CONSIDERATIONS FOR ANTIRETROVIRAL USE IN SPECIAL POPULATIONS

Adolescents and Young Adults With HIV

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Key Considerations and Recommendations
• AYA with HIV largely belong to two distinct groups: (1) those who acquired HIV perinatally (intrauterine, intrapartum, or during breastfeeding), and (2) those who acquired HIV non-perinatally. • All AYA with HIV should initiate ART as soon as possible and stay on it indefinitely to maximize viral suppression, reduce morbidity and mortality, and prevent secondary HIV transmission **(AI).** • It is critically important to assess behavioral and psychosocial context, as these impact adherence to ART. Efforts should be made to provide youth-friendly, strengths-based support and infrastructure to reduce barriers to adherence and maximize success in achieving sustained viral suppression**.** • Pediatric and adolescent care providers should prepare AYA with HIV for the transition into adult care settings. Adult providers should be knowledgeable about this unique population and the challenges that frequently accompany their transition. Consulting and collaborating with pediatric and adolescent HIV care providers is critical to ensure the successful transition of AYA with HIV to adult providers and continued engagement in care**.**
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 or observational cohort studies with long-term clinical outcomes; III = Expert opinion*

Key: ART = antiretroviral therapy; AYA = adolescents and young adults

Introduction

Adolescents (13–19 years old) and young adults (20–24 years old) (AYA) with HIV are largely divided into two distinct groups—those who acquired HIV perinatally (intrauterine, intrapartum, or during breastfeeding) and those who acquired HIV non-perinatally. In the United States, most pregnant women with HIV receive effective antiretroviral therapy (ART) during pregnancy and postpartum, which has significantly reduced the prevalence of AYA who acquired HIV perinatally. As a result, the majority of AYA with HIV have non–perinatally acquired infection. These individuals have lower rates of testing and diagnosis and linkage to care than adults with HIV.[1,2] Importantly, unique developmental, psychosocial, behavioral, and infrastructural factors affect this population. Without having their specific challenges and needs addressed, some AYA with HIV are at risk for poorer HIV-related outcomes, including persistent viremia, drug resistance, morbidity, mortality, and secondary transmission. This section of the Guidelines focuses on issues unique to AYA with HIV and provides guidance on ways to optimize care and achieve the best clinical outcomes.

Epidemiology

The Centers for Disease Control and Prevention estimates that 19% of the individuals newly diagnosed with HIV in the United States between 2020 and 2024 are AYA.[3] The majority of new diagnoses in this age group are among Black/African American and Hispanic/Latino males who identify as men who have sex with men (MSM). In 2024, 48% of the new infections in this age group

were among young Black and African American AYA, and 35% were among Hispanic and Latino AYA; at least 81% were attributed to male-to-male sexual contact and 14% to heterosexual contact. Compared with adults with HIV, AYA with HIV are less likely to have acquired HIV from injection drug use, and trends in HIV and AIDS prevalence indicate that the disproportionate burden of HIV among racial and ethnic minorities is greater among youth aged 13 to 24 years than among those older than 24. Among the 28,000 AYA with HIV in the United States, approximately 23,000 are being followed at pediatric and adult clinics.[3,4]

Heterogeneity of Adolescents and Young Adults With HIV

AYA with HIV represent a diverse population in terms of sociodemographics, mode of HIV acquisition, sexual and substance use history, clinical and immunologic status, psychosocial development, and ability to adhere to medications. These distinctions have implications for HIV treatment, including the best ways to support AYA with HIV to optimize outcomes.

Adolescents and Young Adults With Perinatally Acquired HIV

AYA who acquired HIV perinatally (intrauterine, intrapartum, or during breastfeeding) are more likely to be treatment-experienced and may have antiretroviral (ARV) drug resistance that affects their options for ART regimens.[5] This may be even more relevant for AYA with HIV who emigrated from countries where routine viral load and genotypic resistance testing are not readily available; thus, recognition of virologic failure and drug resistance may be delayed or missed. Also, individuals in this group generally have undergone a longer duration of disease chronicity and may have greater disease burden and more complications, less functional autonomy, and higher mortality risks than those who acquired HIV after the first decade of life.[6-9]

Adolescents and Young Adults With Non–Perinatally Acquired HIV

The vast majority of AYA with diagnosed HIV in the United States fall into the category of non–perinatally acquired HIV. Individuals in this group are a more heterogeneous group of mostly young men (especially MSM) and other people who acquired HIV primarily through sexual contact; very few (<5%) AYA with diagnosed HIV report acquisition through injection drug use.[3] The intersection of AYA with other key risk populations (e.g., adult MSM, people who use drugs, sexual networks with high HIV prevalence) magnifies the risk of poor clinical outcomes in this younger population.[10-12] One study found that a higher percentage of individuals in this group reported extensive negative life experiences (14–21 events) than those with perinatally acquired HIV (39% vs. 16%, $P < 0.012$).[13]

Less commonly, HIV acquisition may occur earlier in childhood via premastication of food,[14] exposure to contaminated blood products or nonsterile medical procedures, or sexual contact (e.g., sexual abuse).[15] AYA who acquire HIV through these pathways may share some clinical and psychosocial experiences with those who acquired HIV perinatally, including early life diagnosis, prolonged engagement with health care systems, and developmental or mental health challenges.

Unique Characteristics and Considerations for Adolescents and Young Adults With HIV

Although a diverse group, many AYA with HIV share unique characteristics that distinguish them from adults with HIV. Furthermore, AYA with HIV have certain commonalities that, while not necessarily unique to youth, disproportionately affect their chances of successful HIV treatment. Compared with adults aged 25 years and older, AYA with HIV have been shown to have poorer outcomes on each step of the HIV care continuum.[16,17] Most notably, <60% of AYA with HIV have been diagnosed, and <40% are virally suppressed; these numbers are significantly worse than

documented in older adults with HIV.[18] In one study of MSM of all ages, the percentage of those linked to HIV care within 1 month of diagnosis was lowest among AYA with HIV aged 13 to 19 years (69%) and 20 to 24 years (70%).[19] This group also had the lowest rates of retention in care and viral suppression. Older young adults (aged 25–34 years), who currently have the highest incidence of HIV infection among all age groups, have similar challenges, with nearly 30% unaware of their infection status.[18] They, too, require focused attention.

Some improvements, albeit modest, have been made in recent years. National HIV Surveillance System data have shown increases in knowledge of status (from 40% to 56%), linkage to care within 1 month of diagnosis (from 75% to 82%), and viral suppression (from 57% to 69% among those diagnosed) between 2017 and 2022/2023. However, there remains significant room to accelerate progress toward improved outcomes for AYA.[20]

Key features that are specific to AYA with HIV should be considered carefully because they can affect HIV treatment and may alter clinical decision-making. These features are discussed below.

Developmental Changes and Engagement in Care

During adolescence and young adulthood, AYA with HIV experience socioemotional, cognitive, and developmental changes that may impact their engagement in medical care. Developmental maturity in AYA with HIV generally can be grouped into several, often overlapping, areas, including physical, cognitive, communication/language, social, emotional, and sexual maturity. Several overarching factors—especially HIV-related stigma, discrimination, and a fear of familial and/or social rejection—can contribute to impaired development in all areas and adversely affect HIV treatment and clinical outcomes for AYA with HIV. Additional psychosocial factors detailed in Unique Psychosocial Factors are also common in this population and can influence development and HIV treatment outcomes.

Cognitive Development

Evolving cognitive processes, which normally continue well into the third decade of life, are particularly relevant to HIV treatment in AYA with HIV. Their decision-making capacity is often driven by concrete thinking processes and limited frontal lobe maturation, which can result in a focus on immediate rather than long-term gratification. AYA experience a strong desire for independence, preoccupation with self-image, and a significant focus on the opinions of their peers; all of which have the potential to affect medication adherence and long-term clinical outcomes.[9,21-23] Likewise, some AYA with HIV are at risk for neurocognitive impairment and mental health comorbidities,[24-27] including psychiatric, behavioral, and substance use disorders, which can further affect cognitive development and compromise effective HIV treatment.

Physical Development

The rapid physiologic changes that occur in adolescence (e.g., puberty, rapid growth) may result in altered ARV pharmacokinetics (PK), underscoring the importance of adolescent-specific studies.[9] AYA with HIV, particularly those who acquired HIV early in life and/or while sexually immature, also are at risk for impaired physical development, especially delayed sexual maturation and impaired bone development, which may have long-term consequences, like reduced final height and peak bone mass, the latter being a key risk factor for developing osteoporosis.[28] Both delayed maturation and short stature may increase anxiety, depression, and stigma, which may, in turn, affect treatment adherence.[29] AYA with non–perinatally acquired HIV may also be affected because peak bone mass is not achieved until around age 30. A small study showed lower bone mass in Tanner Stage 5 young men aged 20 to 25 years who acquired HIV during adolescence than in age-matched controls without HIV.[30]

Thus, developmental maturity should be considered in AYA with HIV, because associated clinical implications may alter HIV treatment decisions, including ARV selection and dosing.

Unique Psychosocial Factors

Several psychosocial, behavioral, and environmental risk factors affect many AYA with HIV and can undermine successful HIV treatment disproportionately in this population. Lack of access to services (e.g., for mental health or substance use disorders) remains a major barrier to successfully addressing these factors. Common key risk factors are summarized below.

Behavioral and Mental Health

The percentage of AYA with HIV with behavioral and mental health conditions is high and can undermine engagement in care and medication adherence. The most common conditions include anxiety and behavioral disorders, mood disorders (including depression), and attention deficit hyperactivity disorder. Adolescents with perinatally acquired HIV have especially high rates of mental health conditions, nearly 70% meet criteria for a psychiatric condition at some point in their lives.[26,31-34] Similarly, among AYA with HIV presenting for care at treatment sites in the Adolescent Trials Network, depression and anxiety were identified by symptom inventory 43% and 31% of the time, respectively.[35] These conditions can create a syndemic that further contributes to poor adherence, virological failure, and HIV-associated neuroinflammation, all of which can exacerbate mental health disorders.[36]

Substance Use

Substance use is prevalent among AYA with HIV. Among more than 2,000 AYA with HIV (72% non–perinatally acquired) surveyed by the Adolescent Trials Network, weekly or more frequent use of tobacco (33%), marijuana (28%), alcohol (21%), and other illicit drugs (23%) was reported.[37,38] Young MSM had higher odds of each substance use behavior. Studies have suggested that substance use contributes to HIV risk through medication nonadherence, sexual violence, internalizing of mental health, and condomless anal sex, with some samples reporting prevalence of polysubstance use as high as 86%.[39-41] Suboptimal ART was associated with increased risk of substance use behaviors,[37] underscoring the need to screen for and address substance use to improve treatment outcomes.

Unstable Housing

Data from the early 2000s found substantially higher rates of HIV among unhoused youth than among the general population.[42] In a more recent nationally representative survey of high school students, respondents from multiple racial and ethnic groups (American Indian/Alaska Native, Native Hawaiian/Pacific Islander, and Black) and sexually minoritized youth experienced disproportionate rates of housing instability; youth with unstable housing also reported higher rates of substance use and suicidal ideation than their housed peers.[43] National surveillance data show that unstable housing and homelessness are more common among young adults with HIV aged 18–24 years (37%) than among those aged 25 years and older (18%).[44] AYA with HIV and unstable housing have greater difficulties securing and sustaining resources and engaging in and being retained in care and treatment, and they are at risk for sexual coercion and transactional or survival sex (e.g., sex for money or a place to stay).[45,46]

Trauma

AYA with HIV may disproportionately experience trauma. According to 2023 Youth Risk Behavior Survey data among the general population, 76.1% of high school students reported one or more

adverse childhood experiences (ACEs), and 18.5% reported four or more.[47] The most common ACEs reported in the sample were emotional abuse (61.5%), physical abuse (31.8%), and household poor mental health (28.4%). Populations of youth that are disproportionately impacted by HIV, including multiracial youth and youth who identified as gay, lesbian, or bisexual, or who described their sexual identity in some other way, experienced the highest number of ACEs. The proportion of ACEs in AYA with HIV is not well studied; however, large adult data analyses suggest that as high as 82% of people with HIV experience one or more ACE,[48] while smaller AYA-focused data have demonstrated this proportion is closer to one-third.[49] Evaluating for the presence of ACEs is important, given data in Black and Latine AYA with HIV found that a history of ACEs was associated with lower odds of engagement in HIV care.[50]

There is a lack of guidance specific to the frequency of and tool used to assess ACEs in clinical practice. Current research suggests that screening for ACEs be part of a trauma-informed approach that has the potential to identify previous or current experiences that could contribute to poor health outcomes (e.g., violence, housing instability, food insecurity).[51] More research is needed to better understand the best screening approaches in AYA with HIV; the potential benefits, challenges, and harms of routinely screening; and the best approach for addressing ACEs in clinical settings and determining how they may impact ART outcomes.

Additional Social and Environmental Factors

A number of social and environmental factors commonly found among AYA with HIV negatively affect their HIV treatment, including limited familial and/or social support, lack of health insurance and/or experience with health care systems, unstructured and chaotic lifestyles, transportation barriers, food insecurity, limited educational opportunities, limited employment opportunities and/or unstable employment, and a history of trauma and/or sexual abuse.[52]

Optimizing Treatment Effectiveness and Supporting Adherence in Adolescents and Young Adults With HIV

Given the unique physiological, developmental, and psychosocial characteristics discussed above, AYA with HIV require comprehensive systems of care with providers with adolescent-specific expertise and tailored treatment to serve all their specific medical and psychosocial needs. To maximize their chances of success, it is imperative to routinely assess each AYA with HIV for individual factors that may need to be addressed or considered in treatment decisions or that may affect adherence.

Table 14 summarizes common adherence barriers among AYA with HIV, along with recommended support strategies. Refer to the Adherence to Antiretroviral Therapy in Children and Adolescents With HIV in the Pediatric ARV Guidelines for additional approaches. Targeted interventions to improve treatment effectiveness and adherence related to a few key psychosocial factors among AYA with HIV also are highlighted in the sections below.

Neurocognitive Considerations

Neurocognitive disorders and limitations are pervasive among AYA with HIV and may be due to HIV neuropathogenesis that occurs during early infection, uncontrolled viremia, and/or virus in the central nervous system, even during aviremic states.[7,53,54] Additional factors, such as intrauterine exposures, trauma, and psychosocial stressors, may exacerbate the risk of developing neurocognitive dysfunction. AYA with perinatally acquired HIV have an increased risk of neurocognitive challenges, including cognitive impairment. A recent meta-analysis highlighted limitations in processing speed, working memory, and, to a lesser degree, executive function compared with matched controls without HIV.[55] In a prospective study, an estimated 65% of young

adults aged 18 to 24 years with non–perinatally acquired HIV had evidence of HIV-associated neurocognitive disorders, and impairments in executive and motor function as well as verbal memory. Notably, histories of special education (22%) and needing to repeat a grade (22%) preceded the HIV diagnosis, suggesting some premorbid limitations.[54,56] Another study demonstrated that young adults aged 18 to 24 years with HIV had poorer executive function than seronegative controls.[57] Data are limited but suggest that neurologic impairment is at least as prevalent as in older adults despite lower viremia, higher CD4 count, and shorter durations of infection in AYA.[54] Given that the neurocognitive limitations may be subtle and are often underrecognized, attaining formal neurocognitive assessments can be critical to identifying potential challenges and providing access to resources where available. Using clear, simple, concrete language with accompanying visual aids and other modalities (e.g., videos, graphics), read-back/teach-back, and other strategies may be critically important to ensuring an understanding of instructions related to ART and other aspects related to HIV treatment and care. Strategies for understanding and mitigating the development of neurocognitive disorders remain active areas in need of research.

Mental Health Care

AYA with HIV are at increased risk for mental health disorders, including depression, anxiety, and post-traumatic stress disorder.[58] Strategies to improve the provision of mental health care for AYA with HIV are critically important for optimizing treatment for co-occurring HIV and mental health problems.[59,60] These strategies include improving provider education, integrating trauma-informed care practices, increasing access to mental health professionals through co-located services for HIV care, expanding care delivery paradigms like telemedicine, and optimizing treatment approaches. An example of the latter is a combination of tailored psychotherapy and pharmacotherapy.[61,62] Screening for mental health disorders should be done routinely and systematically using tools validated in adolescents (e.g., Patient Health Questionnaire [PHQ-2[63] and PHQ-9[64]], Generalized Anxiety Disorder [GAD-7][65,66]). A recent review of evidence-based guidelines highlighted different models and the need for further research on strategies that can effectively address mental health in AYA with HIV.[59,67] Further guidance for providing appropriate mental health care for AYA with HIV can be found in the Pediatric ARV Guidelines.

Substance Use Disorders

Providers should routinely assess and recommend treatment for substance use disorders, with consideration of emerging substance use trends, such as the use of electronic vapor products and marijuana,[68] which can impact the HIV care continuum for AYA with HIV.[69] The American Academy of Pediatrics recommends the use of a validated tool, such as the S2BI (Screening to Brief Intervention) or BSTAD (Brief Screener for Tobacco, Alcohol, and other Drugs), to screen first, followed by a risk-stratified assessment tool like CRAFFT, a clinical questionnaire used to identify problems associated with substance use.[70] Further guidance for providing appropriate substance use screening and treatment for AYA with HIV can be found in the Pediatric ARV Guidelines and in the Substance Use Disorders and HIV section.

Psychosocial and Environmental Stressors

Many AYA with HIV have significant numbers of social determinants of health (SDOH), such as poverty, limited education, food insecurity, intimate partner violence, and insurance gaps. Compared with adults with similar numbers of SDOH indicators, AYA with HIV have worse HIV outcomes.[71] Multimodal interventions that enhance social support and teach adaptive coping skills may help AYA with HIV manage environmental stressors and improve clinical outcomes.

Specific Antiretroviral Therapy Considerations in Adolescents and Young Adults With HIV

All AYA with HIV should initiate ART as soon as possible and stay on ART indefinitely to maximize viral suppression, reduce morbidity and mortality, and prevent secondary HIV transmission **(AI).** As described below, clinicians should consider simplifying ART regimens and using ARV drugs with high barriers to resistance whenever possible to support adherence.

Strategies to Improve Medication Adherence

Clinicians selecting ART for AYA with HIV must balance the goal of prescribing a maximally potent regimen with a high barrier to resistance alongside an individualized assessment of existing and potential adherence barriers and available youth-friendly support strategies to facilitate adherence.[72] Additional considerations and strategies that may affect adherence among AYA with HIV are highlighted below in Table 12.

Table 12. Strategies to Improve Antiretroviral Therapy Adherence

Category	Strategies to Improve ART Adherence
Regimen selection	• Simple ART regimens (e.g., fixed-dose, once daily combinations) with high barriers to resistance are preferable, if possible. • Long-acting injectables may also be considered, including for youth with adherence challenges due to social environment (e.g., unstable housing, coexisting substance use). • Minimal side effects • Small pill size
Treatment plan	• Develop the plan in partnership with AYA with HIV, considering daily schedule; disclosure; tolerance of pill number, size, and frequency; issues affecting absorption; dietary considerations; and potential adverse effects and interactions with other medications. • Design youth-friendly reminder systems (e.g., apps, cell phone/text reminders, pill boxes) for adherence support.
Motivators	• Emphasize personal benefits (e.g., viral suppression, improved health). • Undetectable equals untransmittable (U=U) status disclosure to sexual partners without HIV may act as a particularly strong motivator for reducing stigma and improving adherence among AYA with HIV.

Key: ART = antiretroviral therapy; AYA = adolescents and young adults

Antiretroviral Therapy Regimens for Adolescents and Young Adults With HIV Without Drug Resistance

The recommendations for initial ARV regimens for AYA are the same as for the general population (see What to Start). Clinical trials have demonstrated the superiority of dolutegravir (DTG) over boosted protease inhibitor–based regimens. Bictegravir (BIC) coformulated with tenofovir alafenamide (TAF) and emtricitabine (FTC) also has a low risk of treatment-emergent resistance and is available as a single-tablet regimen with a small pill size and no food requirements. Adolescents

aged ≥12 years and weighing ≥35 kg can be treated with an adult fixed-dose combination of BIC/FTC/TAF given favorable PK and viral suppression results in a stable adolescent switch study.[73]

Several two-drug ARV regimens are effective as initial therapy or as a switch therapy in people who achieved viral control and have no resistance to the ARV drugs in the combination; some examples include oral regimens of DTG plus lamivudine, DTG plus rilpivirine (RPV), doravirine plus islatravir, and the long-acting (LA) injectable combination of cabotegravir (CAB) plus RPV (or LA CAB/RPV). However, none of these two-drug regimens are effective as treatment for hepatitis B virus (HBV), and they are not recommended for AYA with HBV/HIV coinfection, because using these regimens in individuals with concomitant HBV infection risks HBV flaring (see HBV/HIV Coinfection for more details).[74]

LA CAB/RPV, given intramuscularly on a monthly or every-two-month schedule, is U.S. Food and Drug Administration–approved in the United States for individuals with HIV who are engaged in care and virally suppressed on oral therapy. These agents have been studied in adolescents with HIV aged 12 to 17 years, weighing ≥35 kg,[75-77] and virally suppressed on oral ART without relevant ARV resistance.[76] Among adolescents who switched from oral ART, LA CAB/RPV demonstrated sustained viral suppression, a favorable safety profile, and high acceptability and tolerability. Some AYA with HIV who have a history of nonadherence may have high interest in LA regimens.[78,79] Case series of viral suppression with the use of LA CAB/RPV[80] in AYA with HIV with a history of poor adherence are encouraging.[81,82] Studies to evaluate these modalities among nonadherent individuals, including AYA with HIV, are needed,[83] and those including AYA with HIV are underway (see NCT06694805).

Antiretroviral Therapy–Experienced Adolescents and Young Adults With HIV and With Drug Resistance

AYA with HIV who acquired HIV early in life often have treatment challenges associated with the long-term use of ART that mirror those of older ART-experienced adults, such as extensive drug resistance, complex regimens, and adverse drug effects. It is critically important to assemble a comprehensive ARV history and cumulative HIV genotype/phenotype test results to fully appreciate the extent of archived resistance mutations. In ART-experienced adolescents, DTG was safe and well tolerated, and it achieved viral suppression rates of 44% to 66% when combined with an optimized background regimen.[84] Acquired treatment-emergent integrase strand transfer inhibitor resistance may occur.[85] Further, the advent of newer agents with novel mechanisms of action (e.g., fostemsavir, ibalizumab, lenacapavir) presents the opportunity to design suppressive regimens for AYA with drug resistance (see Virologic Failure), including those in need of fully injectable regimens.

Antiretroviral Therapy Considerations in Sexually Immature Adolescents and Young Adults With HIV

The physiological changes (e.g., puberty, rapid growth) that occur in adolescence may result in altered PK. Therefore, although generally it is appropriate for postpubertal adolescents to be dosed with ARV drugs according to adult guidelines, adolescents in early puberty should be dosed according to the Pediatric ARV Guidelines, which factor in dosages by weight and sexual maturity ratings.

Additional Antiretroviral Therapy Considerations in Adolescents and Young Adults With HIV

Additional considerations include an increased risk of side effects, such as bone and renal toxicity with tenofovir-based drugs in rapidly growing adolescents. These concerns are magnified in low-

weight adolescents for whom appropriate lower-dose formulations are not available. Because AYA with HIV have not yet reached peak bone mass, TAF generally should be used instead of tenofovir disoproxil fumarate, because of a greater bone loss with the latter ARV drug.

For a more detailed discussion on ART therapy in AYA with HIV, please see the What to Start section and the Pediatric ARV Guidelines. For additional information on treatment adherence in AYA with HIV, please see Adherence to the Continuum of Care, Adherence to Antiretroviral Therapy in Children and Adolescents With HIV, and Modifying Antiretroviral Regimens in Children With Sustained Virologic Suppression on Antiretroviral Therapy.

Preventive Measures and Supporting Long-Term Health in Adolescents and Young Adults With HIV

People with HIV are at an increased risk of HIV- and ART-related comorbidities, including cardiovascular disease, type 2 diabetes mellitus (DM), metabolic syndrome, osteoporosis, and neurocognitive impairment. When HIV is acquired at birth or early in life, an individual can live for many decades. However, changes indicative of premature aging and earlier onset of multiple comorbidities have been documented.[86] Data from NA-ACCORD found elevated rates of DM (19%), hypercholesterolemia (40%), chronic kidney disease (25%), and other cardiometabolic conditions among young adults aged 18 to 30 years with perinatally acquired HIV.[87] Engagement in health-risk behaviors (e.g., tobacco smoking, alcohol and drug use, unhealthy diet, physical inactivity) may have greater long-term implications for clinical outcomes in this population.

Preventive health care and promotion of positive health behavior during the critical time of adolescence and young adulthood can shape future habits and clinical outcomes over a lifetime. Incorporating regular screening, preventive health care, and health education is critical for optimizing short- and long-term physical and mental well-being and should be considered part of routine HIV treatment. Careful attention should be paid to modifiable risk factors in these early decades, such as weight gain and obesity, dyslipidemia, steatohepatitis, vitamin D deficiency, and tobacco use. Aggressive screening and risk factor mitigation early in the life of AYA with HIV not only improves current health but also can decrease their risk of developing comorbidities later in life. See the HIV Medicine Association of the Infectious Diseases Society of America HIV Primary Care Guidance for more details.

Transitioning to Adult HIV Care

Given lifelong infection with HIV and the need for treatment throughout the life course, HIV care programs and providers need flexibility to transition care appropriately for AYA with HIV. A successful transition requires an awareness of fundamental differences between many adolescent and adult HIV care models.

In most adolescent HIV clinics, care is teen-centered and multidisciplinary, with primary care highly integrated into HIV care.[88] Often, the setting is discrete, with clinics not being devoted specifically to HIV or infectious diseases. Moreover, such services as sexual and reproductive health and mental health care are often found in one clinic setting (i.e., the medical home). Additionally, these clinics are often “youth-friendly” by including such aspects as waiting areas where AYA with HIV can access computers and other items that may facilitate engagement; flexible schedules that include evening hours or walk-ins; technology like social media and texting to engage patients; availability of telemedicine when appropriate; staff who are trained specifically in the unique cognitive, developmental, and other psychosocial aspects of AYA with HIV; and lower patient-to-provider ratios. In contrast, some adult HIV clinics may be more HIV-specific and rely more on referral of the AYA to separate subspecialty care settings, such as gynecology. Furthermore, adult clinic settings tend to be larger and can easily intimidate younger, less motivated AYA.[89]

When transitioning the care of an AYA with HIV, one must consider such factors as medical insurance; degree of independence, autonomy, and decision-making capacity; patient confidentiality; and informed consent. Nonetheless, given the structural limitations (adolescent clinics not being able to see patients over a certain age), care transitions must occur, usually between the ages of 21 and 25. The period of transition is a highly vulnerable time for attrition from HIV care. Data on transition outcomes show variable rates of successful transition to adult care ranging between 50% and 85%.[90-93]

It is important to recognize that the transition for AYA with HIV acquired perinatally versus those who acquired HIV non-perinatally may pose distinct challenges. AYA with HIV who acquired HIV perinatally—who often have experienced significant instability and prior loss—may experience the transition to adult HIV care as yet another traumatizing event. Alternatively, those who acquired HIV non-perinatally, given their more recent engagement in the medical system, may be less likely to be effectively engaged in pediatric and adolescent care, which may affect their ability to transition successfully; however, engagement levels vary, as some may be highly engaged with the pediatric program where they may have received care since being diagnosed. Either group may perceive the transition as a major loss or disruption in their social support. Factors to date that have been associated with successful transition for those with HIV acquired perinatally include high self-management and perceived emotional and social support.[94,95]

To maximize the likelihood of a successful transition, interventions to facilitate transition are best implemented early on.[89,92,93,95] Strategies and approaches for both the adult and pediatric or adolescent programs are discussed in Table 13 below.

Table 13. Approaches to Optimize Transition to Adult Care for Adolescents and Young Adults With HIV

Pediatric/Adolescent	Adult
Personnel	
• Engage a team knowledgeable about medical and psychosocial issues of AYA with HIV, including the challenges of transitioning youth to adult care settings. • Utilize providers with training in medical care across the lifespan, if available, and discuss distinct models of care (i.e., HIV providers as primary care physicians vs. as consultants) with AYA. • Assign a transition point person and have their contact information readily available. • Educate clinic personnel about transitioning AYA with HIV and their needs. • Encourage a member of the pediatric care team to attend the first appointment with the adult provider if feasible.	• Engage an adult care team knowledgeable about medical and psychosocial issues of AYA with HIV, including the challenges of transitioning youth to adult care settings. • Utilize providers with training in medical care across the lifespan and ensure adequate training of adult providers to care for AYA with HIV. • Assign a transition point person and have their contact information readily available. • Identify and engage outreach specialists, navigators, social workers, case managers, and providers with a youth-friendly approach. • Educate clinic personnel about intersection and structural stigmas that many AYA with HIV experience. • Train personnel in cultural competence to address intersectional and structural stigmas that AYA with HIV experience.

Table 13. Approaches to Optimize Care Transition for AYA With HIV

Pediatric/Adolescent	Adult
	• Encourage a member of the pediatric care team to attend the first appointment with the adult provider if feasible.
Education and Preparation of AYA With HIV	
• Enhance AYA with HIV health literacy, including understanding of HIV and their medical history. • Address resistance to transition of care caused by lack of information, concerns about stigma or risk of disclosure, and differences in practice styles. • Help AYA develop life skills, including, but not limited to, counseling on appropriate use of a primary care provider and how to manage appointments; prompt symptom recognition and reporting; and self-efficacy in requesting prescriptions, arranging for transportation to appointments, and managing insurance and assistance benefits.	• If possible, meet AYA with HIV before transition, if possible. Clearly outline policies and expectations before and during the first visit, if possible. • Have an orientation plan to acquaint newly transitioned AYA with HIV to the clinic environment and adult clinical care program, including workflows that may be new to them (e.g., using an electronic portal to schedule appointments), and provide concrete examples of when to use different communication modalities (e.g., messaging, leaving a voicemail, paging). • Implement interventions that may improve outcomes, such as patient navigators, peer support groups, mental health assessment, and inclusion of guardians where available. • Address health literacy and ensure AYA with HIV understand HIV and goals of care. • Continue to work with AYA with HIV toward developing life skills, etc.
Strategies and Approaches	
• Develop a formal, individualized transition plan to address comprehensive care needs, including medical, psychosocial, and financial aspects of transitioning to adult HIV care. • Optimize provider communication between adolescent and adult clinics, including a warm multidisciplinary, medical history handoff that includes prior regimens, outcomes (e.g., adherence, virologic failure and resistance), and primary data (e.g., dated genotypic resistance testing results) whenever possible.	• Develop a clinic model based on specific needs (e.g., simultaneous transition of mental health and/or case management versus a gradual phase-in) and staffing. • Engage in a warm handoff from the pediatric team, which allows a nuanced understanding of challenges and goals for the patient. Devise a plan for how to continue building the skills on the adult side. • Build in flexibility (e.g., permissive grace period for appointments, leniency for missed appointments if feasible), particularly when first transitioning. • Encourage physical spaces, structures, and pins that are supportive of AYA with HIV and their identities (e.g., youth-friendly art, pride flag, expedited rooming, separate waiting areas when space allows). • Incorporate other aspects of care beyond HIV management, if possible (e.g., family planning, sexually transmitted infection testing and treatment, mental health, substance use).

Table 13. Approaches to Optimize Care Transition for AYA With HIV

Pediatric/Adolescent	Adult
	• Close the loop with the pediatric/adolescent providers and encourage them to reach out if the AYA continues to contact their former clinic.
Communication	
• Foster regular dialogue between pediatric and adolescent and adult teams before and after transition through regular meetings, case conferences, etc. • Solicit feedback from the AYA with HIV. • Use digital technology (e.g., texting, HIPAA-compliant messaging apps, telemedicine).	
Evaluation	
• Implement ongoing evaluation to measure the success of the selected model (retention in adult care).	

Key: AYA = adolescents and young adults; HIPAA = Health Insurance Portability and Accountability Act

Discussions regarding transition should begin early and precede the actual transition process. Attention to the key interventions noted above will be likely to improve adherence to appointments and avoid the potential for youth to disengage from care during this period. For a more detailed discussion on specific topics related to transitioning care for AYA, see Transitioning to Adult HIV Care. Please also refer to the Pediatric ARV Guidelines.

Table 14. Adolescents and Young Adults With HIV Antiretroviral Adherence Barriers and Strategies to Support Adherence

ART Adherence Barrier	Adherence Support Strategy	Rationale for Adherence Support Strategy
Prioritization of short-term goals and socialization with peers over daily HIV treatment adherence	Youth-friendly reminder systems (e.g., text, phone, apps, pill boxes, support buddies/peers/groups)	• Daily adherence to ARV regimens may not take priority in the lives of AYA with HIV. • AYA with HIV benefit from reminder systems to facilitate adherence.
	Novel ART delivery strategies (e.g., long-acting oral or injectable ARVs)	• AYA with HIV show high interest in long-acting alternatives for ART delivery. • May obviate disclosure concerns • Promising tool to facilitate adherence for AYA with HIV
	Directly observed therapy (in person or virtual) may be considered	• May provide support and oversight, particularly for AYA with barriers to independently taking ART.
Social concerns related to loss of confidentiality	Simple ARV regimens	• Adolescents do not want to be different from peers; adherence to complex regimens is particularly challenging. • Simple ARV regimens are preferable for AYA with HIV.
	User-friendly and discreet regimens	• Avoidance of HIV-related stigma and of unintentional disclosure of HIV status is a priority for AYA with HIV. • Protect confidentiality with user-friendly and discreet adherence supports (e.g., discreet pill bottles, reminder systems).
Side effects/fear of side effects	ARV regimens that minimize side effects Early and expeditious prevention, recognition, and management of side effects, with transparency about potential side effects	• Side effects are associated with nonadherence to ARVs. • Regimens with minimal side effects and medications that manage side effects have utility for AYA with HIV.
Denial or dismissal of HIV diagnosis	Motivational interviewing and motivational enhancement therapy	• Motivational interviewing and motivational enhancement therapy acknowledge AYA with HIV's autonomy and potential ambivalence about treatment adherence. • Motivational interviewing and motivational enhancement therapy have shown promise for improving adherence to chronic disease treatment, including HIV.

Table 14. Adolescents and Young Adults With HIV Antiretroviral Adherence Barriers and Strategies to Support Adherence

ART Adherence Barrier	Adherence Support Strategy	Rationale for Adherence Support Strategy
	Positive affirmation messages (e.g., text, app, trusted messengers)	• Electronically delivered positive affirmation messages can improve self-esteem and ARV adherence among AYA with HIV. • Some advocacy groups provide other resources with positive affirmations that can improve self-esteem and ARV adherence.
Non-disclosure	Early disclosure and assistance with disclosure	• Early (by age 10–12 years) disclosure of HIV status for those with perinatally acquired HIV enhances adherence and self-esteem and limits stigma. • Assistance with disclosure to partners or peers may enhance outcomes, including self-esteem, self-acceptance, and mood.
Lack of health literacy regarding the benefits of ART	Health literacy support and U=U education	• AYA with HIV may not fully understand the importance of taking ARVs daily or receiving LA CAB/RPV injections, particularly when they are asymptomatic. • Increased health literacy is associated with better adherence to ARV regimens. • U=U education holds promise for AYA with HIV.
Mistrust of providers and the medical establishment	Empathetic and patient-centered communication	• Communication exploring the needs of AYA with HIV can build trust, including exploring needs not directly related to HIV treatment (e.g., school, employment, relationships).
Mental health and/or substance use	Individualized mental health and substance use services	• Comprehensive mental health and substance use services have shown promise for improving viral suppression among AYA with HIV. • Service should be delivered based on individualized needs assessments.
Social isolation and lack of familial and social support	Family and peer support groups	• Family members and peers are a defense against stigma and social isolation, a source of emotional support, and partners in medication management.
Provider views of AYA with HIV as “risky” and/or not ready for ART	Promote development of a positive rather than risk-centered identity among AYA with HIV	• Adolescence and young adulthood are periods of identity development where HIV stigma is particularly problematic. • To reduce stigma and improve ARV adherence, providers should not conceptualize AYA with HIV as “high risk.”
Provider implicit biases regarding AYA with HIV	Implicit bias training	• Consciously changing biased associations and repeated bias self-regulation training can reduce providers’ implicit biases.

Table 14. Adolescents and Young Adults With HIV Antiretroviral Adherence Barriers and Strategies to Support Adherence

ART Adherence Barrier	Adherence Support Strategy	Rationale for Adherence Support Strategy
Lack of youth-friendly services	Dedicated youth HIV clinic or adaptation of youth-friendly services	• Clinic days or hours dedicated to AYA with HIV patients better address unique adherence needs; youth-friendly services include the following: o Flexible hours, easy scheduling, telephone/telehealth appointments o Providers trained in working with AYA with HIV o Youth-friendly waiting rooms and physical spaces o Supplemental services that comprehensively address psychosocial and health needs of AYA with HIV o Incentives for AYA with HIV care engagement
	Youth-friendly hours, staff, and physical space	• Where dedicated hours and services are not possible, youth-friendly service elements can be integrated into existing clinic structures using strategies such as— o Offering evening hours o Staff training on service delivery to AYA with HIV o Youth-friendly waiting rooms and physical spaces
	Referrals to more youth-friendly HIV providers	• Where youth-friendly services are not possible, referrals to more youth-friendly HIV care providers should be considered. • Referral decisions should be made collaboratively with the patient.
Lack of comprehensive services that address common psychosocial stressors	Supplemental health, behavioral health, and psychosocial support services	• Individualized delivery of comprehensive supplemental services helps address unique needs of AYA with HIV, including the following: o Primary care and sexual and reproductive health services o Behavioral health services o Psychosocial support services (e.g., school support, transportation, support groups, housing and food assistance)

Table 14. Adolescents and Young Adults With HIV Antiretroviral Adherence Barriers and Strategies to Support Adherence

ART Adherence Barrier	Adherence Support Strategy	Rationale for Adherence Support Strategy
	Collaboration with and referrals to outside support services	• Where delivery of comprehensive supplemental services is not possible, collaborations with and referrals to outside support services should be considered. • Emphasize strengths-based supports

Key: ART = antiretroviral treatment; ARV = antiretroviral; AYA = adolescent and young adult; LA CAB/RPV = long-acting cabotegravir plus rilpivirine; U=U = undetectable equals untransmittable

Knowledge Gaps

More research is needed related to the following:

- Safety and efficacy of LA injectable ART for AYA patients with viremia
- Best strategies for optimizing retention in care, the transition from pediatric-focused to adult-focused care settings, and clinical and virologic outcomes for AYA
- Metabolic complications associated with HIV and long-term use of ART in AYA with HIV and the effectiveness of preventive strategies (including cardiometabolic and bone health)
- The utility, affordability, scale-up, and cost-effectiveness of strategies for improving outcomes for AYA with HIV (e.g., retention in care, adherence to ART, earlier screening for metabolic complications in AYA)
- Understanding and evaluation of strategies for identifying and mitigating ACEs and the development of neurocognitive disorders in AYA with HIV
- Identifying effective interventions to address mental health and substance use disorders among AYA with HIV

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