Human Immunodeficiency Virus Preexposure Prophylaxis in Adolescents and Young Adults

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PRACTICE GAPS

Pediatricians should be able to identify youth at higher risk for human immunodeficiency virus acquisition and teach human immunodeficiency virus prevention strategies, including preexposure prophylaxis.

OBJECTIVES *After completing this article, readers should be able to:*

1. Identify youth at higher risk for human immunodeficiency virus (HIV) acquisition.
2. Understand how to teach and develop an HIV prevention strategy for at-risk patients.
3. Initiate and manage preexposure prophylaxis for youth at higher risk for HIV acquisition.
4. Understand the special considerations when prescribing preexposure prophylaxis for minors.

ABSTRACT

Human immunodeficiency virus (HIV) prevention holds the promise of decreasing the burden of HIV infections worldwide. Access to HIV prevention services, including preexposure prophylaxis (PrEP), is a key strategy in reducing HIV transmission, but it continues to be underused. PrEP, a once-daily medication for HIV prevention, is approved for adolescents. A pediatrician's role is critical in identifying and increasing access for adolescents and young adults to PrEP services and reducing HIV acquisition in youth.

AUTHOR DISCLOSURE Dr Brundrett has disclosed no financial relationships relevant to this article. This commentary does contain a discussion of an unapproved/investigative use of commercial products.

ABBREVIATIONS

ART	antiretroviral therapy
CDC	Centers for Disease Control and Prevention
CrCl	creatinine clearance
FDA	Food and Drug Administration
HIV	human immunodeficiency virus
PrEP	preexposure prophylaxis
STI	sexually transmitted infection
TAF	tenofovir alafenamide
TDF	tenofovir disoproxil fumarate

HIV INFECTIONS

HIV-1 and HIV-2 are the viruses that cause HIV infection, with HIV-1 causing most infections worldwide, including in the United States, which is the focus of this article. These viruses are enveloped, single-stranded retroviruses that

predominantly target $CD4^+$ T lymphocytes. The virus enters the cell by binding with a cellular coreceptor, which results in envelope fusion with the cell wall. In the $CD4^+$ T lymphocyte, the virus uses reverse transcriptase to create HIV DNA and integrate into the cellular DNA. It then replicates, releasing HIV virions. Ultimately, this process leads to $CD4^+$ lymphocyte death and, if left untreated, immunosuppression from widespread $CD4^+$ lymphocyte cell destruction.

Globally, in 2019 there were 1.7 million newly infected individuals with HIV and 38 million people living with HIV. (1) In the United States there were almost 37,000 persons newly diagnosed as having HIV infections in 2019, of which 21% were youth aged 13 to 24 years. (2) Worldwide, HIV infections in youth predominantly occur in women, acquired through heterosexual contact, with the largest number of new infections in sub-Saharan Africa. (3)(4) In contrast, in the United States, most newly acquired HIV infections in this age group occur in gay and bisexual young men. Male-to-male sexual contact is the leading risk factor of HIV acquisition, followed by heterosexual contact, predominantly in females, with a lesser portion attributed to injection drug use. (2)

Although the incidence of HIV in youth has decreased slightly during the past 10 years, there continue to be significant racial, ethnic, gender, and geographic disparities in HIV acquisition in the United States. Black/African American and Latino youth are disproportionately affected by HIV. In 2018, of new HIV infections in youth, 52% were in Black/African American individuals, although they represent 14% of the general population, compared with 17% in white youth, who compose 53% of the population. (5) At the end of 2017, of females (aged 13–24 years) living with HIV, 62% were Black compared with 13% who were white. (5) Latino gay and bisexual young men had a 13% increase in the incidence of HIV diagnoses between 2010 and 2017, and the overall rates in Black/African American and white gay and bisexual individuals declined or remained stable. (5) Transgender men and women are also disproportionately affected. In the United States in 2017, the HIV prevalence was 14.1% in transgender women and 3.2% in transgender men compared with less than 0.5% in the total adult population. (5)(6)

Regionally there are differences, with the southern United States having the highest rates of new HIV diagnoses. (2) Greater than 50% of new HIV diagnoses occur in 48 US counties, Washington DC, and San Juan, Puerto Rico. *End the HIV Epidemic: A Plan for America* focuses on these regional differences and the unique aspects of these areas and modes of transmission. (7) This focused strategy, led by the US Department of Health and Human Services, provides support and financial resources to these communities. It also includes support to seven states where at least 10% of new diagnoses are in rural areas, which typically have less access to HIV care. The overarching goal is a 75% reduction in new HIV infections by 2025 and at least a 90% reduction by 2030. (7)

ADOLESCENT AND YOUNG ADULT HIV CARE CONTINUUM

The HIV care continuum identifies 4 areas as stepwise indicators to overall HIV control: awareness of HIV diagnosis, being seen within 30 days of diagnosis, continuing in care, and maintaining viral suppression. Compared with older adults, fewer young people living with HIV are linked to care, retained in care, or achieve viral suppression. (8) Viral suppression is achieved when an individual is receiving antiretroviral therapy (ART) and the number of copies of HIV is less than 200 per mL of blood or has reached an "undetectable" level that is too low to be quantified per the assay used. The overall HIV viral suppression rate in the United States is estimated to be 56% and includes individuals who are aware and unaware of their diagnosis. (5)(8) In youth aged 13 to 24 years, the estimated overall viral suppression rate is only 30%. (8) Lower rates of viral suppression lead to an increased potential for transmission to others and higher community viral load.

Youth are also the most likely group to be unaware of their HIV infection status. The Centers for Disease Control and Prevention (CDC) estimates that 4 in 7 people aged 13 to 24 years are unaware that they are living with HIV, and this unawareness increased from 2014 to 2018. (8) Not knowing one's HIV infection status delays entry into care, leads to potentially sicker patients at the time of diagnosis, and decreases the number of individuals who are taking ART and are virally suppressed. These factors lead to increased deaths attributable to HIV in youth compared with older aged groups. In 2017, 48.6% of deaths in youth (aged 13–24 years) diagnosed as having HIV were directly related to HIV, which in most cases was preventable if had been identified and treated. (9)

HIV PREVENTION STRATEGIES

Components of HIV prevention plans include being regularly tested for HIV, getting tested and treated for sexually transmitted infections (STIs), using barrier protection (condoms) during all types of sexual activity, and knowing a sexual partner's HIV status. For people who inject drugs, needle exchange programs that offer clean needles and elimination of needle sharing with others help prevent HIV acquisition. Understanding when and how to access postexposure prophylaxis if one has a known exposure to

HIV is another important prevention strategy, but such strategies must be initiated within 72 hours of HIV exposure.

If an individual seronegative for HIV is in a sexual relationship with a partner living with HIV, knowing the partner's viral load and adherence to ART is important to understanding one's own risk of HIV acquisition. Individuals living with HIV who have been virally suppressed for at least 6 months and are taking ART as prescribed have no risk of transmitting the virus sexually to others, (10) including during unprotected sex. This prevention strategy is the basis for the *U=U, Undetectable = Untransmittable*, campaign, a public awareness effort to improve education and reduce the stigma of HIV.

PREEXPOSURE PROPHYLAXIS

Preexposure prophylaxis (PrEP) should be part of an HIV prevention strategy in patients at high risk for acquiring HIV. The US Preventative Services Task Force recommends that PrEP be offered to those at risk for HIV, noting substantial net benefit. (11) In the current Food and Drug Administration (FDA) approved PrEP, nucleoside reverse transcriptase inhibitors block the transformation of HIV RNA to DNA, inhibiting its ability to integrate into the host cell's DNA and replicate, therefore preventing HIV replication and, ultimately, infection.

In 2012, the FDA approved the use of tenofovir disoproxil fumarate (TDF)/emtricitabine for individuals 18 years and older as chemoprophylaxis for HIV. It was approved as a combination fixed-dose tablet taken orally daily for those at high risk of HIV acquisition (Table 1). In 2018, the FDA extended approval to adolescents weighing at least 77 lb (35 kg) for the same indications.

Efficacy of PrEP is directly correlated with medication adherence and differs by sex and mode of sexual activity. PrEP is estimated to be approximately 99% effective at preventing sexually transmitted HIV for individuals who are adherent to their regimen and more than 74% effective at preventing transmission via injection drug use. (12) Post hoc analysis of data from several PrEP trials has shown that adequate intracellular tenofovir diphosphate levels (≥700 fmol/mL in dried blood samples) correlate with daily PrEP use and 92% to 100% protection from HIV. (13) The concentration of tenofovir differs in colorectal mucosa versus the lower female genital tract. The TDF active metabolite, tenofovir diphosphate, concentration is 10 times higher in colorectal tissue than in the lower genital tract in females. (14) By extrapolating data from PrEP trials and pharmacokinetic/pharmacodynamic studies, it has been determined that women must be 100% adherent to daily PrEP to be effective, whereas men might need to take only 4 tablets per week to achieve the advantages of PrEP. Protective levels of tenofovir diphosphate were found in colorectal tissue at 7 days compared with up to 21 days for vaginocervical tissue. (14) This suggests that women are not fully protected until 3 weeks after taking PrEP daily. This is an important aspect when counseling new PrEP patients.

In 2017, a demonstration project evaluated the safety, acceptability, and adherence of TDF/emtricitabine and monitored patterns of risk behavior in youth. (15) They enrolled 78 healthy young men aged 15 to 17 years who reported sexual activity with other men and did not require parental consent to participate. Eligibility included self-report risk of HIV acquisition via any of the following risk behaviors in the past 6 months: unprotected anal intercourse with an HIV-seropositive male partner or a male partner of unknown HIV status, anal intercourse with at least 3 different partners, or an STI. (15) Due to known adverse effects of TDF/emtricitabine use, the exclusion criteria included a glomerular filtration rate less than 75 mL/min, active hepatitis B, positive hepatitis B surface antigen, or a history of fractures.

Although TDF/emtricitabine has been used for years as part of ART in children and adolescents living with HIV, there were questions about the safety of using this medication in adolescents younger than 18 years for PrEP. The most common adverse effects of TDF/emtricitabine use are mild gastrointestinal upset, headache, and weight loss. However, nephrotoxicity and bone loss have been reported in long-term use of TDF/emtricitabine. (16) The nephrotoxicity is related to damage of the proximal tubules with subsequent development of Fanconi syndrome or type IV renal tubular acidosis. (13) TDF/emtricitabine therapy is recommended only in patients with an estimated creatinine clearance (CrCl) greater than 60 mL/min/1.73 m^2 (>1.00 mL/s/m^2). (16) In adult PrEP trials there were some mild elevations in creatinine level that resolved after discontinuation of the medication and no reported renal adverse effects in the demonstration project in youth. (13)(15)(17)

Bone mineral density loss during adolescence, a period of significant growth and bone development, has been a concern. It was shown in adult PrEP trials that any bone loss is reversible after discontinuation of TDF/emtricitabine, and no increase in fractures or osteoporosis has been reported. (13) In the demonstration project, bone mineral density was studied via dual-energy x-ray absorptiometry and showed a significant increase in bone mineral density over 48 weeks in the participants, which would be expected in growing adolescents. After 48 weeks, the total body *z* score was decreased (–0.20) from baseline, which was statistically significant. However, there were no fractures associated with TDF/emtricitabine use. (15) At this time, there is no recommendation that patients taking

Table 1. Youth with Recommended Indications for Preexposure Prophylaxis Use

Young man or transgender woman engaging in sex with male partners in the past 6 mo or plans to be sexually active in the near future and 1 of the following: • Is having anal sex without condoms (receptive or insertive) • Has had syphilis, gonorrhea, or chlamydia diagnosed in the past 6 mo
Heterosexual young person sexually active in the past 6 mo or plans to be sexually active in the near future and 1 of the following: • Is a young man who has sex with both men and women • Does not use condoms with partners of unknown HIV status who might be at higher risk, such as known injection drug user or bisexual male partner • In a relationship with an HIV-seropositive partner • Diagnosed as having syphilis or gonorrhea in the past 6 mo
Injection drug use – any sharing of equipment/syringes in the past 6 months
Commercial sex work
Exchange of sex for drugs or goods

HIV=human immunodeficiency virus.
Reprinted with permission from Centers for Disease Control and Prevention. Preexposure prophylaxis for the prevention of HIV infection in the United States – 2017 update: a clinical practice guideline. Available at: https://www.cdc.gov/hiv/pdf/risk/prep/cdc-hiv-prep-guidelines-2017.pdf. Accessed June 24, 2021.

Table 2. Open-ended Questions for Expanded Sexual History

Partners	• Can you tell me how many sex partners you had in the past 12 mo? • Are your partners men, women, or both?
Sexual practices	• People have different sexual practices, eg, do you have vaginal sex, anal sex, or oral sex? • When you have anal sex are you on the top (insertive) or bottom (receptive) or both?
Protection from STIs	• How do you protect yourself from STIs? • How is your partner protecting you from STIs?
History of STIs	• Have you or your partner ever been diagnosed as having or treated for an STI?
Pregnancy prevention	• Are you currently trying to become pregnant? • How are you currently preventing pregnancy when you have sex? • How is your partner preventing pregnancy when you have sex?

STI=sexually transmitted infection.

TDF/emtricitabine need routine dual-energy x-ray absorptiometry scans, but they could be considered if an individual has other risk factors for bone loss.

Tenofovir alafenamide (TAF), a prodrug of tenofovir, more rapidly delivers the active metabolite tenofovir diphosphate into peripheral blood mononuclear cells at a dose 10 times less than TDF. With TAF, there is less circulating tenofovir in the plasma, decreasing bone and renal exposure with subsequent fewer nephrotoxic and bone adverse effects. (18)(19) In 2019 the FDA approved TAF/emtricitabine for PrEP, expanding the options for individuals with baseline renal dysfunction. Adolescents with a body weight of at least 35 kg were included in this approval. TAF/emtricitabine is approved only for sexual transmission in men and transgender women. It is not approved in cisgender women, vaginal receptive intercourse, and injection drug use. This is because these populations were not studied in the trials supporting its effectiveness for PrEP. (19)(20)

CURRENT PREP USE

Despite the increase in options and access, PrEP uptake has not matched the need. State Medicaid programs cover PrEP, and states that expanded Medicaid through the Affordable Care Act have a 25% higher prevalence of PrEP use compared with states that did not. (21) Most commercial insurance programs cover PrEP, but there can be associated copays, potentially reducing access. For uninsured patients *Ready, Set, PrEP* is a national program that offers access to free PrEP for those who qualify. (22) Although PrEP use has increased, there are notable disparities. The southern United States has a lower number of PrEP users relative to the number of new HIV diagnoses compared with the northeast. (23) PrEP uptake in youth is lower compared with older age groups. Awareness of PrEP varies, making HIV education and prevention in the primary care setting essential. (23)(24) Adolescents, especially in rural areas, might have access to primary care only, making this the primary source of comprehensive HIV prevention information, including PrEP.

WHO SHOULD BE OFFERED PREP?

As health care providers, understanding who is at increased risk for HIV acquisition can lead to targeted HIV prevention education and access to PrEP. In the United States, PrEP is recommended for anyone at higher risk for HIV acquisition (Table 1). (11)(25) In the adolescent population it is difficult to obtain an accurate and complete sexual and drug history due

to multiple factors, such as time constraints, lack of privacy, concerns for confidentiality, and provider or patient hesitancy. During preventive care visits, there should be adequate time for patients to discuss confidential topics without a parent or guardian in the room. A thorough sexual history is essential for many aspects of adolescent care, including family planning and contraception, screening for STIs, and identifying risks of HIV acquisition. For an expanded sexual history many use the CDC's 5 P's method—partners, sexual practices, protection from STIs, past STIs, and pregnancy prevention. (26) Open-ended, neutral questions should be asked to allow the adolescent an opportunity to express one's self in a safe and nonjudgmental environment (Table 2). (27)

CONFIDENTIALITY AND LEGAL BARRIERS TO PREP IN ADOLESCENTS

Adolescents at high risk for acquiring HIV might require confidential services and request to make decisions about HIV prevention on their own. These individuals can be homeless, in the foster care system, or unwilling to disclose their sexual practices, sexual orientation, or drug use with their parent/guardian present. Minor consent for treatment and confidentiality are important issues that practitioner's face when offering HIV prevention services. There are no states that explicitly prohibit autonomous consent for PrEP in minors. There are 16 states that allow minor consent for HIV prevention services. (28) Other states have a variety of statutes that can allow for STI and/or HIV testing and STI treatment in minors. Understanding the statutes in the state one is practicing is essential. A quick reference on the CDC website can be used to help determine minor consent laws (https://www.cdc.gov/hiv/policies/law/states/minors.html) but should be cross referenced with state and local regulations. (17)(28)

Even a minor's access to HIV prevention services and PrEP does not guarantee confidentiality of services. Minors are typically on a parent/guardian's insurance plan. Billing documentation in explanation of benefits might disclose services rendered, or a minor might have trouble accessing the medication at a pharmacy because of cost or transportation issues. Respecting the autonomy of the adolescent, within the extent of the law, is important. When appropriate and with the adolescent's permission, involving the parent/guardian in the HIV prevention plan can increase protective behaviors and reduce risk behaviors. (17)(29)

INITIAL PREP MANAGEMENT

Prescribing and managing PrEP in the primary care setting is feasible and often the best option for patients because of familiarity, access, and established relationships. This might be the only option for PrEP management for youth in areas with fewer resources. For those uncomfortable with providing PrEP in the general pediatrician's office, referral to a pediatric infectious disease specialist for patients younger than 18 years is an option. Or for youth who are 18 years and older it might be acceptable to refer to adult infectious disease or local health department programs or to transition the patient to adult primary care services. It is important to know the local PrEP providers, often available on health department websites, and ensure that there are no excessive barriers for the youth to obtain PrEP services when referring.

Before PrEP initiation, a history, physical examination, and laboratory evaluation are necessary (Table 3). All patients must have a confirmed negative HIV test result within 7 days of being prescribed PrEP. The antiretrovirals used in PrEP provide only partial treatment for HIV, creating potential viral resistance if the patient has acquired HIV before starting PrEP. The preferred HIV screening test is a fourth-generation antibody/antigen test using a serum sample sent to a laboratory, but an antibody-only test can be used. If using rapid point-of-care testing, it should be a finger-stick blood sample, not an oral fluid sample due to decreased sensitivity compared with blood tests. (25) An assessment of the patient should include reviewing for any signs and symptoms of acute HIV infection in the past 30 days, including recent illnesses, fevers, chills, myalgia, pharyngitis, and rash. If the history or physical examination findings suggest a possible acute HIV infection, a viral load (HIV-1 quantitative RNA) should be completed at the time to rule out an acute infection that could be missed, especially on antibody testing alone. (25) If history reveals that the individual has a known HIV exposure in the past 72 hours, postexposure prophylaxis for 4 weeks should be initiated and then transitioned to PrEP after confirming a negative HIV test result.

Renal function and hepatitis B infection status need to be assessed at the start of PrEP therapy (Table 3). An estimated CrCl greater than 60 mL/min/1.73 m^2 (>1.00 mL/s/m^2) is required for individuals using TDF/emtricitabine due to the risk discussed earlier. TAF/emtricitabine can be used to an estimated CrCl greater than 30 mL/min/1.73 m^2 (0.50 mL/s/m^2). Both TDF/emtricitabine and TAF/emtricitabine are active antiviral agents against hepatitis B. Hepatitis B infection status needs to be determined at the start of PrEP by checking hepatitis B surface antigen, core antibody, and surface antibody. Chronic hepatitis B infection is not a contraindication to using PrEP; however, for these individuals there is a potential risk of hepatitis flare when PrEP is discontinued. In these cases, the patient's transaminase levels should be frequently monitored after discontinuation of PrEP. (16)(30) If an

Table 3. Initiation of Preexposure Prophylaxis

VARIABLE	TDF 300 MG/EMTRICITABINE 200 MG BY MOUTH DAILY	TAF 25 MG/EMTRICITABINE 200 MG BY MOUTH DAILY
Eligible patients by risk of HIV acquisition	Receptive or insertive anal intercourse	Receptive or insertive anal intercourse
	Insertive vaginal intercourse	Insertive vaginal intercourse
	Receptive vaginal intercourse	
	Injection drug use	
Laboratory recommendations	HIV-1/2 Ab/Ag	HIV-1/2 Ab/Ag
	HIV-1 RNA quantitative (if concern for acute HIV infection)	HIV-1 RNA quantitative (if concern for acute HIV infection)
	Creatinine and estimated CrCl >60 mL/min/1.73 m^2 (>1.00 mL/s/m^2)	Creatinine and estimated CrCl >30 mL/min/1.73 m^2 (>0.50 mL/s/m^2)
	Hepatitis B surface antigen	Hepatitis B surface antigen
	Hepatitis B surface antibody	Hepatitis B surface antibody
	Hepatitis B core antibody	Hepatitis B core antibody
	Hepatitis C antibody	Hepatitis C antibody
	Bacterial STIs	Bacterial STIs
	Syphilis	Syphilis
	Pregnancy test	
Other considerations	HPV vaccine series	HPV vaccine series
	Contraception management	

Ab=antibody, Ag=antigen, CrCl=creatinine clearance, HIV=human immunodeficiency virus, HPV=human papillomavirus, STI=sexually transmitted infection, TAF=tenofovir alafenamide, TDF=tenofovir disoproxil fumarate.

individual is not immune to hepatitis B, a vaccination series should be offered. Hepatitis C antibody testing is recommended, especially in patients reporting a history of injection drug use.

Screening for bacterial STIs (gonorrhea, chlamydia, and syphilis) at initiation of PrEP is also recommended because they share the same risk factors for acquisition with HIV. Samples for gonorrhea and chlamydia should be collected from all areas that the individual engages in sexual activity, including pharyngeal, urethral, rectal, and vaginal. Nucleic acid amplification testing is the preferred method due to sensitivity. Self-collected samples have been shown to be equivalent to provider obtained samples and can be more comfortable for some patients to obtain. (25) Syphilis testing is recommended because there is an increased risk of acquiring HIV if currently infected with syphilis. Human papillomavirus vaccination series should be offered in nonpregnant patients if not previously vaccinated.

Women should be tested for pregnancy before initiating PrEP. This is an opportunity to discuss family planning and contraception. There are no interactions between current PrEP therapy and hormonal contraception. The use of PrEP in pregnancy is not contraindicated, and risk should be assessed to determine the need for PrEP during pregnancy. If a woman is attempting to conceive with a partner living with HIV, then PrEP can be advised in this situation and can be continued throughout the pregnancy depending on risk. (25)

If the individual's HIV test result is negative, PrEP can be prescribed. The use of TDF/emtricitabine or TAF/emtricitabine depends on patient factors, including sex, sexual practices, and other risk behavior (Table 3). If the patient is a young man or transgender female and has the risk factor of sexual acquisition only, TAF/emtricitabine can be used due to the improved adverse effect profile compared with TDF/emtricitabine. TDF/emtricitabine is the only PrEP medication approved for females, vaginal receptive intercourse, and injection drug use. (20)(25) Behavior risk reduction counseling should be given, as well as instructions on the use of PrEP, including dosing, days until effectiveness, and adverse effects. PrEP is FDA-approved as a once-daily oral medication. The CDC PrEP guidelines require HIV testing every 3 months while a patient is receiving PrEP, and a negative HIV test result should be confirmed before each new prescription; therefore, a maximum of 90 days should be prescribed at one time.

FOLLOW-UP PREP MANAGEMENT AND ADHERENCE

In the demonstration study, adherence, measured by tenofovir diphosphate levels, was significantly better in the first 3 months, when the participants returned every 4 weeks. Initially, of the 72 participants, adherence rates were 54% at 4 weeks, 47% at 8 weeks, and 49% at 12 weeks. There was a significant drop in adherence when follow-up was spaced to 3-month intervals. At 24, 36, and 48 weeks, adherence rates were 28%, 17%, and 22%, respectively. (15) In this study, the decline in adherence suggests that closer follow-up or other models of engagement might be needed to ensure that adherence is maintained. These adolescents were also enrolled in the study without parental consent. Adherence might differ if there is parental/guardian involvement in the HIV prevention

plan and support for PrEP. Larger peer networks have been potentially related to increased odds of PrEP awareness and uptake. (31) This idea can be leveraged for improved adherence with peer navigators or support groups.

In most cases, a visit or check-in with the patient after 1 month of therapy is beneficial. This visit can be used to recheck an HIV test result (especially if HIV antibody–only testing was completed initially), evaluate adverse effects of the medication, and review adherence and adherence strategies. If a patient is using TDF/emtricitabine, renal function should be assessed. Follow-up intervals will vary with each patient, remembering that adherence can decline if visits are spaced to the maximum allowed of 3 months. At follow-up visits, behavioral risk reduction counseling and reviewing adherence to PrEP are important. At least every 3 months HIV testing needs to be completed, following the same testing guidelines as the initial HIV test, as well as an assessment for acute HIV signs and symptoms. (25) Screening for STI risk factors (unprotected sex, multiple sex partners, etc) and symptoms should prompt appropriate testing. It is recommended to screen for bacterial STIs at least every 6 months even in asymptomatic individuals. (25) Pregnancy tests should be completed every 3 months if a patient is not using a long-acting contraceptive method. If the patient is taking TDF/emtricitabine, evaluation of renal function every 6 months is necessary, or yearly if taking TAF/emtricitabine. Any vaccination series that were started, such as human papillomavirus series, hepatitis A or B, should be completed at appropriate intervals. Importantly, the need for HIV prevention with PrEP can change over time. HIV acquisition risk should be evaluated annually, and PrEP can be discontinued when a patient is no longer at higher risk. Except for patients with active hepatitis B infections, PrEP can be discontinued at any time without the need for further monitoring.

THE FUTURE OF PREP

Adherence, simplicity, confidentiality, and ease of use of PrEP are paramount to ensuring that PrEP is reaching those at higher risk for HIV. There is evidence that using on-demand PrEP (2 tablets 2–24 hours before a sexual encounter, 1 tablet 24 hours after the first dose, and 1 tablet 24 hours after the second dose) is effective for male-to-male sexual contact, but this is not FDA-approved. (32) Long-acting injectable forms of PrEP using the integrase inhibitor cabotegravir has been one of the most promising alternatives for the future of chemoprophylaxis for HIV. Currently in trials, it would be administered intramuscularly every 8 weeks instead of taking an oral daily pill. (33)(34)

Summary

- Based on strong research evidence (grade A), preexposure prophylaxis (PrEP) is recommended to prevent human immunodeficiency virus (HIV) in persons with higher risk of HIV acquisition. PrEP is Food and Drug Administration–approved for adolescents with a weight of 77 lb or greater (≥35 kg).
- The indications for PrEP are as follows: Young men and transgender women engaging in anal sex with male partners without a condom and/or who have had syphilis, gonorrhea, or chlamydia in the previous 6 months. Heterosexual youth sexually active in the previous 6 months without condoms with partners at higher risk for HIV, such as bisexual male partner, known injection drug use, known HIV infection, and/or diagnosed as having syphilis or gonorrhea in the previous 6 months. Youth actively using injection drugs who are sharing needles and/or equipment.
- Youth have increased barriers to PrEP, including minor consent laws, confidentiality, lack of transportation, and fewer financial resources. Clinicians should be aware of these barriers and address them to increase access and improve adherence.

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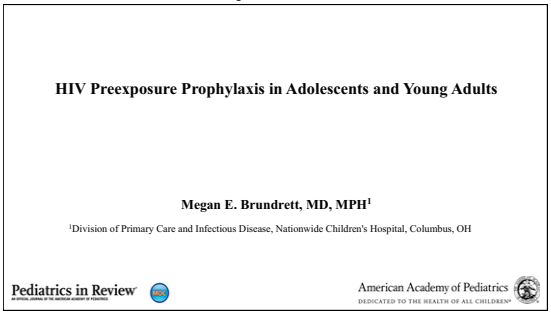
HIV Preexposure Prophylaxis in Adolescents and Young Adults

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Pediatrics in Review

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PIR QUIZ

1. A 17-year-old boy is seen in clinic for a routine sports physical. He is healthy, takes no medications, and his immunizations are up to date. Social history reveals intermittent marijuana use with friends and current sexual activity, with age of first intercourse at 16 years. Which of the following is the most appropriate next step in management?

   A. Complete human immunodeficiency virus (HIV) prevention counseling.
   B. Obtain further information about past and current sexual activity.
   C. Obtain testing for gonorrhea, chlamydia, HIV, and syphilis.
   D. Proceed to physical exam without further testing.
   E. Start HIV preexposure prophylaxis after a negative HIV antibody/antigen serum test.

2. A 17-year-old girl is seen in the office as she found out this morning that her male sexual partner she has been in a relationship with for 3 months tested positive for HIV. They have vaginal intercourse 4–6 times a week without condoms. Last intercourse was last night. She is well-appearing with a normal physical examination and has no other health concerns. She has no history of sexually transmitted infections (STIs). A long-acting hormonal contraceptive implant was placed 4 months ago. In addition to obtaining a fourth-generation antibody/antigen HIV test, which of the following is the most appropriate next step in management?

   A. Obtain CD4 lymphocyte enumeration.
   B. Return in 72 hours to obtain CD4 lymphocyte enumeration.
   C. Return in 72 hours to start preexposure prophylaxis (PrEP).
   D. Start postexposure prophylaxis today.
   E. Start preexposure prophylaxis today.

3. Which of the following states explicitly prohibits autonomous consent for PrEP in minors?

   A. Alaska.
   B. Florida.
   C. Kansas.
   D. None.
   E. North Dakota.

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4. A 17-year-old boy is seen in the office for an adolescent wellness exam. He has been sexually active since age 15 years. A detailed sexual history is gathered. He has had both male and female partners in the past. He was treated for gonorrhea at the health department 6 months ago and uses condoms intermittently. He has oral sex and insertive and receptive anal sex. HIV prevention strategies are discussed, and he is interested in starting PrEP. Last sexual encounter was over 2 weeks ago. On review of systems, he endorses a 3-day history of extreme fatigue and myalgias and he has a sore throat. He denies any diarrhea, night sweats, swollen lymph nodes, rashes, or fevers. Which of the following is the most appropriate next step in management?

   A. Check HIV antibody/antigen test and start HIV postexposure prophylaxis immediately.
   B. Defer PrEP initiation labs due to current health concerns and check for gonorrhea, chlamydia, syphilis, and HIV antibody/antigen test.
   C. Obtain hepatitis B serologies, creatinine, HIV antibody/antigen testing, and quantitative polymerase chain reaction for HIV RNA; check for gonorrhea, chlamydia, syphilis.
   D. Obtain hepatitis B serologies, creatinine, HIV antibody/antigen testing in preparation to start PrEP.
   E. Start PrEP immediately.

5. A 17-year-old girl is seen in the clinic for follow-up after beginning PrEP approximately 3 months ago with TDF/emtricitabine due to a history of intravenous drug use. She has been adherent to her PrEP regimen. Laboratory testing at her initial visit was negative for HIV, hepatitis B, STIs, pregnancy and her renal function was normal. She has an intrauterine device (IUD) for contraception. Immunizations are up to date, including human papillomavirus (HPV). She is well-appearing and has no current health concerns. She has a week of medication left from her prior prescription and would like a refill. Which of the following laboratory tests should be obtained today and results reviewed prior to renewing her PrEP prescription?

   A. CD4 lymphocyte enumeration.
   B. Hepatitis B surface antigen.
   C. HIV antibody/antigen serum test.
   D. Pregnancy test.
   E. Rapid plasma reagin (RPR) test.