

SCREENING FOR HUMAN IMMUNODEFICIENCY VIRUS INFECTION

WOMEN'S PREVENTIVE SERVICES INITIATIVE EVIDENCE UPDATE

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CURRENT WPSI RECOMMENDATIONS

Clinical Recommendation (2016)¹

The Women's Preventive Services Initiative (WPSI) recommends prevention education and risk assessment for human immunodeficiency virus (HIV) infection in adolescents and women at least annually throughout the lifespan. All women should be tested for HIV at least once during their lifetime. Additional screening should be based on risk, and screening annually or more often may be appropriate for adolescents and women with an increased risk of HIV infection.

Screening for HIV is recommended for all pregnant women upon initiation of prenatal care with retesting during pregnancy based on risk factors. Rapid HIV testing is recommended for pregnant women who present in active labor with an undocumented HIV status. Screening during pregnancy enables prevention of vertical transmission.

Implementation Considerations

The WPSI recommends as a preventive service for women, prevention education and risk assessment for HIV infection in adolescents and women at least annually throughout the lifespan. More frequent screening for high-risk women, as determined by clinical judgment, is also recommended. Annual or more frequent HIV testing may be needed and is recommended as a preventive service for women who are identified or self-identify as high risk.

This recommendation refers to routine HIV screening, which is different from incident-based or exposure-based HIV testing. Risk factors for HIV infection in women include, but are not limited to, being an active injection drug user; having unprotected vaginal or anal intercourse; having multiple sexual partners; initiating a new sexual relationship; having sexual partners who are HIV-infected, bisexual, or injection drug users; exchanging sex for drugs or money; being a victim of sex trafficking; being incarcerated (currently or previously); and having other sexually transmitted infections (STI).

Approximately 20% to 26% of infected patients are not identified by risk-based screening. Early detection and treatment improve outcomes for patients and reduces transmission; therefore, based on clinical best practice, screening annually or more frequently may be reasonable.

EVIDENCE SUMMARY

New Evidence

New evidence published since the previous WPSI recommendation is summarized in **Table 1**.

Table 1. New Evidence Since the 2016 WPSI Recommendation

Prevention education and risk assessment for HIV infection in adolescents and women at least annually throughout the lifespan.	
Systematic Reviews	Additional Studies
2020 USPSTF systematic review of 29 studies of behavioral counseling for prevention of STIs in adolescents and adults included HIV: Overall, studies of behavioral interventions reduced risk of STIs (pooled OR, 0.66; 95% CI 0.54 to 0.81; $I^2=74%$; 19 studies).	None
HIV testing at least once during their lifetimes for all women, more frequently for women at higher risk.	
Systematic Reviews	Additional Studies
2019 USPSTF review of HIV screening in nonpregnant adolescents and adults included 29 studies: No study directly evaluated effects of HIV screening compared with no screening or the effects of repeat or alternative screening strategies on clinical outcomes or harms. Studies indicate improved mortality, AIDS-defining events, or serious non-AIDS events, and reduced HIV transmission with early ART initiation. Adverse events of ART include long-term neuropsychiatric, renal, hepatic, and bone adverse events depending on the regimen.	None
Screening for HIV for all pregnant women upon initiation of prenatal care with retesting during pregnancy based on risk factors. Rapid HIV testing for pregnant women who present in active labor with an undocumented HIV status.	
Systematic Reviews	Additional Studies
2019 USPSTF review of HIV screening in pregnant adolescents and adults included 62 studies: No study directly evaluated effects of HIV screening compared with no screening or the effects of repeat or alternative screening strategies on mother-to-child HIV transmission or maternal or infant clinical outcomes or harms. Studies indicate reduced mother-to-child transmission with early ART initiation. Adverse events of prenatal combination ART include preterm delivery, low birth weight, small for gestational age, stillbirth, birth defects, and neonatal death depending on the regimen and timing of therapy.	None

Abbreviations: AIDS= acquired immunodeficiency syndrome; ART= antiretroviral therapy; CI=confidence interval; HIV= human immunodeficiency virus; OR=odds ratio; USPSTF=U.S. Preventive Services Task Force; STI=sexually transmitted infection

Introduction

Human immunodeficiency virus (HIV) is a retrovirus that infects CD4 immune cells leading to acquired immunodeficiency syndrome (AIDS) if untreated. AIDS is characterized by progressive failure of the immune system resulting in life-threatening infections and cancer. HIV infection cannot be cured but can be controlled with antiretroviral therapy (ART) which can prolong life and reduce morbidity and transmission to others, particularly when used during early stages of infection. Screening for HIV detects individuals who are unaware of their infection and would otherwise miss the opportunity to benefit from early therapy.

Current Recommendations and Coverage of Services

The gap in services provided under the provisions of the Patient Protection and Affordable Health Care Act of 2010 (ACA) previously identified by the Institute of Medicine (IOM), now the National Academy of Medicine (NAM), Committee on Prevention Services for Women was that screening was limited to pregnant women and adolescents and adults at high-risk. The Committee recommended expanding this scope to annual counseling and screening for HIV infection for all sexually active women.²

In 2013, the USPSTF updated its recommendation for HIV screening to include all adolescents and adults aged 15 to 65 years; and younger adolescents and older adults who are at increased risk.³ Individuals at increased risk include men who have sex with men; active injection drug users; those with sexually transmitted infections (STIs); having unprotected vaginal or anal intercourse; having sexual partners who are HIV infected, bisexual, or injection drug users; and exchanging sex for drugs or money. Screening during pregnancy is also included under the USPSTF recommendation. The updated 2019 USPSTF recommendations⁴ are similar to the 2013 recommendations (**Table 2**). In addition, the USPSTF provided related recommendations on behavioral counseling for prevention of STIs in adolescents and adults that includes HIV,⁵ and use of preexposure prophylaxis (PrEP) with effective antiretroviral therapy for persons at high risk of HIV acquisition.⁶

In 2016, the WPSI recommended prevention education and risk assessment for HIV infection in adolescents and women at least annually throughout the lifespan, and HIV testing at least once during their lifetimes for all women, and more frequently for women at higher risk.¹ In addition, the WPSI recommended screening for HIV for all pregnant women upon initiation of prenatal care with retesting during pregnancy based on risk factors, and rapid HIV testing for pregnant women who present in active labor with an undocumented HIV status.

The WPSI recommendations differ from the USPSTF by including explicit language regarding HIV testing at least once per lifetime and more frequently with higher risk; including adolescents beginning at age 13 years rather than 15 years; and including HIV prevention education and risk assessment at least annually. The USPSTF includes HIV under its general recommendation for behavioral counseling for prevention of STIs.⁵

Table 2. Summary of Recommendations Currently Covered under the Affordable Care Act

WPSI ¹	Prevention education and risk assessment for HIV infection in adolescents and women at least annually throughout the lifespan. All women should be tested for HIV at least once during their lifetime. Additional screening should be based on risk, and screening annually or more often may be appropriate for adolescents and women with an increased risk of HIV infection. Screening for HIV is recommended for all pregnant women upon initiation of prenatal care with retesting during pregnancy based on risk factors. Rapid HIV testing is recommended for pregnant women who present in active labor with an undocumented HIV status.
USPSTF ⁴	Screening for HIV infection in adolescents and adults aged 15 to 65 years. Younger adolescents and older adults who are at increased risk of infection should also be screened (A recommendation). Screening for HIV infection in all pregnant persons, including those who present in labor or at delivery whose HIV status is unknown. (A recommendation)
Bright Futures ⁷	Screen once between ages 15 and 18 years. Those at increased risk of HIV infection, including those who are sexually active, participate in injection drug use, or are being tested for other STIs, should be tested for HIV and reassessed annually.

Abbreviations: HIV=human immunodeficiency virus; USPSTF=U.S. Preventive Services Task Force; STI=sexually transmitted infection; WPSI= Women’s Preventive Services Initiative

The Centers for Disease Control and Prevention (CDC) and professional organizations have also issued practice recommendations regarding screening for HIV (**Table 3**).

Table 3. Recommendations of Professional Organizations

American College of Obstetricians and Gynecologists (ACOG) ⁸	Females age 13 to 64 years be tested at least once in their lifetime and annually thereafter based on factors related to risk. Obstetrician–gynecologists should annually review patients’ risk factors for HIV and assess the need for retesting. Repeat HIV testing should be offered at least annually to women who are injection drug users or sex partners of injection-drug users; exchange sex for money or drugs; are sex partners of HIV-infected persons; have had sex with men who have sex with men since the most recent HIV test; have had more than one sex partner since their most recent HIV test.
Centers for Disease Control and Prevention (CDC) ⁹	Everyone between the ages of 13 and 64 be tested for HIV at least once as part of routine health care. Those at higher risk should be tested at least once a year. Higher risk includes: men who have sex with men; sex with a partner with HIV; more than one sex partner since last HIV test; using injection drugs and shared needles, syringes, or other drug injection equipment; exchanging sex for drugs or money; diagnosed or treated for another STI; diagnosed or treated for hepatitis or TB; sex with someone with these risk factors or someone whose sexual history is unknown.

American Academy of Family Physicians (AAFP) ¹⁰	Affirms USPSTF recommendation.
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Abbreviations: CDC=Centers for Disease Control and Prevention; HIV=human immunodeficiency virus; TB=tuberculosis; USPSTF=United States Preventive Services Task Force; STI=sexually transmitted infection; WPSI=Women’s Preventive Services Initiative

Background

An estimated 1,189,700 million individuals age 13 years and older were living with HIV infection in the United States in 2019, including 158,500 (13%) whose infections had not been diagnosed.¹¹ In 2019, the estimated number of new HIV diagnoses in the United States was 36,801. Among women with HIV infection, 5,863 infections were attributed to heterosexual contact and 1,111 to injection drug use.^{3,11,12} Adults age 25 to 29 years accounted for the most new cases of infection (7,396) among different age groups. Blacks accounted for the most (15,340) new cases among racial/ethnic groups, followed by Hispanics (10,502), and whites (9,018).¹¹

Risk factors for HIV infection in women include active injection drug use; unprotected vaginal or anal intercourse; sexual partners who are HIV-infected, bisexual, or injection drug users; exchanging sex for drugs or money; and having other STIs. However, women may not be aware of their sexual partner’s HIV risk.¹¹ Primary prevention involves behavioral counseling to prevent STIs and increase effective condom use and use of PrEP medication for individuals at high risk of acquiring HIV.

Several tests are approved for screening including the conventional serum test (reactive immunoassay followed by confirmatory Western blot or immunofluorescent assay); rapid HIV test using blood or oral fluid specimens; combination tests (p24 antigen and HIV antibodies); and qualitative HIV-1 RNA. Tests are highly sensitive and specific. Clinical progression and disease transmission can be reduced with effective combined antiretroviral therapy using three or more antiretroviral agents, immunizations, and prophylaxis for opportunistic infections.

Update of Evidence

USPSTF Systematic Review

Two USPSTF systematic reviews published in 2019 addressed the effectiveness of screening for HIV in asymptomatic adolescents and adults in primary care practice and during pregnancy.^{13,14} The USPSTF based their A-level screening recommendations on studies of the effectiveness of early ART in improving HIV-related health outcomes and reducing HIV transmission.

The review of HIV screening in non-pregnant adolescents and adults included 18 new studies and 11 studies from the prior 2013 USPSTF report.¹³ Of these, no study directly evaluated effects of HIV screening compared with no screening or the effects of repeat or alternative screening strategies on clinical outcomes or harms. Two new RCTs indicated improved composite outcomes of mortality, AIDS-defining events, and serious non-AIDS events with

ART initiation early in the infection (CD4 cell counts $>500/\text{mm}^3$)¹³ compared with delayed treatment (relative risk [RR], 0.44; 95% confidence interval [CI], 0.31 to 0.63;¹⁵ RR, 0.57; 95% CI, 0.35 to 0.95).¹⁶ In addition, early ART initiation was associated with sustained reduction in HIV transmission at 5.5 years (RR, 0.07; 95% CI, 0.02 to 0.22).¹³ Adverse events associated with specific ART regimens include long-term neuropsychiatric, renal, hepatic, and bone adverse events.

The review of HIV screening in pregnant adolescents and adults included 29 new studies and 33 studies from the prior 2012 USPSTF report.¹⁴ Of these, no study directly evaluated effects of HIV screening compared with no screening or the effects of repeat or alternative screening strategies on mother-to-child HIV transmission or maternal or infant clinical outcomes or harms. New studies supported earlier research of the effectiveness of combination ART in reducing mother-to-child transmission. In cohort studies, rates of mother-to-child transmission with combination ART were 0% to 0.4% when begun in the first trimester and 0.4% to 2.8% when begun later.¹⁴ In comparison, mother-to-child transmission without ART ranged from 9% to 22%. Adverse events of prenatal combination ART include preterm delivery with a boosted protease inhibitor ranging from 14.4% to 26.1%; and low birth weight, small for gestational age, stillbirth, birth defects, and neonatal death reported in some cohort studies depending on the specific antiretroviral regimen and timing of therapy.

WPSI Update

A literature search to identify relevant studies published since the 2019 USPSTF systematic review included Ovid® MEDLINE®, Cochrane CENTRAL, and Cochrane Database of Systematic Reviews libraries from July 1, 2018, through October 27, 2021, overlapping with the 2019 USPSTF reviews' surveillance of publications through January 25, 2019. Search terms included "HIV" and "mass screening"; the terms "pregnancy" and "maternal" were included in a separate search for screening during pregnancy. The search for screening in nonpregnant adolescents and adults yielded 518 citations; the search for screening in pregnancy yielded 145 citations. Seventeen papers were pulled for full-text review and were excluded for wrong outcome, comparison, or setting.

Conclusions

Screening for HIV identifies individuals who are unaware of their infection and would otherwise miss the opportunity to benefit from early treatment. Studies of ART indicate significantly reduced risks of serious AIDS-related events, death, and disease transmission, including mother-to-child transmission during pregnancy, when treatment is initiated early in the infection. In addition, there are fewer adverse effects with the newer antiretroviral medications. New studies reinforce results of earlier research and further strengthen the rationale for population screening.

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