
Exploring the Interplay of Substance Use Disorder, High-Risk Sexual Behaviors, and HIV in Heterosexual Populations: Implications for Public Health and Preventive Medicine Strategies

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Conflicts of Interest/Financial Disclosures

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Learning Objectives

Upon completion of this lecture, participants will be able to:

- Define high-risk sexual behavior in heterosexual and LGBTQ+ populations and the associated risk of HIV transmission.
- Review the epidemiology of HIV in individuals with a comorbid substance use disorder.
- Address the gaps in treatment guidelines for heterosexual individuals engaging in high-risk sexual behaviors compared to LGBTQ+ populations.
- Identify public health and preventative care interventions, such as pre-exposure prophylaxis (PreP), aimed at reducing HIV transmission.

Overview

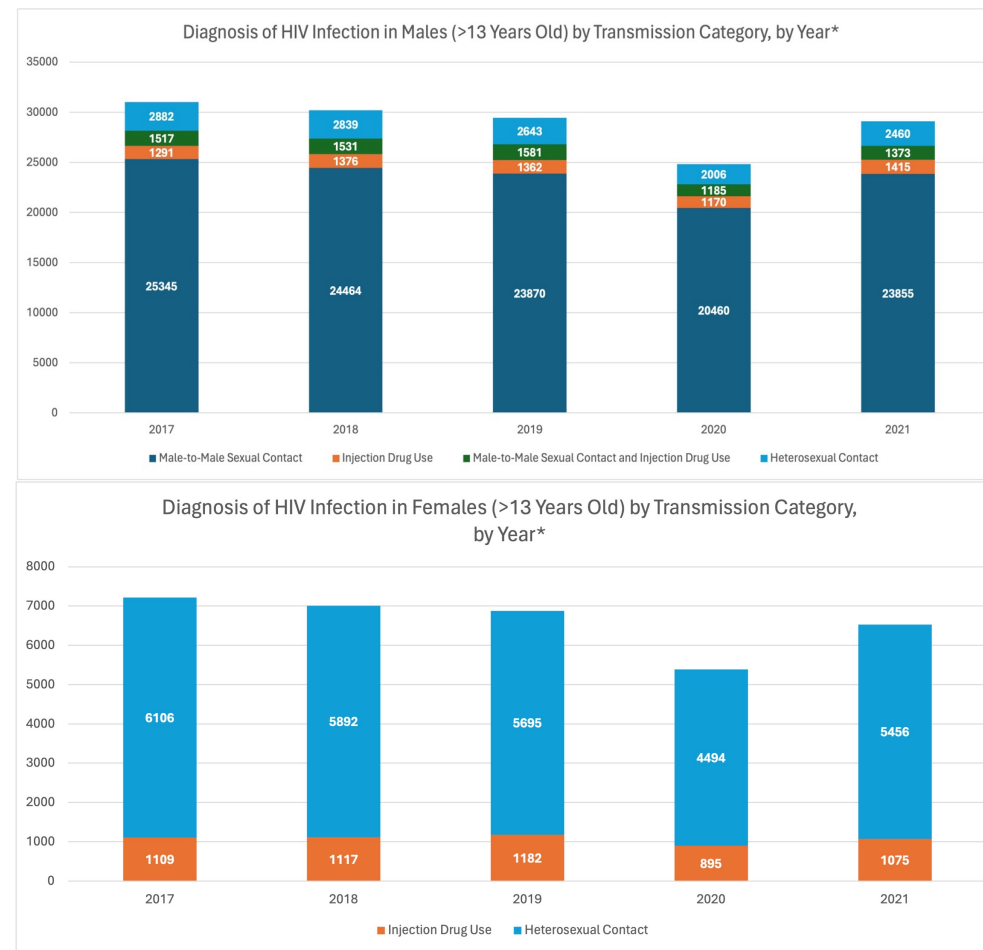
Part I: HIV Surveillance, Transmission, and Prevention

Part II: Case presentation

Part III: HIV Prevention and Potential Public Health Gap

Current State: HIV Surveillance

- Among males, male-to-male sexual contact continues to be the highest demographic category (82% of new HIV diagnoses in 2021). Our review aimed to further analyze risk factors impacting the heterosexual contact transmission category (8% of new HIV diagnoses in 2021).
- Among females, this analysis is crucial due to heterosexual contact being the leading transmission category (84% of new HIV diagnoses in 2021).
- In 2021, Texas had the second-highest number of new HIV diagnoses (4,363) and the sixth-highest rate of diagnosis (18 per 100,000) in the United States.¹

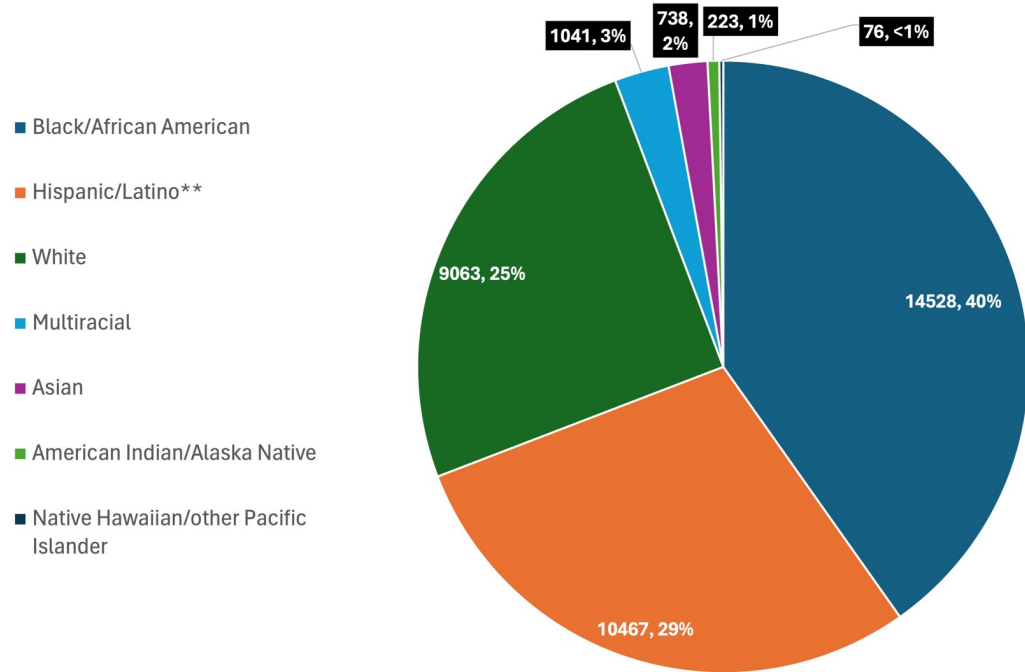


*Sex assigned at birth

Source: Centers for Disease Control and Prevention. *HIV Surveillance Report*, 2023; vol. 34.

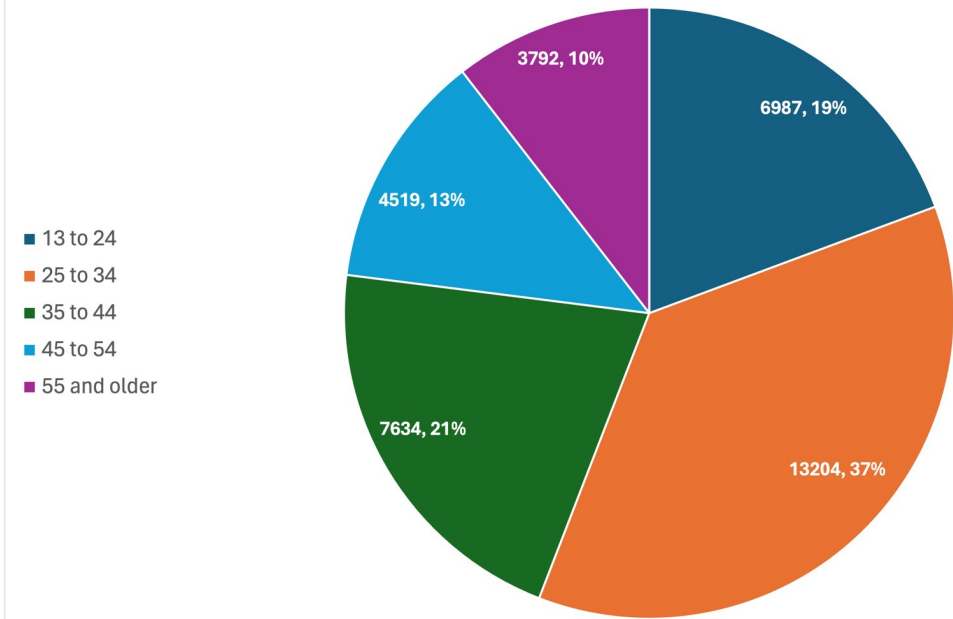
Current State: HIV Surveillance

New HIV Diagnosis by Race/Ethnicity, 2021 *



*Among people aged 13 and older
 **Hispanic/Latino people can be of any race

New HIV Diagnosis by Age, 2021

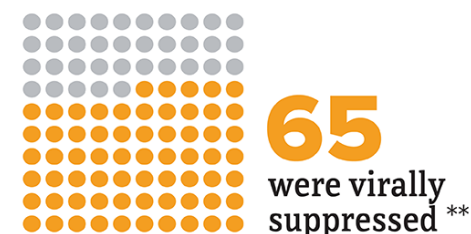
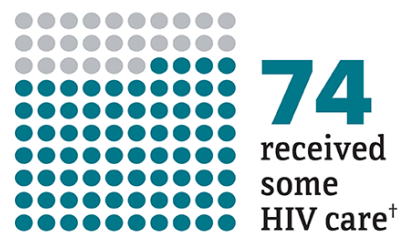


Source: Centers for Disease Control and Prevention. *HIV Surveillance Report*, 2023; vol. 34.

HIV: Access to Care

HIV Care Among People with Diagnosed HIV in 45 States and the District of Columbia*

For every 100 people overall with diagnosed HIV:



Data for 2020 should be interpreted with caution due to the impact of the COVID-19 pandemic. For more information, view the report commentary section.

Data from 45 states and the District of Columbia with complete reporting of laboratory data to CDC.

* Among people aged 13 and older.

† At least 1 viral load or CD4 test.

‡ Had 2 viral load or CD4 tests at least 3 months apart in a year.

** Based on most recent viral load test.

Source: CDC. Monitoring selected national HIV prevention and care objectives by using HIV surveillance data—United States and 6 dependent areas, 2020.
HIV Surveillance Supplemental Report, 2022; 27(3).



High-Risk Sexual Behavior and HIV Transmission Risk

- Many categories can be used to define high-risk sexual behavior, but our review identified three common behaviors independent of sexual orientation: sex with a known HIV-positive partner, sex with multiple partners, and/or transactional sex.²
- In isolated events, the risk of HIV transmission may be low or negligible. However, with repeated high-risk sexual behavior such as above, the risk of HIV transmission increases.
- In general, the CDC has provided a per-act probability of acquiring HIV from an infected source. This begins to highlight a framework in which HIV is transmitted.

Type of Exposure	Risk per 10,000 Exposures
Parenteral	
Blood Transfusion	9,250
Needle-Sharing During Injection Drug Use	63
Percutaneous (Needle-Stick)	23
Sexual	
Receptive Anal Intercourse	138
Insertive Anal Intercourse	11
Receptive Penile-Vaginal Intercourse	8
Insertive Penile-Vaginal Intercourse	4
Receptive Oral Intercourse	Low
Insertive Oral Intercourse	Low
Other [^]	
Biting	Negligible
Spitting	Negligible
Throwing Body Fluids (Including Semen or Saliva)	Negligible
Sharing Sex Toys	Negligible

Source: Centers for Disease Control and Prevention. *HIV Risk Behaviors*, 2015.

HIV Prevention

- Non-pharmaceutical
 - Routine testing/screening
 - Use of condoms
 - Addressing risk factors (i.e., sexual, drug use)
- Pharmaceutical
 - Pre-Exposure Prophylaxis (PrEP)
 - Post-Exposure Prophylaxis (PEP)
 - Treatment of HIV (undetectable = untransmittable)

HIV in Heterosexual Individuals with Substance Use Disorder Comorbidity

1. Substance use disorder increases the chances of high-risk sexual behavior^{3,4}
2. High-risk sexual behavior increases the chances of HIV transmission⁵
3. The connection between substance use disorder and HIV transmission in heterosexuals is scarcely studied^{3,6}

CASE PRESENTATION

HPI

- RM is a 47-year-old male with a past medical history of MDD recurrent moderate, anemia, alcohol use disorder severe, and opioid use disorder severe presents to the emergency department complaining of generalized weakness, nausea, and yellowing of the skin for the past week. He has felt tired for weeks and was inclined to remain resting at home, but his sister at his bedside insisted he come for evaluation.



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Substance Use History

- He reports his last drink was yesterday. He reports has been drinking six 8-ounce beers daily for the past five years. He reports multiple unsuccessful attempts of quitting in the past, including three rehab stays. He reports he has been using opioids for the past three years. He did not report previous fentanyl use. He reports he last injected an unknown amount of heroin this morning. He is open to assistance with quitting substance use.



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Clinical Assessment

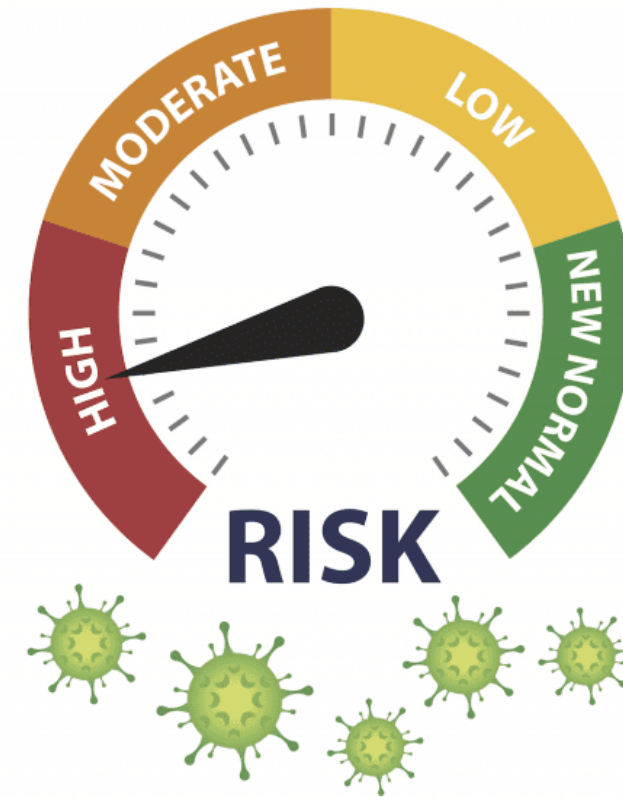


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- Upon admission, initial laboratory investigations revealed elevated liver enzymes and bilirubin levels, low Hb, low platelets, and UDS positive for cocaine, fentanyl, opioids, and cannabis. Upon further discussion, he admitted to high-risk sexual behavior, and the medical team suspected concurrent HIV infection and hepatitis B/C. However, due to the overwhelming nature of emergency department admissions, multiple recent previous negative screening, and the lack of a comprehensive screening protocol for high-risk populations, RM was not promptly tested for these infections upon admission.

Medical Oversight

- Unfortunately, amidst the chaos of the emergency department, RM's risk factors for HIV and hepatitis were not thoroughly assessed, and appropriate testing was delayed. The focus of care primarily centered on addressing his acute symptoms, treating alcohol withdrawal, and stabilizing his condition. Despite the critical need for screening in high-risk populations, such as intravenous drug users with multiple sexual partners, the oversight led to a missed opportunity for early diagnosis and intervention.



Outcome

- Several days into his hospital stay, RM's condition deteriorated rapidly, manifesting as acute liver failure and worsening systemic symptoms. Recognizing the urgency of his presentation, the medical team initiated comprehensive testing for HIV and hepatitis, which confirmed concurrent infections. Unfortunately, the delay in diagnosis significantly hindered the effectiveness of treatment interventions. RM's prognosis became increasingly grim as he developed complications secondary to advanced HIV infection and hepatic decompensation.



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Lessons Learned



- This case underscores the importance of implementing standardized screening protocols for high-risk populations, including individuals with a history of intravenous drug use and risky sexual behaviors. Timely identification and intervention are crucial in preventing the progression of infectious diseases such as HIV and hepatitis, ultimately improving patient outcomes and reducing transmission within communities. We must remain vigilant in assessing patients' risk factors and advocating for comprehensive testing, even amidst busy clinical environments.

Infectious Disease on the Rise

- HIV prevalence continues to steadily rise
- Other STIs also increasing
 - 1.6 million chlamydia cases
 - 648,049 cases of gonorrhea
 - 207,255 cases of syphilis
 - 3,755 cases of congenital syphilis
- Hepatitis C incidence rising
- Why does this matter?
 - HIV, STIs, and viral hepatitis affect millions of people
 - These disease are preventable, treatable, and curable for some
 - Illnesses are chronic and asymptomatic for some – screening/testing important!

Treatment/Clinical Guidelines on PrEP for the prevention of HIV

U.S. Preventive Services Task Force (USPSTF)

Centers for Disease Control and Prevention (CDC)

General Approach to HIV/STIs/Viral Hepatitis Prevention

- ASSESS/SCREEN
- EDUCATE
- RECOMMEND
- TREAT

Talk to Patients About Sex and Drug Use

- Complete sex and drug use history
 - 5Ps of sex history
 - IV drug use
 - Recognize Risk Factors for HIV

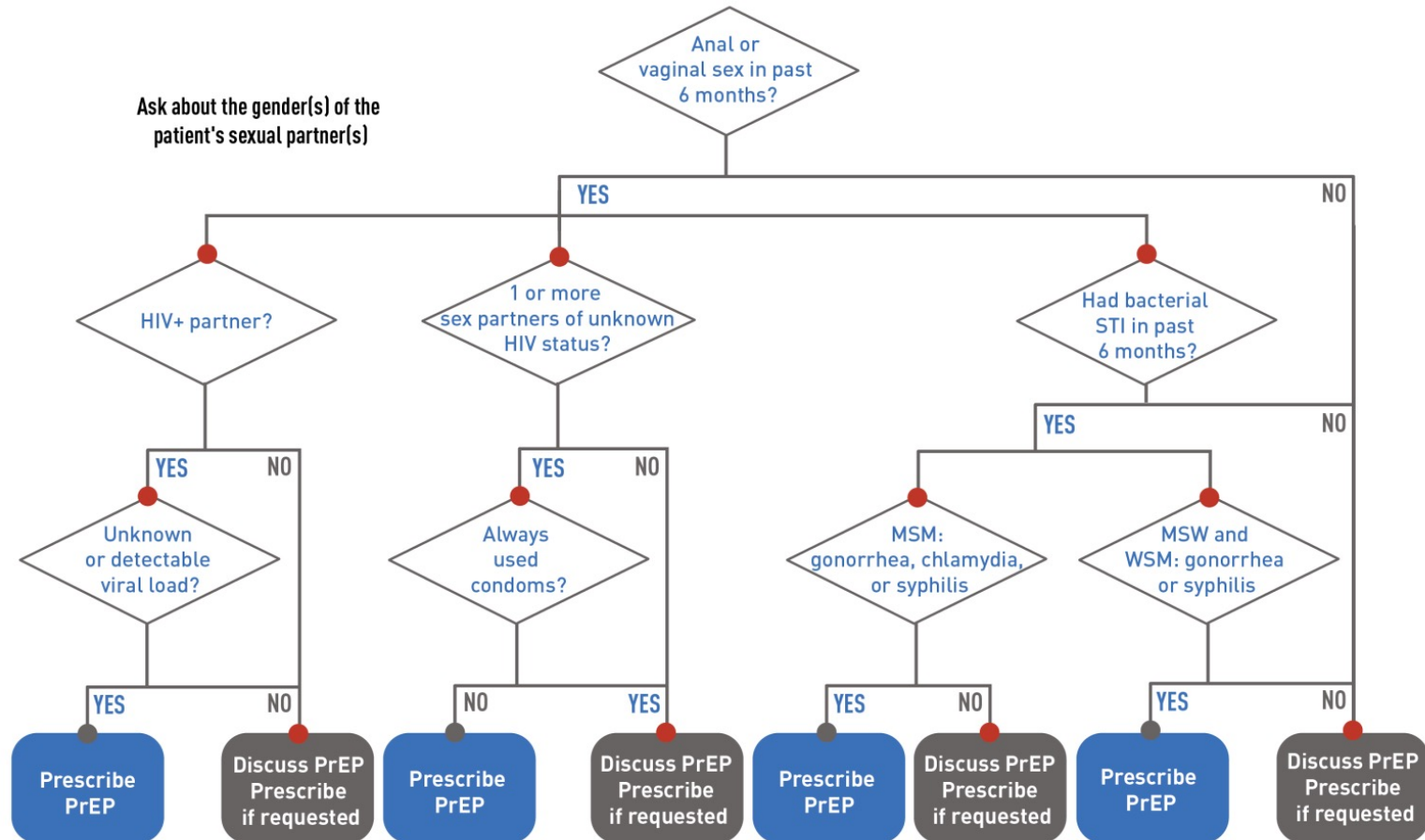
HIV Prevention

- **Diagnosis = Prevention**
 - ~80% of HIV transmitted by undiagnosed individuals or those not in care
 - Screening/testing could lead to early detection and faster treatment

HIV Prevention

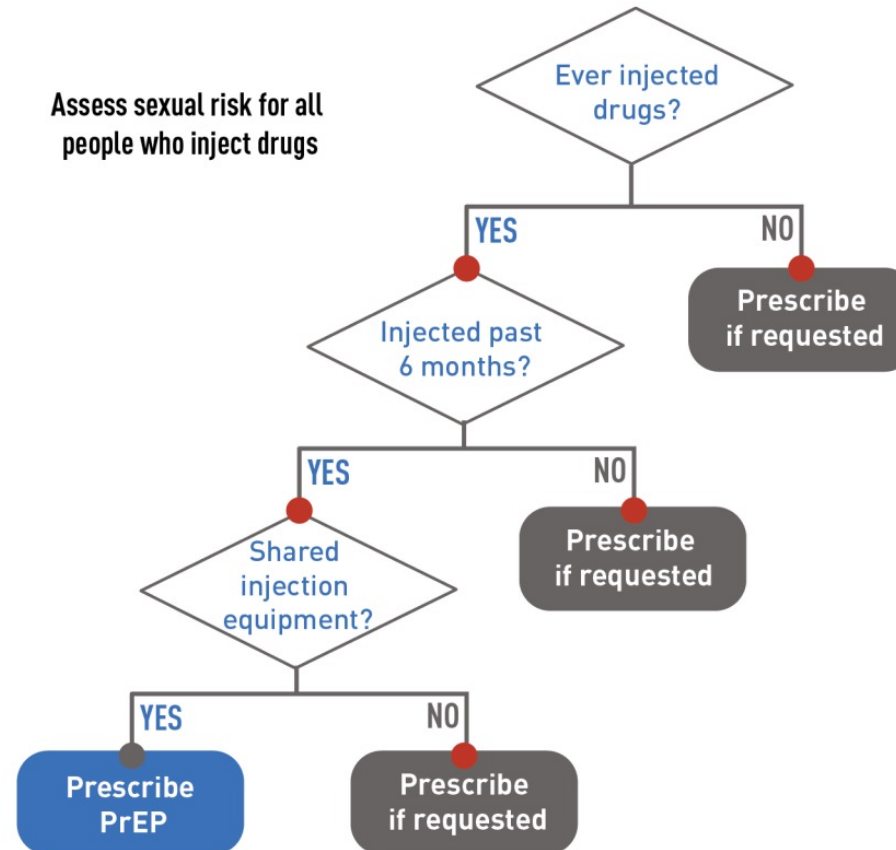
- **Pharmaceutical Interventions**
 - **Pre-Exposure Prophylaxis (PrEP)**
 - Post-Exposure Prophylaxis (PEP)
 - Treatment of HIV (undetectable = untransmittable)

CDC Guidelines: PrEP for HIV Prevention



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.

CDC Guidelines: PrEP for HIV Prevention



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Prescribing PrEP

- **What is PrEP?** The use of antiretroviral medications in those **without** HIV to prevent from getting HIV
- **Who can use it?** Any adult and adolescent weighing at least 77 lbs (35kg) who are at risk of getting HIV
- **What are the available formulations?**
 - Oral – Truvada: Emtricitabine 200 mg in combination with tenofovir disoproxil fumarate 300 mg
 - Oral – Descovy: Emtricitabine 200 mg in combination with tenofovir alafenamide 25 mg
 - Injectable – Apretude: Cabotegravir 600 mg injection

Prescribing PrEP

- **Who can prescribe it?**
 - Any medical professional with prescribing privileges
 - Not only by "HIV" or Infectious Disease specialist
 - Primary Care settings
- How much does it cost? \$\$\$
- Special considerations:
 - Adolescents
 - The 2-1-1 method
 - Perinatal use

PrEP

- **Efficacy:**
 - ~99% effective for those at risk during sexual encounters
 - ~74% effective in those at risk through intravenous drug use
- **Side effects:**
 - Overall, well tolerated for all three formulations
 - Headache, nausea, abdominal discomfort (most common)
 - Creatinine clearance decrease
 - Bone density decrease
 - Weight gain, increased lipid levels

Before You Prescribe PrEP

- Obtain laboratory labs
 - HIV
 - Other infectious disease work up (e.g., STIs, HepB)
 - CMP, Lipid profile
- Discuss treatment goals
- Discuss potential/specific scenarios (e.g., HIV acquisition, drug use and harm reduction strategies)

Barriers

- Infectious disease testing considered separate from "routine care"
- Confusion, misconceptions regarding guidelines or recommendations
- Care is often patient initiated
- "Hot potato" - easier to defer screening/discussion to other providers
- Cost
- Stigma and fear

Strategies to Overcome Barriers

- Screen for risk factors
- Incorporate universal/routine screening for HIV/STIs/viral hepatitis
- Opt-in vs Opt-out approach
- Normalize screening as part of "routine visit"
- Educate staff and treatment team
- Provide resources even when patients decline
- Assistance programs to pay for care

Public Health Gap in HIV Prevention?

- Lack of adequate screening in non "high risk" populations
- PrEP prescribing in heterosexual vs LGBTQ+ populations
- Access to resources
- Stigma/fear within the medical community

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