

Screening for Chlamydial Infection: U.S. Preventive Services Task Force Recommendation Statement

U.S. Preventive Services Task Force*

Description: Update of 2001 U.S. Preventive Services Task Force (USPSTF) recommendations about screening sexually active adolescents and adults for chlamydial infection.

Methods: The USPSTF weighed the benefits (improved fertility, pregnancy outcomes, and infection transmission) and harms (anxiety, relationship problems, and unnecessary treatment of false-positive results) of chlamydial screening identified in their 2001 recommendations and the accompanying systematic review of English-language articles published between July 2000 and July 2005.

Recommendations: Screen for chlamydial infection in all sexually active nonpregnant young women age 24 years or younger and for older nonpregnant women who are at increased risk. (A recommendation)

Screen for chlamydial infection in all pregnant women age 24 years or younger and in older pregnant women who are at increased risk. (B recommendation)

Do not routinely screen for chlamydial infection in women age 25 years or older, regardless of whether they are pregnant, if they are not at increased risk. (C recommendation)

Current evidence is insufficient to assess the balance of benefits and harms of screening for chlamydial infection for men. (I statement)

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*For a list of the members of the U.S. Preventive Services Task Force, see the Appendix (available at www.annals.org).

The U.S. Preventive Services Task Force (USPSTF) makes recommendations about preventive care services for patients without recognized signs or symptoms of the target condition.

The USPSTF bases its recommendations on a systematic review of the evidence of the benefits and harms and an assessment of the net benefit of the service.

The USPSTF recognizes that clinical or policy decisions involve more considerations than this body of evidence alone. Clinicians and policymakers should understand the evidence but individualize decision making to the specific patient or situation.

See also:

Print

Related article. 135
Summary for Patients. I-44

Web-Only

Appendix
Conversion of figure and tables into slides
Audio summary
Downloadable recommendation summary

SUMMARY OF RECOMMENDATION AND EVIDENCE

The USPSTF recommends screening for chlamydial infection for all sexually active nonpregnant young women age 24 years or younger and older nonpregnant women who are at increased risk (**Figure**). This is a **grade A** recommendation.

The USPSTF recommends screening for chlamydial infection for all pregnant women age 24 years or younger and for older pregnant women who are at increased risk (**Figure**). This is a **grade B** recommendation.

The USPSTF recommends against routinely screening for chlamydial infection for women age 25 years or older, regardless of whether they are pregnant, if they are not at increased risk (**Figure**). This is a **grade C** recommendation.

The USPSTF concludes that the current evidence is insufficient to assess the balance of benefits and harms of screening for chlamydial infection for men (**Figure**). This is an **I statement**.

See **Table 1** for a description of the USPSTF grades and **Table 2** for a description of the USPSTF classification of levels of certainty regarding net benefit. Both are also available at www.annals.org.

See the Clinical Considerations section for discussion of assessing risk for chlamydial infection in women and suggestions for practice regarding screening for men.

RATIONALE

Importance

Chlamydial infection is the most common sexually transmitted bacterial infection in the United States. In women, genital chlamydial infection may result in urethritis, cervicitis, pelvic inflammatory disease (PID), infertility, ectopic pregnancy, and chronic pelvic pain. Chlamydial infection during pregnancy is related to adverse pregnancy outcomes, including miscarriage, premature rupture of membranes, preterm labor, low birth weight, and infant mortality.

Detection

The USPSTF found fair evidence that nucleic acid amplification tests (NAATs) can identify chlamydial infection in asymptomatic men and women, including asymptomatic pregnant women, with high test specificity. In low-prevalence populations, however, a positive test result is more likely to be false positive than true positive, even with the most accurate tests available.

Benefits of Detection and Early Intervention

Nonpregnant Women at Increased Risk

There is good evidence that screening for chlamydial infection in nonpregnant women who are at increased risk can reduce the incidence of PID. The USPSTF concluded that the benefits of screening nonpregnant women at increased risk are substantial.

Pregnant Women at Increased Risk

There are no studies evaluating the effectiveness of screening for chlamydial infection in pregnant women who are at increased risk. The USPSTF, however, found that 1) screening identifies infection in asymptomatic pregnant women, 2) there is a relatively high prevalence of infection among pregnant women who are at increased risk, and 3) there is fair evidence of improved pregnancy and birth outcomes for women who are treated for chlamydial infection. The USPSTF concluded that the benefits of screening pregnant women who are at increased risk are substantial.

Women Not at Increased Risk

The USPSTF identified no studies documenting the benefits of screening women, including pregnant women, who are not at increased risk for chlamydial infection. While recognizing the potential benefit to women identified through screening, the USPSTF concluded that the overall benefit of screening would be small, given the low prevalence of infection among women not at increased risk.

Men

While concluding that the direct benefit of screening in men was likely to be small, the USPSTF noted that screening for chlamydial infection in men may be benefi-

cial if it were to lead to a decreased incidence of chlamydial infection in women. The USPSTF did not, however, find evidence to support this outcome and therefore concluded that the benefits of screening men are unknown. The USPSTF identified this as a critical gap in the evidence.

Harms of Detection and Early Treatment

The USPSTF concluded that the harms of screening for chlamydial infection are small, although few studies have been published on this subject. Potential harms include anxiety and relationship problems arising from false-positive results and overtreatment. The USPSTF identified the lack of evidence related to potential harms of screening as a gap in the evidence.

The USPSTF reached the following conclusions:

For *nonpregnant women at increased risk*, the certainty is high that the benefits of screening for chlamydial infection substantially outweigh the harms. This is a **grade A** recommendation.

For *pregnant women at increased risk*, the certainty is moderate that the benefits substantially outweigh the harms of screening for chlamydial infection. This is a **grade B** recommendation.

For *women not at increased risk (including pregnant women not at increased risk)*, the certainty is moderate that the benefits outweigh the harms of screening to only a small degree. There may be considerations that support screening an individual patient. This is a **grade C** recommendation.

For *men*, the benefits of screening are not known; thus, the USPSTF could not determine the balance of benefits and harms of screening men for chlamydial infection. This is an **I statement**.

CLINICAL CONSIDERATIONS

Patient Population under Consideration

These recommendations target all sexually active individuals, including adolescents and pregnant women.

Assessment of Risk

All sexually active women 24 years of age or younger, including adolescents, are at increased risk for chlamydial infection. In addition to sexual activity and age, other risk factors for chlamydial infection include a history of chlamydial or other sexually transmitted infection, new or multiple sexual partners, inconsistent condom use, and exchanging sex for money or drugs. Risk factors for pregnant women are the same as for nonpregnant women. Prevalence of chlamydial infection varies widely among patient populations. African-American and Hispanic women have a higher prevalence of infection than the general population in many communities and settings. Among men and women, increased prevalence rates are also found in incarcerated populations, military recruits, and patients at public sexually transmitted infection clinics.

Screening Tests

Nucleic acid amplification tests have high specificity and sensitivity when used as screening tests for chlamydial infection. Nucleic acid amplification tests can be used with urine and vaginal swabs, enabling screening when a pelvic examination is not performed.

Treatment

Appropriate treatment of chlamydial infection has been outlined by the Centers for Disease Control and Prevention (CDC) (www.cdc.gov/std/treatment). In its 2006 sexually transmitted disease treatment guidelines, the CDC recommends that chlamydia infection be treated with 1 g of azithromycin in a single oral dose or with oral doxycycline, 100 mg twice daily for 7 days. Pregnant women with chlamydial infection may be treated with 1 g of azithromycin in a single oral dose or amoxicillin, 500 mg orally 3 times daily for 7 days (1). Because the CDC updates these recommendations regularly, clinicians are encouraged to access the CDC Web site (www.cdc.gov/std/treatment) to obtain the most up-to-date information.

To prevent recurrent transmission, clinicians should ensure that all sexual partners of infected individuals are tested and treated if infected, or treated presumptively.

Screening Intervals

Screening pregnant women who are at increased risk for chlamydial infection is recommended at the first prenatal visit. For pregnant women who remain at increased risk and for those who acquire a new risk factor, such as a new sexual partner, a screening should be conducted during the third trimester. The optimal interval for screening for nonpregnant women is unknown. The CDC recommends at least annual screening for women at increased risk (1).

Suggestions for Practice with regard to Insufficient Evidence on Screening in Men

The USPSTF concluded that the evidence is insufficient to determine the balance of benefits and harms related to screening men for chlamydial infection. Specifically, the USPSTF did not find evidence that screening programs that target men result in a decreased incidence of infection in women. The USPSTF notes that programs that screen men as a means of reducing transmission to women are not common practice, that primary care clinicians can institute screening in men, that the costs of additional screening tests per individual are relatively low, and that the potential harms of screening are small. The USPSTF recognizes that asymptomatic, untreated infections in men provide a reservoir of infection that may make it difficult to improve health outcomes in women through screening programs that target only women. However, given the low national rates of screening in women at risk, the USPSTF believes that clinicians and health care systems should focus on improving the screening rates among women at increased risk, a group in which the benefits of screening are certain.

Other Approaches to Prevention

Primary care clinicians and the health care systems in which they work are responsible for ensuring that asymptomatic women at risk for chlamydial infection are screened. In some communities, this may involve home- or school-based screening programs.

Useful Resources

See other USPSTF recommendations on screening for sexually transmitted infections (hepatitis B and C virus infection, HIV, genital herpes simplex, gonorrhea, and syphilis) at www.preventiveservices.ahrq.gov.

OTHER CONSIDERATIONS

Health Care System Needs

Screening rates for chlamydial infection among young women in the United States remain very low. Public health organizations, health care systems, and clinicians must work together to develop and implement effective programs to ensure that all women at increased risk are screened for chlamydial infection.

Research Needs

There is a critical gap in the evidence relating to whether chlamydia screening programs that target men decrease the incidence of infection among women. Additional research is also needed to determine the most effective intervals for screening nonpregnant women, including the potential for different follow-up intervals for women with positive or negative test results. Continued research is also needed on the potential harms of screening.

DISCUSSION

Burden of Disease

Chlamydia trachomatis infection is the most commonly reported sexually transmitted infection in the United States. In women, chlamydial infections commonly result in cervicitis and urethritis. Untreated cases of *C. trachomatis* infection in women frequently progress to PID. This disease, in turn, can lead to ectopic pregnancy, infertility, and chronic pelvic pain. Chlamydial infection during pregnancy is associated with adverse outcomes, including miscarriage, premature rupture of membranes, preterm labor, low birth weight, infant mortality, neonatal chlamydial infection, and postpartum endometritis. Chlamydial infection in men can cause nongonococcal urethritis and acute epididymitis, and in rare instances may result in urethral strictures and the Reiter syndrome. In both men and women, chlamydial infection is usually asymptomatic and, as with other inflammatory sexually transmitted infection, chlamydial infection facilitates the transmission of HIV infection among both men and women in both the HIV carrier and recipient (2).

In 2004, 929 462 chlamydial infections were reported to the CDC. Unlike gonorrhea, the number of cases of chlamydial infection reported to the CDC has increased

Figure. Screening for chlamydial infection.

Annals of Internal Medicine

Screening for Chlamydial Infection



Population	Nonpregnant Women		Pregnant Women		Men
	Age 24 years or younger Includes adolescents	Age 25 years or older Not at increased risk	Age 24 years or younger Includes adolescents	Age 25 years or older Not at increased risk	
Recommendation	A Screen if sexually active	C At increased risk Screen if sexually active	B Screen	C At increased risk Screen	No recommendation due to insufficient evidence*
Risk assessment	<p>Age: Women and men age 24 years or younger are at greatest risk.</p> <p>History of: previous chlamydial infection or other sexually transmitted infections, new or multiple sexual partners, inconsistent condom use, sex work.</p> <p>Demographics: African-American and Hispanic women and men have higher prevalence rates than the general population in many communities.</p>				
Screening tests	<p>Nucleic acid amplification tests (NAATs) can identify chlamydial infection in asymptomatic women (nonpregnant and pregnant) and asymptomatic men. NAATs have high specificity and sensitivity and can be used with urine and vaginal swabs.</p>				
Screening intervals	Nonpregnant Women		Pregnant Women		Men
	The optimal interval for screening is not known. The Centers for Disease Control and Prevention (CDC) recommends that women at increased risk be screened at least annually. [†]		Women 24 years or younger and older women at increased risk: Screen at the first prenatal visit. Patients at continuing risk or who are newly at risk: Screen in the third trimester.		Not applicable
Treatment	The CDC has outlined appropriate treatment: www.cdc.gov/STD/treatment . Test and/or treat partners of patients treated for chlamydial infection.				

For a summary of the evidence systematically reviewed in making these recommendations, the full recommendation statement, and supporting documents, please go to www.preventiveservices.hhs.gov. *Chlamydial infection results in few sequelae in men. Therefore, the major benefit of screening men would be to reduce the likelihood that infected and untreated men would pass the infection to sexual partners. There is no evidence that screening men reduces the long-term consequences of chlamydial infection in women. Because of this lack of evidence, the USPSTF could not assess the balance of benefits and harms and concluded that the evidence is insufficient to recommend for or against routinely screening men. †Information from reference 1.

Table 1. What the U.S. Preventive Services Task Force 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	The USPSTF recommends against routinely providing the service. There may be considerations that support providing the service in an individual patient. There is at least moderate certainty that the net benefit is small.	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.

* 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 based on the nature of the overall evidence available to assess the net benefit of a preventive service. USPSTF = U.S. Preventive Services Task Force.

Table 2. U.S. Preventive Services Task Force 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 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 lack of information on important health outcomes More information may allow estimation of effects on health outcomes.

* The U.S. Preventive Services Task Force (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 based on the nature of the overall evidence available to assess the net benefit of a preventive service.

steadily over the past 10 years. This increase is thought to be due to a combination of increased screening, more sensitive screening tests, and increased emphasis on reporting rather than an increasing incidence of infection. Since 2000, all 50 states and the District of Columbia have instituted regulations requiring that cases of chlamydial infection be reported to the CDC. Because many cases continue to remain undetected and unreported, the actual number of new cases of chlamydial infection is thought to be more than 2.8 million per year (2).

Sexually active young women are at highest risk for chlamydial infection. Women age 24 years or younger are more than 5 times as likely as women older than age 30 years to be infected. Although chlamydial infection is widely distributed among all racial and ethnic groups in the United States, higher prevalence rates are found in African-American and Hispanic persons. Other risk factors include a history of chlamydial infection or other sexually transmitted infections, new or multiple sexual partners, inconsistent condom use, and sex work. Risk factors for pregnant women are the same as those for nonpregnant women (2).

Scope of Review

In 2005, to update its 2001 recommendation on screening for chlamydial infection, the USPSTF reviewed the literature published on this topic between July 2000 and July 2005. The review focused on a systematic search for direct evidence of the effect of screening in asymptomatic individuals on health outcomes.

Assessment of Evidence

The 2001 USPSTF recommendation supporting screening of women at increased risk for chlamydial infection was based largely on the results of a good-quality randomized, controlled trial of screening in a managed care organization. This trial found that screening and treatment of young women at risk for chlamydial infection reduced the incidence of PID at 1 year of follow-up (3). In its update, the USPSTF found only 1 study addressing the effectiveness of screening for chlamydial infection among nonpregnant women at increased risk. In a cluster randomized trial, Ostergaard and colleagues (4) found that a 1-time home-based screening intervention was associated with a lower prevalence of chlamydial infection and fewer reported cases of PID at 1 year of follow-up. This study was rated as being of poor quality because of significant loss to follow-up; nonetheless, its findings were in line with those of the earlier study. In its earlier review and in 2005, the USPSTF did not find any studies evaluating health outcomes related to screening programs in nonpregnant women not at increased risk for infection, pregnant women, or men.

The USPSTF considered each link in the evidence chain for a screening service to make its recommendation (For a further discussion of USPSTF methods, see www.ahrq.gov/clinic/ajpmsuppl/harris1.htm and the accompanying papers in this issue [5, 6]). These included the accu-

racy of screening tests, the effectiveness of treatment, estimation of the potential magnitude of benefit from screening, and bounding of the potential for harms of screening and treatment. (The term *bounding* comprises the severity of the harm, the prevalence of the harm, and how precise the data are on which estimates from it are based.)

The USPSTF recommends screening for chlamydial infection in all sexually active nonpregnant women age 24 years or younger. This represents a change in age from the previous USPSTF recommendation on chlamydia screening. This was done to align the recommendation with the evidence in support of screening, including national surveillance data assembled by the CDC.

Accuracy of Screening Tests

In 2001, the USPSTF conducted a systematic review of the evidence related to screening technologies and concluded that the body of evidence was fair. The USPSTF noted at that time that many studies were performed under optimal conditions and that most studies did not include large screening populations with low prevalence rates. While noting that NAATs had higher sensitivities and specificities than older antigen detection tests and better sensitivities than culture, the USPSTF did not offer any specific clinical guidance on what type of testing should be used. In 2002, the CDC published recommendations concluding that NAATs be used when screening for chlamydial infection in both women and men (7). Cook and colleagues (8) performed a systematic review of noninvasive testing for chlamydial infection in 2005 and concluded that urine-based screening using NAATs had comparable sensitivity and specificity to cervical and urethral specimens.

Effectiveness of Treatment

The USPSTF recognizes the clinical benefits of treatment of chlamydial infection in women with recognized infection and therefore did not perform a systematic review of the evidence of treatment. In 2001, the USPSTF found fair evidence that treatment of chlamydial infection during pregnancy improves pregnancy outcomes (9). The USPSTF assessed the potential benefit of treating women with chlamydial infection as substantial.

Harms

The USPSTF found no direct evidence of the harms of chlamydia screening programs. Several small qualitative studies, however, describe how women in whom chlamydial infection is diagnosed (including women who did not receive a diagnosis as part of screening programs) experience anxiety and have significant concerns about their relationships with male partners. The CDC recently commissioned a study of the harms of screening for sexually transmitted infections, including the harms associated with a false-positive diagnosis. The harms associated with treatment of chlamydial infection are mild to moderate gastrointestinal symptoms, including nausea, diarrhea, and ab-

dominal pain (9). The USPSTF bounded the harms of screening and treatment in men, women, and pregnant women as small.

Estimate of Magnitude of Net Benefit

In considering the potential magnitude of benefit from a screening program for chlamydial infection among women, the USPSTF noted the documented effectiveness of programs that screen nonpregnant women at increased risk and concluded with high certainty that the benefits are substantial. The USPSTF also concluded with moderate certainty that the benefits of screening among pregnant women at increased risk are substantial. Given the substantial benefits and small harms, the USPSTF recommends screening for chlamydial infection in all women at increased risk, including pregnant women.

Women not at increased risk who are found to have chlamydial infection through screening programs are likely to benefit from treatment. Nevertheless, the USPSTF concluded with moderate certainty that given the low prevalence of infection among such women, the overall benefits are likely to be small. Balancing the small benefits and small harms, the USPSTF does not recommend routine screening for chlamydial infection in women not at increased risk for infection, including pregnant women not at increased risk.

Although the direct benefits to men from screening and treatment are relatively small, if benefits are found among women resulting from screening in men, the potential benefits to society are very large. In considering the magnitude of benefit in screening men for chlamydial infection, the USPSTF identified a significant evidence gap. It is not known whether screening programs for men improve health outcomes in women. Therefore, the USPSTF found insufficient evidence to make a recommendation regarding screening for chlamydia infection in men.

RECOMMENDATIONS OF OTHERS

The American Academy of Family Physicians (AAFP), American College of Obstetricians and Gynecologists (ACOG), American College of Preventive Medicine (ACPM), Canadian Task Force on Preventive Health, and CDC all recommend screening for chlamydia in women at increased risk for chlamydial infection. The ACPM and Canadian Task Force recommend screening all pregnant women, whereas the AAFP and ACOG recommend screening pregnant women who are at increased risk for chlamydial infection. The CDC also recommends at least annual screening for chlamydia in men who have sex with men.

The Web sites of these organizations provide further information.

American Academy of Family Physicians (2001): www.aafp.org/PreBuilt/RCPS_August2005.pdf

American College of Obstetricians and Gynecologists (2002 and 2003): www.acog.org/publications/guidelines/ForPerinatalCare and www.acog.org/publications/committee_opinions/co292.cfm

American College of Preventive Medicine Practice Policy Statement (2003): www.acpm.org/chlamydia.pdf

Canadian Task Force on Preventive Health Care (1996): www.ctfphc.org

Centers for Disease Control and Prevention (2006): www.cdc.gov/std/treatment

From the U.S. Preventive Services Task Force, Agency for Healthcare Research and Quality, Rockville, Maryland.

Disclaimer: Recommendations made by the USPSTF are independent of the U.S. government. They should not be construed as an official position of the Agency for Healthcare Research and Quality or the U.S. Department of Health and Human Services.

Potential Financial Conflicts of Interest: None disclosed.

Requests for Single Reprints: Reprints are available from the USPSTF Web site (www.preventiveservices.ahrq.gov) and from the Agency for Healthcare Research and Quality Publication Clearinghouse (800-358-9295 or e-mail at AHRQPubs@ahrq.hhs.gov).

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APPENDIX: U.S. PREVENTIVE SERVICES TASK FORCE

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[†]Members of the Task Force at the time this recommendation was finalized. For a list of current Task Force members, go to www.ahrq.gov/clinic/uspstfab.htm.