HIV in Adolescents and Young Adults

This is a PDF version of the following document:
Module 6: Key Populations
Lesson 2: HIV in Adolescents and Young Adults

You can always find the most up-to-date version of this document at https://www.hiv.uw.edu/go/key-populations/pediatric-adolescents-young-adults-hiv/core-concept/all.

Background

Adolescence and young adulthood is a period of intense physical and developmental transition that is characterized by experimentation and self-discovery.[1] This time period may pose unique challenges for the prevention and treatment of HIV.[2] Adolescents and young adults with HIV in the United States primarily represent two distinct groups based on when and how they acquired HIV: (1) those who acquired HIV through perinatal transmission and now have reached the age of adolescence or young adulthood, and (2) those who acquired HIV during adolescence or young adulthood through sexual contact or drug use.[3,4] In the United States, since the contemporary perinatal HIV transmission rate has been reduced to less than 1% of pregnancies in women with HIV, most adolescents and young adults living with HIV have acquired HIV through sexual contact or drug use.[2] This Topic Review will address routine care for adolescents and young adults with HIV, adolescent sexuality and reproductive health, transitioning from adolescent to adult care, and HIV preexposure prophylaxis (PrEP).

Definition of Adolescents and Young Adults

In the Centers for Disease Control and Prevention (CDC) surveillance reports, adolescents are defined as persons 13 to 19 years of age and young adults are defined as persons 20 to 24 years of age, unless otherwise specified.[5] In addition, the Adult and Adolescent ARV Guidelines also define adolescents as persons 13 to 19 years of age and young adults as persons 20 to 24 years of age.[2] In general, postpubertal adolescents and young adults should receive the same antiretroviral therapy as recommendations for adults, but adolescents in early puberty should receive antiretroviral therapy based on the sexual maturity rating (SMR) for females (Table 1) and males (Table 2).[2,6,7]

Epidemiology of HIV in Adolescents and Young Adults

HIV Prevalence in Adolescents and Young Adults

For the year 2022, the Centers for Disease Control and Prevention (CDC) estimated 1,238,000 people were living with HIV in the United States.[8] For that same year, the CDC estimated the HIV prevalence for different age groups, including an estimated 42,200 persons 13 to 24 years of age who were living with HIV (Figure 1).[8] Based on these estimates, adolescents and adults comprise approximately 3.4% of the total number of people living with HIV in the United States.[8]

New HIV Infections in Adolescents and Young Adults

The CDC also estimates the number of new HIV infections that occur each year in the United States and there was an estimated 31,800 new infections for the year 2022.[5] Adolescents and young adults (persons 13–24 years of age) accounted for 6,400 (20.1%) of the new infections for the year 2022 (Figure 2).[8] The incidence of HIV among persons 13–24 years of age declined approximately 30% from 2018-2022 (9,200 to 6,400).[8]

Knowledge of HIV Status

Based on estimates from CDC surveillance data and estimates in 2022, adolescents and young adults with HIV have the lowest percentage of awareness of HIV status, with only 56.3% aware of their HIV diagnosis (Figure 3).[8] Although awareness of HIV status is low among adolescents and young adults, it has improved significantly from 2028 to 2022 (42.1% to 56.3%).[8]

Testing, Linkage to Care, and Retention in Care

CDC HIV Testing Recommendations

Since 2006, the CDC has recommended opt-out HIV testing for all persons 13 to 64 years of age, unless the local prevalence of undiagnosed HIV infection has been documented to be less than 0.1%.[9] Accordingly, routine HIV screening should include adolescents and young adults.[9] Testing should be performed annually (or more frequently) for individuals at higher risk of acquiring HIV—defined by the CDC as persons who use injection drugs (and their sex partners), persons who exchange sex for money or drugs, sex partners of persons with HIV, and men who have sex with men, or heterosexual persons who themselves or whose sex partners have had more than one sex partner since their most recent HIV test.[9] Suboptimal HIV testing rates in vulnerable youth at risk of HIV acquisition translate into missed opportunities for HIV prevention and HIV treatment in these youth.

Youth Sexual Activity and HIV Testing Rates

In the United States, multiple sources and studies have shown that many adolescents and young adults regularly engage in sexual activity that could place them at risk of acquiring HIV. Data summary from the Youth Risk Behavior Surveillance System (YRBS) for the year 2023 reported that among high school students, 32% reported having sexual intercourse at least once in their lifetime, 21% reported being sexually active, 48% reported condomless sex at last intercourse, and 6% reported having had 4 or more lifetime sex partners (Figure 4).[10] For the year 2023, only 7% of the high school students reported they had ever been tested for HIV; female students were more likely than male students to get HIV tested (8% of females and 6%).[10] During the 10-year period from 2013 to 2023, there was a major decrease in the percentage who had ever had HIV testing in both males (11% to 6%) and females (15% to 8%).[10]

Barriers to HIV Testing in Adolescents and Young Adults

The reasons for the discordance between youth HIV risk activity and HIV testing rates are varied and include lack of knowledge about HIV risk, lack of perceived risk, sense of invulnerability to disease, lack of awareness of free and confidential HIV testing sites, and misconception that parental consent is required for HIV testing.[11,12,13,14] Additional HIV testing barriers that have been identified are lack of medical provider awareness that CDC HIV testing recommendations include testing of adolescents and young adults, lack of medical insurance, and overall limited engagement with health systems.[15] Educating pediatricians and primary care medical providers about HIV testing recommendations for adolescents and young adults has the potential to increase HIV testing, especially given that a private physician’s office or other clinic site is still the most likely setting for adolescents and young adults to get HIV testing.[12,15] In Connect to Testing and Prevention Services, a demonstration study conducted by the Adolescent Medicine Trials Network for HIV/AIDS Interventions (ATN), investigators concluded that targeted, community-based HIV testing strategies can play an important role in identifying youths who have enhanced risk for acquiring HIV who are unaware of their HIV status.[16]

Factors Impacting Linkage and Engagement in Care

For persons diagnosed with HIV, linkage to care within 30 days of diagnosis and retention in HIV clinical care are associated with improved clinical outcomes, decreased mortality, and decreased HIV transmission to sex and injecting drug partners.[17,18] Although significant research has been conducted on interventions to improve linkage to care for persons newly diagnosed with HIV, few studies have included adolescents and young adults. Therefore, the individual and structural barriers for linkage to care and engagement in HIV care that are unique to adolescents and young adults remain poorly defined. Adolescents and young adults with HIV may struggle to navigate complex medical systems, especially as they transition from pediatric to adult health centers; during this transition, many adolescents and young adults lack full autonomy as they remain dependent on their families for health insurance, transportation, housing, and other needs.[17] For those

young adults who are diagnosed with HIV while on a parental insurance plan, inadvertent disclosure of their HIV status may occur. In addition, receiving an HIV diagnosis during the vulnerable period spanning adolescence and early adulthood can lead to higher rates of depression and anxiety that may serve as barriers to engagement in care.[17]

Strategies for Improving Linkage to Care and Retention in Care

Interventions to improve engagement along every step of the HIV care continuum include the following: adolescent-targeted (or adolescent-friendly) services include providing dedicated adolescent-only office hours; screening for sexually transmitted infections (of genital and extragenital sites); providing condoms and hormonal contraceptives; offering preexposure prophylaxis and nonoccupational postexposure prophylaxis; connecting to peer educators and adolescent support groups; and linkage to care specialists and intensive case management.[19,20,21]

HIV Care Cascade/HIV Care Continuum

Limited data exist regarding the HIV care cascade (or HIV care continuum) outcomes in adolescents and young adults in the United States.[22,23,24] In 2022 end-of-year estimates based on CDC surveillance data, among persons with HIV 13 to 24 years of age, the overall rates of virologic suppression were only 37%, and the overall cascade of care numbers for all ages was lowest in the 13 to 24 year age group (Figure 5).[25] Unfortunately, there is a relative lack of data on the needs of adolescents and young adults with HIV, and more research is needed to develop optimal strategies for engaging, diagnosing, and managing this population.[19,26]

Clinical and Laboratory Monitoring

Baseline Evaluation for Newly Diagnosed Adolescents or Young Adults

For an adolescent or young adult newly diagnosed with HIV, the goals of the initial evaluation are the same as for adults and are outlined by the Adult and Adolescent ARV Guidelines: confirm the diagnosis of HIV, obtain a complete medical history, perform a physical examination, obtain relevant laboratory data, screen for sexually transmitted infections (at genital and extragenital sites of exposure), screen for mental health and substance use disorders, provide education about HIV, address reproductive health concerns, and link to appropriate primary care resources if necessary.[27,28] For younger adolescents, additional psychosocial intervention and additional education may be necessary, and this should ideally involve the parents or guardians, though this depends on multiple factors, including state law, institutional policy, maturity of the adolescent, and social situation. The initial evaluation of persons newly diagnosed with HIV is discussed in detail in the Initial Evaluation Lesson in the Basic Primary Care module.

Routine Monitoring

Routine laboratory and clinical monitoring of adolescents and young adults with HIV is the same as for adults with HIV and is outlined in the antiretroviral therapy guidelines.[29]

Antiretroviral Therapy for Adolescents with HIV

Initiating Antiretroviral Therapy for Adolescents and Young Adults

All adolescents and young adults with HIV should receive antiretroviral therapy, regardless of their CD4 cell count or HIV RNA level.[2] Adolescents or young adults who acquired HIV via perinatal transmission have typically been on antiretroviral therapy for many years prior to reaching adolescence and often have more complex antiretroviral regimens as a result of antiretroviral resistance mutations that accumulated over the many preceding years of receiving antiretroviral therapy.[30,31,32] All youth who acquire HIV as an adolescent or young adult should start on antiretroviral therapy (if they are not already receiving it).[2] Concurrent with initiating antiretroviral therapy, the clinician should assess for adherence issues and screen for mental health and substance use disorders.[2] In addition, reproductive health issues should be addressed in the process of starting antiretroviral therapy, including contraception, drug interactions between antiretrovirals and oral contraceptives, pregnancy intention or planning, preexposure prophylaxis for seronegative partners, and safer sex techniques to prevent transmission of HIV or other sexually transmitted infections.[27] Standard baseline laboratory testing, including an HIV drug resistance genotype, should be ordered prior to starting antiretroviral therapy.

Choosing Antiretroviral Therapy Regimens

The selection and dosing of antiretroviral medications for adolescents is based on sexual maturity rating rather than on age. The recommended antiretroviral regimens for initial therapy for post-pubescent adolescents whose sexual maturity rating is IV or V, and for all young adults, are the same as the Adult and Adolescent ARV Guidelines (Table 3).[27,33] For pre-pubescent adolescents with sexual maturity ratings between I and III, see separate Pediatric ART Guidelines in the Lesson HIV in Infants and Children.[6] For adolescent girls who may become pregnant, their antiretroviral regimen should be designated as a preferred regimen for use during pregnancy.[34,35,36]

Laboratory Monitoring after Starting Antiretroviral Therapy

Routine laboratory and clinical monitoring of adolescents and young adults after starting antiretroviral therapy is the same as for adults with HIV and is outlined below.[29,37] The following summarizes recommendations in the Adult and Adolescent ARV Guidelines for monitoring HIV RNA levels and CD4 cell counts after starting antiretroviral therapy:[29,37]

HIV RNA Monitoring

During the first 8 to 12 weeks after starting antiretroviral therapy, most individuals will achieve a reduction in HIV RNA levels to less than 50 copies/mL. For some individuals, particularly those with extremely high baseline HIV RNA levels, the time for virologic suppression may extend past 12 weeks. The important parameter is whether the HIV RNA levels continue to decline.

- **Baseline**: All individuals initiating antiretroviral therapy should have a baseline HIV RNA level.
- **After Initiating Therapy**: After starting antiretroviral therapy, an HIV RNA level should be obtained, preferably within 4 to 8 weeks. Subsequently, HIV RNA levels should be repeated every 4 to 8 weeks until the HIV RNA is suppressed to less than 50 copies/mL.
- **After Virologic Suppression**: Once HIV RNA levels are suppressed, the frequency of HIV RNA monitoring should extend to every 3 to 4 months.
- **With Long-Term Virologic Suppression**: For individuals who consistently take antiretroviral therapy as prescribed and have suppressed HIV RNA levels for at least 1 year (and stable clinical and immunologic status), HIV RNA monitoring can be extended to 6-month intervals.
- **After Antiretroviral Regimen Change:** Following any change in the antiretroviral regimen, the HIV RNA level should be checked within 4 to 8 weeks, whether the medication change was for drug

toxicity, regimen simplification, or another reason. This recommendation holds even when the person has virologic suppression at the time of change in the antiretroviral regimen.

CD4 Cell Count

Individuals who have suppressed HIV RNA levels on antiretroviral therapy typically have an increase in CD4 count of approximately 50 to 150 cells/mm^3 after the first year, with subsequent average yearly increases of approximately 50 to 100 cells/mm^3 until a steady state is attained.

- **Baseline**: All persons starting antiretroviral therapy should have a baseline CD4 cell count checked.
- **After Initiating Therapy**: A repeat CD4 cell count should be obtained 3 months after starting therapy.
- **During First 1–2 Years After Initiating Therapy**: During the first 1 to 2 years while taking suppressive antiretroviral therapy, CD4 count monitoring should occur every 3 to 4 months if the CD4 cell count is less than 300 cells/mm^3 and every 6 months if the CD4 count is greater than 300 cells/mm^3.
- **With Long-Term Stable Virologic Suppression**: After 1 to 2 years taking antiretroviral therapy, the frequency of CD4 cell count monitoring for individuals with consistently suppressed HIV RNA levels should be determined by immune status:
    - If the CD4 count is less than 300 cells/mm^3, CD4 monitoring can be extended to 6-month intervals.
    - If the CD4 count is consistently greater than 300 cells/mm^3, monitoring should be considered optional, unless a recheck is indicated based on clinical changes.
- **Change in Clinical Status**: If an individual has a change in clinical status or has to initiate therapy with chronic corticosteroids or chemotherapy, the CD4 cell count should be checked more frequently, as clinically indicated.

Adherence with Antiretroviral Therapy

Challenges with Adherence with Antiretroviral Therapy

As a group, adolescents and young adults with HIV struggle with adherence more than their adult counterparts and have lower rates of viral suppression and higher rates of viral rebound.[38] Multiple studies have identified several important barriers to antiretroviral medication adherence for adolescent populations, including depression, disruption of daily routine, poor understanding of the importance of adherence, denial and fear, forgetfulness, comorbid mental health diagnoses, substance use, lack of family and social support, and structural barriers such as homelessness.[2,39,40,41] In a study of adherence in youth (aged 12 to 24 years) with either perinatal HIV acquisition ("perinatal group") or HIV acquisition through sexual activity or drug use, the two groups in the study had many overlapping adherence challenges but also had distinct reasons for having problems with adherence.[40] "Forgetting" to take the medication was by far the most common adherence barrier in both groups.[40]

Adherence Monitoring in Adolescents and Young Adults

The Pediatric ART Guidelines recommend assessing adherence at every visit and addressing strategies that optimize adherence at every visit. This approach should utilize evidence-based approaches for adherence monitoring, including monitoring of HIV RNA levels and one additional method.[42](Table 4)

Strategies for Improving Antiretroviral Adherence in Adolescents

Whenever possible, adolescents should be placed on a once-daily antiretroviral regimen with a low pill burden that has a low likelihood of causing side effects.[2,6] In some studies, reminder systems, such as cell phone calls, alerts, and text messaging, have been found to be particularly effective for adolescents and young adults.[2,40] Studies that have evaluated the usage of mobile phone and text messaging interventions to assist with medication adherence have found mixed results, depending on the measured outcome and the specific technology that was used.[43,44,45,46] In general, technologies involving two-way communication seemed to yield better antiretroviral adherence outcomes compared to stand-alone short message service (SMS) text message reminders.[45,46] A multipronged approach may prove more fruitful if it combines medication-specific adherence tactics, such as decreasing pill burden, with health care provider-oriented strategies that include supportive, emotional, or behavioral strategies for youth living with HIV. The Pediatric ART Guidelines provide strategies for improving adherence that are focused on initial intervention strategies, medication strategies, and follow-up intervention strategies (Table 5).[42]

HIV Preexposure Prophylaxis (PrEP) for Adolescents

The use of HIV preexposure prophylaxis (PrEP) is an important prevention strategy for persons who are at high risk of acquiring HIV, with several landmark clinical trials demonstrating safety and efficacy in preventing HIV acquisition in men who have sex with men (MSM), men and women in heterosexual HIV-serodifferent couples, and in people who inject drugs.[47,48,49,50,51,52] Most of these trials included a significant proportion of young adults aged 18 to 24 years in the patient population enrolled, but very few included adolescents (18 years of age or younger). The U.S. Public Health Service issued updated clinical practice guidelines for the use of HIV PrEP in 2021, with a 2025 update adding guidance on the use of lenacapavir for HIV PrEP.[53] The CDC recommendations for the use of HIV PrEP in adolescents and young adults are based on a weight greater than 35 kg (77 pounds), not on a specific age.[53] Planning for the potential use of HIV PrEP in adolescents requires an infrastructure for the coordinated delivery of HIV prevention services for adolescents, including HIV testing programs that link youth at-risk of acquiring HIV to HIV PrEP services if they test negative for HIV.[16,54]

Recommendations for Preexposure Prophylaxis in Youth

For young adults aged 18 to 24 years who are at risk of acquiring HIV, the guidelines for HIV PrEP are the same as for adults at risk of acquiring HIV.[53] Although there are no guidelines specific to adolescents, HIV PrEP is recommended for adolescents weighing at least 35 kg (77 lbs) who report sexual or drug use behaviors placing them at risk for HIV acquisition. Of the four medications used for HIV PrEP—oral tenofovir DF-emtricitabine, oral tenofovir alafenamide-emtricitabine, long-acting injectable cabotegravir, and subcutaneous lenacapavir—all have been studied and are FDA approved for use in persons who weigh at least 35 kg (77 pounds).[47,50,51,52,55,56] Note that tenofovir alafenamide-emtricitabine has not been FDA-approved for persons at risk of acquiring HIV through receptive vaginal sex.[53] In addition, although oral tenofovir DF-emtricitabine and subcutaneous lenacapavir are recommended for HIV prevention among people who inject drugs (PWID), no medications are specifically FDA approved specifically for preventing HIV acquisition through injection drug use. For further information on HIV PrEP, see the lesson HIV Preexposure Prophylaxis (PrEP), which is in Module 5 of this curriculum. For a more detailed discussion of HIV PrEP in Youth, see HIV PrEP for Adolescents and Young Adults in the National HIV PrEP Curriculum.

Major PrEP Studies in Adolescents and Young Adults

Two major trials have been conducted examining the safety and efficacy of tenofovir DF-emtricitabine for HIV PrEP specifically for adolescents and young adults in the United States.

- **ATN 110: The Adolescent Trials Network 110 (ATN 110) study enrolled 400 adolescent males (aged 18 to 22 years who have sex with other males) between March and September 2013.[57] Using tenofovir diphosphate levels in dried blood spots as a marker for adherence with PrEP, the investigators concluded there was a major decline in adherence at week 24.[57] The rates of STIs were high at baseline (22% of participants) and remained high throughout the study.[57]**
- **ATN 113: The Adolescent Trials Network 113 (ATN 113) study enrolled 260 adolescent males living in the United States, aged 15 to 17 years, who have sex with other males.[58] In this study, open-label use of tenofovir DF-emtricitabine for HIV PrEP was found to be safe and well-tolerated, but adherence to PrEP, based on tenofovir diphosphate levels in dried blood spots, decreased markedly over time during the study (Figure 6).[58] The HIV seroconversion rate was 6.4 per 100 person-years.[58]**

Legal Issues Related to HIV PrEP and Minors

All states and the District of Columbia permit minors to consent for testing and treatment of sexually transmitted infections without parental consent, and many explicitly designate HIV as a sexually transmitted

infection in the law with respect to parental consent.[59] In addition, several states have laws that provide minors with broad authority to consent to any health care service or procedure, but these state laws have different age cutoffs and criteria (e.g., homelessness, living separate or apart from parents, and/or managing their own financial affairs) for minors to be granted this authority.[59] No states have a law that prohibits a minor from granting autonomous consent for preexposure prophylaxis. From a practical standpoint, it may be very difficult for a minor to maintain the confidentiality of their receipt of HIV PrEP from their parents (if they are on the parent's health insurance plan), since many states allow medical providers to disclose the minor's treatment information to the parents, and billing services often include information in the explanation of benefits and specific charges that would reveal receipt of HIV PrEP clinical services and medications for HIV PrEP.[59]

Immunizations for Adolescents with HIV

General Principles for Vaccine Administration in Youth with HIV

There are multiple sources of guidelines for immunizations involving adolescents and young adults with HIV. These include recommendations from The Advisory Committee on Immunization Practices (ACIP), the American Academy of Pediatrics (AAP), and the Adult and Adolescent OI Guidelines.[60,61] It is beyond the scope of this topic review to cover all vaccines that should be considered for adolescents and young adults. Therefore, the following will focus on key recommendations for several commonly administered vaccines in adolescents and young adults, with a focus on recommendations from the Adult and Adolescent OI Guidelines since these are specific to people with HIV.[61] All inactivated vaccines are considered safe to administer to adolescents and young adults with HIV, irrespective of immune status. In addition, all adolescents with HIV through 18 years of age should receive most vaccines per standard recommended (or catch-up) schedules, with the following major exceptions:

- The measles-mumps-rubella (MMR) and vaccines is contraindicated if the CD4 count is less than 200 cells/mm^3
- The varicella vaccines ia contraindicated if the CD4 count is less than 200 cells/mm^3
- Live attenuated trivalent influenza vaccine is contraindicated, regardless of CD4 cell count

Human Papillomavirus (HPV) Vaccine

The 3-dose series of the 9-valent HPV vaccine (9vHPV) is recommended for all males and females with HIV who are aged 11 to 26 years; the series may be started as early as 9 years of age (and should be started at age 9 in children with a history of sexual abuse or assault).[61] All adolescents and young adults with HIV should receive the 3-dose 9vHPV vaccine series, regardless of the age when the HPV vaccine series is started.[61] For pregnant adolescent girls who have not received a complete HPV immunization series, the vaccine series initiation (or series completion) should be deferred until after pregnancy.[62]

Influenza

Annual inactivated influenza vaccine is recommended for all adolescents and young adults, including those with HIV and regardless of CD4 cell count.[62,63,64,65] The recombinant influenza vaccine should not be administered to persons younger than 18 years of age. The live-attenuated influenza vaccines should not be administered to any person with HIV, regardless of age.[61]

Meningococcal ACWY Vaccine

Immunization with the quadrivalent meningococcal conjugate vaccine (MenACWY) is recommended for all persons with HIV.[61] The primary vaccination series for individuals with HIV requires a 2-dose initial series, with the doses given at least 8 weeks apart. The following summarizes meningococcal ACWY vaccine booster dose recommendations for adolescents and young adults with HIV.[61]

- If the initial meningococcal series was administered prior to age 7 years, then the first booster dose should be given 3 years after completing the primary series, and then subsequent booster doses are given every 5 years.
- If the individual was 7 years of age or older when the primary series was given, then the first booster dose should be given 5 years after the primary series was completed, and then subsequent booster doses should be given every 5 years.

The pentavalent meningococcal vaccine (ABCWY) can be considered when there is an indication for immunization for both MenACWY and MenB.

Meningococcal B Vaccine

The serogroup B conjugate meningococcal vaccine is considered an optional vaccine for adolescents and young adults with HIV who are 16–23 years of age, with shared decision-making.[61] Two meningococcal B vaccines are available: MenB-FHbp and MenB-4C. For persons with HIV, the recommended dosing schedule is a 3-dose series administered at 0, 1-2, and 6 months.[61] If the second dose was administered at least 6 months after the first dose, a third dose is not needed. If the third dose is administered less than 4 months after the second dose, the dose should be repeated at least 4 months after the last dose. Adolescents and young adults previously immunized with MenB vaccine should receive a booster dose of the MenB vaccine if there is ongoing high risk for serogroup B meningococcal diseases and more than 1 year has elapsed since finishing the vaccine series. As long as this high risk persists, booster doses should be repeated every 2–3 years thereafter.[61] The MenB vaccine should be avoided during pregnancy unless the benefit of immunization outweighs the risk. The pentavalent meningococcal vaccine (ABCWY) can be considered when there is an indication for immunization for both MenACWY and MenB.

Pneumococcal Vaccine

The following summarizes pneumococcal vaccine recommendations for adolescents and young adults.[61] Pneumococcal vaccines include pneumococcal conjuagate vaccines (PCV) and pneumococcal polysaccharide vaccine (PPSV).[61]

- Initial Immunization Options: 1 dose of PCV20, 1 dose of PCV21, or 1 dose of PCV15 followed by one dose of PPSV23 at least 8 weeks later. Note that PCV21 is not recommended in regions of the United States where the prevalence of pneumococcal serotype 4 is greater than 30% among pneumococcal isolates.
- Prior Pneumococcal Immunization: In general, persons who receive prior immunization with older pneumococcal vaccines (PCV13 alone, PPSV23 alone, or doses of both PCV13 and PPSV23) can receive one dose of PCV20 or PCV21. Following PCV13, there should be at least a 1-year gap before administering PCV20 or PCV21. Following PPSV23, there should be a 5-year gap before giving PCV20 or PCV21.

Varicella Vaccine

Because the varicella vaccine is a live attenuated vaccine, adolescents and young adults with HIV should not receive this vaccine if their CD4 count is less than 200 cells/mm^3.[61] The following summarizes recommendations for administering varicella vaccine to nonimmune adolescents and young adults.

- Adolescents and young adults without evidence of varicella immunity and who have a CD4 count of 200 cells/mm^3 or greater should receive two doses of the single-antigen varicella vaccine administered subcutaneously, 4 to 8 weeks apart.
- All adolescents and young adults who receive the varicella vaccine should be instructed to return promptly for evaluation if they develop a varicella-like rash following receipt of the vaccine. If vaccination causes clinical varicella, antiviral treatment is indicated.

Adolescent Reproductive Health

Screening for Sexually Transmitted Infections

All adolescents and young adults with HIV should undergo screening for sexually transmitted infections, according to the 2021 STI Treatment Guidelines.[66] These guidelines recommend screening for sexually transmitted infections in all sexually active persons with HIV at the initial HIV care visit and at least annually thereafter, with more increased screening based on the presence of ongoing risk factors and the prevalence of sexually transmitted diseases in the community.[66] Specific screening should be performed at genital and extragenital sites for curable sexually transmitted diseases (e.g., syphilis, gonorrhea, and chlamydia).[66] For those with ongoing sexually transmitted infection risk, screening (at genital and/or extragenital sites of exposure) is recommended once every 3 to 6 months.[66]

Contraceptive Management

Sexually active adolescent and young adult women with HIV should have access to the same array of contraceptive options as older women with HIV, including hormonal contraception (e.g., pill, ring, injection, or implant) and intrauterine devices (IUDs). Significant drug interactions can occur between hormonal contraceptives and certain antiretroviral medications; these interactions are detailed in the Adult and Adolescent ARV Guidelines in the table on Drug Interactions Between Antiretroviral Agents and Hormonal Contraceptives.[36] The CDC has published the U.S. Medical Eligibility Criteria for Contraceptive Use (US MEC), which provides specific guidance regarding hormonal contraceptive use for women at high risk of acquiring HIV.[67] These guidelines take into consideration the available data related to HIV acquisition or transmission associated with hormonal contraception use and the benefits of preventing unintended pregnancy.[68] A full discussion of contraceptive management for HIV in persons with HIV is available in a separate Topic Review HIV in Women in the Key Populations module.

Special Considerations for Youth with Perinatal HIV

Informing Children and Adolescents of Their HIV Status

For children who have acquired HIV perinatally, the timing of informing them of their HIV status is a highly sensitive and complicated issue. Studies of youth who acquire HIV perinatally found 10 years of age was the typical time for informing a youth of their HIV status, which is older than for many other chronic conditions.[69] The LEGACY study that included 571 youth with perinatally-acquired HIV found that 32% of those aged 13 years and older were unaware of their HIV status, and 25% of those unaware of HIV status were sexually active.[69] Lack of knowledge of HIV status as a young person who is entering adolescence is problematic and has obvious implications for HIV transmission.[69,70] The American Academy of Pediatrics strongly encourages the disclosure of HIV to school-aged children and states that adolescents should know their HIV status and be informed about the potential outcomes of their health behaviors (including sexual activity).[71]

Mental Health

Adolescents and young adults who acquired HIV perinatally have higher rates of mental health disorders compared with peers without HIV, as shown in one study that found a 12-month psychiatric disorder prevalence of nearly 70% among adolescents and young adults with HIV (or with a history of exposure to HIV).[] An extensive literature review further confirmed the high prevalence rates of psychiatric disorders in youth with HIV.[] According to a review of 8 small studies involving youth with HIV (who acquired HIV perinatally), the most common mental disorders were attention deficit hyperactivity disorder (28.6%), anxiety (24.3%), and depression (25%).[74] Youth with perinatally-acquired HIV may also have high rates of behavioral, developmental, and neurocognitive disorders.[75,76] Anxiety, depression, substance use, and post-traumatic stress disorder are common among youth with HIV who acquired HIV as an adolescent or young adult.[77]

Transitioning to Adult Care

Transitioning from Adolescent to Adult Care

Adolescents and young adults with chronic diseases, including HIV, may face a difficult time transitioning from adolescent to adult health care settings. The transition may be complicated by several different factors, including the presence of coexisting developmental or psychosocial delays, attachment to pediatric/adolescent providers, difficulty trusting a new provider, adjustment to an adult care setting that typically has less psychosocial support and allows less time per encounter, insurance and financial issues, and a lack of communication between pediatric and adult providers.[2,13,26,78,79,80] Medical providers and institutions transition youth to adult clinics at different ages (some at age 18, some at age 21, and some at age 24 or 25), so the maturity of the transitioning adolescent/young adult often varies in different health care settings. Adolescents with perinatal HIV may struggle with additional burdens, such as the loss of a parent to HIV.[78,79] Because of these many factors, there is often a high rate of attrition—and potentially an increase in mortality among adolescents with HIV—as they transition from the pediatric/adolescent multidisciplinary care setting to the adult medical care setting.[79,81]

Models of Transition to Adult Care

The concept of health care transition, which has been defined as the purposeful, planned movement of children with special health needs from child-centered to adult-centered care, is a relatively new frontier for HIV medicine, since children with HIV did not typically survive to adulthood prior to the availability of effective antiretroviral therapy.[78,80,82] Researchers have found that an organized, deliberate, developmentally appropriate, and compassionate process of medical care transition can improve outcomes as adolescents and young adults enter adult care settings.[26,83] Adolescents and young adults should be included in the conversations around transition, as there are clear discrepancies between what adolescents and young adults need and expect from their medical environment and what they experience (Table 6).[84,85] Various facilitators to a successful transition have been identified, such as developing a relationship with the new adult provider prior to the actual transition, educating adult HIV care teams about transition, developing an individualized transition plan, and providing a formal written transition document. [2,26,78,79,83] There are, however, no evidenced-based guidelines or models to inform the type of transitional care that should be provided to adolescents and young adults with HIV.

Summary Points

- In the United States, for the year 2022, adolescents and young adults comprised only about 3% of all persons living with HIV, but they accounted for approximately 20% of all new HIV infections.
- HIV testing rates are low among adolescents and young adults, and only 56% of adolescents and young adults with HIV are aware of their HIV status.
- All adolescents and young adults with HIV should receive antiretroviral therapy, both for their own health benefit and to reduce the risk of HIV transmission to others.
- Antiretroviral therapy selection and dosing for adolescents and young adults is based on their sexual maturity rating rather than on age. For adolescents and young adults who have a sexual maturity rating of IV or V, the antiretroviral regimen recommendations are the same as for adults.
- Concerns about barriers to adherence with adolescents should not exclude youth from receiving antiretroviral therapy, but should prompt extra effort to prepare youth for starting antiretroviral therapy and to support adherence while on treatment.
- All inactivated vaccines are considered safe to administer to adolescents and young adults with HIV, irrespective of immune status, but live vaccines, including the varicella vaccine and the MMR vaccine, should not be given to persons with a CD4 count less than 200 cells/mm^3.
- Researchers have found that an organized, deliberate, culturally competent, developmentally appropriate, and compassionate process of transition can improve health outcomes as adolescents and young adults enter adult care settings, which is essential for their continued engagement in HIV.

Citations

1. Kadede K, Ruel T, Kabami J, et al. Increased adolescent HIV testing with a hybrid mobile strategy in Uganda and Kenya. AIDS. 2016;30:2121-6.
[PubMed Abstract] -

2. Panel on Antiretroviral Guidelines for Adults and Adolescents. Guidelines for the use of antiretroviral agents in adults and adolescents with HIV. Department of Health and Human Services. Considerations for antiretroviral use in special patient populations: adolescents and young adults with HIV. June 3, 2021.
[HIV.gov] -

3. Nesheim S, Taylor A, Lampe MA, et al. A framework for elimination of perinatal transmission of HIV in the United States. Pediatrics. 2012;130:738-44.
[PubMed Abstract] -

4. Centers for Disease Control and Prevention. Diagnoses of HIV Infection Among Adolescents and Young Adults in the United States and 6 Dependent Areas, 2012–2017. HIV Surveillance Supplemental Report 2019;24(No. 5): 1-47. Published October 2019.
[CDC] -

5. 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] -

6. Panel on Antiretroviral Therapy and Medical Management of Children Living with HIV. Guidelines for the use of antiretroviral agents in pediatric HIV infection. What to start: antiretroviral treatment regimens recommended for initial therapy in infants and children with HIV. September 30, 2025.
[HIV.gov] -

7. WHO Guidelines Approved by the Guidelines Review Committee. Annex H. Sexual Maturity Rating (Tanner Stage) in Adolescents. Antiretroviral Therapy for HIV Infection in Infants and Children: Towards Universal Access: Recommendations for a Public Health Approach: 2010 Revision.
[WHO] -

8. 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 (revised February 7, 2025).
[CDC] -

9. Branson BM, Handsfield HH, Lampe MA, et al. Revised recommendations for HIV testing of adults, adolescents, and pregnant women in health-care settings. MMWR Recomm Rep. 2006;55:1-17.
[PubMed Abstract] -

10. Centers for Disease Control and Prevention. Youth Risk Behavior Survey Data Summary & Trends Report: 2013–2023. U.S. Department of Health and Human Services; 2024.
[CDC and Prevention] -

11. Turner SD, Anderson K, Slater M, Quigley L, Dyck M, Guiang CB. Rapid point-of-care HIV testing in youth: a systematic review. J Adolesc Health. 2013;53:683-91.
[PubMed Abstract] -

12. Inungu J, Lewis A, Mustafa Y, Wood J, O'Brien S, Verdun D. HIV Testing among Adolescents and Youth

in the United States: Update from the 2009 Behavioral Risk Factor Surveillance System. Open AIDS J. 2011;5:80-5.
[PubMed Abstract] -

13. Committee On Pediatric AIDS. Transitioning HIV-infected youth into adult health care. Pediatrics. 2013 Jul;132:192-7.
[PubMed Abstract] -

14. Hsu KK, Rakhmanina NY. Adolescents and Young Adults: The Pediatrician's Role in HIV Testing and Pre- and Postexposure HIV Prophylaxis. Pediatrics. 2022;149(1):e2021055207.
[PubMed Abstract] -

15. Van Handel M, Kann L, Olsen EO, Dietz P. HIV Testing Among US High School Students and Young Adults. Pediatrics. 2016;137:e20152700.
[PubMed Abstract] -

16. Miller RL, Boyer CB, Chiaramonte D, et al. Evaluating Testing Strategies for Identifying Youths With HIV Infection and Linking Youths to Biomedical and Other Prevention Services. JAMA Pediatr. 2017;171:532-537.
[PubMed Abstract] -

17. Philbin MM, Tanner AE, Duval A, Ellen J, Kapogiannis B, Fortenberry JD. Linking HIV-positive adolescents to care in 15 different clinics across the United States: creating solutions to address structural barriers for linkage to care. AIDS Care. 2014;26:12-9.
[PubMed Abstract] -

18. Philbin MM, Tanner AE, DuVal A, et al. Factors affecting linkage to care and engagement in care for newly diagnosed HIV-positive adolescents within fifteen adolescent medicine clinics in the United States. AIDS Behav. 2014;18:1501-10.
[PubMed Abstract] -

19. MacPherson P, Munthali C, Ferguson J, et al. Service delivery interventions to improve adolescents' linkage, retention and adherence to antiretroviral therapy and HIV care. Trop Med Int Health. 2015;20:1015-32.
[PubMed Abstract] -

20. Lamb MR, Fayorsey R, Nuwagaba-Biribonwoha H, et al. High attrition before and after ART initiation among youth (15-24 years of age) enrolled in HIV care. AIDS. 2014;28:559-68.
[PubMed Abstract] -

21. Miller RL, Chiaramonte D, Strzyzykowski T, Sharma D, Anderson-Carpenter K, Fortenberry JD. Improving Timely Linkage to Care among Newly Diagnosed HIV-Infected Youth: Results of SMILE. J Urban Health. 2019;96:845-55.
[PubMed Abstract] -

22. Centers for Disease Control and Prevention. Monitoring Selected National HIV Prevention and Care Objectives by Using HIV Surveillance Data—United States and 6 Dependent Areas, 2021. HIV Surveillance Supplemental Report. 2023;28(No. 4). Published May 2023.
[CDC] -

23. Zanoni BC, Mayer KH. The adolescent and young adult HIV cascade of care in the United States: exaggerated health disparities. AIDS Patient Care STDS. 2014;28:128-35.
[PubMed Abstract] -

24. Kapogiannis BG, Koenig LJ, Xu J, et al. The HIV Continuum of Care for Adolescents and Young Adults Attending 13 Urban US HIV Care Centers of the NICHD-ATN-CDC-HRSA SMILE Collaborative. J Acquir Immune Defic Syndr. 2020;84:92-100.
[PubMed Abstract] -

25. Centers for Disease Control and Prevention. Monitoring Selected National HIV Prevention and Care Objectives by Using HIV Surveillance Data—United States and 6 Dependent Areas, 2022. HIV Surveillance Supplemental Report. 2024;29(No. 2). Published May 2024.
[CDC] -

26. Dowshen N, D'Angelo L. Health care transition for youth living with HIV/AIDS. Pediatrics. 2011;128:762-71.
[PubMed Abstract] -

27. Panel on Antiretroviral Therapy and Medical Management of Children Living with HIV. Guidelines for the use of antiretroviral agents in pediatric HIV infection. Specific considerations in antiretroviral therapy use in adolescents with HIV. June 27, 2024
[HIV.gov] -

28. Panel on Antiretroviral Guidelines for Adults and Adolescents. Guidelines for the use of antiretroviral agents in adults and adolescents with HIV. Department of Health and Human Services. Baseline evaluation. September 21, 2022.
[HIV.gov] -

29. Panel on Antiretroviral Guidelines for Adults and Adolescents. Guidelines for the use of antiretroviral agents in adults and adolescents with HIV. Department of Health and Human Services. Laboratory testing: laboratory testing for initial assessment and monitoring of people with HIV. September 25, 2025.
[HIV.gov] -

30. Tassiopoulos K, Moscicki AB, Mellins C, et al. Sexual risk behavior among youth with perinatal HIV infection in the United States: predictors and implications for intervention development. Clin Infect Dis. 2013;56:283-90.
[PubMed Abstract] -

31. Chandwani S, Koenig LJ, Sill AM, Abramowitz S, Conner LC, D'Angelo L. Predictors of antiretroviral medication adherence among a diverse cohort of adolescents with HIV. J Adolesc Health. 2012;51:242-51.
[PubMed Abstract] -

32. Delaugerre C, Warszawski J, Chaix ML, et al. Prevalence and risk factors associated with antiretroviral resistance in HIV-1-infected children. J Med Virol. 2007;79:1261-9.
[PubMed Abstract] -

33. Panel on Antiretroviral Guidelines for Adults and Adolescents. Guidelines for the Use of Antiretroviral Agents in Adults and Adolescents with HIV. Department of Health and Human Services. What to Start. Initial Combination Antiretroviral Regimens for People With HIV. September 12, 2024.
[HIV.gov] -

34. Panel on Treatment of HIV During Pregnancy and Prevention of Perinatal Transmission. Recommendations for the Use of Antiretroviral Drugs During Pregnancy and Interventions to Reduce Perinatal HIV Transmission in the United States. Antepartum care: recommendations for use of antiretroviral drugs during pregnancy. January 31, 2023.
[HIV.gov] -

35. Panel on Treatment of HIV During Pregnancy and Prevention of Perinatal Transmission. Recommendations for the Use of Antiretroviral Drugs During Pregnancy and Interventions to Reduce Perinatal HIV Transmission in the United States. Recommendations for Use of Antiretroviral Drugs During Pregnancy. Antiretroviral Therapy When Trying to Conceive. June 12, 2025. [HIV.gov] -

36. Panel on Treatment of HIV During Pregnancy and Prevention of Perinatal Transmission. Recommendations for the Use of Antiretroviral Drugs During Pregnancy and Interventions to Reduce Perinatal HIV Transmission in the United States. Prepregnancy counseling and care. June 12, 2025. [HIV.gov] -

37. Panel on Antiretroviral Guidelines for Adults and Adolescents. Guidelines for the use of antiretroviral agents in adults and adolescents with HIV. Department of Health and Human Services. Laboratory testing: plasma HIV-1 RNA (viral load) and CD4 count monitoring. September 25, 2025. [HIV.gov] -

38. Ryscavage P, Anderson EJ, Sutton SH, Reddy S, Taiwo B. Clinical outcomes of adolescents and young adults in adult HIV care. J Acquir Immune Defic Syndr. 2011;58:193-7. [PubMed Abstract] -

39. Rudy BJ, Murphy DA, Harris DR, Muenz L, Ellen J. Patient-related risks for nonadherence to antiretroviral therapy among HIV-infected youth in the United States: a study of prevalence and interactions. AIDS Patient Care STDS. 2009;23:185-94. [PubMed Abstract] -

40. MacDonell K, Naar-King S, Huszti H, Belzer M. Barriers to medication adherence in behaviorally and perinatally infected youth living with HIV. AIDS Behav. 2013;17:86-93. [PubMed Abstract] -

41. Shubber Z, Mills EJ, Nachega JB, et al. Patient-Reported Barriers to Adherence to Antiretroviral Therapy: A Systematic Review and Meta-Analysis. PLoS Med. 2016;13:e1002183. [PubMed Abstract] -

42. Panel on Antiretroviral Therapy and Medical Management of Children Living with HIV. Guidelines for the use of antiretroviral agents in pediatric HIV infection. Adherence to antiretroviral therapy in children and adolescents with HIV. September 30, 2025. [HIV.gov] -

43. Belzer ME, Kolmodin MacDonell K, Clark LF, et al. Acceptability and Feasibility of a Cell Phone Support Intervention for Youth Living with HIV with Nonadherence to Antiretroviral Therapy. AIDS Patient Care STDS. 2015;29:338-45. [PubMed Abstract] -

44. Garofalo R, Kuhns LM, Hotton A, Johnson A, Muldoon A, Rice D. A Randomized Controlled Trial of Personalized Text Message Reminders to Promote Medication Adherence Among HIV-Positive Adolescents and Young Adults. AIDS Behav. 2016;20:1049-59. [PubMed Abstract] -

45. Amankwaa I, Boateng D, Quansah DY, Akuoko CP, Evans C. Effectiveness of short message services and voice call interventions for antiretroviral therapy adherence and other outcomes: A systematic review and meta-analysis. PLoS One. 2018;13:e0204091. [PubMed Abstract] -

46. Shah R, Watson J, Free C. A systematic review and meta-analysis in the effectiveness of mobile phone interventions used to improve adherence to antiretroviral therapy in HIV infection. BMC Public Health. 2019;19:915.
[PubMed Abstract] -

47. Grant RM, Lama JR, Anderson PL, et al. Preexposure chemoprophylaxis for HIV prevention in men who have sex with men. N Engl J Med. 2010;363:2587-99.
[PubMed Abstract] -

48. 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] -

49. Baeten JM, Donnell D, Ndase P, et al. Antiretroviral prophylaxis for HIV prevention in heterosexual men and women. N Engl J Med. 2012;367:399-410.
[PubMed Abstract] -

50. Delany-Moretlwe S, Hughes JP, Bock P, et al. Cabotegravir for the prevention of HIV-1 in women: results from HPTN 084, a phase 3, randomised clinical trial. Lancet. 2022;399:1779–89.
[PubMed Abstract] -

51. Kelley CF, Acevedo-Quiñones M, Agwu AL, et al. Twice-Yearly Lenacapavir for HIV Prevention in Men and Gender-Diverse Persons. N Engl J Med. 2025;392:1261-76.
[PubMed Abstract] -

52. Landovitz RJ, Donnell D, Clement ME, et al. N Engl J Med. 2021;385:595-608.
[PubMed Abstract] -

53. 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] -

54. Doll M, Fortenberry JD, Roseland D, McAuliff K, Wilson CM, Boyer CB. Linking HIV-Negative Youth to Prevention Services in 12 U.S. Cities: Barriers and Facilitators to Implementing the HIV Prevention Continuum. J Adolesc Health. 2018;62:424-433.
[PubMed Abstract] -

55. Mayer KH, Molina JM, Thompson MA, et al. Emtricitabine and tenofovir alafenamide vs emtricitabine and tenofovir disoproxil fumarate for HIV pre-exposure prophylaxis (DISCOVER): primary results from a randomised, double-blind, multicentre, active-controlled, phase 3, non-inferiority trial. Lancet. 2020;396:239-54.
[PubMed Abstract] -

56. Bekker LG, Das M, Abdool Karim Q, et al. Twice-Yearly Lenacapavir or Daily F/TAF for HIV Prevention in Cisgender Women. N Engl J Med. 2024;391:1179-92.
[PubMed Abstract] -

57. Hosek SG, Rudy B, Landovitz R, et al. An HIV Preexposure Prophylaxis Demonstration Project and Safety Study for Young MSM. J Acquir Immune Defic Syndr. 2017;74:21-9.
[PubMed Abstract] -

58. Hosek SG, Landovitz RJ, Kapogiannis B, et al. Safety and Feasibility of Antiretroviral Preexposure

Prophylaxis for Adolescent Men Who Have Sex With Men Aged 15 to 17 Years in the United States. JAMA Pediatr. 2017;171:1063-71.
[PubMed Abstract] -

59. Tanner MR, Miele P, Carter W, et al. Preexposure Prophylaxis for Prevention of HIV Acquisition Among Adolescents: Clinical Considerations, 2020. MMWR Recomm Rep. 2020;69:1-12.
[PubMed Abstract] -

60. American Academy of Pediatrics. Recommended Child and Adolescent Immunization Schedule for Ages 18 Years or Younger, United States, 2026.
[AAP] -

61. Panel on Guidelines for the Prevention and Treatment of Opportunistic Infections in Adults and Adolescents with HIV. Guidelines for the prevention and treatment of opportunistic infections in adults and adolescents with HIV. National Institutes of Health, HIV Medicine Association, and Infectious Diseases Society of America. Immunizations for Preventable Diseases in Adults and Adolescents with HIV. Last updated: February 24, 2026.
[HIV.gov] -

62. Advisory Committee on Immunization Practices (ACIP). Recommended Immunization Schedule for Ages 19 Years or Older, United States, 2025.
[ACIP] -

63. Advisory Committee on Immunization Practices (ACIP). Recommended Child and Adolescent Immunization Schedule for Ages 18 Years or Younger, United States, 2024.
[ACIP] -

64. Advisory Committee on Immunization Practices (ACIP). Recommended Adult Immunization Schedule by Medical Condition and Other Indications, United States, 2025.
[ACIP] -

65. Advisory Committee on Immunization Practices (ACIP). Recommended Child and Adolescent Immunization Schedule by Medical Indication, United States, 2025.
[ACIP] -

66. Workowski KA, Bachmann LH, Chan PA, et al. Sexually transmitted infections treatment guidelines, 2021. MMWR Recomm Rep. 2021;70(No. RR-4):1-187.
[2021 STI Treatment Guidelines] -

67. Tepper NK, Krashin JW, Curtis KM, Cox S, Whiteman MK. Update to CDC's U.S. Medical Eligibility Criteria for Contraceptive Use, 2016: Revised Recommendations for the Use of Hormonal Contraception Among Women at High Risk for HIV Infection. MMWR Morb Mortal Wkly Rep. 2017;66:990-994.
[PubMed Abstract] -

68. Tepper NK, Curtis KM, Cox S, Whiteman MK. Update to U.S. Medical Eligibility Criteria for Contraceptive Use, 2016: Updated Recommendations for the Use of Contraception Among Women at High Risk for HIV Infection. MMWR Morb Mortal Wkly Rep. 2020;69:405-10.
[PubMed Abstract] -

69. Setse RW, Siberry GK, Gravitt PE, et al. Correlates of sexual activity and sexually transmitted infections among human immunodeficiency virus-infected youth in the LEGACY cohort, United States, 2006. Pediatr Infect Dis J. 2011;30:967-73.
[PubMed Abstract] -

70. Elkington KS, Bauermeister JA, Santamaria EK, Dolezal C, Mellins CA. Substance use and the development of sexual risk behaviors in youth perinatally exposed to HIV. J Pediatr Psychol. 2015;40:442-54.
[PubMed Abstract] -

71. Disclosure of illness status to children and adolescents with HIV infection. American Academy of Pediatrics Committee on Pediatrics AIDS. Pediatrics. 1999;103:164-6.
[PubMed Abstract] -

72. Scharko AM. DSM psychiatric disorders in the context of pediatric HIV/AIDS. AIDS Care. 2006;18:441-5.
[PubMed Abstract] -

73. Nozyce ML, Lee SS, Wiznia A, et al. A behavioral and cognitive profile of clinically stable HIV-infected children. Pediatrics. 2006;117:763-70.
[PubMed Abstract] -

74. Smith R, Wilkins M. Perinatally acquired HIV infection: long-term neuropsychological consequences and challenges ahead. Child Neuropsychol. 2015;21:234-68.
[PubMed Abstract] -

75. Young-Wolff KC, Sarovar V, Sterling SA, et al. Adverse childhood experiences, mental health, substance use, and HIV-related outcomes among persons with HIV. AIDS Care. 2019;31:1241-1249.
[PubMed Abstract] -

76. Gilliam PP, Ellen JM, Leonard L, Kinsman S, Jevitt CM, Straub DM. Transition of adolescents with HIV to adult care: characteristics and current practices of the adolescent trials network for HIV/AIDS interventions. J Assoc Nurses AIDS Care. 2011;22:283-94.
[PubMed Abstract] -

77. Reiss JG, Gibson RW, Walker LR. Health care transition: youth, family, and provider perspectives. Pediatrics. 2005;115:112-20.
[PubMed Abstract] -

78. Vijayan T, Benin AL, Wagner K, Romano S, Andiman WA. We never thought this would happen: transitioning care of adolescents with perinatally acquired HIV infection from pediatrics to internal medicine. AIDS Care. 2009;21:1222-9.
[PubMed Abstract] -

79. Fish R, Judd A, Jungmann E, O'Leary C, Foster C. Mortality in perinatally HIV-infected young people in England following transition to adult care: an HIV Young Persons Network (HYPNet) audit. HIV Med. 2014;15:239-44.
[PubMed Abstract] -

80. Blum RW, Garell D, Hodgman CH, et al. Transition from child-centered to adult health-care systems for adolescents with chronic conditions. A position paper of the Society for Adolescent Medicine. J Adolesc Health. 1993;14:570-6.
[PubMed Abstract] -

81. Andiman WA. Transition from pediatric to adult healthcare services for young adults with chronic illnesses: the special case of human immunodeficiency virus infection. J Pediatr. 2011;159:714-9.
[PubMed Abstract] -

82. Tebb KP, Pica G, Peake K, Diaz A, Brindis CD. Adolescent and Health Professional Perspectives on the

Medical Home: Improving Health Care Access and Utilization Under the Affordable Care Act: Philip R. Lee Institute for Health Policy Studies and Division of Adolescent and Young Adult Medicine, Department of Pediatrics, University of California, San Francisco; July 2016.
[Health Policy Brief] -

83. Horberg M, Thompson M, Agwu A, et al. Primary Care Guidance for Providers of Care for Persons With Human Immunodeficiency Virus: 2024 Update by the HIV Medicine Association of the Infectious Diseases Society of America. Clin Infect Dis. 2024 Oct 12. Online ahead of print.
[PubMed Abstract] -

References

- Delany-Moretlwe S, Cowan FM, Busza J, Bolton-Moore C, Kelley K, Fairlie L. Providing comprehensive health services for young key populations: needs, barriers and gaps. J Int AIDS Soc. 2015;18:19833.
[PubMed Abstract] -

- Doll M, Fortenberry JD, Roseland D, McAuliff K, Wilson CM, Boyer CB. Linking HIV-Negative Youth to Prevention Services in 12 U.S. Cities: Barriers and Facilitators to Implementing the HIV Prevention Continuum. J Adolesc Health. 2018;62:424-33.
[PubMed Abstract] -

- Havens PL, Stephensen CB, Van Loan MD, et al. Vitamin D3 Supplementation Increases Spine Bone Mineral Density in Adolescents and Young Adults With Human Immunodeficiency Virus Infection Being Treated With Tenofovir Disoproxil Fumarate: A Randomized, Placebo-Controlled Trial. Clin Infect Dis. 2018;66:220-8.
[PubMed Abstract] -

- Hosek S, Henry-Reid L. PrEP and Adolescents: The Role of Providers in Ending the AIDS Epidemic. Pediatrics. 2020;145:e20191743
[PubMed Abstract] -

- Lally MA, van den Berg JJ, Westfall AO, et al. HIV Continuum of Care for Youth in the United States. J Acquir Immune Defic Syndr. 2018;77:110-117.
[PubMed Abstract] -

- Marin M, Güris D, Chaves SS, Schmid S, Seward JF; Advisory Committee on Immunization Practices, Centers for Disease Control and Prevention (CDC). Prevention of varicella: recommendations of the Advisory Committee on Immunization Practices (ACIP). MMWR Recomm Rep. 2007;56(RR-4):1-4.
[MMWR] -

- Mbaeyi SA, Bozio CH, Duffy J, et al. Meningococcal Vaccination: Recommendations of the Advisory Committee on Immunization Practices, United States, 2020. MMWR Recomm Rep. 2020;69:1-41.
[PubMed Abstract] -

- Meites E, Kempe A, Markowitz LE. Use of a 2-Dose Schedule for Human Papillomavirus Vaccination - Updated Recommendations of the Advisory Committee on Immunization Practices. MMWR Morb Mortal Wkly Rep. 2016;65:1405-8.
[PubMed Abstract] -

- Mellins CA, Tassiopoulos K, Malee K, et al. Behavioral health risks in perinatally HIV-exposed youth: co-occurrence of sexual and drug use behavior, mental health problems, and nonadherence to antiretroviral treatment. AIDS Patient Care STDS. 2011;25:413-22.
[PubMed Abstract] -

- Mullins TLK, Idoine CR, Zimet GD, Kahn JA. Primary Care Physician Attitudes and Intentions Toward the Use of HIV Pre-exposure Prophylaxis in Adolescents in One Metropolitan Region. J Adolesc Health. 2019;64:581-8.
[PubMed Abstract] -

- Petsis D, Min J, Huang YV, Akers AY, Wood S. HIV Testing Among Adolescents With Acute Sexually Transmitted Infections. Pediatrics. 2020;145:e20192265.
[PubMed Abstract] -

- Saenjun P, Vongsirimas N, Klainin-Yobas P. Factors influencing antiretroviral therapy adherence among youth living with HIV: a systematic review and meta-analysis. BMC Public Health. 2025;25:4213.
[PubMed Abstract] -

- Stein R, Song W, Marano M, Patel H, Rao S, Morris E. HIV Testing, Linkage to HIV Medical Care, and Interviews for Partner Services Among Youths - 61 Health Department Jurisdictions, United States, Puerto Rico, and the U.S. Virgin Islands, 2015. MMWR Morb Mortal Wkly Rep. 2017;66:629-35.
[PubMed Abstract] -

- Wilson PA, Kahana SY, Fernandez MI, et al. Sexual Risk Behavior Among Virologically Detectable Human Immunodeficiency Virus-Infected Young Men Who Have Sex With Men. JAMA Pediatr. 2016;170:125-31.
[PubMed Abstract] -

- Workowski KA, Bachmann LH, Chan PA, et al. Sexually transmitted infections treatment guidelines, 2021. HIV infection: detection, counseling, and referral. MMWR Recomm Rep. 2021;70(No. RR-4):1-187.
[2021 STD Treatment Guidelines] -

Figures

Figure 1 Estimated HIV Prevalence, by Age Group, United States, 2022

Source: 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 (revised February 7, 2025).

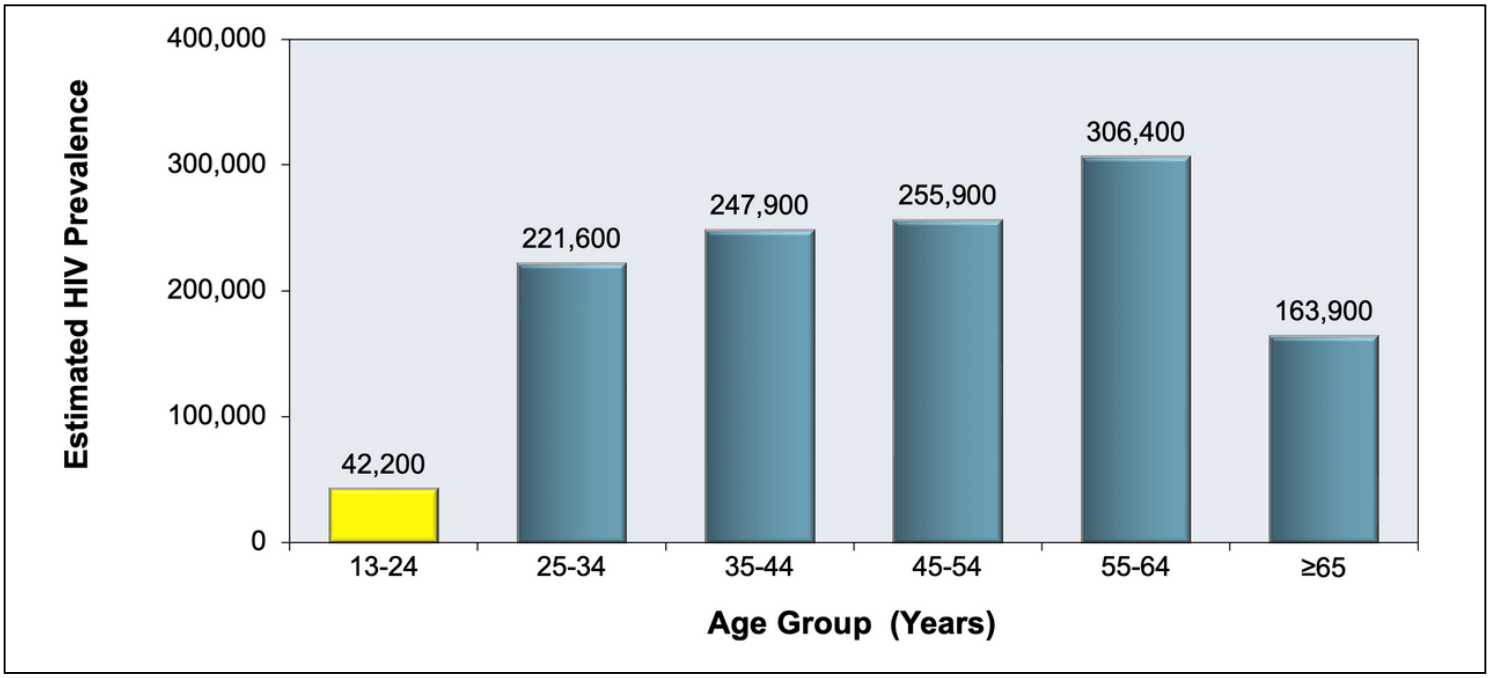

Figure 2 Estimated HIV Incidence, by Age Group, United States, 2022

Source: 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 (revised February 7, 2025).

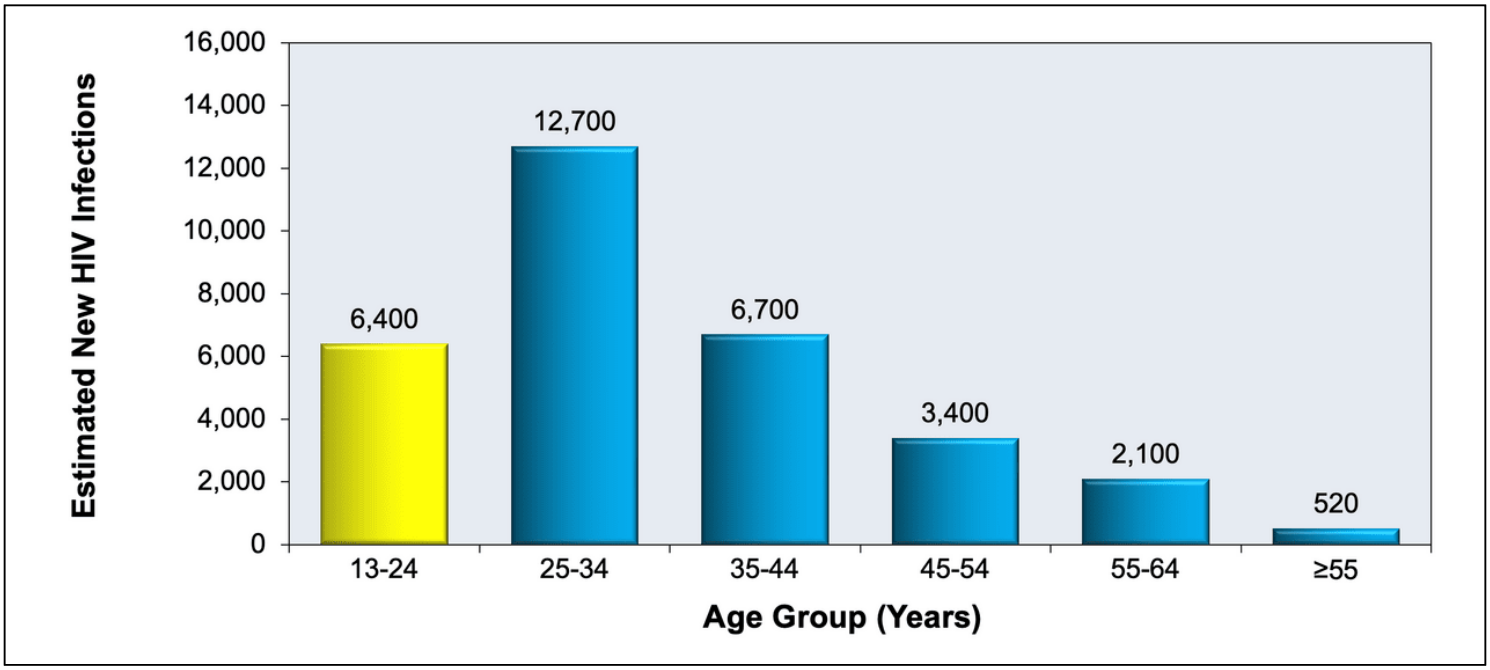

Figure 3 Proportion of Persons Aware of HIV Status, by Age Group, United States, 2022

Source: 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 (revised February 7, 2025).

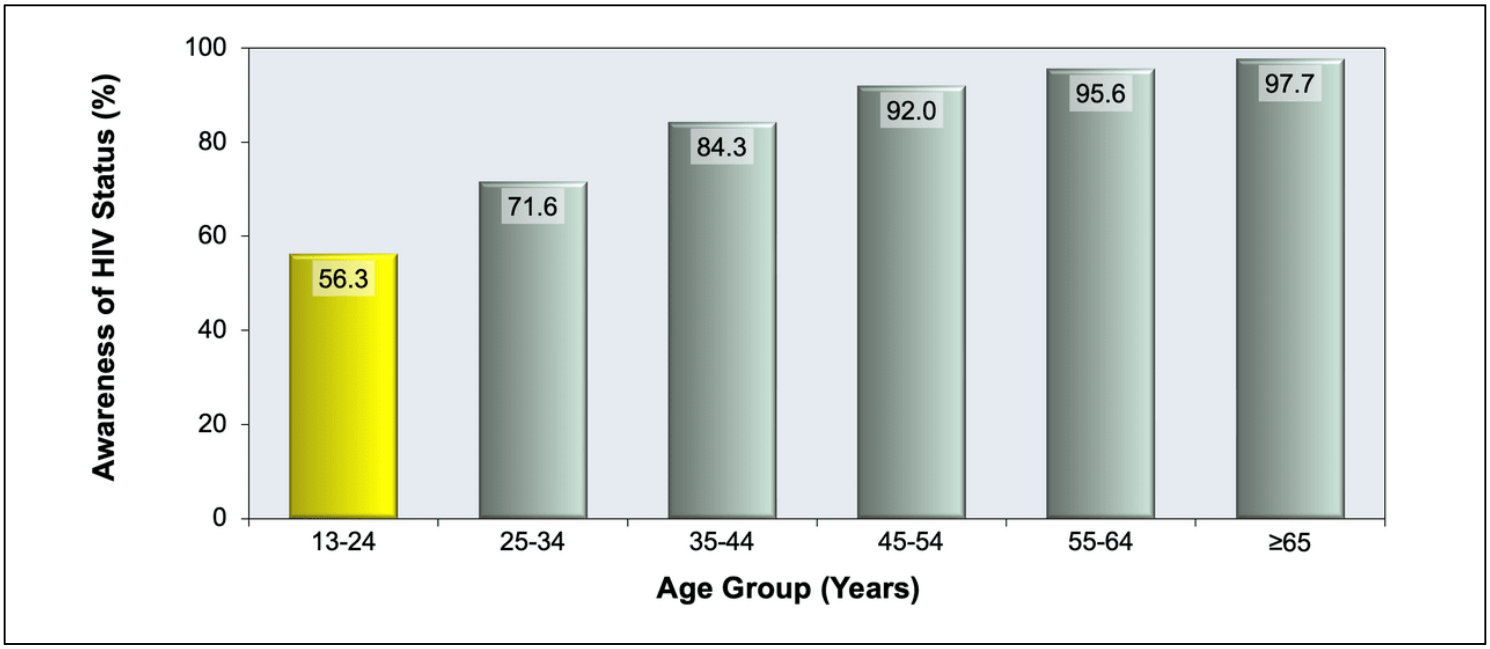

Figure 4 (Image Series) - Youth Risk Behavior Survey Data, High School Students, 2013-2023
(Image Series) - Figure 4 (Image Series) - Youth Risk Behavior Survey Data, High School Students, 2013-2023
Image 4A: Ever Had Sex

Source: Centers for Disease Control and Prevention. Youth Risk Behavior Survey Data Summary & Trends Report: 2013–2023. U.S. Department of Health and Human Services; 2024.

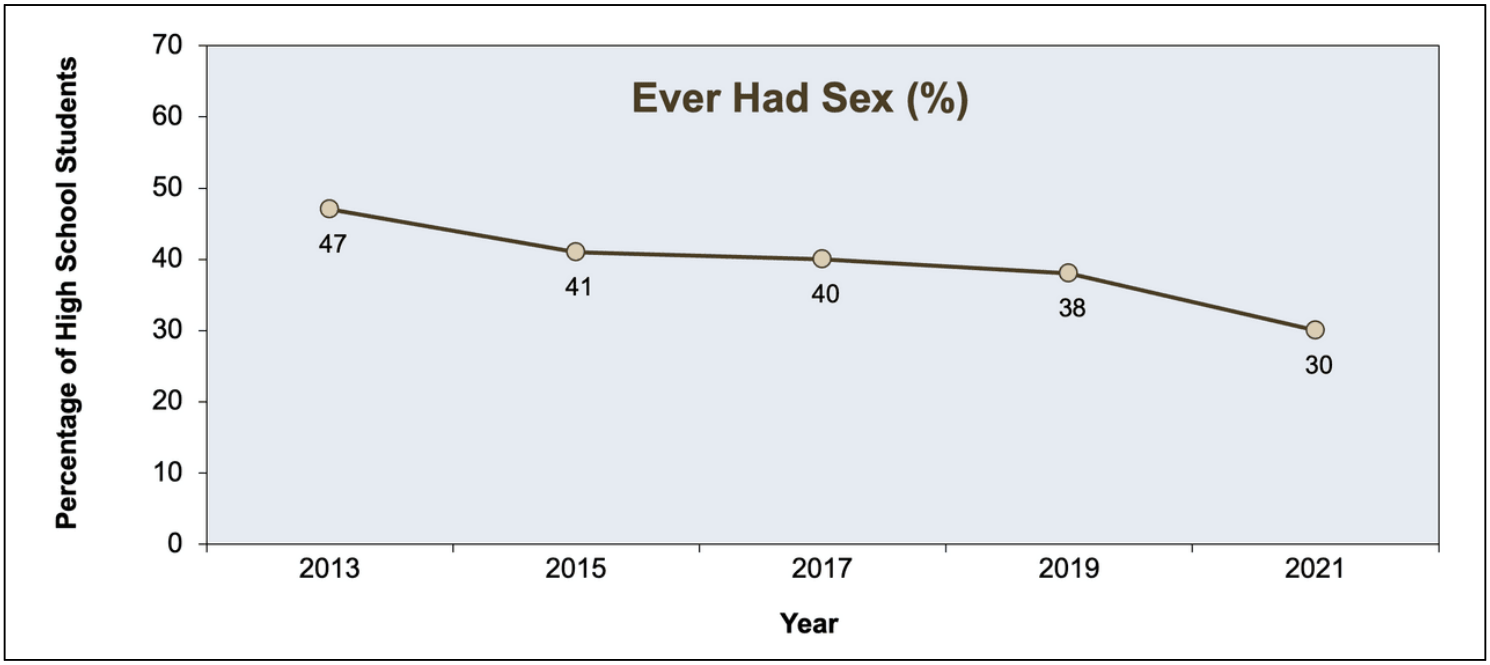

Figure 4 (Image Series) - Youth Risk Behavior Survey Data, High School Students, 2013-2023
Image 4B: Sexually Active

Source: Centers for Disease Control and Prevention. Youth Risk Behavior Survey Data Summary & Trends Report: 2013–2023. U.S. Department of Health and Human Services; 2024.

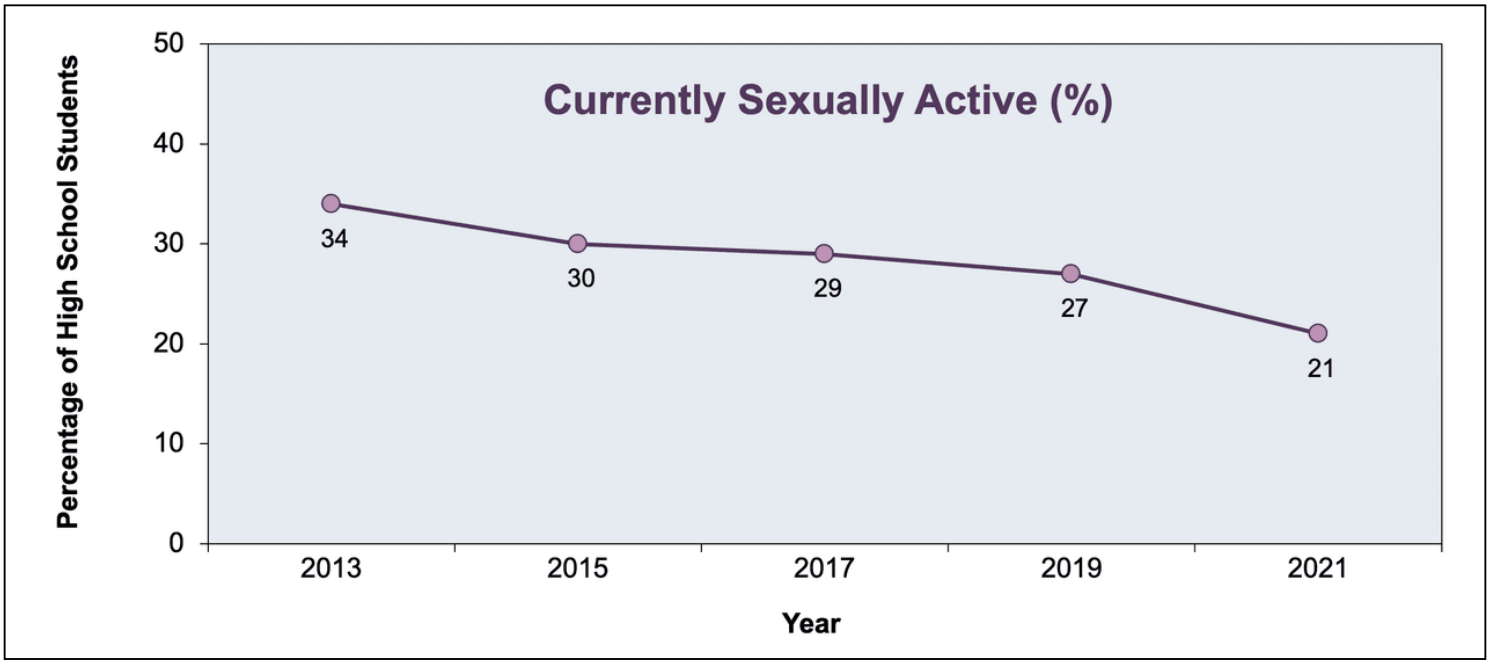

Figure 4 (Image Series) - Youth Risk Behavior Survey Data, High School Students, 2013-2023
Image 4C: Used Condom During Last Sexual Intercourse

Source: Centers for Disease Control and Prevention. Youth Risk Behavior Survey Data Summary & Trends Report: 2013–2023. U.S. Department of Health and Human Services; 2024.

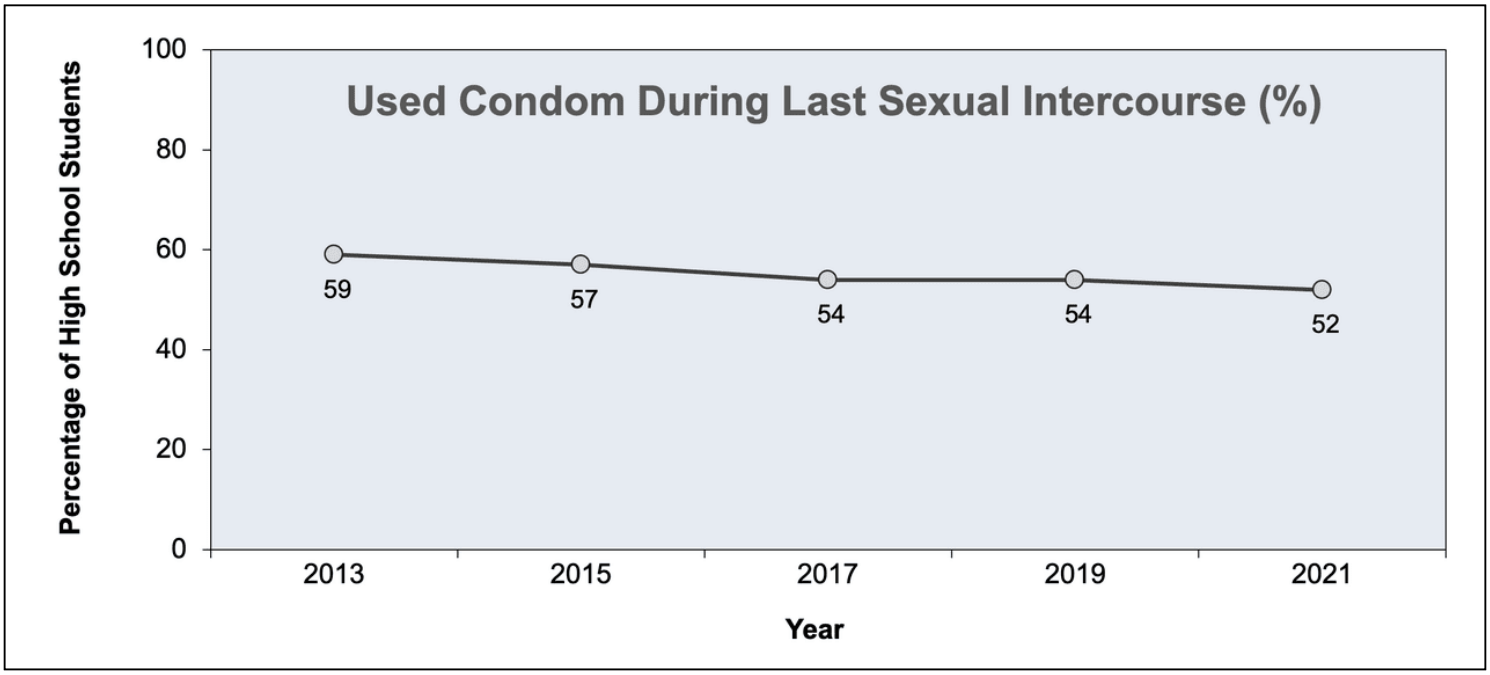

Figure 4 (Image Series) - Youth Risk Behavior Survey Data, High School Students, 2013-2023
Image 4D: Ever Tested for HIV

Source: Centers for Disease Control and Prevention. Youth Risk Behavior Survey Data Summary & Trends Report: 2013–2023. U.S. Department of Health and Human Services; 2024.

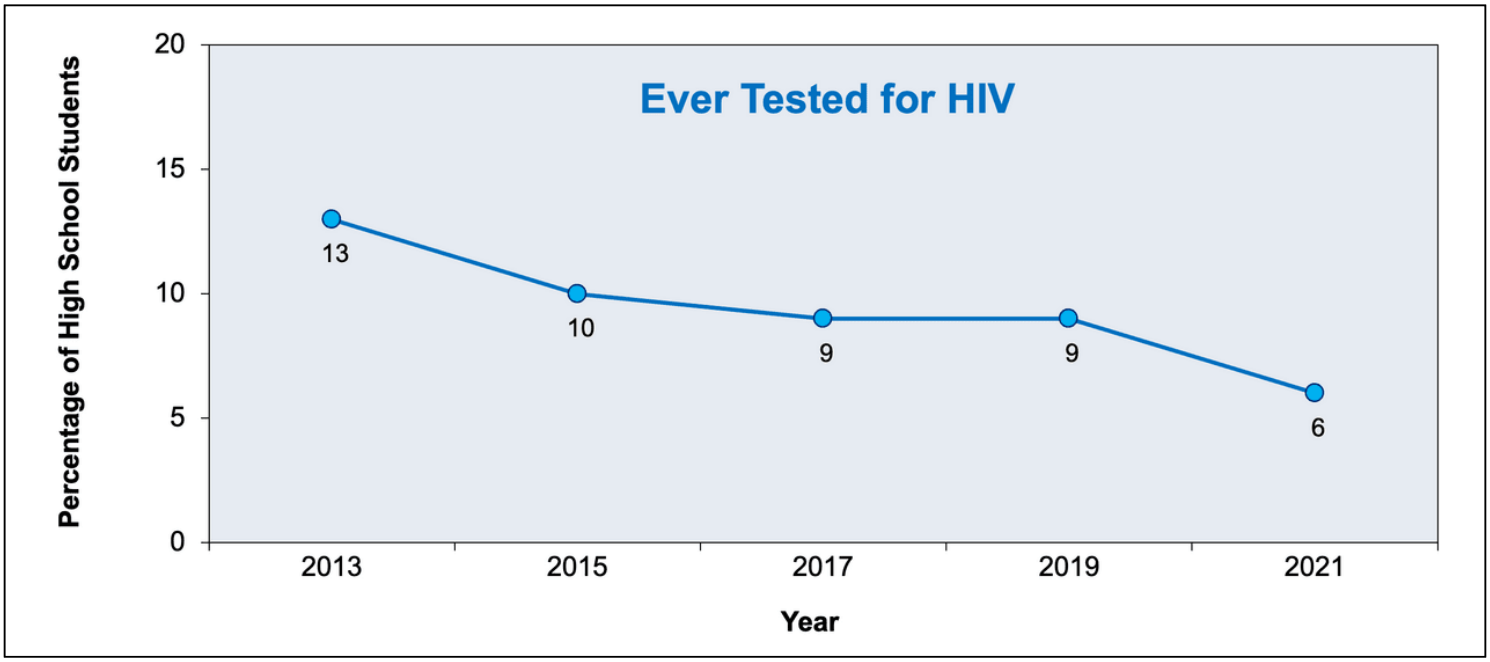

Figure 5 HIV Continuum of Care, by Age Group, United States, 2022

Source:Centers for Disease Control and Prevention. Monitoring Selected National HIV Prevention and Care Objectives by Using HIV Surveillance Data—United States and 6 Dependent Areas, 2022. HIV Surveillance Supplemental Report. 2024;29(No. 2). Published May 2024.

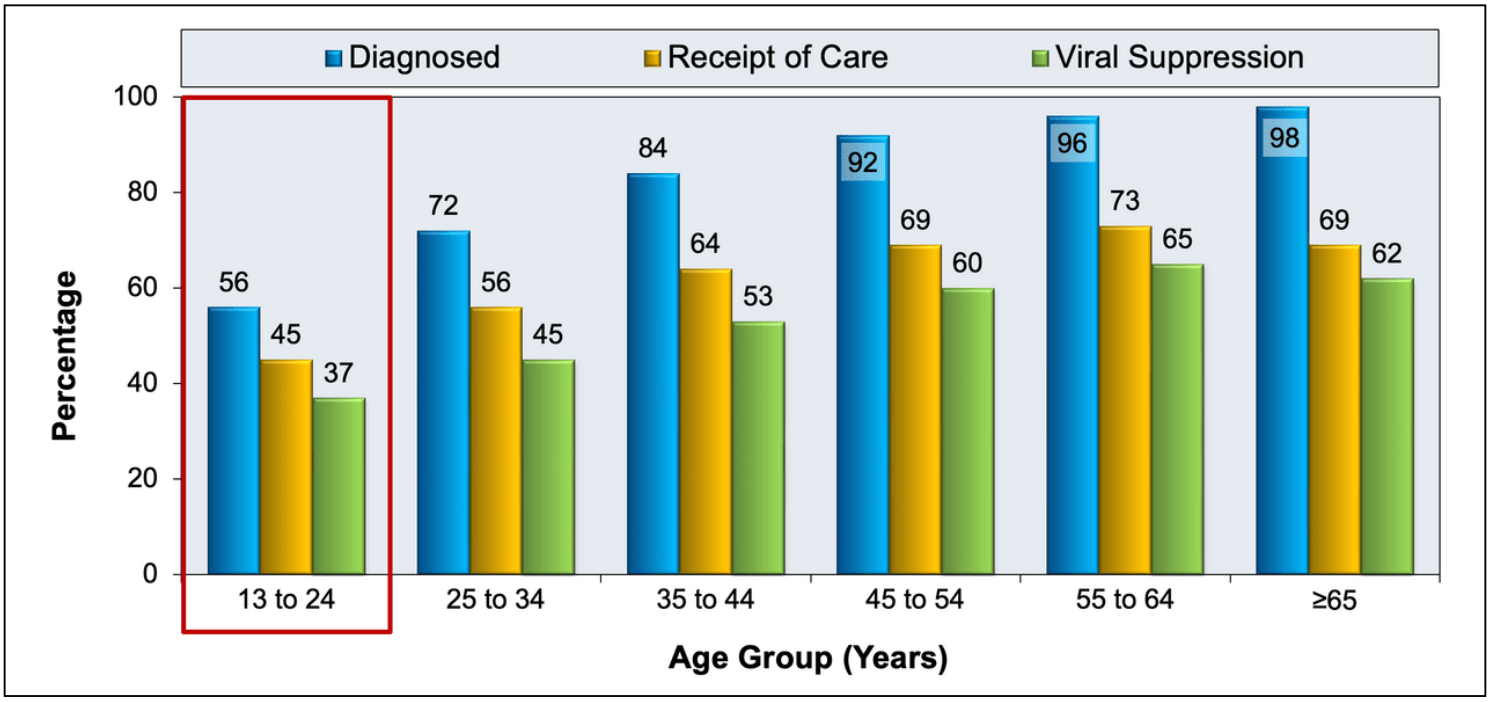

Figure 6 Tenofovir diphosphate Levels During 48 Weeks of PrEP in ATN 113 Study

Source: Hosek SG, Landovitz RJ, Kapogiannis B, et al. Safety and Feasibility of Antiretroviral Preexposure Prophylaxis for Adolescent Men Who Have Sex With Men Aged 15 to 17 Years in the United States. JAMA Pediatr. 2017;171:1063-1071.

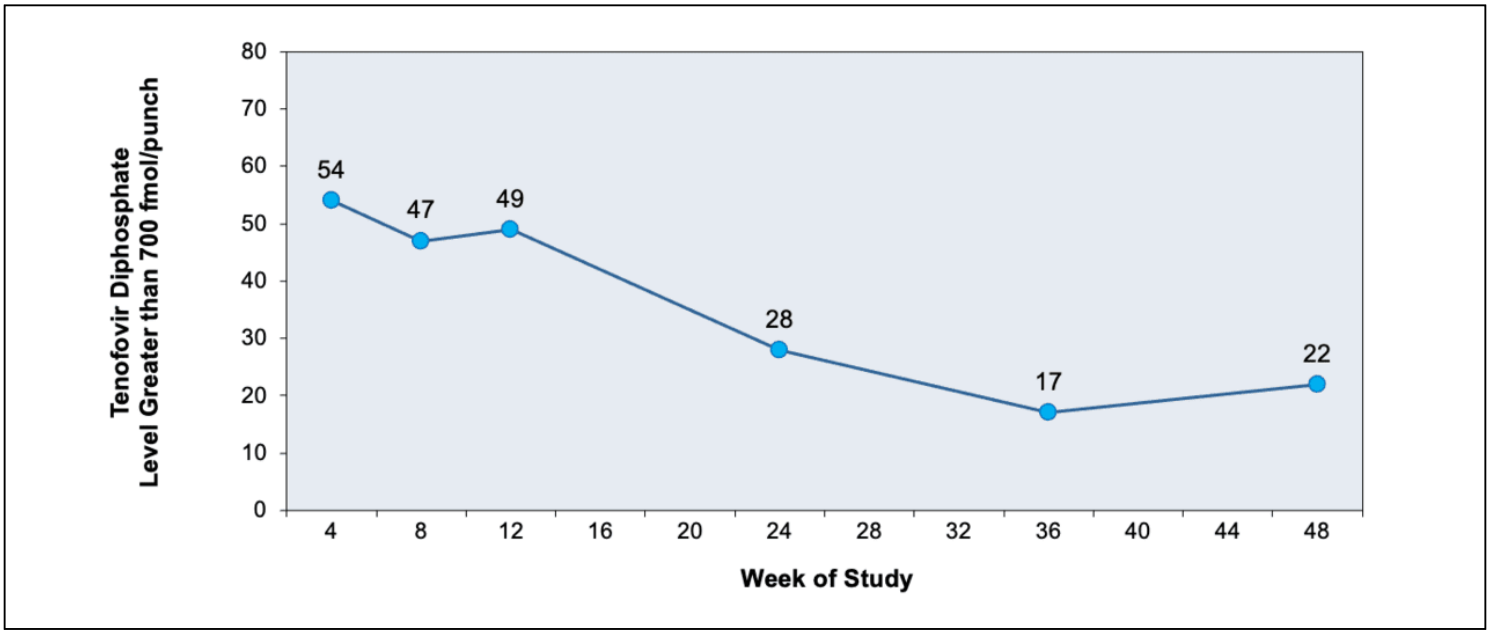

Figure 7 Sexually Transmitted Infections in Youth in IMPAACT P1074

The International Maternal Pediatric Adolescent AIDS Clinical Trials (IMPAACT) P1074 observational cohort study followed 1,042 adolescents and young adults ages 13-24 years and determined rates of sexually transmitted infections (STIs) and compared these rates based on mode of HIV acquisition.

Source: Camacho-Gonzalez AF, Chernoff MC, Williams PL, et al. Sexually Transmitted Infections in Youth With Controlled and Uncontrolled Human Immunodeficiency Virus Infection. J Pediatric Infect Dis Soc. 2017;6:e22-e29.

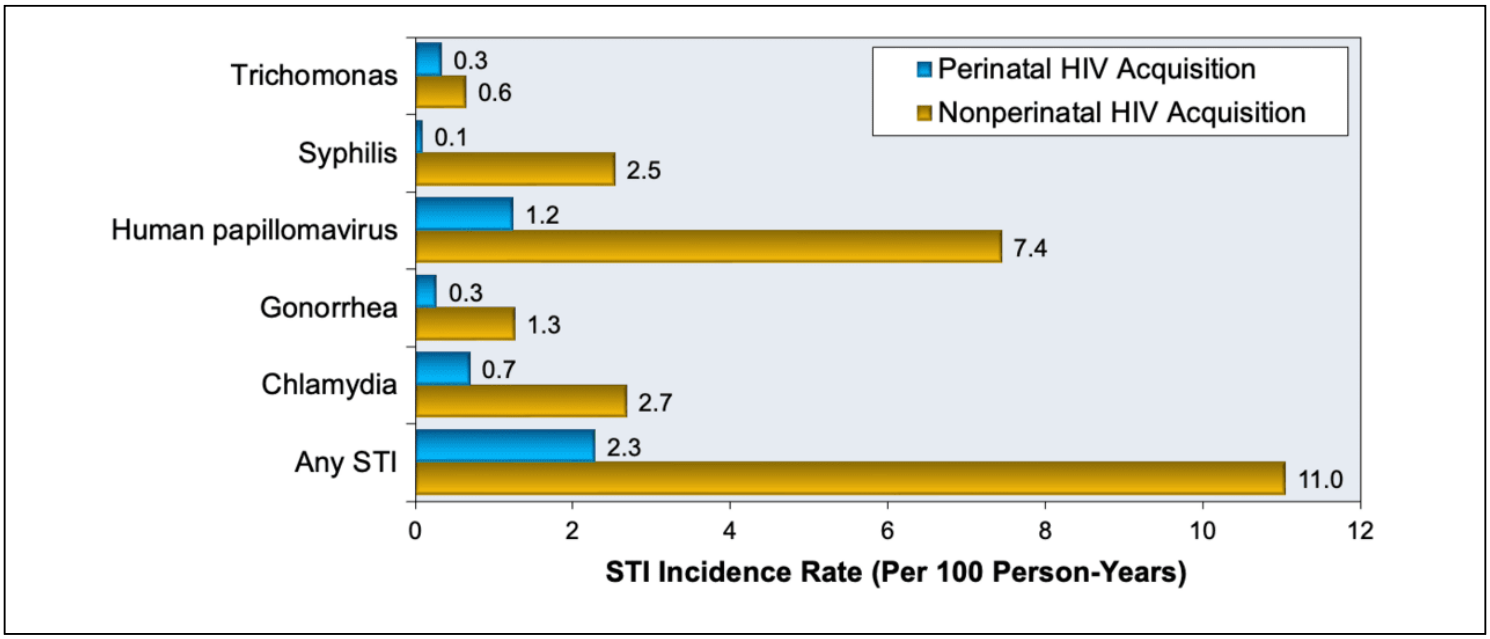

Figure 8 Sexual Activity Among Youth with HIV Aged 12-26 Years in ATN Sites, 2009-2012

Abbreviations: ATN = Adolescent Medicine Trials Network for HIV/AIDS Interventions

Source: Kahana SY, Fernandez MI, Wilson PA, et al. Rates and correlates of antiretroviral therapy use and virologic suppression among perinatally and behaviorally HIV-infected youth linked to care in the United States. J Acquir Immune Defic Syndr. 2015;68:169-77.

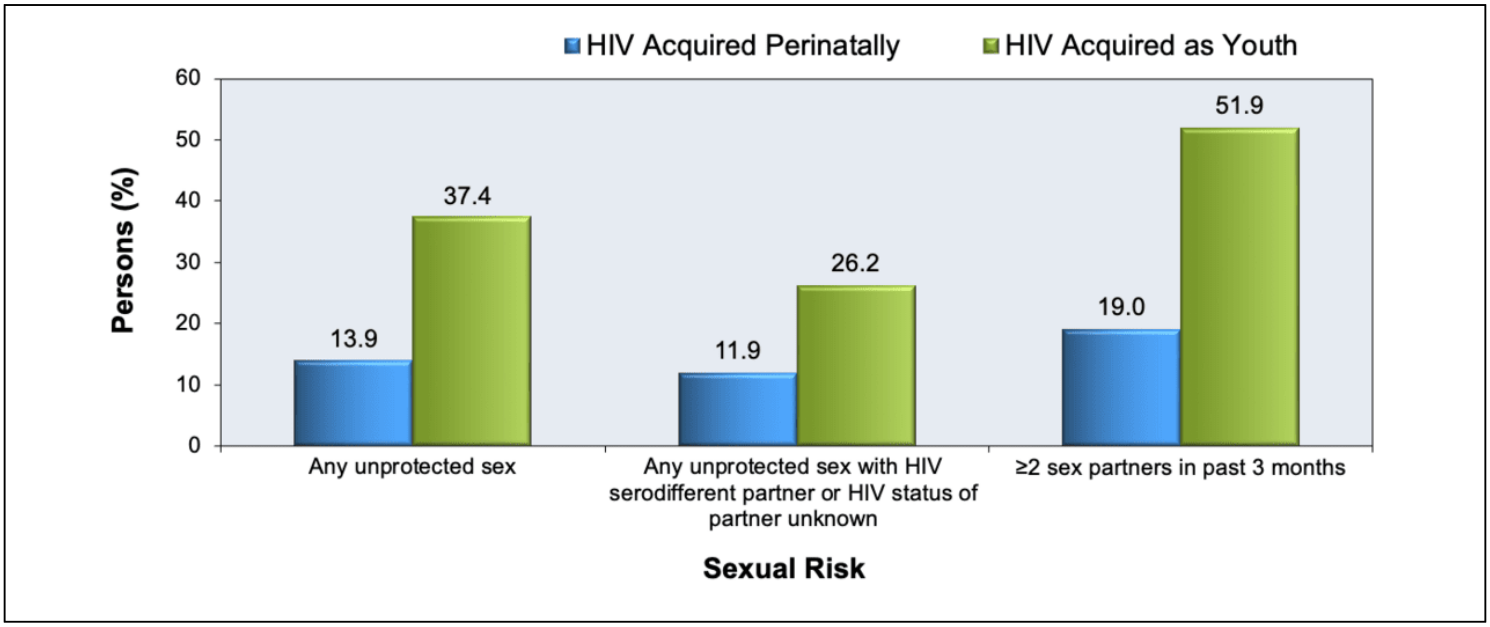

Table 1. Sexual Maturity Rating (Tanner Staging) in Females

Stage	Female			
	Age (years)	Breast Growth	Pubic Hair	Other changes
I	0-15	Pre-adolescent	None	Pre-adolescent
II	8-15	Breast budding (thelarche); areolar hyperplasia with small amount of breast tissue	Long downy pubic hair near the labia, often appearing with breast budding or several weeks or months later	Peak growth velocity oft soon after stage II
III	10-15	Further enlargement of breast tissue and areola, with no separation of their contours	Increase in amount and pigmentation of hair	Menarche occurs in 2% late in stage III
IV	10-17	Separation of contours; areola and nipple form secondary mound above breasts tissue	Adult in type but not in distribution	Menarche occurs in mos stage IV, 1–3 years after thelarche
V	12.5-18	Large breast with single contour	Adult in distribution	Menarche occurs in 10% in stage V.

Source:

- WHO Guidelines Approved by the Guidelines Review Committee. Annex H. Sexual Maturity Rating (Tanner Stage) in Adolescents. Antiretroviral Therapy for HIV Infection in Infants and Children: Towards Universal Access: Recommendations for a Public Health Approach: 2010 Revision. [WHO]

Table 2. Sexual Maturity Rating (Tanner Staging) in Males

Stage	Male				
	Age (years)	Testes growth	Penis growth	Pubic hair	Other changes
I	0-15	Pre-adolescent testes (≤2.5 cm)	Pre-adolescent	None	Pre-adolescent
II	10-15	Enlargement of testes; pigmentation of scrotal sac	Minimal or no enlargement	Long downy hair, often appearing several months after testicular growth; variable pattern noted with pubarche	Not applicable
III	1½–16.5	Further enlargement	Significant enlargement, especially in diameter	Increase in amount; curling	Not applicable
IV	Variable: 12–17	Further enlargement	Further enlargement, especially in diameter	Adult in type but not in distribution	Development of axill hair and some facial
V	13–18	Adult in size	Adult in size	Adult in distribution (medial aspects of thighs; linea alba)	Body hair continues grow and muscles co to increase in size fo several months to ye 20% of boys reach p growth velocity durir period

Source:

- WHO Guidelines Approved by the Guidelines Review Committee. Annex H. Sexual Maturity Rating (Tanner Stage) in Adolescents. Antiretroviral Therapy for HIV Infection in Infants and Children: Towards Universal Access: Recommendations for a Public Health Approach: 2010 Revision. [WHO]

Table 3. Recommended Initial Regimens for Most People with HIV

Guidelines for the Use of Antiretroviral Agents in Adults and Adolescents with HIV
Recommended Initial Regimens for Most People with HIV
Recommended regimens are those with demonstrated durable virologic efficacy, favorable tolerability and toxicity profiles, and ease of use. Choice of antiretroviral therapy during pregnancy should be guided by recommendations from the Perinatal Guidelines.
For people who do NOT have a history of long-acting cabotegravir use as HIV PrEP, the following regimens are recommended:
• Bictegravir-tenofovir alafenamide-emtricitabine (AI) • Dolutegravir plus (tenofovir alafenamide or tenofovir DF)[a] plus (emtricitabine or lamivudine) (AI) • Dolutegravir-lamivudine (AI), except for individuals with HIV RNA >500,000 copies/mL, hepatitis B virus (HBV) coinfection, or when antiretroviral therapy is to be started before the results of HIV genotypic resistance testing for reverse transcriptase or HBV testing are available
For people with HIV and a history of using long-acting cabotegravir as HIV PrEP, integrase genotypic drug resistance testing should be done before the start of antiretroviral therapy. If treatment is begun prior to the results of genotypic testing, the following regimen is recommended:
• Darunavir (boosted with cobicistat or ritonavir) plus (tenofovir alafenamide or tenofovir DF)[a] plus (emtricitabine or lamivudine)—pending the results of the genotype test (AIII).
[a]Tenofovir alafenamide and tenofovir DF are two forms of tenofovir approved by the FDA. Tenofovir alafenamide has fewer bone and kidney toxicities than tenofovir DF, whereas tenofovir DF is associated with lower lipid levels. Safety, cost, and access are among the factors to consider when choosing between these drugs. Rating of Recommendations: A = Strong; B = Moderate; C = Weak Rating of Evidence: I = Data from randomized controlled trials; II = Data from well-designed nonrandomized trials, observational cohort studies with long-term clinical outcomes, relative bioavailability/bioequivalence studies, or regimen comparisons from randomized switch studies; III = Expert opinion

Source:

- Panel on Antiretroviral Guidelines for Adults and Adolescents. Guidelines for the Use of Antiretroviral Agents in Adults and Adolescents with HIV. Department of Health and Human Services. What to Start. Initial Combination Antiretroviral Regimens for People With HIV. September 12, 2024. [HIV.gov]

Table 4. Evidence-Based Approaches for Monitoring Medication Adherence

Guidelines for the Use of Antiretroviral Agents in Pediatric HIV Infection	
Evidence-Based Approaches for Monitoring Medication Adherence	Routine Assessment of Medication Adherence in C
	Monitor viral load.
	Assess quantitative self-report of missed doses.
	Request a description of the medication regimen.
	Assess barriers to medication administration.
	Monitor pharmacy refills.
	Employ telemedicine to monitor and support medi administration.
	Conduct announced and unannounced pill counts.
	Monitor attendance for injection clinic visits amon long-acting injectable regimens.
	Targeted Approaches to Monitor Adherence in Spe
	Implement directly observed therapy (DOT) in per telemedicine.
	Measure drug concentration in plasma or dried blo
	Approaches to Monitor Medication Adherence in R
	Measure drug concentrations in hair.
	Use electronic monitoring devices.
	Use mobile phone-based technologies.

Source:

- Panel on Antiretroviral Therapy and Medical Management of Children Living with HIV. Guidelines for the use of antiretroviral agents in pediatric HIV infection. Adherence to antiretroviral therapy in children and adolescents with HIV. September 30, 2025. [HIV.gov]

Table 5. Strategies for Improving Adherence to Antiretroviral Medications

Guidelines for the Use of Antiretroviral Agents in Pediatric HIV Infection	
Strategies for Improving Adherence to Antiretroviral Medications	Initial Intervention Strategies
	• Establish trust and identify mutually acceptable goals for care. • Obtain explicit agreement on the need for treatment and adherence. • Identify depression, low self-esteem, substance abuse, or other mental health issues in the child/adolescent and/or caregiver that may decrease adherence. Evaluate and initiate treatment for mental health issues before starting antiretroviral drugs, if possible. • Determine whether the child is aware of their HIV status. Consider talking to the child's caregivers about disclosing this information to the child in a developmentally appropriate way. • Identify family, friends, health team members, and others who can support adherence. • Educate patient and family about the critical role of adherence in therapy outcome including the relationship between partial adherence and resistance and resistance and potential impact on future drug regimen choices. Develop a treatment plan that the patient and family understand and to which they feel committed. • Identify barriers—such as co-pays and insurance access—related to medication access to help prevent interruptions in antiretroviral therapy. • Schedule a home visit or telemedicine visit to review medications with the patient and family to make specific plans for taking medications as prescribed and supporting adherence. Assist them to arrange for administration in day care, school, and other settings, when needed. Consider home delivery of medications. • Establish readiness to take

	medication through practice sessions or other means. • Schedule a home or telemedicine visit to review medications and determine how they will be administered in the home setting. • Consider a brief period of hospitalization at start of therapy in selected circumstances for patient education and to assess tolerability of medications chosen. • In certain circumstances, consider a brief period of hospitalization at the start of therapy for patient education and to assess the tolerability of the chosen medication.
	Medication Strategies
	• Choose the simplest regimen possible, reducing dosing frequency and number of pills. • When choosing a regimen, consider the daily and weekly routines and variations in patient and family activities. • Choose the most palatable medicine possible (pharmacists may be able to add syrups or flavoring agents to increase palatability). • Choose drugs with the fewest adverse effects; provide anticipatory guidance for management of adverse effects. • Simplify food requirements for medication administration. • Prescribe drugs carefully to avoid adverse drug-drug interactions. • Assess pill-swallowing capacity and offer pill-swallowing training and aids (e.g., pill swallowing cup, pill glide). Adjust pill size as needed. • Choose an antiretroviral regimen with a high genetic barrier to resistance, when available, if there are concerns about adherence.
	Follow-Up Intervention Strategies
	• Have more than one member of the multidisciplinary team monitor adherence at each visit and in between visits by telephone, email, text, and social media, as needed.

	• Provide ongoing support, encouragement, and understanding of the difficulties associated with maintaining adherence to daily medication regimens. • Use patient education aids including pictures, calendars, and stickers. • Encourage use of pill boxes, reminders, alarms, and timers—such as the CDC's Every Dose, Every Day (E2D2) Toolkit and App. • Provide follow-up clinic visits, telephone calls, and text messages to support and assess adherence. • Provide access to support groups, peer groups, or one-on-one counseling for caregivers and patients, especially for those with known depression or drug use issues that are known to decrease adherence. • Provide pharmacist-based adherence support, such as medication education and counseling, blister packs, refill reminders, automatic refills, and home delivery of medications. • Consider directly observed therapy at home, in the clinic, or in selected circumstances, during a brief inpatient hospitalization. • Consider gastrostomy tube use in selected circumstances. • Information on other interventions to consider can be found at http://www.cd c.gov/hiv/prevention/research/compendium/ma/complete.html

Source:

- Panel on Antiretroviral Therapy and Medical Management of Children Living with HIV. Guidelines for the use of antiretroviral agents in pediatric HIV infection. Adherence to antiretroviral therapy in children and adolescents with HIV. September 30, 2025. [HIV.gov]

Table 6. Meeting the Needs of Adolescents

Guidelines for the Use of Antiretroviral Agents in Pediatric HIV Infection **Discrepancies Between What Adolescents Want Compared to What Adolescents Experienced**	
What Adolescents Want	**What Adolescents Experience**
Relationship with primary care provider who: • Knows them and cares about their health; • Responds to them as individuals and treats them with respect; • Can be accessed on a regular basis; and • Can talk to about issues that are important to adolescents.	• Lack of an established primary care provider • Lack of understanding and respect from their primary care provider • Barriers to accessing a primary care provider • Insufficient opportunities to talk with primary care provider
Comprehensive care where physical, mental, vision and dental health care needs are met.	• Concerns about privacy and sharing information between providers • Limited selection of providers and care
Confidentiality assurances and protections	• Lack of knowledge of existing confidentiality rights and protections for adolescents • Barriers to having time alone with primary care providers

Source:

- Tebb KP, Pica G, Peake K, Diaz A, Brindis CD. Adolescent and Health Professional Perspectives on the Medical Home: Improving Health Care Access and Utilization Under the Affordable Care Act: Philip R. Lee Institute for Health Policy Studies and Division of Adolescent and Young Adult Medicine, Department of Pediatrics, University of California, San Francisco; July 2016. [Health Policy Brief]