HIV acquisition through injection drug use, and it is not recommended for HIV PrEP in PWID.
- **Lenacapavir Subcutaneous Injection (LEN-SQ)**: Limited data on the use of LEN-SQ for HIV PrEP suggests that protective levels are likely achieved 2 hours after the second loading dose of oral LEN-SQ.[28] There are no data on time to protection against HIV acquisition in PWID.

Follow-Up and Laboratory Monitoring

For PWID who are taking HIV PrEP, the recommendations in the 2021 CDC HIV PrEP Guidelines and the 2025 CDC LEN-SQ HIV PrEP Guidelines for routine follow-up clinical evaluations and follow-up laboratory studies are the same as outlined for other persons receiving HIV PrEP.[22] Any PWID who is experiencing signs or symptoms of acute hepatitis should have a prompt evaluation that includes testing for hepatic aminotransferase levels and HCV RNA. In addition, all persons with ongoing risk for HCV acquisition should receive counseling that HCV acquisition can occur after an HCV treatment cure. The clinical follow-up and recommended monitoring laboratory studies are summarized and discussed in detail in the *HIV PrEP Fundamentals* module lesson on Follow-Up Care and Monitoring on HIV PrEP. In addition, summary tables for follow-up laboratory studies are available in the Laboratory Monitoring Guide on this website.

Implementation of HIV PrEP for PWID

HIV PrEP Uptake and Utilization among PWID

Among PWID, HIV PrEP has been underutilized. Cross-sectional data from major United States cities indicated that HIV PrEP use is exceedingly low among PWID. In a survey of 265 HIV-seronegative PWID in Baltimore, authors reported that only 2 (0.75%) survey respondents were currently taking HIV PrEP despite 43% being eligible for HIV PrEP based on injection practices.[32] Similar data from the 2022 National HIV Behavioral Surveillance survey in Philadelphia showed that only 1% of PWID surveyed had taken HIV PrEP in the prior 12 months.[17] Data on low HIV PrEP uptake and utilization among PWID have also emerged from a survey of PWID in San Francisco, where only 3.0% of PWID reported taking HIV PrEP.[33] In Miami, a study of 152 syringe services program clients found that no participants were taking HIV PrEP, despite 57.2% of those surveyed being interested in receiving more information about HIV PrEP.[34]

Barriers to Implementation

Implementation of HIV PrEP for PWID is limited by several factors, including low awareness of HIV PrEP, a low self-perceived risk for HIV acquisition, competing health and survival priorities, cost, concern about HIV PrEP medication side effects, and unstable living situations.[35,36,37,38] Several recent studies have shown low awareness of HIV PrEP among PWID, with estimates of HIV PrEP awareness ranging from 12 to 35% among surveyed groups of PWID.[17,32,39,40,41] Furthermore, qualitative data from United States-based samples of PWID suggest that many PWID do not perceive themselves to be at risk for HIV acquisition despite the presence of multiple risk behaviors.[17,35,36,37,38] These barriers, paired with other barriers, such as poverty, unstable housing, and competing medical, social, and survival priorities, represent major obstacles to the wider dissemination of HIV PrEP for populations of PWID.

Strategies to Improve PrEP Uptake and Persistence

There is no clear consensus on how to best deliver HIV PrEP services to PWID. Lessons learned from other service delivery models for PWID suggest that low-barrier, co-located services (e.g., integration of HIV PrEP into syringe service programs or co-prescribing with medications for opioid use disorder) are likely to be most effective, but further efforts are needed to better understand successful strategies for operationalizing HIV PrEP for PWID within the broader context of HIV prevention and addiction services.[35,36]

Additional Care Services for PWID

Additional Considerations for Care Delivery Among PWID

Programs providing HIV PrEP for PWID should ideally provide (or link to) additional services, including those focused on safer injection practices, MOUD, mental health counseling, social services, and screening and management of other infectious complications of injection drug use. For medical personnel providing HIV PrEP to PWID, it is important to recognize that PWID have an elevated risk of developing other infections associated with injection drug use, including HBV, HCV, endocarditis, bacteremia, and skin and soft tissue infections. In accordance with CDC guidelines, PWID should be screened at least once for HBV and undergo routine periodic screening for HCV.[42,43,44] For PWID who are susceptible to HBV, immunization with the HBV vaccine should be given to reduce ongoing risk for HBV acquisition incurred by injection drug use.[42,43] In addition, PWID should also be vaccinated against hepatitis A virus (HAV), particularly given recent outbreaks of HAV in the United States among PWID and/or those with housing insecurity.[45,46]

Medications for Opioid Use Disorder (MOUD)

The use of MOUD has been associated with a reduction in all-cause mortality and opioid-related mortality for people with opioid use disorder.[47] Although there has been a push to expand MOUD services in the face of the ongoing opioid epidemic, access to MOUD remains limited in many parts of the United States due to a lack of prescribers and the consolidation of opioid use disorder care in specialized addiction treatment centers.[48,49,50,51,52] In the past, physicians and advanced practice providers (APPs) were required to complete an 8- to 24-hour training to obtain a buprenorphine prescribing waiver (also known as an X-waiver), a major barrier for busy primary care medical providers. However, as of January 2023, the X-waiver is no longer required, and practitioners with a current DEA license that includes schedule III authority can prescribe buprenorphine, subject to state requirements, for opioid use disorder. The three medications used for the treatment of opioid use disorder include buprenorphine-naloxone, methadone, and naltrexone.

- **Buprenorphine and Buprenorphine-Naloxone**: Buprenorphine is a partial opioid agonist with a high affinity for the mu-opioid receptor. It can be prescribed in office-based settings and does not require a daily dosing visit, as typically required with methadone. Buprenorphine is available in transmucosal (sublingual, buccal) formulations and typically dosed 1 to 3 times a day. Buprenorphine is also available as a long-acting injectable depot formulation, which is given as subcutaneous injections weekly or monthly.
- **Methadone**: Methadone is a full opioid agonist, dosed orally every day. Methadone maintenance therapy is the most established treatment for OUD. Patients enrolled in methadone maintenance visit a specific opioid treatment center daily for directly observed therapy.
- **Naltrexone**: Naltrexone is an opioid antagonist that can be dosed daily via an oral formulation or monthly via an extended-release injection. Naltrexone blocks the opioid receptor and inhibits the effects of opioids.

Drug Interactions Between Medications Used to Treat Opioid Addiction and HIV PrEP

There are no significant drug interactions between oral HIV PrEP medications and MOUD. Coadministration of CAB-LA and methadone has not been studied, but CAB-LA is expected to decrease methadone concentrations. No dose adjustment is required, but clinical monitoring is recommended as methadone dosing may need to be adjusted upward in certain individuals. There is similarly no data on the coadministration of LEN-SQ and MOUD. LEN-SQ is a moderate CYP3A4 inhibitor and may increase buprenorphine and methadone exposure; however, the clinical significance of this is felt to be minimal and no a priori dose adjustment is

Management and Prevention of Infectious Complications in PWID

For medical personnel providing HIV PrEP to PWID, it is important to recognize that PWID have an elevated

risk for other infections associated with injection drug use, including HBV, HCV, endocarditis and bacteremia, and skin and soft tissue infections.

- **Hepatitis A Virus (HAV)**: In the United States, multiple outbreaks of HAV have occurred among PWID.[53] The CDC considers PWID at increased risk of acquiring HAV and therefore recommends HAV immunization for all PWID unless they are known to be immune to hepatitis A.[53] Although the CDC has recommended PWID receive HAV immunization since 1996, the HAV seropositivity rates among PWID remain less than 50%.[54,55] The recommendation to vaccinate PWID is an especially high priority for those individuals who are living unhoused.[45,53] Prevaccination serologic testing for hepatitis A immunity is not routinely recommended but may be considered, particularly in populations with a high baseline prevalence of HAV (e.g., persons from endemic areas). In PWID, prevaccination serologic testing should not be a barrier to vaccination.[53] Owing to the high degree of seroprotection afforded by the HAV vaccine, postvaccination serologic testing for immunity is not recommended.[53]
- **Hepatitis B Virus (HBV)**: People who inject drugs are at increased risk for HBV. In 2023, injection drug use was reported in 19% (186 of 963) reported cases of acute HBV in the United States for which information on drug use was available.[56] All adults in the United States, including PWID, should undergo HBV serologic screening with HBsAg, anti-HBc, and anti-HBs.[57] Those without immunity to HBV should be vaccinated given the ongoing risk for HBV acquisition incurred by injection drug use and in accordance with guidelines recommending universal adult HBV vaccination.[58]
- **Hepatitis C Virus**: Injection drug use remains the most common risk factor for HCV and has led to a steady increase in acute HCV cases since 2010, particularly among individuals ages 20 to 39.[] In 2021, among the 1,952 reported cases of acute HCV where information on injection drug use status was known, 67% of individuals reported a history of injection drug use.[] In accordance with CDC guidelines, all individuals, including PWID, should be screened at least once for HCV.[60] Those PWID with ongoing risk of HCV acquisition should be screened annually thereafter.[60] All PWID who are diagnosed with chronic HCV (positive HCV RNA) should undergo evaluation for treatment, as active drug use is not a contraindication to the use of direct-acting antiviral therapy for HCV.[61,62]
- **Bacterial Infections**: Persons with active injection practices, including intravenous injecting, skin popping, and muscling, have a substantial risk of developing serious bacterial infections, including skin and soft tissue infections, bacteremia, and endocarditis. They should receive counseling on sterile injection practices that may lessen the risk of these infections, as well as specific information on seeking medical care for signs or symptoms of these infections. Clinicians caring for PWID should ask about any signs or symptoms of these infections at clinical visits.

Summary Points

- In the United States, PWID are disproportionately impacted by HIV, accounting for an estimated 10% of persons living with HIV and about 7% of annual new HIV infections.
- As a consequence of the ongoing opioid epidemic, HIV outbreaks have increased among populations of PWID across the United States, and these outbreaks highlight the vulnerability of this population for acquiring HIV infection.
- People who inject drugs can experience overlapping risk factors for HIV, including receptive sharing of syringes and injection works, as well as condomless sex, multiple sex partners, and exchanging sex for money or drugs.
- The strongest evidence supporting the use of HIV PrEP for PWID comes from the Bangkok Tenofovir Study, which showed that daily oral TDF reduced the risk of HIV infection in PWID by 49%; adherence had an important impact on the effectiveness of TDF. A clinical trial is ongoing with LEN-SQ as HIV PrEP for PWID.
- Based on available data, the CDC recommends the use of oral daily TDF–TCF for HIV PrEP or LEN-SQ in PWID. On-demand (2-1-1) dosing with TDF-FTC is not recommended for use in PWID.
- There are no data supporting the use of TAF-FTC or iCAB-LA for the prevention of HIV in PWID and these medications are not recommended for HIV PrEP in PWID.
- As part of the baseline evaluation for HIV PrEP in PWID, it is essential to confirm the individual considering HIV PrEP does not already have HIV, since the regimens used for the prevention of HIV are not adequate if used alone for the treatment of HIV.
- In addition to HIV testing, baseline HIV PrEP labs should include serum creatinine, HBV serology, and a pregnancy test. Due to overlapping risk factors, PWID initiating HIV PrEP should also be screened for HCV and STIs.
- PWID receiving oral HIV PrEP should undergo HIV testing every 3 months, in accordance with CDC guidelines.
- There is no clear consensus on how to best deliver HIV PrEP services to PWID. Lessons learned from other service delivery models for PWID suggest that low-barrier, co-located services (e.g., integration of HIV PrEP into syringe service programs or co-prescribing with medications for opioid use disorder) are likely to be most effective.

Citations

1. Centers for Disease Control and Prevention. Estimated HIV Incidence and Prevalence in the United States, 2018–2022. HIV Surveillance Supplemental Report. 2024;29(No. 1):1-131. Published May 2024. [CDC] -

2. Centers for Disease Control and Prevention. Diagnoses of HIV infection in the United States and dependent areas, 2021. HIV Surveillance Report, 2021; vol. 34. Published May 2023. [CDC] -

3. Centers for Disease Control and Prevention. Estimated HIV Incidence and Prevalence in the United States, 2015–2019. HIV Surveillance Supplemental Report. 2021;26(No. 1):1-81. Published May 2021. [CDC] -

4. Alpren C, Dawson EL, John B, et al. Opioid Use Fueling HIV Transmission in an Urban Setting: An Outbreak of HIV Infection Among People Who Inject Drugs-Massachusetts, 2015-2018. Am J Public Health. 2020;110:37-44. [PubMed Abstract] -

5. Des Jarlais DC, Sypsa V, Feelemyer J, et al. HIV outbreaks among people who inject drugs in Europe, North America, and Israel. Lancet HIV. 2020;7:e434-e42. [PubMed Abstract] -

6. Golden MR, Lechtenberg R, Glick SN, et al. Outbreak of Human Immunodeficiency Virus Infection Among Heterosexual Persons Who Are Living Homeless and Inject Drugs - Seattle, Washington, 2018. MMWR Morb Mortal Wkly Rep. 2019;68:344-9. [PubMed Abstract] -

7. Peters PJ, Pontones P, Hoover KW, et al. HIV Infection Linked to Injection Use of Oxymorphone in Indiana, 2014-2015. N Engl J Med. 2016;375:229-39. [PubMed Abstract] -

8. Mistler CB, Copenhaver MM, Shrestha R. The Pre-exposure Prophylaxis (PrEP) Care Cascade in People Who Inject Drugs: A Systematic Review. AIDS Behav. 2021;25:1490-1506. [PubMed Abstract] -

9. Streed CG Jr, Morgan JR, Gai MJ, Larochelle MR, Paasche-Orlow MK, Taylor JL. Prevalence of HIV Preexposure Prophylaxis Prescribing Among Persons With Commercial Insurance and Likely Injection Drug Use. JAMA Netw Open. 2022;5:e2221346. [PubMed Abstract] -

10. Bradley H, Hall EW, Asher A, et al. Estimated Number of People Who Inject Drugs in the United States. Clin Infect Dis. 2023;76:96-102. [PubMed Abstract] -

11. Centers for Disease Control and Prevention. Diagnoses, Deaths, and Prevalence of HIV in the United States and 6 Territories and Freely Associated States, 2022. *HIV Surveillance Report, 2022*; vol. 35. Published May 2024. [CDC] -

12. Lyss SB, Buchacz K, McClung RP, Asher A, Oster AM. Responding to Outbreaks of Human Immunodeficiency Virus Among Persons Who Inject Drugs-United States, 2016-2019: Perspectives on Recent Experience and Lessons Learned. J Infect Dis. 2020;222:S239-S249.

[PubMed Abstract] -

13. Tumpney M, John B, Panneer N, et al. Human Immunodeficiency Virus (HIV) Outbreak Investigation Among Persons Who Inject Drugs in Massachusetts Enhanced by HIV Sequence Data. J Infect Dis. 2020;222:S259-S267.
[PubMed Abstract] -

14. Kim MM, Conyngham SC, Smith C, et al. Understanding the Intersection of Behavioral Risk and Social Determinants of Health and the Impact on an Outbreak of Human Immunodeficiency Virus Among Persons Who Inject Drugs in Philadelphia. J Infect Dis. 2020;222:S250-S258.
[PubMed Abstract] -

15. Atkins A, McClung RP, Kilkenny M, et al. Notes from the Field: Outbreak of Human Immunodeficiency Virus Infection Among Persons Who Inject Drugs - Cabell County, West Virginia, 2018-2019. MMWR Morb Mortal Wkly Rep. 2020;69:499-500.
[PubMed Abstract] -

16. Hershow RB, Wilson S, Bonacci RA, et al. Notes from the Field: HIV Outbreak During the COVID-19 Pandemic Among Persons Who Inject Drugs - Kanawha County, West Virginia, 2019-2021. MMWR Morb Mortal Wkly Rep. 2022;71:66-8.
[PubMed Abstract] -

17. Centers for Disease Control and Prevention. HIV Infection, Risk, Prevention, and Testing Behaviors among Persons Who Inject Drugs—National HIV Behavioral Surveillance, 20 U.S. Cities, 2022. HIV Surveillance Special Report 35:1-51. Published February 2024.
[CDC] -

18. Centers for Disease Control and Prevention. HIV Infection, Risk, Prevention, and Testing Behaviors among Persons Who Inject Drugs National HIV Behavioral Surveillance: Injection Drug Use, 20 U.S. Cities, 2015. HIV Surveillance Special Report 18:1-38. Revised edition: Published May 2018.
[CDC] -

19. Centers for Disease Control and Prevention. HIV Infection, Risk, Prevention, and Testing Behaviors among Persons Who Inject Drugs National HIV Behavioral Surveillance: Injection Drug Use, 23 U.S. Cities, 2018. HIV Surveillance Special Report 24:1-43. Revised edition: Published February 2020.
[CDC] -

20. Larney S, Mathers BM, Poteat T, Kamarulzaman A, Degenhardt L. Global Epidemiology of HIV Among Women and Girls Who Use or Inject Drugs: Current Knowledge and Limitations of Existing Data. J Acquir Immune Defic Syndr. 2015;69 Suppl 2:S100-9.
[PubMed Abstract] -

21. Choopanya K, Martin M, Suntharasamai P, et al. Antiretroviral prophylaxis for HIV infection in injecting drug users in Bangkok, Thailand (the Bangkok Tenofovir Study): a randomised, double-blind, placebo-controlled phase 3 trial. Lancet. 2013;381:2083-90.
[PubMed Abstract] -

22. Centers for Disease Control and Prevention: US Public Health Service: Preexposure prophylaxis for the prevention of HIV infection in the United States—2021 Update: a clinical practice guideline. December 2021:1-108.
[CDC] -

23. Burnett JC, Broz D, Spiller MW, Wejnert C, Paz-Bailey G. HIV Infection and HIV-Associated Behaviors Among Persons Who Inject Drugs - 20 Cities, United States, 2015. MMWR Morb Mortal Wkly Rep.

2018;67:23-8.
[PubMed Abstract] -

24. Kral AH, Bluthenthal RN, Lorvick J, Gee L, Bacchetti P, Edlin BR. Sexual transmission of HIV-1 among injection drug users in San Francisco, USA: risk-factor analysis. Lancet. 2001;357:1397-401.
[PubMed Abstract] -

25. Centers for Disease Control and Prevention: US Public Health Service: Preexposure prophylaxis for the prevention of HIV infection in the United States—2021 Update: clinical providers' supplement. December 2021:1-53.
[CDC] -

26. Smith DK, Pan Y, Rose CE, et al. A Brief Screening Tool to Assess the Risk of Contracting HIV Infection Among Active Injection Drug Users. J Addict Med. 2015;9:226-32.
[PubMed Abstract] -

27. US Preventive Services Task Force; Barry MJ, Nicholson WK, et al. Preexposure Prophylaxis to Prevent Acquisition of HIV: US Preventive Services Task Force Recommendation Statement. JAMA. 2023;330:736-45.
[PubMed Abstract] -

28. Patel RR, Hoover KW, Lale A, Cabrales J, Byrd KM, Kourtis AP. Clinical Recommendation for the Use of Injectable Lenacapavir as HIV Preexposure Prophylaxis - United States, 2025. MMWR Morb Mortal Wkly Rep. 2025;74:541-9.
[CDC] -

29. Cottrell ML, Yang KH, Prince HM, et al. A translational pharmacology approach to predicting outcomes of preexposure prophylaxis against HIV in men and women using tenofovir disoproxil fumarate with or without emtricitabine. J Infect Dis. 2016;214:55-64.
[PubMed Abstract] -

30. Patterson KB, Prince HA, Kraft E, et al. Penetration of tenofovir and emtricitabine in mucosal tissues: implications for prevention of HIV-1 transmission. Sci Transl Med. 2011;3:112re4.
[PubMed Abstract] -

31. Sherman SG, Schneider KE, Park JN, et al. PrEP awareness, eligibility, and interest among people who inject drugs in Baltimore, Maryland. Drug Alcohol Depend. 2019;195:148-55.
[PubMed Abstract] -

32. McFarland W, Lin J, Santos GM, Arayasirikul S, Raymond HF, Wilson E. Low PrEP Awareness and Use Among People Who Inject Drugs, San Francisco, 2018. AIDS Behav. 2020;24:1290-3.
[PubMed Abstract] -

33. Jo Y, Bartholomew TS, Doblecki-Lewis S, et al. Interest in linkage to PrEP among people who inject drugs accessing syringe services; Miami, Florida. PLoS One. 2020;15:e0231424.
[PubMed Abstract] -

34. Allen ST, O'Rourke A, White RH, Sherman SG, Grieb SM. Perspectives on Fentanyl Test Strip Use among People Who Inject Drugs in Rural Appalachia. Subst Use Misuse. 2020;55:1594-1600.
[PubMed Abstract] -

35. Bazzi AR, Biancarelli DL, Childs E, et al. Limited Knowledge and Mixed Interest in Pre-Exposure Prophylaxis for HIV Prevention Among People Who Inject Drugs. AIDS Patient Care STDS. 2018;32:529-37.

[PubMed Abstract] -

36. Biello KB, Bazzi AR, Mimiaga MJ, et al. Perspectives on HIV pre-exposure prophylaxis (PrEP) utilization and related intervention needs among people who inject drugs. Harm Reduct J. 2018;15:55. [PubMed Abstract] -

37. Footer KHA, Lim S, Rael CT, et al. Exploring new and existing PrEP modalities among female sex workers and women who inject drugs in a U.S. city. AIDS Care. 2019;31:1207-13. [PubMed Abstract] -

38. Walters SM, Rivera AV, Starbuck L, et al. Differences in Awareness of Pre-exposure Prophylaxis and Post-exposure Prophylaxis Among Groups At-Risk for HIV in New York State: New York City and Long Island, NY, 2011-2013. J Acquir Immune Defic Syndr. 2017;75 Suppl 3:S383-91. [PubMed Abstract] -

39. Walters SM, Reilly KH, Neaigus A, Braunstein S. Awareness of pre-exposure prophylaxis (PrEP) among women who inject drugs in NYC: the importance of networks and syringe exchange programs for HIV prevention. Harm Reduct J. 2017;14:40. [PubMed Abstract] -

40. Kuo I, Olsen H, Patrick R, et al. Willingness to use HIV pre-exposure prophylaxis among community-recruited, older people who inject drugs in Washington, DC. Drug Alcohol Depend. 2016;164:8-13. [PubMed Abstract] -

41. Schillie S, Vellozzi C, Reingold A, et al. Prevention of Hepatitis B Virus Infection in the United States: Recommendations of the Advisory Committee on Immunization Practices. MMWR Recomm Rep. 2018;67:1-31. [PubMed Abstract] -

42. Weinbaum CM, Williams I, Mast EE, et al. Recommendations for identification and public health management of persons with chronic hepatitis B virus infection. MMWR Recomm Rep. 2008;57:1-20. [PubMed Abstract] -

43. Abara WE, Qaseem A, Schillie S, McMahon BJ, Harris AM. Hepatitis B Vaccination, Screening, and Linkage to Care: Best Practice Advice From the American College of Physicians and the Centers for Disease Control and Prevention. Ann Intern Med. 2017;167:794-804. [PubMed Abstract] -

44. Doshani M, Weng M, Moore KL, Romero JR, Nelson NP. Recommendations of the Advisory Committee on Immunization Practices for Use of Hepatitis A Vaccine for Persons Experiencing Homelessness. MMWR Morb Mortal Wkly Rep. 2019;68:153-6. [PubMed Abstract] -

45. Fiore AE, Wasley A, Bell BP. Prevention of hepatitis A through active or passive immunization: recommendations of the Advisory Committee on Immunization Practices (ACIP). MMWR Recomm Rep. 2006;55:1-23. [PubMed Abstract] -

46. Larochelle MR, Bernson D, Land T, et al. Medication for Opioid Use Disorder After Nonfatal Opioid Overdose and Association With Mortality: A Cohort Study. Ann Intern Med. 2018;169:137-145. [PubMed Abstract] -

47. Wyse JJ, Gordon AJ, Dobscha SK, et al. Medications for opioid use disorder in the Department of Veterans Affairs (VA) health care system: Historical perspective, lessons learned, and next steps.

Subst Abus. 2018;39:139-44.
[PubMed Abstract] -

48. Hawkins EJ, Malte CA, Gordon AJ, et al. Accessibility to Medication for Opioid Use Disorder After Interventions to Improve Prescribing Among Nonaddiction Clinics in the US Veterans Health Care System. JAMA Netw Open. 2021;4:e2137238.
[PubMed Abstract] -

49. Substance Abuse and Mental Health Services Administration (SAMHSA). Medications for Opioid Use Disorder. Treatment Improvement Protocol (TIP) Series, No. 63. HHS Publication No. (SMA) 09-4380. Rockville, MD: Substance Abuse and Mental Health Services Administration, Updated 2021.
[SAMHSA] -

50. Abraham AJ, Adams GB, Bradford AC, Bradford WD. County-level access to opioid use disorder medications in medicare Part D (2010-2015). Health Serv Res. 2019;54:390-398.
[PubMed Abstract] -

51. Conway KP, Khoury D, Hilscher R, Aldridge AP, Parker SJ, Zarkin GA. Rural and urban differences in undersupply of buprenorphine provider availability in the United States, 2018. Addict Sci Clin Pract. 2022;17:5.
[PubMed Abstract] -

52. Nelson NP, Weng MK, Hofmeister MG, et al. Prevention of Hepatitis A Virus Infection in the United States: Recommendations of the Advisory Committee on Immunization Practices, 2020. MMWR Recomm Rep. 2020;69:1-38.
[PubMed Abstract] -

53. Collier MG, Drobeniuc J, Cuevas-Mota J, Garfein RS, Kamili S, Teshale EH. Hepatitis A and B among young persons who inject drugs--vaccination, past, and present infection. Vaccine. 2015;33:2808-12.
[PubMed Abstract] -

54. Yin S, Barker L, Ly KN, et al. Susceptibility to Hepatitis A Virus Infection in the United States, 2007-2016. Clin Infect Dis. 2020;71:e571-e579.
[PubMed Abstract] -

55. Centers for Disease Control and Prevention (CDC). 2023 Viral Hepatitis Surveillance Report – Hepatitis B Surveillance. Published April 15, 2025.
[CDC] -

56. Conners EE, Panagiotakopoulos L, Hofmeister MG, et al. Screening and Testing for Hepatitis B Virus Infection: CDC Recommendations - United States, 2023. MMWR Recomm Rep. 2023;72:1-25.
[PubMed Abstract] -

57. Weng MK, Doshani M, Khan MA, et al. Universal Hepatitis B Vaccination in Adults Aged 19-59 Years: Updated Recommendations of the Advisory Committee on Immunization Practices - United States, 2022. MMWR Morb Mortal Wkly Rep. 2022;71:477-83.
[PubMed Abstract] -

58. Schillie S, Wester C, Osborne M, Wesolowski L, Ryerson AB. CDC Recommendations for Hepatitis C Screening Among Adults - United States, 2020. MMWR Recomm Rep. 2020;69:1-17.
[PubMed Abstract] -

59. AASLD/IDSA. Recommendations for testing, management, and treating hepatitis C. When and in whom to initiate HCV therapy.

[AASLD/IDSA Hepatitis C Guidance] -

60. Bhattacharya D, Aronsohn A, Price J, Lo Re V. Hepatitis C Guidance 2023 Update: AASLD-IDSA Recommendations for Testing, Managing, and Treating Hepatitis C Virus Infection. Clin Infect Dis. 2023 May 25;ciad319.
[PubMed Abstract] -

References

- Bernard CL, Brandeau ML, Humphreys K, et al. Cost-Effectiveness of HIV Preexposure Prophylaxis for People Who Inject Drugs in the United States. Ann Intern Med. 2016;165:10-19.
[PubMed Abstract] -

- Bernard CL, Owens DK, Goldhaber-Fiebert JD, Brandeau ML. Estimation of the cost-effectiveness of HIV prevention portfolios for people who inject drugs in the United States: A model-based analysis. PLoS Med. 2017;14:e1002312.
[PubMed Abstract] -

- Cranston K, Alpren C, John B, et al. Notes from the Field: HIV Diagnoses Among Persons Who Inject Drugs - Northeastern Massachusetts, 2015-2018. MMWR Morb Mortal Wkly Rep. 2019;68:253-4.
[PubMed Abstract] -

- Degenhardt L, Peacock A, Colledge S, et al. Global prevalence of injecting drug use and sociodemographic characteristics and prevalence of HIV, HBV, and HCV in people who inject drugs: a multistage systematic review. Lancet Glob Health. 2017;5:e1192-e1207.
[PubMed Abstract] -

- Des Jarlais DC, Sypsa V, Feelemyer J, et al. HIV outbreaks among people who inject drugs in Europe, North America, and Israel. Lancet HIV. 2020;7:e434-e442.
[PubMed Abstract] -

- Fu R, Owens DK, Brandeau ML. Cost-effectiveness of alternative strategies for provision of HIV preexposure prophylaxis for people who inject drugs. AIDS. 2018;32:663-72.
[PubMed Abstract] -

- Krebs E, Zang X, Enns B, et al. Ending the HIV Epidemic Among Persons Who Inject Drugs: A Cost-Effectiveness Analysis in Six US Cities. J Infect Dis. 2020;222:S301-S311.
[PubMed Abstract] -

- Lansky A, Finlayson T, Johnson C, et al. Estimating the number of persons who inject drugs in the united states by meta-analysis to calculate national rates of HIV and hepatitis C virus infections. PLoS One. 2014;9:e97596.
[PubMed Abstract] -

- Nerlander LM, Hess KL, Rose CE, et al. Exchange Sex and HIV Infection Among Women Who Inject Drugs-20 US Cities, 2009. J Acquir Immune Defic Syndr. 2017;75 Suppl 3:S333-40.
[PubMed Abstract] -

- Roth A, Tran N, Piecara B, Welles S, Shinefeld J, Brady K. Factors Associated with Awareness of Pre-exposure Prophylaxis for HIV Among Persons Who Inject Drugs in Philadelphia: National HIV Behavioral Surveillance, 2015. AIDS Behav. 2019;23:1833-40.
[PubMed Abstract] -

- Roth AM, Aumaier BL, Felsher MA, et al. An Exploration of Factors Impacting Preexposure Prophylaxis Eligibility and Access Among Syringe Exchange Users. Sex Transm Dis. 2018;45:217-21. [PubMed Abstract] -

- Substance Abuse and Mental Health Services Administration. (2020). Key substance use and mental health indicators in the United States: Results from the 2019 National Survey on Drug Use and Health (HHS Publication No. PEP20-07-01-001, NSDUH Series H-55). Rockville, MD: Center for Behavioral Health Statistics and Quality, Substance Abuse and Mental Health Services Administration. [SAMHSA] -

- Violette LR, Corcorran MA, Austin EJ, et al. PrEP Awareness, Interest, and Use among Women Who Inject Drugs in Seattle, Washington: A Mixed Methods Study. AIDS Behav. 2025;29:1775-83. [PubMed Abstract] -

Figures

Figure 1 People Who Inject Drugs in the United States, 2018

Source: Bradley H, Hall EW, Asher A, et al. Estimated Number of People Who Inject Drugs in the United States. Clin Infect Dis. 2023;76:96-102.

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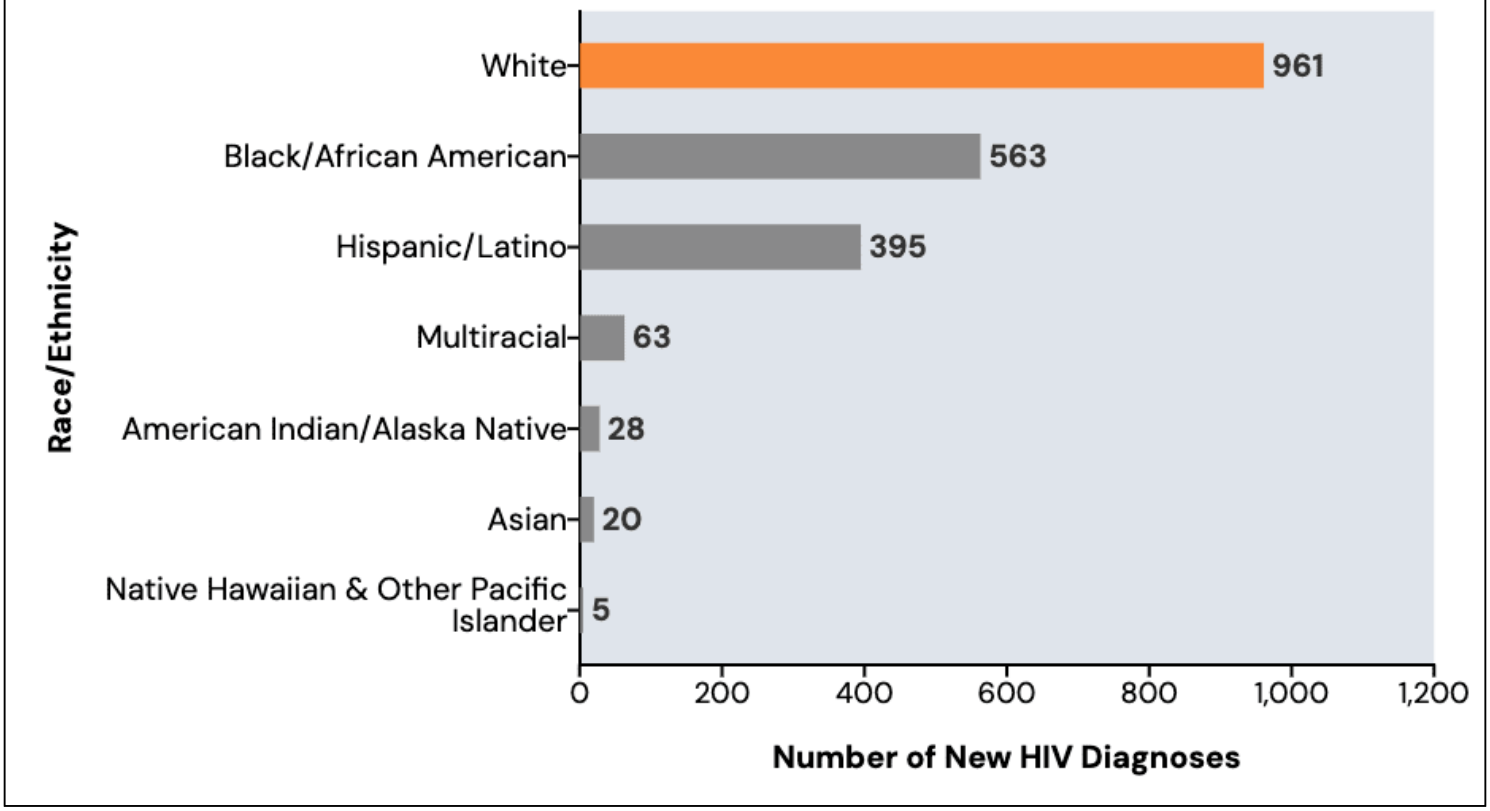

Figure 2 New HIV Diagnoses Among People Who Inject Drugs, 2022, United States

Source: Centers for Disease Control and Prevention. Diagnoses, Deaths, and Prevalence of HIV in the United States and 6 Territories and Freely Associated States, 2022. *HIV Surveillance Report*, 2022; vol. 35. Published May 2024.

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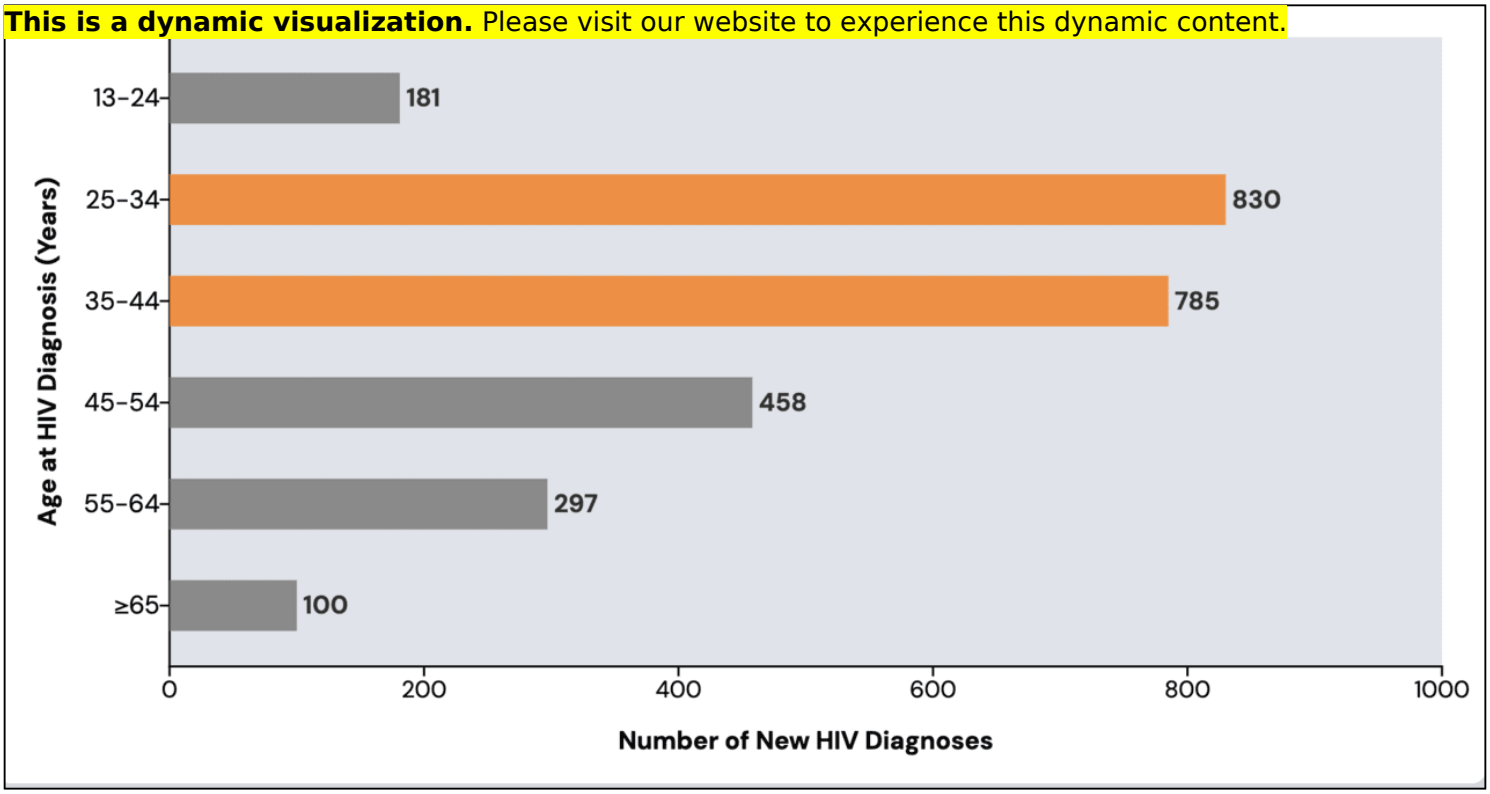

Figure 3 HIV Outbreaks In United States Among People Who Inject Drugs

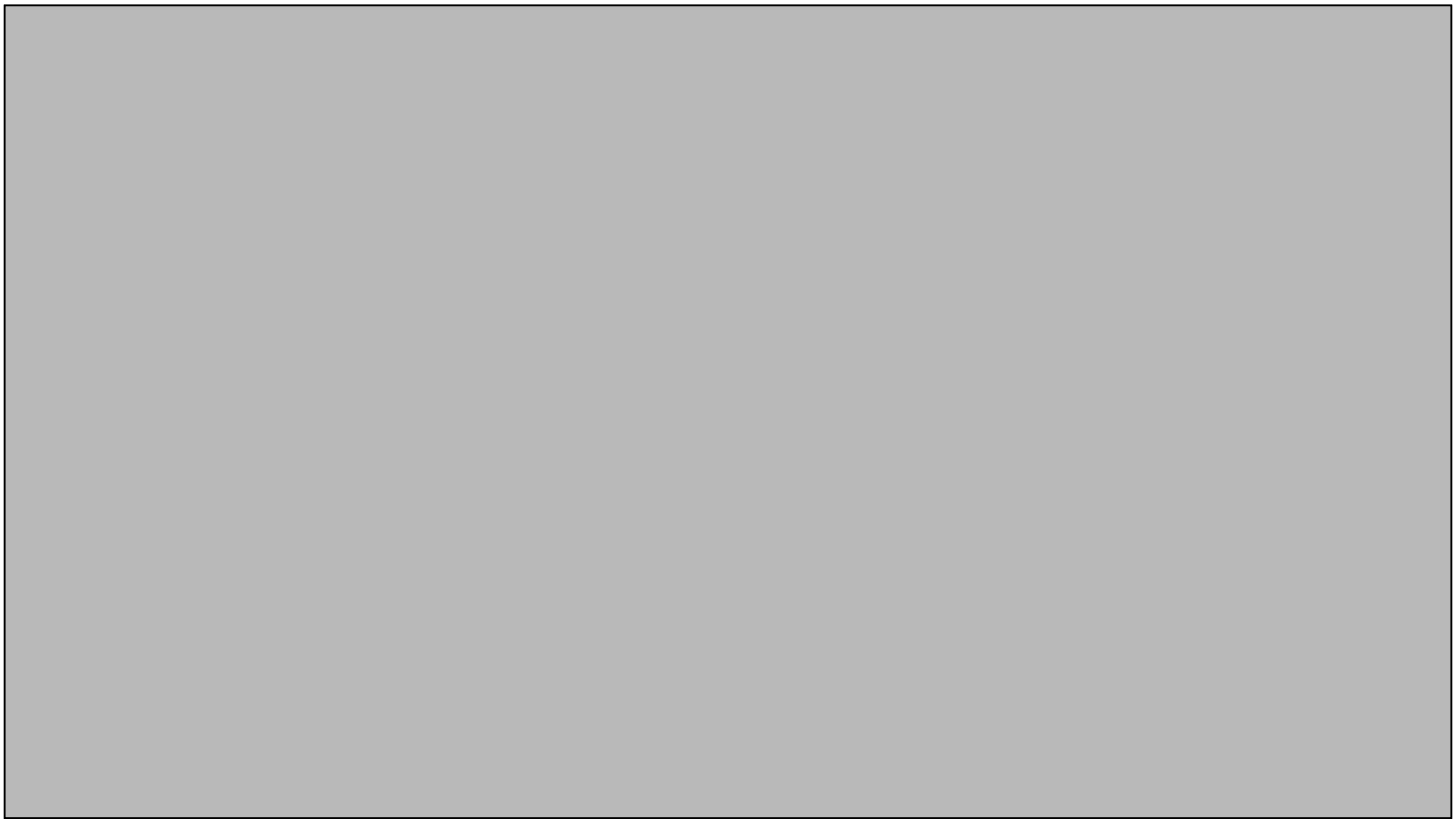

Figure 4 Receptive Syringe Sharing and PrEP Awareness Among People Who Inject Drugs

Source: Centers for Disease Control and Prevention. HIV Infection, Risk, Prevention, and Testing Behaviors among Persons Who Inject Drugs National HIV Behavioral Surveillance: Injection Drug Use, 23 U.S. Cities, 2018. HIV Surveillance Special Report 24:1-43. Revised edition: Published February 2020.

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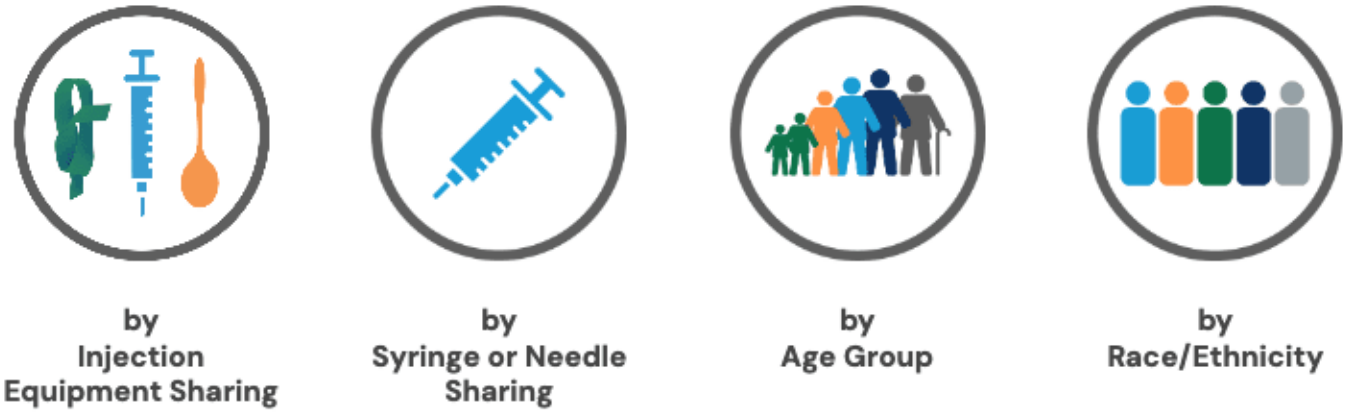

Figure 5 Bangkok Tenofovir Study-Visual Abstract

Source: Choopanya K, Martin M, Suntharasamai P, et al. Lancet. 2013;381:2083-90.

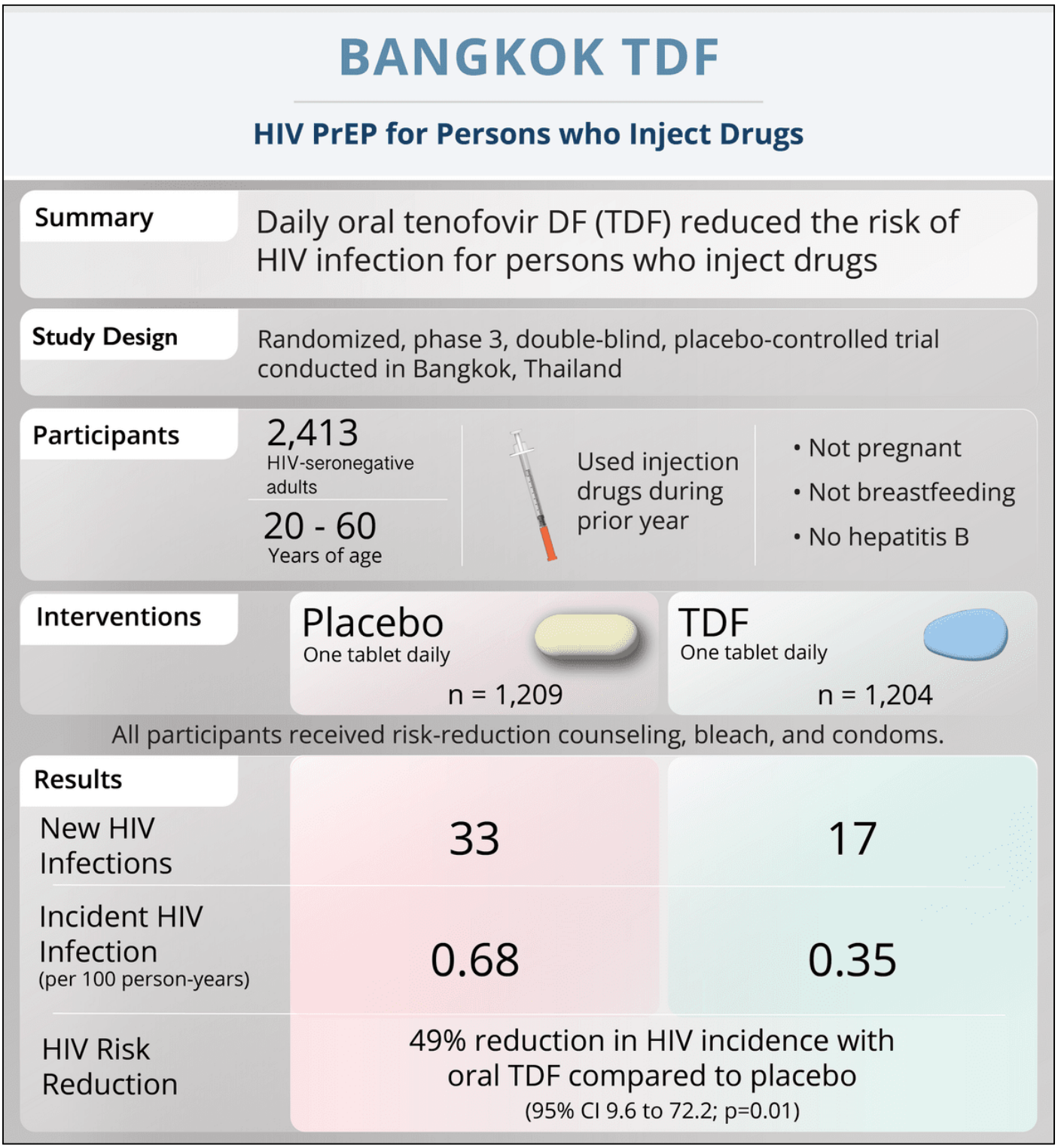

Figure 6 Assessing Indications for HIV PrEP in Persons Who Inject Drugs

Source: Centers for Disease Control and Prevention: US Public Health Service: Preexposure prophylaxis for the prevention of HIV infection in the United States—2021 Update: a clinical practice guideline. December 2021:1-108.