

Syphilis in Children



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KEYWORDS

• Syphilis • Congenital infection • Antibodies • Penicillin G

KEY POINTS

- Congenital and acquired syphilis are common infections around the world and cases are increasing in the United States after declining for many years.
- Syphilis is diagnosed using serology. Nontreponemal antibodies against cardiolipin are measured to screen for syphilis and the diagnosis is confirmed with treponemal specific antibodies.
- The drug of choice for treating syphilis is parenteral penicillin G; route and duration of therapy are determined by the stage of infection and neurologic involvement.
- All pregnant women should be screened for syphilis and treated as soon as possible after the diagnosis is confirmed.
- All neonates born to mothers who tested positive for syphilis should have maternal titers and treatment reviewed as well as a nontreponemal antibody titer and complete clinical evaluation.

INTRODUCTION

Syphilis is caused by *Treponema pallidum*, a spirochete that is transmitted sexually and transplacentally.¹ If untreated, syphilis is a progressive disease that may result in death or disability from cardiac or neurologic complications in adults.² Untreated congenital syphilis also results in death or significant neurologic and musculoskeletal disabilities.^{3–5} The diagnosis of syphilis requires 2-stage serologic testing for nontreponemal and treponemal antibodies^{1,6}; however, reverse testing algorithms allow the use of automated screening for treponemal antibodies.⁷ A diagnosis of congenital syphilis requires careful review of maternal testing and treatment, comparison of maternal and neonatal nontreponemal antibody titers, and clinical evaluation of the neonate.^{6,8,9} In this review, we present the current epidemiology of syphilis, and the clinical manifestations, diagnosis, and management of syphilis as they relate to

The authors have no conflicts of interest to disclose.

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Infect Dis Clin N Am 32 (2018) 129–144

<https://doi.org/10.1016/j.idc.2017.11.007>

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pediatric practice, specifically, congenital syphilis and acquired syphilis in adolescents and pregnant women.

ACQUIRED SYPHILIS

Epidemiology

The global burden of syphilis along with other sexually transmitted infections remains high with approximately 1 million new infections (syphilis, chlamydia, gonorrhea, and trichomoniasis) daily.^{9,10} Worldwide, the rate of syphilis in 2015 was 25.7 cases per 100,000 adults. The burden of syphilis is highest among female sex workers and men who have sex with men (MSM), for whom the prevalence is 5%.¹⁰

After reaching an all-time low of 2.1 cases per 100,000 population in 2000, primary and secondary syphilis rates¹¹ have been increasing in the United States, reaching 7.5 cases per 100,000 in 2015, a 67% increase since 2011.¹¹ Cases in men account for 90% of this change across all ages (including adolescents), races, ethnicities, and regions; as in other countries, cases in MSM predominate.¹¹ In addition, a 27.3% increase in cases in women was seen in 2014 and 2015 to a rate of 1.4 cases per 100,000.¹¹ This increase has led to a call to action by the Centers for Disease Control and Prevention to federal and state agencies and health care providers to improve the identification of and access to treatment for at-risk individuals, and, to research and industry, to develop novel diagnostic tests and vaccines to combat syphilis.¹²

Clinical Disease

Acquired syphilis presents in a similar fashion regardless of age of acquisition, although signs of tertiary syphilis rarely present in childhood. Syphilis has 3 stages with varying clinical manifestations (**Table 1**). The hallmark of primary syphilis is 1 or more chancres (painless ulcers) at the site of primary inoculation. Secondary syphilis, resulting from dissemination of infection, typically presents as a polymorphous rash involving the palms and soles, fever, and lymphadenopathy along with other findings (see **Table 1**). Signs and symptoms of secondary syphilis overlap with other self-limited infectious conditions, often obscuring the diagnosis. Untreated syphilis enters a latent, asymptomatic, stage for a variable length of time, during which infected persons remain seropositive but not contagious. Signs of tertiary syphilis occur 10 to 30 years after initial infection. Manifestations include gummas (granulomatous skin and tissue growths), and cardiovascular and central nervous system involvement (see **Table 1**). Neurosyphilis may be diagnosed at any stage of symptomatic infection and is more common in individuals infected with the human immunodeficiency virus (HIV).^{2,13}

Diagnosis

Although screening for syphilis is not routinely recommended for sexually active adolescents, it is recommended yearly in MSM and in all pregnant females at the first prenatal visit (including adolescents in both groups). A systematic review of screening for syphilis concluded that screening high risk-men (HIV positive or MSM) every 3 months improved early syphilis detection, but no data on the effect of screening on clinical outcomes was available.¹⁴ Adolescents diagnosed with other sexually transmitted infections (chlamydia, gonorrhea, HIV) should be screened for syphilis.⁶

Darkfield microscopy of lesion scrapings to identify organisms is diagnostic, but is infrequently performed in practice.^{1,6} Syphilis is diagnosed using serologic tests that are classified as nontreponemal and treponemal.^{1,6} Nontreponemal tests detect

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