Draft Recommendation Statement

I would like to comment on the draft Recommendation Statement.

What is in a Recommendation Statement?

Return to the Public Comment Home Page

Return to the USPSTF Page

Note: This draft Recommendation Statement is not the final recommendation of the U.S. Preventive Services Task Force. This draft is distributed solely for the purpose of pre-release review. It has not been disseminated otherwise by AHRQ. It does not represent and should not be interpreted to represent an AHRQ determination or policy.

This draft Recommendation Statement is based on an evidence review that was published on November 20, 2012 (available at http://www.uspreventiveservicestaskforce.org/uspstf13/hiv/hivadultart.htm).

The USPSTF makes recommendations about the effectiveness of specific clinical preventive services for patients without related signs or symptoms.

It bases its recommendations on the evidence of both the benefits and harms of the service, and an assessment of the balance. The USPSTF does not consider the costs of providing a service in this assessment.

The USPSTF recognizes that clinical decisions involve more considerations than evidence alone. Clinicians should understand the evidence but individualize decisionmaking to the specific patient or situation. Similarly, the USPSTF notes that policy and coverage decisions involve considerations in addition to the evidence of clinical benefits and harms.

This draft Recommendation Statement is available for comment from November 20 until December 17, 2012, at 5:00 PM ET. You may wish to read the entire Recommendation Statement before you comment. A fact sheet that explains the draft recommendations in plain language is available here.

DRAFT

DRAFT

DRAFT

DRAFT

DRAFT

DRAFT

DRAFT

DRAFT

DRAFT

DRAFT

DRAFT

DRAFT

DRAFT

Screening for HIV: U.S. Preventive Services Task Force Recommendation Statement
DRAFT

Summary of Recommendations and Evidence

The U.S. Preventive Services Task Force (USPSTF) recommends that clinicians screen adolescents and adults ages 15 to 65 years for HIV infection. Younger adolescents and older adults who are at increased risk should also be screened. See the Clinical Considerations for more information about screening intervals.

This is a grade A recommendation.

The USPSTF recommends that clinicians screen all pregnant women for HIV, including those who present in labor whose HIV status is unknown.

This is a grade A recommendation.

Table 1 describes the USPSTF grades, and Table 2 describes the USPSTF classification of levels of certainty about net benefit.

Rationale

Importance

An estimated 1.2 million people in the United States are currently living with HIV infection, and the annual incidence of the disease is approximately 50,000 cases per year. Since the first cases of acquired immune deficiency syndrome (AIDS) were reported in 1981, more than 1.1 million people have been diagnosed with AIDS and nearly 595,000 have died from the disease. Approximately 20% to 25% of individuals living with HIV infection are unaware of their positive status.

Detection

The USPSTF found convincing evidence that standard and rapid HIV antibody tests are both highly accurate in diagnosing HIV infection.

Benefits of Detection and Early Intervention

The USPSTF found convincing evidence that identification and treatment of HIV infection is associated with a markedly reduced risk for progression to AIDS, AIDS-related events, and death in individuals with immunologically advanced disease (defined as CD4 count <200 cells/mm^3). There is adequate evidence that initiating combined antiretroviral therapy (ART) earlier (i.e., at CD4 counts of 200–500 cells/mm^3), when individuals are more likely to be asymptomatic and detected via screening rather than clinical presentation, is also associated with reduced risk for AIDS-related events or death. There is convincing evidence that the use of ART is associated with a substantially decreased risk for transmission from HIV-positive persons to uninfected heterosexual partners. There is also convincing evidence that identification and treatment of HIV-positive pregnant women dramatically reduces rates of mother-to-child transmission. The overall benefits of screening for HIV infection in adolescents, adults, and pregnant women are substantial.

Harms of Detection and Early Intervention

There is convincing evidence that individual antiretroviral drugs, drug classes, and combinations are all associated with short-term adverse events; however, many are transient or self-limited, and effective alternatives are often available. Although the long-term use of certain antiretroviral drugs is associated with increased risk for cardiovascular and other adverse events, the magnitude of risk seems to be small. The overall harms of screening for and treatment of HIV infection in adolescents, adults, and pregnant women are small.

USPSTF Assessment

The USPSTF concludes that there is high certainty that the net benefit of screening for HIV infection in adolescents, adults, and pregnant women is substantial.

Clinical Considerations

Patient Population Under Consideration

This recommendation applies to adolescents, adults, and pregnant women.

Screening for HIV infection could begin at age 15 years, unless an individual is identified at an earlier age with risk factors for HIV infection. Screening after age 64 years is generally not

indicated unless there is ongoing risk for HIV infection, as indicated by risk assessment (e.g., new sexual partners).

Assessment of Risk

According to Centers for Disease Control and Prevention (CDC) estimates, men who have sex with men account for about 60% of HIV-positive persons in the United States (1). Among men living with HIV infection (who were diagnosed at age 13 years or older), 68% of infections were attributed to male-to-male sexual contact, 8% were attributed to male-to-male sexual contact and injection drug use, and 11% were attributed to heterosexual contact. Among women living with HIV infection, 74% of infections were attributed to heterosexual contact. The remainder of infections were attributed to injection drug use (1, 2).

Based on HIV prevalence data, the USPSTF considers men who have sex with men and active injection drug users to be at very high risk for new HIV infection.

Behavioral risk factors for HIV infection include having unprotected vaginal or anal intercourse with more than one partner; having sexual partner(s) who are HIV-infected, bisexual, or injection drug users; or exchanging sex for drugs or money. Other patients at high risk for HIV infection include those who have acquired, or request testing for, other sexually transmitted infections. Patients may request HIV testing in the absence of reported risk factors. Individuals not at increased risk for HIV infection include persons who are not sexually active, those who are sexually active in exclusive monogamous relationships with uninfected partners, and those who do not fall into any of the above categories. The USPSTF recognizes that the above categories are not mutually exclusive and that the degree of sexual risk exists on a continuum. For patients younger than age 15 years and older than age 64 years, it would be reasonable for clinicians to consider HIV prevalence among their respective patient populations and HIV risk factors among individual patients, especially new sexual partners. However, clinicians should bear in mind that both adolescent and adult patients may be reluctant to disclose having HIV risk factors, even when asked.

Screening Tests

The standard serum test for diagnosing HIV infection, repeatedly reactive enzyme immunoassay (EIA) followed by confirmatory Western blot or immunofluorescent assay, is highly accurate (>99% sensitivity and specificity for both). Rapid HIV testing may use either blood or oral fluid specimens, and can provide results in 5 to 40 minutes compared with 1 to 2 weeks for standard testing. The sensitivity and specificity of rapid HIV testing are both also >99%; however, initial positive results require confirmation using conventional methods.

Screening Intervals

The evidence is insufficient to determine optimal time intervals for HIV screening. One reasonable approach would be one-time screening of adolescent and adult patients to identify persons who are already HIV-positive, with repeat screening of persons who are known to be at risk for HIV infection, those who are actively engaged in risky behaviors, or those living in a high-prevalence setting.

Patient populations that would be more likely to benefit from more frequent testing include persons who are known to be at higher risk for HIV infection, those who are actively engaged in risky behaviors, or those living in a high-prevalence setting. As such, a reasonable approach may be to rescreen groups at very high risk for new HIV infection at least annually, and individuals at increased risk at somewhat longer intervals (such as every 3 to 5 years). Routine rescreening may not be necessary for individuals who have not been at increased risk since they were found to be HIV-negative. Women screened during a previous pregnancy should be rescreened in subsequent pregnancies.

Treatment

At present, there is no cure for chronic HIV infection. However, appropriately timed interventions in HIV-positive persons can reduce risks for clinical progression, complications or death from the disease, and disease transmission. Effective interventions include ART (specifically, the use of combined ART, defined as three or more antiretroviral agents used together, usually from at least two drug classes), immunization, and prophylaxis for opportunistic infections.

Other Approaches to Prevention

The USPSTF recognizes that the most effective strategy for reduction of HIV-related morbidity and mortality in the United States is primary prevention or avoidance of exposure to HIV infection.

The USPSTF recommends high-intensity behavioral counseling to prevent sexually transmitted infections for all sexually active adolescents and for adults at increased risk of acquiring an infection. More information is available at http://www.uspreventiveservicestaskforce.org/uspstf/uspsstds.htm.

The Community Preventive Services Task Force has made several recommendations related to the prevention of HIV/AIDS and other sexually transmitted infections, including person-to-person behavioral interventions (information and skill-building to change knowledge, attitudes, beliefs, and self-efficacy) for men who have sex with men, which can be implemented at the individual, group, or community level. It also recommends health provider notification and encouragement for HIV testing for sexual or needle-sharing partners of individuals diagnosed with HIV, as well as comprehensive risk reduction interventions in adolescents. More information is available at http://www.thecommunityguide.org/hiv/index.html.

Other Considerations

Implementation

For populations in which the prevalence of HIV infection is known to be 0.1% or less (that is, 1 person or fewer in 1,000 is HIV-positive), in which the potential benefit per person screened is quite low, it is reasonable to forgo routine HIV screening and instead screen based on risk assessment. The CDC suggests that for populations in which the prevalence of HIV infection has not been documented, clinicians should initiate voluntary routine screening. If no HIV-infected patients are found after screening approximately 4,000 patients, the upper limit of the 95% confidence interval for prevalence is less than 0.1% (3), and routine screening may be discontinued and replaced with risk-based screening.

Research Needs and Gaps

Individuals who begin ART tend to remain on therapy for an extended length of time. Better evidence is needed about the long-term harms of ART, including risks for cardiovascular and kidney disease. Further followup is necessary to better delineate potential long-term harms of ART initiation at higher CD4 counts, including possible suboptimal adherence to medications, earlier development of ART resistance, and transmission of primary drug-resistant HIV. It would also be helpful to better elucidate the potential risks and long-term outcomes associated with in utero or perinatal exposure to ART.

Direct evidence of the effectiveness of ART and behavioral counseling in reducing HIV transmission among men who have sex with men and other high-risk groups could also guide prevention and treatment strategies. Similarly, additional studies are needed to better define the most optimal timing of treatment initiation. More research is needed regarding the differential effects of various HIV screening strategies on testing acceptability and uptake, linkage to and receipt of care, and harms. Information that could quantify any incremental benefits and harms of repeat HIV screening and identify ideal time intervals for rescreening in different populations would be of great use.

Discussion

Burden of Disease

Since the first cases of AIDS were reported in 1981, nearly 600,000 people in the United States have died from the disease (4). Despite the decline in AIDS cases and deaths after the introduction of ART, the CDC estimates that more than 1.1 million people in the United States were living with HIV infection at the end of 2008, including 236,400 (20%) who did not know they were infected (5). Risk factors for HIV infection include having unprotected vaginal or anal intercourse with more than one partner; having sexual partner(s) who are HIV-infected, bisexual, or injection drug users; exchanging sex for drugs or money; and engaging in injection drug use. According to the CDC, late diagnosis of HIV infection is common. Among persons with newly diagnosed HIV infection in 2008, 33% developed AIDS within 1 year of initial HIV diagnosis (1).

Scope of Review

In 2005, the USPSTF strongly recommended that clinicians screen for HIV in all adolescents and adults at increased risk for HIV infection, as well as all pregnant women (6). The USPSTF found good evidence that standard and rapid HIV screening tests are highly accurate, and that most ART-associated adverse events, including metabolic disturbances associated with an increased risk for cardiovascular events, could be ameliorated by changes in regimen or appropriate treatment. The USPSTF found good evidence that treatment of HIV-positive patients at immunologically advanced stages of disease (defined as CD4 count <200 cells/mm^3) results in markedly decreased risk for AIDS-related clinical events and mortality.

At that time, the USPSTF made no recommendation for or against routine screening for HIV in adolescents and adults not at increased risk for HIV infection. The USPSTF's rationale was based largely on the following considerations. First, the USPSTF determined that screening for HIV in patients without known risk factors would be lower yield than targeted screening. The USPSTF

estimated that the benefits of HIV screening would be substantial in high-risk patients and settings, but small for populations not at increased risk for infection. Second, the USPSTF found insufficient evidence that initiation of ART in patients with CD4 counts >200 cells/mm^3 results in improved clinical outcomes. Third, the USPSTF found insufficient evidence that knowledge of HIV-positive status, via initiation of highly active ART or reductions in risky behaviors, actually results in decreased HIV transmission.

For this updated recommendation, the USPSTF reviewed new evidence on the effectiveness of treatments in HIV-infected persons with CD4 counts >200 cells/mm^3; effects of screening, counseling, and ART on risky behaviors and HIV transmission risk; and long-term harms of ART.

Accuracy of Screening Tests

In 2005, the USPSTF found that standard and rapid HIV tests are highly accurate, with >99% sensitivity and specificity (6). However, studies indicate that rapid testing is associated with higher false-positive rates in lower-prevalence settings, though results are generally confirmed prior to treatment.

Effectiveness of Early Detection and Treatment

The 2005 USPSTF review found convincing evidence that initiation of ART in HIV-positive patients with CD4 counts <200 cells/mm^3 markedly reduces AIDS-related morbidity and mortality. At that time, however, the USPSTF found inadequate evidence to conclude that initiation of ART in patients with higher CD4 counts results in improved clinical outcomes.

To date, no randomized trials or observational studies have evaluated clinical outcomes among patients who were screened versus not screened for HIV infection, the yield of repeat versus one-time HIV screening, or the yield of different screening strategies (e.g., risk-based vs. routine repeat screening). However, there is new evidence of treatment benefits for HIV-positive patients with CD4 counts of 200 to 500 cells/mm^3, which dramatically increases the pool of patients that could benefit from early detection.

Several studies show that initiation of ART at CD4 counts of 200 to 500 cells/mm^3 is associated with reduced risk for AIDS-related events or death. At this stage of HIV infection, patients are likely to be asymptomatic and detected via screening rather than clinical presentation.

The updated USPSTF review found two good-quality randomized trials (7, 8), one retrospective subgroup analysis from one randomized trial (9), and five observational studies (10-15) that evaluated clinical outcomes after initiation of ART at different CD4 count thresholds.

The randomized, controlled trial with the largest study population was the HIV Prevention Trials Network (HPTN) 052 trial (8). This study compared mortality and clinical outcomes among 886 HIV-positive patients who received “early” ART (when CD4 counts were 350–550 cells/mm^3) with 877 HIV-positive patients who received “delayed” ART (after CD4 counts declined to ≤200 cells/mm^3 or symptom onset). This multicontinent study was conducted in nine countries, with 54% of study subjects from Africa. HPTN 052 did not detect a significant difference in mortality between treatment groups. However, patients who received early treatment were less likely to experience serious HIV-related clinical events or death than those who received delayed treatment (2.4 vs. 4.0 events per person-year; hazard ratio [HR], 0.59 [95% CI, 0.40 to 0.88]). According to the study investigators, differences in the rates of serious HIV-related clinical events were largely driven by intergroup differences in the incidence of extrapulmonary tuberculosis, the majority of which were observed in India.

Another randomized, open-label, controlled trial conducted in Haiti compared 408 HIV-positive patients who received “early” ART (when CD4 counts were 201–350 cells/mm^3) with 408 HIV-positive patients who received “standard” treatment (when CD4 counts were ≤200 cells/mm^3) (7). Deaths occurred more frequently in the standard-treatment group than the early-treatment group (6% vs. 2%; HR, 4.0 [95% CI, 1.6 to 9.8]; p=0.001). Similarly, incident cases of tuberculosis occurred more frequently in the standard-treatment group (9% vs. 4%; HR, 2.0 [95% CI, 1.2 to 3.6]; p=0.001). Because the study was not blinded, there may have been differential reporting and detection of nonfatal outcomes, which could affect progression to mortality. The generalizability of these findings to the U.S. primary care population is limited by, and the large effect size observed in this study may be partially attributed to, the fact that this study was conducted in a resource-poor setting with high rates of tuberculosis, malnutrition, and co-infection with tropical diseases. Accordingly, clinical benefits observed in the United States might not be as dramatic as those observed in these two trials.

Data from a third large, randomized trial conducted primarily in Europe and North America (Strategies for Management of Antiretroviral Therapy) (9) were re-examined in a post hoc exploratory analysis. In a retrospective subgroup analysis of 477 patients, initiation of ART at CD4 counts <250 cells/mm^3 was associated with increased risks for death or opportunistic disease compared with initiation at CD4 counts >350 cells/mm^3 (2.7% vs. 0.5%; HR, 3.5 [95% CI, 1.3 to 9.6]; p=0.02) (9). Because this question was not part of the original study plan, the investigators acknowledged that their findings could be less reliable and warranted further confirmation.

Observational studies of fair quality consistently found that initiation of ART at CD4 counts of 350 to 500 cells/mm^3 compared with deferred or no ART was consistently associated with decreased risk for mortality (or a trend toward decreased risk). Studies on initiation of ART at CD4 counts >500 cells/mm^3 yielded less consistent results, as did studies of the combined outcome of mortality plus AIDS-defining events. Limitations of these studies included insufficient information about baseline differences in patients who initiated ART at different CD4 count thresholds, suboptimal reporting of attrition, unblinded assessment of outcomes and analysis of data, and possible residual confounding.

Recent studies also show that early initiation of ART can reduce risk for HIV transmission to uninfected sexual partners. HPTN 052 enrolled 1,763 serodiscordant couples (in which one partner was HIV-positive and the other HIV-negative); most couples were heterosexual. HIV-positive patients with CD4 counts of 350 to 550 cells/mm^3 were randomly assigned to receive either "early" (immediate) or "delayed" ART (after CD4 counts declined to ≤200 cells/mm^3 or symptom onset). At median followup of 1.7 years, with most couples reporting 100% condom use, the incidence of seroconversion in HIV-negative partners was significantly lower among those whose HIV-positive partners had received early rather than delayed ART (0.3 vs. 2.2 cases per 100 person-years; HR, 0.11 [95% CI, 0.04 to 0.32]; p<0.001). Seven observational studies of heterosexual transmission included in the USPSTF review were consistent with the results of this randomized trial. The potential effects of ART on HIV transmission have not been well studied, and could be attenuated, in men who have sex with men and other high-risk populations, which account for the majority of HIV-infected individuals in the United States.

Early diagnosis of HIV infection allows for risk-reduction counseling and behavior change to reduce HIV transmission. In 2008, the USPSTF recommended high-intensity behavioral counseling to prevent sexually transmitted infections for all sexually active adolescents and for adults at increased risk of acquiring an infection. The 2005 USPSTF review on screening for HIV included two systematic reviews that found that consistent condom use was associated with substantially reduced risk for sexual transmission of HIV infection; these findings have been confirmed in more recent observational studies. Self-reported condom use was associated with a 93% reduction in risk for heterosexual HIV transmission in a prospective cohort study (n=476) (16). Inconsistent condom use was associated with an eightfold increase in risk for seroconversion in another study of 1,927 serodiscordant heterosexual couples (adjusted relative risk [RR], 8.4 [95% CI, 4.8 to 15]) (17).

Observational studies included in the current USPSTF review found that knowledge of HIV-positive status was associated with decreased participation in several high-risk behaviors, including unprotected intercourse, having sex in exchange for money or drugs, having sex with sex workers, using intravenous drugs, and needle sharing among injection drug users. Reductions in high-risk behaviors occurred in all populations studied, including men who have sex with men, injection drug users, and heterosexuals. Similarly, observational studies also reported no clear association between initiation of ART and high-risk sexual behaviors.

In its deliberations regarding the age at which to begin screening, the USPSTF considered the prevalence of sexual activity and sexually transmitted infections among different age groups. According to CDC Youth Risk Behavior Surveillance data, nearly half of U.S. high school students have engaged in sexual intercourse, with one third being currently sexually active (18). Of students who are sexually active, one third have engaged in sexual intercourse prior to age 16 years (19). Although adolescents and young adults comprise one quarter of the sexually experienced population in the United States, they account for nearly one half of newly acquired sexually transmitted infections (20). As such, routine HIV testing starting at age 15 years would be reasonable. Since HIV prevalence markedly declines after age 65 years, routine screening may not be necessary in older patients.

In its 2005 review, the USPSTF found convincing evidence that recommended regimens of ART resulted in significantly reduced rates of mother-to-child transmission. For this updated review, the USPSTF identified no new randomized trials of full-course combination ART during pregnancy in nonresource-poor, nonbreastfeeding settings. Three U.S. and European cohort studies published since 2005 found that perinatal full-course triple ART was associated with decreased risk for mother-to-child transmission (<1%–2.4% among treated women vs. 9%–22% among untreated women) (21-23).

Potential Harms of Screening and Treatment

Because of the high specificity of both conventional and rapid HIV testing strategies, false-positive test results are rare. There is limited and largely anecdotal evidence regarding potential consequences of receiving a false-positive HIV test result (e.g., anxiety, psychological distress, or labeling) (24). The actual consequences of initially false-positive rapid test results depend on whether patients are notified of these results prior to confirmatory testing.

The 2005 USPSTF review included results from a large ongoing study, Data Collection on Adverse Events of Anti-HIV Drugs (DAD), which found a 26% adjusted relative increase in the annual incidence of myocardial infarction during the first 4 to 6 years of exposure to ART (RR, 1.26 [95% CI, 1.12 to 1.41]; p<0.001). In persons with more prolonged exposure to ART, the absolute risk for myocardial infarction was <0.6%, and absolute event rates were low (3.5 per 1,000 person-years) (25). Subsequent analyses from the DAD study (26-28) and other cohort studies (29, 30) also report cardiovascular harms associated with ART.

In the randomized trials comparing clinical outcomes among patients who received early versus standard ART, severe or life-threatening drug reactions did not occur more frequently in the early-treatment group after exclusion of primary clinical endpoints (4,

7, 8). However, the early-treatment group in HPTN 052 more frequently experienced ART-related adverse events (27% vs. 18%; p<0.001), particularly grade 3 or 4 laboratory abnormalities, which the study investigators described as having unclear clinical significance (8).

Individual antiretroviral drugs, drug classes, and combinations are all associated with short-term adverse events; many are transient or self-limited, and effective alternatives are often available. Longer-term use of ART regimens can result in metabolic disturbances such as hyperlipidemia and diabetes. A small increase in cardiovascular risk has been associated with specific protease inhibitors and nucleoside reverse transcriptase inhibitors in observational studies. The estimates of risk and the drugs implicated vary among studies. In one study of rapid HIV testing of pregnant women in labor in a low-prevalence setting, 90% of women with positive rapid HIV test results were ultimately confirmed as having HIV infection. Because confirmatory testing is not available in time to inform emergent treatment decisions, a small percentage of HIV-negative mothers and their infants will potentially be exposed to the adverse effects of ART or surgical delivery.

Since the prior USPSTF review, multiple cohort studies of perinatal exposure to ART have reported increased risk for late preterm delivery, with no clear association between maternal use of ART and low birth weight, congenital anomalies, or differences in neurodevelopmental outcomes. Among infants exposed to ART, other studies reported echocardiographic abnormalities, mitochondrial dysfunction, anemia, and neutropenia. However, the clinical significance of these findings remains unclear. The 11 studies included in the review were considered fair or poor quality.

Estimate of Magnitude of Net Benefit

The USPSTF recognizes that the most effective overall strategy for reduction of HIV-related morbidity and mortality in the United States is primary prevention or avoidance of exposure to HIV infection. The USPSTF concludes with high certainty that early detection and treatment of HIV transmission would result in substantial public health benefits in the United States. According to CDC estimates, more than 1.1 million persons were living with HIV infection in the United States at the end of 2008, including 236,400 (20%) who did not know they were infected. Screening for HIV infection in all adolescents and adults ages 15 to 65 years, in addition to persons at increased risk for infection and pregnant women, would allow for earlier and expanded detection of HIV infection, thus creating opportunities for earlier linkages to medical and behavioral interventions.

In the USPSTF's view, earlier initiation of ART in HIV-positive persons with CD4 counts <500 cells/mm^3 could substantially reduce disease burden in the United States. When ART is initiated at the CD4 count threshold of ≤500 cells/mm^3, approximately 60 people would need to be treated to prevent one death from HIV infection after 3 years. The USPSTF found good evidence that this intervention in this population both improves clinical outcomes and reduces sexual transmission. The USPSTF found adequate evidence that the harms of early detection and treatment of HIV infection are small and that the clinical benefits of ART substantially outweigh potential risks of treatment in HIV-positive patients with CD4 counts <500 cells/mm^3. The USPSTF also found convincing evidence that screening for HIV in pregnant women confers substantial clinical benefits, with adequate evidence that the potential harms are small.

The expected magnitude of benefit to an overall population that can be achieved by HIV screening depends in part on the frequency with which the disease occurs in that population. More individuals have the potential to benefit from routine HIV screening in settings where HIV infection is more prevalent, as the pool of affected individuals in which interventions could potentially have a positive effect is larger. At the same time, an accurate assessment of the prevalence of HIV infection in a given geographic location may not be readily available, and in some cases, it can be difficult to reliably distinguish which individuals are actually at increased risk for HIV infection. Studies have shown that screening for HIV based on risk factor assessment alone may miss 20% to 25% of HIV-positive individuals who report no risk factors.

Based on these findings, the USPSTF concludes with high certainty that early detection and treatment of HIV infection would result in substantial net benefits in the United States.

How Does Evidence Fit With Biological Understanding?

Late diagnosis of HIV infection is common. In 2008, one third of persons newly diagnosed with HIV developed AIDS within 1 year of diagnosis; according to the CDC, these persons had likely been infected for an average of 10 years prior to diagnosis. Moreover, one out of five persons living with HIV infection did not know that they were infected (5). The long preclinical phase from HIV infection to symptom onset allows for the opportunity to screen for, identify, and treat persons with HIV infection in order to reduce HIV-related morbidity and transmission. Reduction in viral load via ART can result in improved clinical outcomes for HIV-infected individuals and reduce transmission to uninfected persons.

Update of Previous USPSTF Recommendation

This updated recommendation reaffirms and expands the USPSTF's previous recommendations for HIV screening (6). In 2005, the USPSTF strongly recommended that clinicians screen for HIV in all adolescents and adults at increased risk for HIV infection, as

well as all pregnant women. At that time, the USPSTF made no recommendation for or against routine screening for HIV in adolescents and adults not at increased risk for HIV infection.

In addition to reaffirming its recommendation for screening for HIV in persons at increased risk and pregnant women, the USPSTF expands its prior recommendation to include adolescents and adults ages 15 to 65 years who are not known to be at increased risk for HIV infection.

The USPSTF's expansion of its HIV screening recommendation is based on studies published since 2005 that address previous gaps in the evidence. The USPSTF found that expanded HIV screening identifies a substantial number of persons with previously undiagnosed HIV infection, many of whom could benefit from initiation of ART, behavioral counseling, and other interventions. In particular, this recommendation includes new evidence that initiation of ART in HIV-infected persons with CD4 counts <500 cells/mm^3 improves clinical outcomes and reduces sexual transmission.

Recommendations of Other Groups

In 2006, the CDC recommended routine voluntary screening for HIV in all adults ages 13 to 64 years regardless of other recognized risk factors, unless the prevalence of HIV has been documented to be less than 0.1% (31). The CDC also recommended “opt-out” HIV testing, meaning that all patients should be informed about testing and tested unless they specifically decline, without requiring prevention counseling prior to screening in order to reduce barriers to testing. In 2009, the American College of Physicians endorsed the CDC's approach (32). The Infectious Diseases Society of America recommends routine screening for HIV in all sexually active adults (33). The American Congress of Obstetricians and Gynecologists recommends routine opt-out screening in all women ages 19 to 64 years, and targeted screening in women with risk factors outside of that age range (34). The American Academy of Pediatrics recommends routine HIV testing be offered to all adolescents at least once by ages 16 to 18 years when HIV prevalence is greater than 0.1% in the community, and testing of all sexually active adolescents and those with risk factors in low-prevalence settings (35). The American Academy of Family Physicians is updating its recommendations for HIV screening.

Table 1: What the Grades Mean and Suggestions for Practice

Grade	Definition	Suggestions for Practice
A	The USPSTF recommends the service. There is high certainty that the net benefit is substantial.	Offer or provide this service.
B	The USPSTF recommends the service. There is high certainty that the net benefit is moderate or there is moderate certainty that the net benefit is moderate to substantial.	Offer or provide this service.
C	*Note: The following statement is undergoing revision.* Clinicians may provide this service to selected patients depending on individual circumstances. However, for most individuals without signs or symptoms there is likely to be only a small benefit from this service.	Offer or provide this service only if other considerations support offering or providing the service in an individual patient.
D	The USPSTF recommends against the service. There is moderate or high certainty that the service has no net benefit or that the harms outweigh the benefits.	Discourage the use of this service.
I Statement	The USPSTF concludes that the current evidence is insufficient to assess the balance of benefits and harms of the service. Evidence is lacking, of poor quality, or conflicting, and the balance of benefits and harms cannot be determined.	Read the clinical considerations section of USPSTF Recommendation Statement. If the service is offered, patients should understand the uncertainty about the balance of benefits and harms.

Table 2: Levels of Certainty Regarding Net Benefit

Level of Certainty*	Description
High	The available evidence usually includes consistent results from well-designed, well-conducted studies in representative primary care populations. These studies assess the effects of the preventive service on health outcomes. This conclusion is therefore unlikely to be strongly affected by the results of future studies.
Moderate	The available evidence is sufficient to determine the effects of the preventive service on health outcomes, but confidence in the estimate is constrained by factors such as: • The number, size, or quality of individual studies. • Inconsistency of findings across individual studies. • Limited generalizability of findings to routine primary care practice. • Lack of coherence in the chain of evidence. As more information becomes available, the magnitude or direction of the observed effect could change, and this change may be large enough to alter the conclusion.
Low	The available evidence is insufficient to assess effects on health outcomes. Evidence is insufficient because of: • The limited number or size of studies. • Important flaws in study design or methods. • Inconsistency of findings across individual studies. • Gaps in the chain of evidence. • Findings not generalizable to routine primary care practice. • A lack of information on important health outcomes. More information may allow an estimation of effects on health outcomes.

*The U.S. Preventive Services Task Force defines certainty as "likelihood that the USPSTF assessment of the net benefit of a preventive service is correct." The net benefit is defined as benefit minus harm of the preventive service as implemented in a general, primary care population. The USPSTF assigns a certainty level based on the nature of the overall evidence available to assess the net benefit of a preventive service.

References

1. Centers for Disease Control and Prevention. HIV Surveillance Report: Diagnoses of HIV Infection and AIDS in the United States and Dependent Areas, 2009. Vol. 21. Atlanta: Centers for Disease Control and Prevention; 2011. Accessed at http://www.cdc.gov/hiv/surveillance/resources/reports/2009report/ on 16 October 2012.
2. Centers for Disease Control and Prevention. HIV Surveillance Report: Diagnoses of HIV Infection and AIDS in the United States and Dependent Areas, 2010. Vol. 22. Atlanta: Centers for Disease Control and Prevention; 2012. Accessed at http://www.cdc.gov/hiv/surveillance/resources/reports/2010report/ on 16 October 2012.
3. Sanders GD, Bayoumi AM, Holodniy M, Owens DK. Cost-effectiveness of HIV screening in patients older than 55 years of age. *Ann Intern Med*. 2008;148(12):889-903.
4. Donnell D, Baeten JM, Kiarie J, Thomas KK, Stevens W, Cohen CR, et al; Partners in Prevention HSV/HIV Transmission Study Team. Heterosexual HIV-1 transmission after initiation of antiretroviral therapy: a prospective cohort analysis. *Lancet*. 2010;375(9731):2092-8.
5. Centers for Disease Control and Prevention. HIV surveillance—United States, 1981–2008. *MMWR Morb Mortal Wkly Rep*. 2011;60(21):689-93.
6. Chou R, Huffman LH, Fu R, Smits AK, Korthuis PT; US Preventive Services Task Force. Screening for HIV: a review of the evidence for the U.S. Preventive Services Task Force. *Ann Intern Med*. 2005;143(1):55-73.
7. Severe P, Juste MA, Ambroise A, Eliacin L, Marchand C, Apollon S, et al. Early versus standard antiretroviral therapy for HIV-infected adults in Haiti. *N Engl J Med*. 2010;363(3):257-65.
8. Cohen MS, Chen YQ, McCauley M, Gamble T, Hosseinipour MC, Kumarasamy N, et al; HPTN 052 Study Team. Prevention of HIV-1 infection with early antiretroviral therapy. *N Engl J Med*. 2011;365(6):493-505.
9. Emery S, Neuhaus JA, Phillips AN, Babiker A, Cohen CJ, Gatell JM, et al; Strategies for Management of Antiretroviral Therapy (SMART) Study Group. Major clinical outcomes in antiretroviral therapy (ART)-naive participants and in those not receiving ART at baseline in the SMART study. *J Infect Dis*. 2008;197(8):1133-44.
10. Cain LE, Logan R, Robins JM, Sterne JA, Sabin C, Bansi L, et al; HIV-CAUSAL Collaboration. When to initiate combined antiretroviral therapy to reduce mortality and AIDS-defining illness in HIV-infected persons in developed countries: an observational study. *Ann Intern Med*. 2011;154(8):509-15.
11. Ray M, Logan R, Sterne JA, Hernández-Díaz S, Robins JM, Sabin C, et al; HIV-CAUSAL Collaboration. The effect of combined antiretroviral therapy on the overall mortality of HIV-infected individuals. *AIDS*. 2010;24(1):123-37.

12. Kitahata MM, Gange SJ, Abraham AG, Merriman B, Saag MS, Justice AC, et al; NA-ACCORD Investigators. Effect of early versus deferred antiretroviral therapy for HIV on survival. *N Engl J Med*. 2009;360(18):1815-26.
13. May M, Sterne JA, Sabin C, Costagliola D, Justice AC, Thiébaut R, et al; Antiretroviral Therapy (ART) Cohort Collaboration. Prognosis of HIV-1-infected patients up to 5 years after initiation of HAART: collaborative analysis of prospective studies. *AIDS*. 2007;21(9):1185-97.
14. Writing Committee for the CASCADE Collaboration. Timing of HAART initiation and clinical outcomes in human immunodeficiency virus type 1 seroconverters. *Arch Intern Med*. 2011;171(17):1560-9.
15. Sterne JA, May M, Costagliola D, de Wolf F, Phillips AN, Harris R, et al; When To Start Consortium. Timing of initiation of antiretroviral therapy in AIDS-free HIV-1-infected patients: a collaborative analysis of 18 HIV cohort studies. *Lancet*. 2009;373(9672):1352-63.
16. Del Romero J, Castilla J, Hernando V, Rodríguez C, García S. Combined antiretroviral treatment and heterosexual transmission of HIV-1: cross sectional and prospective cohort study. *BMJ*. 2010;340:c2205.
17. Lu W, Zeng G, Luo J, Duo S, Xing G, Guo-Wei D, et al. HIV transmission risk among serodiscordant couples: a retrospective study of former plasma donors in Henan, China. *J Acquir Immune Defic Syndr*. 2010;55(2):232-38.
18. Eaton DK, Kann L, Kinchen S, Shanklin S, Flint KH, Hawkins J, et al; Centers for Disease Control and Prevention. Youth risk behavior surveillance—United States, 2011. *MMWR Surveill Summ*. 2012;61(4):1-162.
19. Cavazos-Rehg PA, Krauss MJ, Spitznagel EL, Schootman M, Bucholz KK, Peipert JF, et al. Age of sexual debut among US adolescents. *Contraception*. 2009;80(2):158-62.
20. Centers for Disease Control and Prevention. Sexually Transmitted Disease Surveillance, 2010. Atlanta: Centers for Disease Control and Prevention; 2011. Accessed at http://www.cdc.gov/std/stats10/default.htm on 16 October 2012.
21. Garcia-Tejedor A, Maiques V, Perales A, Lopez-Aldeguer J. Influence of highly active antiretroviral treatment (HAART) on risk factors for vertical HIV transmission. *Acta Obstet Gynecol Scand*. 2009;88(8):882-7.
22. Harris NS, Fowler MG, Sansom SL, Ruffo N, Lampe MA. Use of enhanced perinatal human immunodeficiency virus surveillance methods to assess antiretroviral use and perinatal human immunodeficiency virus transmission in the United States, 1999–2001. *Am J Obstet Gynecol*. 2007;197(3 Suppl):S33-41.
23. Townsend CL, Cortina-Borja M, Peckham CS, de Ruiter A, Lyall H, Tookey PA. Low rates of mother-to-child transmission of HIV following effective pregnancy interventions in the United Kingdom and Ireland, 2000–2006. *AIDS*. 2008;22(8):973-81.
24. Gielen AC, O'Campo P, Faden RR, Eke A. Women's disclosure of HIV status: experiences of mistreatment and violence in an urban setting. *Women Health*. 1997;25(3):19-31.
25. Friis-Møller N, Sabin CA, Weber R, d'Arminio Monforte A, El-Sadr WM, Reiss P, et al; Data Collection on Adverse Events of Anti-HIV Drugs (DAD) Study Group. Combination antiretroviral therapy and the risk of myocardial infarction. *N Engl J Med*. 2003;349(21):1993-2003.
26. Friis-Møller N, Reiss P, Sabin CA, Weber R, Monforte A, El-Sadr W, et al; DAD Study Group. Class of antiretroviral drugs and the risk of myocardial infarction. *N Engl J Med*. 2007;356(17):1723-35.
27. Sabin CA, Worm SW, Weber R, Reiss P, El-Sadr W, Dabis F, et al; DAD Study Group. Use of nucleoside reverse transcriptase inhibitors and risk of myocardial infarction in HIV-infected patients enrolled in the DAD study: a multi-cohort collaboration. *Lancet*. 2008;371(9622):1417-26.
28. Rasmussen LD, Omland LH, Pedersen C, Gerstoft J, Kronborg G, Jensen J, et al. Risk of myocardial infarction in parents of HIV-infected individuals: a population-based cohort study. *BMC Infect Dis*. 2010;10:169.
29. Bedimo RJ, Westfall AO, Drechsler H, Vidiella G, Tebas P. Abacavir use and risk of acute myocardial infarction and cerebrovascular events in the highly active antiretroviral therapy era. *Clin Infect Dis*. 2011;53(1):84-91.
30. Obel N, Farkas DK, Kronborg G, Larsen CS, Pedersen G, Riis A, et al. Abacavir and risk of myocardial infarction in HIV-infected patients on highly active antiretroviral therapy: a population-based nationwide cohort study. *HIV Med*. 2010;11(2):130-6.
31. Branson BM, Handsfield HH, Lampe MA, Janssen RS, Taylor AW, Lyss SB, et al; Centers for Disease Control and Prevention. Revised recommendations for HIV testing of adults, adolescents, and pregnant women in health-care settings. *MMWR Recomm Rep*. 2006;55(RR-14):1-17.
32. Qaseem A, Snow V, Shekelle P, Hopkins R Jr, Owens DK; Clinical Efficacy Assessment Subcommittee, American College of Physicians. Screening for HIV in health care settings: a guidance statement from the American College of Physicians and HIV Medicine Association. *Ann Intern Med*. 2009;150(2):125-31.
33. Lubinski C, Aberg J, Bardeguez AD, Elion R, Emmanuel P, Kuritzkes D, et al. HIV policy: the path forward—a joint position paper of the HIV Medicine Association of the Infectious Diseases Society of America and the American College of Physicians. *Clin Infect Dis*. 2009;48(10):1335-44.
34. American College of Obstetricians and Gynecologists. ACOG committee opinion: routine human immunodeficiency virus screening. *Obstet Gynecol*. 2008;112(2 Pt 1):401-3.
35. Committee on Pediatric AIDS; Emmanuel PJ, Martinez J. Adolescents and HIV infection: the pediatrician's role in promoting routine testing. *Pediatrics*. 2011;128(5):1023-9.

AHRQ Publication No. 12-05173-EF-3
Current as of November 2012

Internet Citation:

U.S. Preventive Services Task Force. Screening for HIV: Draft Recommendation Statement. AHRQ Publication No. 12-05173-EF-3.
http://www.uspreventiveservicestaskforce.org/draftrec.htm
