Screening for Chlamydial Infection

Recommendations and Rationale

U.S. Preventive Services Task Force

This statement summarizes the current U.S. Preventive Services Task Force (USPSTF) recommendations for screening for chlamydial infection and the supporting scientific evidence, and it updates the 1995 recommendations contained in the *Guide to Clinical Preventive Services*, second edition.[1] Explanations of the ratings and of the strength of overall evidence are given in Appendix A and Appendix B, respectively. The complete information on which this statement is based, including evidence tables and references, is available in the article Screening for Chlamydial Infection[2] (which follows this recommendation) and in the Systematic Evidence Review[3] on this topic. These documents, along with reprints, can be obtained through the USPSTF Web site (www.ahrq.gov/clinic/uspstfix.htm), through the National Guideline Clearinghouse™ (www.guideline.gov), or in print through the AHRQ Publications Clearinghouse (call 1-800-358-9295 or e-mail ahrqpubs@ahrq.gov).

This first appeared in *Am J Prev Med.* 2001;20(suppl 3):90-93.

Summary of Recommendations

- The U.S. Preventive Services Task Force (USPSTF) strongly recommends that clinicians routinely screen all sexually active women aged 25 and younger, and other asymptomatic women at increased risk for infection, for chlamydial infection. (see "Clinical Considerations" for discussion of risk factors). **A recommendation.**

The USPSTF found good evidence that screening women at risk for chlamydial infection reduces the incidence of pelvic inflammatory disease and fair evidence that community-based screening reduces prevalence of chlamydial infection. The USPSTF concludes that the benefits of screening substantially outweigh the potential harms (see "Potential Adverse Effects of Screening" for discussion of potential harms).

- The USPSTF makes no recommendation for or against routinely screening asymptomatic low-risk women in the general population for chlamydial infection. **C recommendation.**

The USPSTF found at least fair evidence that screening low-risk women could detect some additional cases of Chlamydia trachomatis, *but concludes that the potential benefits of screening low-risk women may be small and may not justify the possible harms.*

- The USPSTF recommends that clinicians routinely screen asymptomatic pregnant women aged 25 and younger and others at increased risk for infection for chlamydial infection (see "Clinical Considerations" for discussion of risk factors in pregnancy). **B recommendation.**

The USPSTF found at least fair evidence that screening and treatment of women at risk for chlamydial infection improves pregnancy outcomes and concludes that the benefits of screening outweigh potential harms.

- The USPSTF makes no recommendation for or against routine screening of asymptomatic, low-

Corresponding Author: Alfred O. Berg, MD, MPH, Chair, U.S. Preventive Services Task Force, c/o David Atkins, MD, MPH, Chief Medical Officer, U.S. Preventive Services Task Force, Agency for Healthcare Research and Quality, Center for Practice and Technology Assessment, 6010 Executive Boulevard, Suite 300, Rockville, MD 20852. (301) 594-4016, fax (301) 594-4027, E-mail: datkins@ahrq.gov

risk pregnant women aged 26 and older for chlamydial infection. **C recommendation.**

The USPSTF found fair evidence that the benefits of screening low-risk pregnant women are small and may not justify the possible harms.

- The USPSTF concludes that the evidence is insufficient to recommend for or against routinely screening asymptomatic men for chlamydial infection. **I recommendation.**

No direct evidence was found to determine whether screening asymptomatic men for chlamydial infection is effective for reducing the incidence of new infections in women. The benefits and harms of screening men cannot be determined, but the potential magnitude of benefits could be large if the effectiveness of screening men can be demonstrated.

Clinical Considerations

- **Women and adolescents through age 20 years are at highest risk for chlamydial infection, but most reported data indicate that infection is prevalent among women aged 20 to 25 years.** Age is the most important risk marker. Other patient characteristics associated with a higher prevalence of infection include being unmarried, African American race, having a prior history of sexually transmitted disease (STD), having new or multiple sexual partners, having cervical ectopy, and using barrier contraceptives inconsistently. Individual risk depends on the number of risk markers and local prevalence of the disease. Specific risk-based screening protocols need to be tested at the local level.
- **Clinicians should consider the characteristics of the communities they serve in determining appropriate screening strategies for their patient population.** More targeted screening may be indicated in specific settings as better prevalence data become available. Prevalence of chlamydial infection varies widely among communities and patient populations. Knowledge of the patient population is the best guide to developing a screening strategy. Local public health authorities can be a source of valuable information.
- **The optimal interval for screening is uncertain.** For women with a previous negative screening test, the interval for re-screening should take into account changes in sexual partners. If there is evidence that a woman is at low risk for infection (eg, in a mutually monogamous relationship with a previous history of negative screening tests for chlamydial infection), it may not be necessary to screen frequently. Re-screening at 6 to 12 months may be appropriate for previously infected women because of high rates of reinfection.
- **The optimal timing of screening in pregnancy is also uncertain.** Screening early in pregnancy provides greater opportunities to improve pregnancy outcomes, including low birth weight and premature delivery; however, screening in the third trimester may be more effective at preventing transmission of chlamydial infection to the infant during birth. The incremental benefit of repeated screening is unknown.
- **Screening high-risk young men is a clinical option.** Until the advent of urine-based screening tests, routine screening of men was rarely performed. As a result, very little evidence regarding the efficacy of screening in men in reducing infection among women exists. Trials are underway to assess the effectiveness of screening asymptomatic men. The choice of specific screening technique is left to clinical judgment.

  Choice of test will depend on issues of cost, convenience, and feasibility, which may vary in different settings. Although specificity is high with most approved tests, false-positive results can occur with all non-culture tests and rarely with culture tests. The Centers for Disease Control and Prevention (CDC) is developing laboratory guidelines that outline the advantages and disadvantages of available tests. These guidelines will be available at www.cdc.gov.

- **Partners of infected individuals should be tested and treated if infected or treated presumptively.**
- **Clinicians should remain alert for findings suggestive of chlamydial infection during pelvic examination of asymptomatic women (eg, discharge, cervical erythema, and cervical friability).**
- **Clinicians should be sensitive to the potential effect of diagnosing a sexually transmitted disease on a couple.**

  To prevent false-positive results, confirmatory testing may be appropriate in settings with low population prevalence.

Scientific Evidence

Epidemiology and Clinical Consequences

Chlamydia trachomatis is the most common sexually transmitted bacterial pathogen in the United States. There are estimated to be 3 million new infections each year. Chlamydial infection can cause urethritis, cervicitis, pelvic inflammatory disease (PID), and result in ectopic pregnancy, infertility, and chronic pelvic pain in women. In men, chlamydial infection can cause nongonococcal urethritis, acute epididymitis, and result in infertility, chronic prostatitis, reactive arthritis, and urethral strictures. In pregnant women, chlamydial infection is associated with adverse pregnancy outcomes, including preterm delivery and postpartum endometritis; perinatal transmission to infants can cause neonatal conjunctivitis and pneumonia. Chlamydial infection increases the risk of acquiring HIV infection.

Seventy percent to 90% of women and a large percentage of men with chlamydial infection are asymptomatic. The prevalence of asymptomatic infection varies widely depending on the population tested and individual characteristics and risk factors, ranging from 4% to 12% among female family planning clinic patients, 9% among female Army recruits, and 2% to 7% among female college students. Significant declines in prevalence have been noted over the last 10 years in areas where screening programs have been in place.

Accuracy and Reliability of Screening Test

A number of tests are available to identify chlamydial infection that use endocervical or urethral swab specimens and urine specimens. Until recently, culture has been accepted as the most specific test but it requires specialized handling and laboratory services. Antigen detection tests (direct fluorescent antibody [DFA] assay and enzyme immunoassay [EIA]) and non-amplified nucleic acid hybridization, as well as newer technologies based on amplified DNA assays (polymerase chain reaction [PCR], ligase chain reaction [LCR], strand displacement assay [SDA], hybrid capture system [HCS] and transcription-mediated amplification [TMA] of RNA) may provide improved sensitivity, lower expense, availability, or timeliness of results over culture. New tests that use urine specimens provide a noninvasive method of screening both men and women. Self-administered vaginal and vulval-introital swabs using PCR and LCR, including submitting samples by mail, are being used in research settings. The sensitivities and specificities of nucleic acid amplification tests are all high, ranging from 82% to 100%. The sensitivity of antigen detection tests (EIA, DFA) is slightly lower (70% to 80%) but specificity remains high (96% to 100%).

Effectiveness of Early Detection

The strongest evidence supporting screening is a well-designed randomized trial demonstrating that screening women at risk (prevalence of infection 7%) reduced the incidence of PID from 28 per 1,000 woman-years to 13 per 1,000 woman-years. The prevalence of chlamydial infection has declined in populations that have been targeted by screening programs (primarily women attending family planning and other publicly funded clinics). In addition, 2 ecological analyses in Europe reported reductions in ectopic pregnancy and PID with the advent of community-based screening for chlamydial

infection. There is little evidence of the effectiveness of screening asymptomatic women who are not in high-risk groups.

There is fair evidence indicating that screening for chlamydial infection among asymptomatic high-risk pregnant women and subsequent treatment improves pregnancy outcomes. Two non-randomized trial studies demonstrated improved pregnancy outcomes following treatment of chlamydial infection: fewer premature rupture of membranes, fewer low birth weights, higher infant survival, and fewer small-for-gestational age births. There is little evidence regarding the effectiveness of screening and treatment of asymptomatic pregnant women who are not in high-risk groups.

There is good evidence showing that treatment of men can eradicate chlamydial infection. Unfortunately, there are no studies describing the effectiveness of screening or early treatment of men in reducing acute infection and sequelae in men or women.

Potential Adverse Effects of Screening

No studies were identified that directly examined adverse effects of screening. Potential harms include adverse effects of both false-positive and true-positive diagnoses of STD on patients and their partners, the inconvenience of pelvic examinations for tests employing cervical specimens, and the potential harms of adverse reactions from antibiotic treatment. There may be added cost for confirmation of positive results and testing of partners.

Cost-Effectiveness of Screening

Evaluation of cost-effectiveness of a specific screening strategy considers test performance, cost, treatment and disease outcomes, prevalence of infection in the screened population, and other factors. The USPSTF identified 8 cost-effectiveness or cost-benefit analyses that examined screening in nonpregnant and pregnant women. These analyses suggest that screening may be cost-saving when conducted among nonpregnant women who are at moderate to high risk of chlamydial infection. These studies also suggest that selective screening is more likely to be cost-effective than universal screening, and that less expensive and more sensitive DNA or RNA tests would improve cost-effectiveness when compared with culture. However, because of inconsistencies in methodology and assumptions made in these cost analyses, the USPSTF concludes that available evidence on cost-effectiveness is insufficient to guide specific screening recommendations. An interactive model that allows clinicians to compare the cost-effectiveness of different screening strategies is available at www.cdc.gov/nchstp/dstd/HEDIS.htm.

Discussion

The introduction of sensitive, easy-to-use tests has increased the primary care physician's ability to incorporate screening for chlamydial infection into the routine care of younger women, and there is now good evidence that screening can produce important clinical benefits. Important gaps remain, however, in the information needed to guide screening in the primary care setting. Both benefits and cost-effectiveness of screening increase with the prevalence of infection, which varies markedly between communities. There is no agreement, however, on the precise prevalence that justifies screening. Clinical strategies to identify women at risk need to balance feasibility and specificity: more detailed risk assessments may yield more specific information but be harder to implement than asking questions about age and marital status. Moreover, better data on the prevalence and incidence of infection in community practice are needed to develop optimal strategies for screening in a general practice.

The advent of urine-based tests allows for routine specimen collection without a pelvic examination, which may increase acceptability to patients and providers. Urine screening has also spurred interest in screening young men. Asymptomatic young men are an important reservoir for infection and are less likely than women to be detected in the course of usual care. Whether targeting men will be an effective and cost-effective strategy for reducing the

burden of disease in women will depend on additional factors that have not been adequately studied, including compliance with therapy, referral of female partners, infectivity of asymptomatic men, and rates of reinfection following treatment. Trials are underway to assess the role of screening men as one strategy for controlling chlamydial infection.

Recommendations of Others

The Canadian Task Force on Preventive Health Care[4] recommends that all members of high-risk groups be screened for chlamydial infection. The CDC[5] recommends at least routine annual screening for sexually active women under age 20, for women aged 20 to 24 years who meet either of the following criteria: inconsistent use of a barrier contraceptive or more than one sexual partner during the last 3 months, and for women older than age 24 who meet both criteria of inconsistent use of a barrier contraceptive and more than one sexual partner during the last 3 months. The American College of Obstetricians and Gynecologists[6] recommends routine screening for chlamydial infection for all sexually active adolescents and other asymptomatic women at high risk for infection. In 2000, annual chlamydia screening of sexually active women between the ages of 15 and 25 years was added to the National Committee for Quality Assurance Health Plan Employer Data and Information Set (HEDIS)[7] quality measures.

References

1. U.S. Preventive Services Task Force. *Guide to Clinical Preventive Services*. 2nd ed. Washington, DC: Office of Disease Prevention and Health Promotion, U.S. Government Printing Office; 1996.
2. Nelson HD, Helfand M. Screening for chlamydial infection. *Am J Prev Med*. 2001;20 (suppl 3):95-107.
3. Nelson HD, Saha S, Helfand M. *Screening for Chlamydial Infection*. Systematic Evidence Review No. 3 (Prepared by the Oregon Health & Science University Evidence-based Practice Center under Contract No. 290-97-0018). AHRQ Publication No. 01-S003. Rockville, MD: Agency for Healthcare Research and Quality. April 2001. (Available on the AHRQ Web site at: www.ahrq.gov/clinic/serfiles.htm).
4. Davies HD, Wang EEL. Periodic health examination, 1996 update: 2. Screening for chlamydial infections. *CMAJ*. 1996;154:1631-1644.
5. Centers for Disease Control and Prevention. Recommendations for prevention and management of *Chlamydia trachomatis* infections. *MMWR Morb Mort Wkly Rep*. 1993;42:1-39.
6. American College of Obstetricians and Gynecologists, ACOG Committee on Primary Care. *Committee Opinion No. 229*. Washington, DC: American College of Obstetricians and Gynecologists; 1999.
7. National Committee for Quality Assurance. *HEDIS 2000: The health plan employer data and information set. Volume 1: Narrative – What's in it and why it matters.* Washington, DC: National Committee for Quality Assurance, 2000.

Appendix A
U.S. Preventive Services Task Force - Recommendations and Ratings

The Task Force grades its recommendations according to one of 5 classifications (A, B, C, D, I) reflecting the strength of evidence and magnitude of net benefit (benefits minus harms):

A. The USPSTF strongly recommends that clinicians routinely provide [the service] to eligible patients. *The USPSTF found good evidence that [the service] improves important health outcomes and concludes that benefits substantially outweigh harms.*

B. The USPSTF recommends that clinicians routinely provide [the service] to eligible patients. *The USPSTF found at least fair evidence that [the service] improves important health outcomes and concludes that benefits outweigh harms.*

C. The USPSTF makes no recommendation for or against routine provision of [the service]. *The USPSTF found at least fair evidence that [the service] can improve health outcomes but concludes that the balance of benefits and harms is too close to justify a general recommendation.*

D. The USPSTF recommends against routinely providing [the service] to asymptomatic patients. *The USPSTF found at least fair evidence that [the service] is ineffective or that harms outweigh benefits.*

I. The USPSTF concludes that the evidence is insufficient to recommend for or against routinely providing [the service]. *Evidence that [the service] is effective is lacking, of poor quality, or conflicting and the balance of benefits and harms cannot be determined.*

Appendix B
U.S. Preventive Services Task Force - Strength of Overall Evidence

The USPSTF grades the quality of the overall evidence for a service on a 3-point scale (good, fair, poor):

Good: Evidence includes consistent results from well-designed, well-conducted studies in representative populations that directly assess effects on health outcomes.

Fair: Evidence is sufficient to determine effects on health outcomes, but the strength of the evidence is limited by the number, quality, or consistency of the individual studies, generalizability to routine practice, or indirect nature of the evidence on health outcomes.

Poor: Evidence is insufficient to assess the effects on health outcomes because of limited number or power of studies, important flaws in their design or conduct, gaps in the chain of evidence, or lack of information on important health outcomes.