Syphilis (Screening)

Clinical Preventive Service Recommendations

U.S. Preventive Services Task Force Recommendation

The U.S. Preventive Services Task Force (USPSTF) strongly recommends that clinicians screen all persons at increased risk for syphilis infection. Increased risk includes men who have sex with men (MSM) and engage in high-risk sexual behavior, commercial sex workers, persons who exchange sex for drugs, and those in adult correctional facilities. Clinicians should consider the characteristics of the communities they serve in determining appropriate screening strategies.[1]

The USPSTF strongly recommends that clinicians screen all pregnant women for syphilis infection.[1]

***Evidence Rating:* A (Strongly Recommended/Good Evidence)**

Although the USPSTF found no new direct evidence that screening for syphilis infection leads to improved health outcomes in persons at increased risk, there is adequate evidence that screening tests can accurately detect syphilis infection and that antibiotics can cure syphilis.[1]

A (Strongly Recommended/Good Evidence)

The USPSTF found observational evidence that the universal screening of pregnant women decreases the proportion of infants with clinical manifestations of syphilis infection and those with positive serologies.[1]

CDC Recommendation

CDC also recommends screening of all pregnant women, and all persons at increased risk for syphilis infection, per the USPSTF definition.

Information Sources

The recommendations and supporting information contained in this document came from several sources, including the:

- Centers for Disease Control and Prevention (CDC)
- Peer-reviewed research
- U.S. Preventive Services Task Force (USPSTF)

The background and supporting information contained in this document is a compilation of research findings. All information presented in this document should be attributed to its referenced source and should not be considered a reflection of other organizations cited in the text.

Condition/Disease Specific Information

Epidemiology of Condition/Disease

Approximately 33,289 cases of syphilis were reported by state health departments in the United States in 2004, a slight decrease when compared to 2003 data.[2] Syphilis rates vary dramatically by region and are highest in the Southeastern United States and in concentrated pockets of metropolitan areas such as Atlanta, Baltimore, Chicago, Detroit, Indianapolis, Memphis, New Orleans, Newark, Richmond, St. Louis, and Washington, D.C.[3] Surveillance data from the Centers for Disease Control and Prevention (CDC) indicate that the rate of syphilis increased nationwide by 19% between 2000 and 2003.[4]

Syphilis is a serious condition that, if left untreated, may result in cardiovascular and neurological complications leading to disability and ultimately death.[1] Syphilis can be transmitted from an infected mother to her infant during labor and delivery. Congenital syphilis can be particularly severe and results in fetal or infant death in 40% of cases.[1] Infants who survive may suffer serious central nervous system abnormalities, deafness, bone and joint deformities, skin abnormalities, blood disorders, and other problems.

Condition/Disease Risk Factors

Populations at increased risk for syphilis infection (as determined by incident rates) include men who have sex with men and engage in high-risk sexual behavior, commercial sex workers, persons who exchange sex for drugs, and those in adult correctional facilities.[1]

The prevalence of syphilis infection varies widely among communities and patient populations.[1] Some populations have a particularly high risk of infection, specifically African-Americans and people living in the Southeastern United States.[5] In 2004, the incidence of P&S syphilis was highest among women aged 20 to 24 years (3.0 cases per 100,000 population) and among men aged 35 to 39 years (12.4 cases per 100,000 population).[6]

Value of Prevention

Economic Burden of Condition/Disease

The lifetime cost per case of syphilis has been estimated at $444 (in year 2000 dollars).[7] The economic burden of syphilis would be much higher if the costs of congenital syphilis and HIV infections occurring from the facilitating effect of syphilis were included in cost analyses.

Workplace Burden of Condition/Disease

The health, disability, and life insurance costs of syphilis-infected employees impose a significant economic burden on employers. Lost productivity may also accrue when infected employees seek medical attention for their condition.

Economic Benefit of Preventive Intervention

Screening and early detection are key to averting costs associated with disease progression and long-term complications. The avertable syphilis-attributable HIV cost was estimated to be $4,653 (in year 1996 dollars) for each new syphilis case.[8] Treatment for early stage syphilis is also much less expensive than treatment for later stage disease: the baseline cost of treating early syphilis was estimated to be $41.26 (in year 2001 dollars) compared to $2,061.70 for late syphilis.[9]

Estimated Cost of Preventive Intervention

In 2004, the private-sector cost of screening for syphilis averaged $12; approximately 95% of all paid claims fell within the range of $0 to $32.[10]

Estimated Cost of Treatment

The cost of treating syphilis will vary depending on the treatment medication and other factors. The public-sector cost of standard IM benzathine penicillin therapy (first-line treatment) ranged from $18.64 to $22.22 (in year 2001 dollars).[9] Treatment for late-stage syphilis can cost upwards of $2,000 (in year 2001 dollars).[9]

Cost-Effectiveness and/or Cost-Benefit Analysis of Preventive Intervention

One study compared the per-case cost and cost-effectiveness of two alternative strategies – selective screening and partner notification — from the perspective of a health department. When prophylactic treatment of sexual contacts was not considered, selective screening proved to be more cost-effective. Cost, in general, was low for both strategies for all cases of infectious syphilis considered.[11]

Serological screening of pregnant women can be cost-effective even when there is a very low prevalence of maternal infection because screening is inexpensive while treating congenital syphilis is costly.[12]

Preventive Intervention Information

Preventive Intervention: Purpose of Screening

Screening for syphilis allows clinicians to identify affected patients and begin treatment earlier in the course of disease, potentially improving outcomes and avoiding the health and economic consequences of latent disease. Treatment also reduces the likelihood of spread to others.

Benefits and Risks of Intervention

No studies have documented the harms associated with screening for syphilis. Potential harms include partner discord, stigma, unnecessary anxiety or treatment in the case of a false-positive result, and opportunity costs (in terms of time and resources) to both the clinician and the patient. Harms of treatment include allergic reaction to penicillin, and side effects of the medication including the Jarisch-Herxheimer reaction (fever, headache, and pain that occurs during the 24 hours after initiating antibiotic treatment for syphilis due to the release of treponema antigens).[1]

The benefits associated with screening are great. Screening allows for early detection and treatment, preventing complications that may occur in later stages of disease, and it reduces the risk that syphilis will be spread to others. Antibiotic treatment for syphilis is effective and inexpensive. The USPSTF concluded that the benefits of screening persons at increased risk for syphilis infection substantially outweigh the potential harms.[1]

Initiation, Cessation, and Interval of Screening

The optimal screening interval for syphilis is unknown. Experts recommend that clinicians base the frequency at which they screen patients for syphilis on the patient's risk factors and the characteristics of the community in which they practice. Pregnant women at risk of syphilis should be screened at the first visit of every pregnancy and, if at high risk, again during the third trimester (28 weeks) and at delivery.[5]

Intervention Process

A variety of syphilis tests are available and in development. Screening for syphilis typically involves the use of 2 different tests, a nontreponemal test and a treponemal-specific test, for screening and confirmation. For example, a nontreponemal blood test such as the venereal disease research laboratory (VDRL) or the rapid plasma reagin (RPR) may be performed, a second, different kind of test, such as the fluorescent treponemal antibody absorbed (FTA-ABS) or the *T. palladium* particle agglutination (TP-PA) may then be used to confirm the results of the nontreponemal test.[1]

The tests for syphilis screening that are approved or pending FDA approval include:

- Nontreponemal test such as the venereal disease research laboratory (VDRL) or the rapid plasma regain (RPR) on serum specimens followed by a fluorescent treponemal antibody absorbed (FTA-ABS) or *T. palladium* particle agglutination (TP-PA) for confirmation.
- Immunochromatographic strip (ICS) point-of-care test on blood specimen, when FDA approved.
- Line Immunoassay (LIA) point-of-care test on blood specimen, when FDA approved.
- Enzyme-linked immunosorbent assay (ELISA) for treponemal antibody in serum specimens.
- RPR point-of-care test for nontreponemal antibody in serum specimens.
- Dark field microscope examination of lesion specimens.

Follow-up tests should be performed using the same nontreponemal test initially used to document infection (e.g., VDRL or RPR) to ensure comparability.

Treatment Information

Syphilis is treated with penicillin. Health benefits should include provisions for treatment.

Strength of Evidence for the Clinical Preventive Service

The level of evidence supporting the recommendation in this section is described below.

Evidence-Based Research:

U.S. Preventive Services Task Force (USPSTF)
Strength of Evidence: A (Strongly Recommended/Good Evidence)

- The USPSTF found good evidence to support screening for syphilis among all persons at increased risk for syphilis infection.[1]
- The USPSTF found good evidence to support screening for syphilis among all pregnant women.[1]

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Campbell KP, Lentine D. Sexually transmitted infections (STIs) evidence-statement: screening and counseling. In: Campbell KP, Lanza A, Dixon R, Chattopadhyay S, Molinari N, Finch RA, editors. *A Purchaser's Guide to Clinical Preventive Services: Moving Science into Coverage*. Washington, DC: National Business Group on Health; 2006.

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