

Behavioral Counseling Interventions to Prevent Sexually Transmitted Infections: U.S. Preventive Services Task Force Recommendation Statement

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Description: Update of the U.S. Preventive Services Task Force (USPSTF) 2008 recommendation on behavioral counseling interventions to prevent sexually transmitted infections (STIs).

Methods: The USPSTF reviewed the evidence on behavioral counseling for sexual risk reduction in primary care, including interventions targeting risky sexual behaviors to prevent STIs (alone or in combination with other behaviors) in persons of any sexual orientation or level of reported sexual activity.

Population: This recommendation applies to all sexually active adolescents and to adults who are at increased risk for acquiring or transmitting STIs.

Recommendation: The USPSTF recommends intensive behavioral counseling for all sexually active adolescents and for adults who are at increased risk for STIs. (B recommendation)

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* For a list of USPSTF members, see the **Appendix** (available at www.annals.org).

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The U.S. Preventive Services Task Force (USPSTF) makes recommendations about the effectiveness of specific preventive care 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 decision making 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.

SUMMARY OF RECOMMENDATION AND EVIDENCE

The USPSTF recommends intensive behavioral counseling for all sexually active adolescents and for adults who are at increased risk for sexually transmitted infections (STIs). (B recommendation)

See the Clinical Considerations section for a description of high-risk populations.

See the **Figure** for a summary of the recommendation and suggestions for clinical practice.

Appendix Table 1 describes the USPSTF grades, and **Appendix Table 2** describes the USPSTF classification of levels of certainty about net benefit (both tables are available at www.annals.org).

RATIONALE

Importance

The Centers for Disease Control and Prevention (CDC) estimate that approximately 20 million new cases of STIs occur each year in the United States. Half of these cases occur in persons aged 15 to 24 years. Sexually transmitted infections are frequently asymptomatic, which leads persons to unknowingly transmit STIs to others. Serious sequelae of STIs include pelvic inflammatory disease, infertility, and cancer. Untreated STIs present during pregnancy or birth may cause harms to the infant, including perinatal infection, death, and serious physical and mental disabilities.

Recognition of Behavior

Primary care clinicians can identify adolescents and adults who are at increased risk for STIs. See the Clinical Considerations section for more information.

Benefits of Behavioral Counseling Interventions

The USPSTF found adequate evidence that intensive behavioral counseling interventions reduce the likelihood of STIs in sexually active adolescents and in adults who are

See also:

- Related article 1
- Summary for Patients 2

Web-Only

Figure. Behavioral counseling interventions to prevent sexually transmitted infections: clinical summary of U.S. Preventive Services Task Force recommendation.

Annals of Internal Medicine



**BEHAVIORAL COUNSELING INTERVENTIONS TO PREVENT SEXUALLY TRANSMITTED INFECTIONS
CLINICAL SUMMARY OF U.S. PREVENTIVE SERVICES TASK FORCE RECOMMENDATION**

Population	Sexually active adolescents and adults at increased risk for sexually transmitted infections (STIs)
Recommendation	Offer or refer to intensive behavioral counseling interventions to prevent STIs. Grade: B
Risk Assessment	All sexually active adolescents are at increased risk for STIs. Other risk groups include adults with current STIs or other infections within the past year, adults who have multiple sex partners, and adults who do not consistently use condoms.
Behavioral Counseling Interventions	Behavioral counseling interventions can reduce a person's likelihood of acquiring an STI. Interventions ranging in intensity from 30 min to ≥2 h of contact time are beneficial; evidence of benefit increases with intervention intensity. Interventions can be delivered by primary care clinicians or through referral to trained behavioral counselors. Most successful approaches provide basic information about STIs and STI transmission; assess risk for transmission; and provide training in pertinent skills, such as condom use, communication about safe sex, problem solving, and goal setting.
Balance of Benefits and Harms	The USPSTF concludes with moderate certainty that intensive behavioral counseling interventions to prevent STIs have a moderate net benefit in sexually active adolescents and in adults at increased risk.
Other Relevant USPSTF Recommendations	The USPSTF has issued numerous recommendations related to screening for STIs, including screening for chlamydia and gonorrhea, hepatitis B, genital herpes, HIV, and syphilis. These recommendations are available on the USPSTF Web site (www.uspreventiveservicestaskforce.org).

For a summary of the evidence systematically reviewed in making this recommendation, the full recommendation statement, and supporting documents, please go to www.uspreventiveservicestaskforce.org.

at increased risk. The USPSTF determined that this benefit is of moderate magnitude. The USPSTF also found adequate evidence that intensive interventions reduce risky sexual behaviors and increase the likelihood of condom use and other protective sexual practices.

Harms of Behavioral Counseling Interventions

The USPSTF found adequate evidence that the harms of behavioral interventions to reduce the likelihood of STIs are small at most. The primary harm is the opportunity cost associated with intensive behavioral counseling interventions.

USPSTF Assessment

The USPSTF concludes with moderate certainty that intensive behavioral counseling interventions reduce the likelihood of STIs in sexually active adolescents and in adults who are at increased risk, resulting in a moderate net benefit.

CLINICAL CONSIDERATIONS

Patient Population Under Consideration

This recommendation applies to all sexually active adolescents and to adults who are at increased risk for acquiring or transmitting STIs.

Assessment of Risk

All sexually active adolescents are at increased risk for STIs and should be counseled. Other risk groups that have been included in counseling studies include adults with current STIs or other infections within the past year, adults who have multiple sex partners, and adults who do not consistently use condoms.

Clinicians should be aware of populations with a particularly high prevalence of STIs. African Americans have the highest STI prevalence of any racial/ethnic group, and STI prevalence is higher in American Indians, Alaska Natives, and Latinos than in white persons. Increased STI prevalence rates are also found in men who have sex with men (MSM), persons with low incomes living in urban settings, current or former inmates, military recruits, persons who exchange sex for money or drugs, persons with mental illness or a disability, current or former intravenous drug users, persons with a history of sexual abuse, and patients at public STI clinics.

Behavioral Counseling Interventions

Behavioral counseling interventions can reduce a person's likelihood of acquiring an STI. Interventions ranging in intensity from 30 minutes to 2 or more hours of contact time are beneficial. Evidence of benefit increases with intervention intensity. High-intensity counseling interven-

tions (defined in the review as contact time of ≥ 2 hours) were the most effective, moderate-intensity interventions (defined as 30 to 120 minutes) were less consistently beneficial, and low-intensity interventions (defined as < 30 minutes) were the least effective. Interventions can be delivered by primary care clinicians or through referral to trained behavioral counselors.

Most successful approaches provided basic information about STIs and STI transmission; assessed the person's risk for transmission; and provided training in pertinent skills, such as condom use, communication about safe sex, problem solving, and goal setting. Many successful interventions used a targeted approach to the age, sex, and ethnicity of the participants and also aimed to increase motivation or commitment to safe sex practices. Intervention methods included face-to-face counseling, videos, written materials, and telephone support. The USPSTF did not find enough evidence to determine whether the following intervention characteristics were related independently to effectiveness: degree of cultural tailoring, group versus individual format, condom negotiation or other communication as an intervention component, counselor characteristics, setting, or type of control group.

Additional Approaches to Prevention

The CDC provides information about STI prevention, testing, and resources at www.cdc.gov/std/prevention/default.htm. It recommends that health care providers inform patients on how to reduce their risk for STI transmission, including abstinence, correct and consistent condom use, and limiting the number of sex partners. The CDC also maintains an inventory of efficacious interventions in the "Compendium of Evidence-Based HIV Behavioral Interventions" (available at www.cdc.gov/hiv/prevention/research/compendium).

The Community Preventive Services Task Force has issued several recommendations on the prevention of HIV/AIDS, other STIs, and teen pregnancy. The Community Guide discusses interventions that have been effective in school settings and for MSM (available at www.thecommunityguide.org/hiv/index.html).

The CDC Advisory Committee on Immunization Practices has issued recommendations on the control of vaccine-preventable diseases, including hepatitis B and human papillomavirus (available at www.cdc.gov/vaccines/hcp/acip-recs/index.html).

The National Coalition of Sexually Transmitted Disease Directors and the National Alliance of State and Territorial AIDS Directors developed optimal care checklists for health providers of MSM (available at www.ncsddc.org/publications/optimal-care-checklists-providers-msm-patients).

Useful Resources

The USPSTF has issued several recommendations related to screening for STIs, including screening for chlamydia and gonorrhea, hepatitis B, genital herpes, HIV, and

syphilis. These recommendations can be found at www.uspreventiveservicestaskforce.org.

OTHER CONSIDERATIONS

Implementation

Intensive behavioral counseling may be delivered in primary care settings or other sectors of the health care system. This may require referral from the primary care clinician or system. In addition, risk-reduction counseling may be offered by community organizations, schools, and health departments or their affiliated STI clinics. Despite the seriousness and prevalence of STIs, primary care clinicians often do not provide counseling about sexual activity, contraception, or STIs during routine periodic health examinations or other health care visits, and many believe that counseling is ineffective. Surveys examining STI counseling by primary care clinicians have found wide variations in practice (1). Stronger linkages between the primary care setting and the community may greatly improve the delivery of this service.

Providers should select behavioral counseling interventions on the basis of their effectiveness, appropriateness to the patient population, and feasibility of implementation. Examples of effective behavioral counseling interventions are described in the **Table**.

Research Needs and Gaps

Most of the studies identified by the USPSTF were in high-risk populations of adults or sexually active girls. Research on interventions that reduce risk for STIs in sexually active boys, prevent STIs in younger adolescents who are not yet sexually active, and reduce risk for STIs in older adults are needed. More data are needed from trials including both sexes and other broad-based interventions that could be implemented in or linked to primary care. The effectiveness of low-intensity interventions that are more practical in the typical primary care setting is another research gap. Promising approaches have been identified that need replication.

DISCUSSION

Burden of Disease

According to the CDC, approximately 20 million new cases of STIs occur each year in the United States, and half of these cases occur in persons aged 15 to 24 years (8). A 2009 nationally representative survey found that STI prevalence (not including HIV) was 24.1% among female adolescents aged 14 to 19 years and 37.7% in those who were sexually active (9). In 2010, the inflation-adjusted annual direct medical costs of STIs (including HIV) were an estimated \$16.9 billion in the United States (10). According to the CDC, STI incidence rates are consistently 8 or more times higher in African Americans than white persons (11), and African American youth accounted for 57% of all new

Table. Examples of Behavioral Counseling Interventions for STIs*

Intervention (Reference)	Study Population, Setting, and Goals	Intervention Characteristics	Intervention Package Information
HORIZONS (2)	Population: heterosexual, sexually active African American adolescent girls seeking sexual health services Setting: public community clinic Goals: reduce STIs, increase condom use, increase communication with male partners about safer sex and STIs, and increase male partners' use of STI services	Duration: two 4-h group sessions on 2 consecutive Saturdays, followed by 4 (15 min) telephone contacts approximately every 10 wk over 9 mo Delivered by: African American female health educators Methods: Discussion, exercises, games, practice, printed materials, role play, telephone reinforcement, and vouchers for STI services	An intervention package is not available at this time. For details about intervention materials, contact Dr. Ralph J. DiClemente, Department of Behavioral Sciences and Health Education, Rollins School of Public Health, Emory University, 1518 Clifton Road Northeast, Atlanta, GA 30322; e-mail, rdiclem@sph.emory.edu.
RESPECT (3)	Population: heterosexual, HIV-negative patients Setting: public STI clinics Goals: eliminate or reduce risky sexual behaviors and reduce STIs	Duration of brief counseling: two 20-min sessions (40 min total) delivered over 7 to 10 d Duration of enhanced counseling: one 20-min and three 60-min sessions (200 min total) delivered over 3 to 4 consecutive wk Delivered by: trained HIV and STI counselors Methods: Counseling, exercises, goal setting, printed materials, and risk-reduction supplies (condoms)	An intervention package was developed with funding from the CDC Replicating Effective Programs Project. The intervention package and training are available through the CDC Diffusion of Effective Behavioral Interventions Project (www.effectiveinterventions.org).
Sister to Sister (4)	Population: inner-city African American women Setting: inner-city women's health clinic Goals: eliminate or reduce sexual risk behaviors and prevent new STIs	Duration: 1 session; 200 min for the group format and 20 min for the one-on-one format Delivered by: African American female nurses with >10 y of nursing experience and working with the target population Methods: demonstration, exercises, games, group discussion, lectures and teaching, practice, printed materials, role play, and video	An intervention package for the individual-level format is currently being developed with funding from the CDC Replicating Effective Programs Project. For details on intervention materials, contact Dr. Loretta Sweet Jemmott, University of Pennsylvania School of Nursing, Claire M. Fagin Hall, 418 Curie Boulevard, Philadelphia, PA 19104; e-mail, jemmott@nursing.upenn.edu .
Video Opportunities for Innovative Condom Education & Safer Sex/VOCES (5, 6, 7)	Population: African American and Hispanic patients Setting: inner-city public STI clinic Goals: prevent new STIs and increase condom use	Duration: one 20-min video followed by one 25-min group discussion session Delivered by: gender-matched facilitators Methods: video, group discussion, risk-reduction supplies (condoms), and printed materials	An intervention package was developed with funding from the CDC Replicating Effective Programs Project. The intervention package and training are available through the CDC Diffusion of Effective Behavioral Interventions Project (www.effectiveinterventions.org).

CDC = Centers for Disease Control and Prevention; STI = sexually transmitted infection.

* Adapted from the CDC Compendium of Evidence-Based Interventions and Best Practices for HIV Prevention (available at www.cdc.gov/hiv/prevention/research/compendium).

HIV infections among persons aged 13 to 24 years in 2009 (12).

Scope of Review

To update its 2008 recommendation, the USPSTF commissioned a systematic review (1, 13) of the benefits and harms of behavioral counseling for sexual risk reduction in primary care to prevent STIs in adolescents and adults. The review included randomized, controlled trials and nonrandomized, controlled clinical trials of interventions targeting risky sexual behaviors to prevent STIs (alone or in combination with other behaviors) in adults and adolescents (including pregnant women) of any sexual orientation or level of reported sexual activity.

The review included studies that were conducted in, or recruited participants from, primary care settings, mental health clinics, reproductive health clinics (including STI clinics), or broader health care systems in developed countries. Included studies reported health outcomes (STI incidence or related illness), behavioral outcomes (changes in sexual behavior), or adverse effects of sexual risk-reduction counseling (for example, care avoidance, shame, guilt, or stigma). Included studies had to have at least 3 months of

postbaseline follow-up for all outcomes except harms. High-, moderate-, and low-intensity interventions were defined as having contact time of more than 2 hours, 30 minutes up to 2 hours, and less than 30 minutes, respectively.

Effectiveness of Counseling to Change Outcomes and Behavior

In adolescents, 7 trials (2, 3, 14–18) with 8 treatment groups ($n = 3407$) reported STI outcomes. Incidence of STIs decreased in all 8 comparisons, although results were not statistically significant in 2 trials. Pooled results showed a 62% reduction in the odds of acquiring an STI after 12 months with high-intensity counseling (odds ratio [OR], 0.38 [95% CI, 0.24 to 0.60]; $I^2 = 65\%$; $k = 5$) and a 43% reduction with the 2 moderate-intensity interventions (OR, 0.57 [CI, 0.37 to 0.86; $I^2 = 0\%$]). In all trials, most participants were not white, and most trials were limited to female participants.

In adolescents, 6 trials (2, 14, 16, 18–20) ($n = 3030$) reported sexual behavioral outcomes. Interventions yielded benefit in 3 of 5 trials reporting effects on condom use or unprotected sex and 4 of 5 trials reporting other sexual

behavior outcomes (for example, number of sex partners or use of birth control).

In adults, 19 trials (3–5, 15, 18, 21–34) ($n = 61\,909$) reported STI outcomes, 4 of which had multiple treatment groups with varying intervention intensity. High-intensity interventions resulted in a 30% reduction in the odds of acquiring an STI (OR, 0.70 [CI, 0.56 to 0.87]; $I^2 = 23\%$; $k = 9$). The pooled effects from trials of low- and moderate-intensity interventions did not show a reduction in the odds of acquiring an STI. However, 2 low- and 2 moderate-intensity interventions proved effective in preventing STIs (4, 24). For example, 1 large ($n = 40\,282$), good-quality randomized, controlled trial (24) created a 23-minute video, “Safe in the City,” that participants watched in the waiting rooms of STI clinics. The video covered basic information on HIV and STI risk and prevention and attempted to build condom use skills along with self-efficacy and positive attitudes for condom use. Vignettes of young couples of various races, ethnicities, and sexual orientations demonstrated communication about partner notification and the acquisition, negotiation, and use of condoms. This trial found a small but statistically significant reduction in the proportion of participants with an STI. After an average of almost 15 months, 4.9% of intervention participants had an STI compared with 5.7% of control group participants (adjusted hazard ratio, 0.91 [CI, 0.84 to 0.99]; unadjusted OR, 0.85 [CI, 0.73 to 0.99]), which represents a number needed to treat of 123 (CI, 68 to 1859). Planned subgroup analyses revealed that the effect was statistically significant for men (adjusted hazard ratio, 0.88 [CI, 0.80 to 0.98]) but not for women (adjusted hazard ratio, 1.02 [CI, 0.86 to 1.21]).

In adults, 21 trials reporting sexual behavioral outcomes yielded mixed results, but high-intensity interventions were fairly consistent in reporting beneficial results. In a meta-analysis of 9 trials (with 11 comparisons) (3, 21, 23, 28, 29, 34–37) reporting condom use or related outcomes, the odds of condom use increased by 29% with high-intensity interventions (OR, 1.29 [CI, 1.13 to 1.48]; $I^2 = 0\%$; $k = 4$) and by 21% with moderate-intensity interventions (OR, 1.21 [CI, 1.00 to 1.46]; $I^2 = 28\%$; $k = 4$).

The USPSTF evaluated variations in treatment effect for different population characteristics. Trials and subgroup analyses targeting adolescents were highly likely to be effective, with most showing at least a 50% decrease in the odds of acquiring an STI after behavioral counseling. The USPSTF found no consistent evidence of differential effectiveness by sex or race/ethnicity. The USPSTF also found no evidence of differential effectiveness associated with low-income setting; mental illness; or history of sexual, physical, or intimate partner abuse. However, these groups were poorly represented in available studies. Some subpopulations were also poorly represented, such as low-risk populations, adolescent boys, MSM, and American Indians or Alaska Natives. Aside from the underrepresent-

ation of important subpopulations, other limitations of the evidence review include reliance on self-reported behavioral outcomes and exclusion of comparative effectiveness studies.

The USPSTF also evaluated the effects of different intervention characteristics. Intensity was the most important factor; high-intensity interventions were most likely to be effective, moderate-intensity interventions were less consistently beneficial, and low-intensity interventions were least likely to be effective. Pooled effect estimates were similar for trials with a single session and those with more than 1 session. The USPSTF found no clear relationship between the effect size and degree of cultural tailoring, group versus individual format, condom negotiation or other communication as an intervention component, counselor characteristics, setting, or type of control group based on qualitative synthesis. The USPSTF could not isolate the importance of these features because they were not evenly distributed across the spectrum of intervention intensity or population risk.

Although most trials of low-intensity interventions did not show treatment benefit, 2 such trials effectively demonstrated a reduced odds of acquiring an STI: 1 very large trial of a video-based intervention that was powered to detect a small effect (24) and the low-intensity group of a trial of African American women (4). In the latter trial, the intervention included a 20-minute individualized and culturally sensitive counseling session with trained African American nurse educators. Incidence of STIs was lower in both of the skill-based intervention groups at 12 months (14% [high-intensity] and 15% [low-intensity]) than in the control group (27%). The 2 skill-based intervention groups were not statistically different from the 2 information-based intervention groups (19% [high-intensity] and 22% [low-intensity]). Two (3, 4) of the 4 trials that included high-intensity treatment counseling groups with low- or moderate-intensity groups were successful in reducing STI incidence in both groups and seemed to use the same interventionists for both treatment groups.

Potential Harms of Counseling

Two fair-quality studies (22, 32) and 1 good-quality trial (27) explicitly reported no adverse effects ($n = 6837$). No studies reported an overall paradoxical effect on the incidence of STIs. However, 1 study of risk-reduction counseling with rapid HIV testing showed a paradoxical, statistically significant increase in the incidence of STIs in MSM (18.7% in men who received behavioral counseling vs. 12.5% in men who received only HIV test results; adjusted risk ratio, 1.41 [98.3% CI, 1.05 to 1.90]) (27). The USPSTF found no consistent evidence that interventions increased sexual activity in adolescents.

Estimate of Magnitude of Net Benefit

The USPSTF concludes with moderate certainty that intensive behavioral counseling interventions reduce the

likelihood of STIs in sexually active adolescents and in adults who are at increased risk, resulting in a moderate net benefit.

Response to Public Comments

A draft version of this recommendation statement was posted for public comment on the USPSTF Web site from 29 April to 26 May 2014. In response to public comments, the USPSTF clarified that the recommendation applies to all sexually active adolescents and to adults who are at increased risk for STIs. The USPSTF further clarified that persons diagnosed with an STI should be considered at increased risk for subsequent STIs. The revised recommendation provides more information about treatment factors other than intensity and expanded discussion of the limitations of the available evidence. In addition, the USPSTF offered more guidance for providers on implementation of this recommendation. The USPSTF also noted the need for more information from trials in both sexes and other broad-based interventions that could be implemented in or linked to primary care, as well as interventions to reduce risk for STIs in older Americans.

UPDATE OF PREVIOUS USPSTF RECOMMENDATION

In 2008, the USPSTF recommended high-intensity behavioral counseling to prevent STIs for all sexually active adolescents and for adults who were at increased risk for STIs (B recommendation). At that time, the USPSTF also found that the evidence was insufficient to assess the balance of benefits and harms of behavioral counseling to prevent STIs in non-sexually active adolescents and in adults who were not at increased risk for STIs (I statement). This updated recommendation reaffirms that the evidence is adequate to recommend high-intensity behavioral counseling for persons who are at increased risk (including all sexually active adolescents) and recognizes that some interventions of lesser intensity are also effective.

RECOMMENDATIONS OF OTHERS

The CDC recommends that all providers routinely obtain a sexual history from their patients and encourage risk reduction using various strategies (for example, prevention counseling) (38). It also recommends that HIV prevention counseling be offered and encouraged in all health care facilities that serve patients who are at high risk (for example, STI clinics) and persons living with HIV (39).

The American Congress of Obstetricians and Gynecologists recommends discussing contraception and STIs during the initial reproductive health visit for adolescent patients (40). It also recognizes that the annual well-woman visit provides an excellent opportunity to counsel patients about maintaining a healthy lifestyle and minimizing health risks. The visit should include screening, evaluation and counseling, and immunizations based on the patient's age and risk factors (41). In addition, applying

principles of motivational interviewing (for example, prompting patients to use safe sex practices and more consistent contraception) to daily patient practices has proved effective in eliciting behavior change that contributes to positive health outcomes and improved patient-clinician communication (42). Comprehensive care, including prevention of STIs, is recommended for lesbian and bisexual patients (43); education about the risks for STIs and dispelling the perception that STI transmission between women is negligible will help these patients make informed decisions. All patients should be encouraged to use safe sex practices to reduce the risk for transmitting or acquiring STIs and HIV, such as using condoms on sex toys, gloves, and dental dams and avoiding sharing other sex paraphernalia (43). Several approaches (for example, gender-tailored and culturally appropriate interventions to reduce risk-taking behavior) can reduce the rate of HIV infection and optimize health in women of color (44). Practitioners should provide risk-reduction counseling to prevent STIs in women participating in noncoital activities (for example, mutual masturbation or anal sex) (45).

The Institute for Clinical Systems Improvement states that counseling on sexual behaviors to prevent STIs could be recommended beginning at age 12 years (46) and for higher-risk adults (47). The National Institute for Health and Care Excellence recommends one-on-one structured discussions with patients who are identified as high risk for STIs (if the health professional is trained in sexual health) or arranging these discussions with a trained practitioner (48). When appropriate, practitioners should provide one-on-one sexual advice about STI prevention and information on testing to persons younger than 18 years, including pregnant women and mothers. The American Academy of Family Physicians recommends intensive behavioral counseling for all sexually active adolescents and for adults who are at increased risk for STIs (49).

From the U.S. Preventive Services Task Force, Rockville, Maryland.

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APPENDIX: U.S. PREVENTIVE SERVICES TASK FORCE

Members of the U.S. Preventive Services Task Force at the time this recommendation was finalized† are Michael L. LeFevre, MD, MSPH, *Chair* (University of Missouri School of Medicine, Columbia, Missouri); Albert L. Siu, MD, MSPH, *Co-Vice Chair* (Mount Sinai School of Medicine, New York, and James J. Peters Veterans Affairs Medical Center, Bronx, New York); Kirsten Bibbins-Domingo, PhD, MD, *Co-Vice Chair* (University of California, San Francisco, San Francisco, California); Linda Ciofu Baumann, PhD, RN (University of Wisconsin, Madison, Wisconsin); Susan J. Curry, PhD (University of Iowa College of Public Health, Iowa City, Iowa); Karina W. Davidson, PhD, MASc (Columbia University, New York, New York); Mark Ebell, MD, MS (University of Georgia, Athens, Georgia); Francisco A.R. Garcia, MD, MPH (Pima County Department of

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† For a list of current Task Force members, go to www.uspreventiveservicestaskforce.org/members.htm.

Appendix Table 1. What the USPSTF 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/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/provide this service.
C	The USPSTF recommends selectively offering or providing this service to individual patients based on professional judgment and patient preferences. There is at least moderate certainty that the net benefit is small.	Offer/provide this service for selected patients depending on individual circumstances.
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 the USPSTF Recommendation Statement. If the service is offered, patients should understand the uncertainty about the balance of benefits and harms.

Appendix Table 2. USPSTF 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 such factors as: the number, size, or quality of individual studies; inconsistency of findings across individual studies; limited generalizability of findings to routine primary care practice; and 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 that are not generalizable to routine primary care practice; and a lack of information on important health outcomes. More information may allow an estimation of effects on health outcomes.

* The USPSTF 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 on the basis of the nature of the overall evidence available to assess the net benefit of a preventive service.