

**THE RISE OF CONGENITAL SYPHILIS: CURRENT EVIDENCE AND  
IMPLICATIONS FOR NURSING PRACTICE**

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## **The Rise of Congenital Syphilis: Current Evidence and Implications for Nursing Practice**

Congenital syphilis is often considered a health crisis of the past; however, there has been a recent rise in cases that have both detrimental maternal and neonatal outcomes. Congenital syphilis is caused by the transmission of *Treponema pallidum* from mother to fetus during gestation. *T. pallidum* enters the mother's bloodstream, which enters the fetus's bloodstream, affecting various organs in the fetus. The contraction of *T. pallidum* in the fetus leads to an inflammatory response creating several clinical presentations ranging from preterm births, stillbirths, or an asymptomatic term fetus with clinical manifestations that typically appear around three months of age (Hussain, 2023). However, many of these adverse neonatal outcomes can be prevented through proper prenatal care and treatment.

Pregnant women are screened for syphilis early in gestation for early treatment with repeat testing done in the third trimester for high-risk individuals. Traditional screening includes nontreponemal tests including the VDRL and RPR tests; however, these do not test specifically for *T. Pallidum* and often give false positives. After nontreponemal tests are conducted they are often followed up by treponemal tests which use immunoglobulin assays including the Syphilis IgG or the Syphilis IgG/IgM (Foster, 2024). The new reverse sequence conducts treponemal tests first for better accuracy and results leading to quicker treatment.

### **Factors Leading to the Dramatic Increase in Diagnoses**

Adequate screening and prompt treatment are contingent on the mother receiving proper prenatal care. The rates of women receiving adequate prenatal care are not as high as they should be resulting in many women not being screened for syphilis during their gestation. According to the March of Dimes Peristats regarding prenatal care, in 2022, only 77% of livebirths had women who received early prenatal care, 16.3% of women received prenatal care during the

second trimester, and 6.8% of women received late or no prenatal care (MarchofDimes, 2024). The lack of prenatal care is due to low socioeconomic status, lower educational levels, lack of emotional support, and prior negative experiences with healthcare (Rosa et al., 2014). Inadequate prenatal care leads to a lack of screening throughout the pregnancy, resulting in a lack of treatment and resulting in a greater risk of fetal complications.

Overall, fetal complications due to the contraction of congenital syphilis could be significantly mitigated with proper prenatal care to ensure adequate prenatal testing and treatment. The increase in congenital syphilis cases has recently redeemed itself as a health crisis. The increase in cases, as well as fetal complications, shows the increasing importance of advocating for proper prenatal care.

According to the Centers for Disease Control (CDC), congenital syphilis cases have increased in 2022 by ten times the amount of cases in 2012 (2023). Approximately 3,700 babies were born with congenital syphilis in 2022 and these were just the reported cases. The CDC stated that about 9 in 10 cases could have been prevented with adequate prenatal care and treatment; however, over 50% of women who tested positive for syphilis did not receive proper treatment, and 40% did not have any prenatal care. The adverse effects of inadequate prenatal care and treatment are primarily due to the barriers to receiving proper care and the increase of syphilis cases in these communities that may not have access to care and treatment. The CDC went on to state that nearly 70% of the U.S. population lives in high-risk areas of syphilis in childbearing age women (2023).

Not only are the increased rates of syphilis and lack of prenatal care in the U.S. population the only contributing factor, but treatment availability has also been sparse. Penicillin G is the only known antimicrobial that is effective enough to treat syphilis adequately. The

treatment is efficient enough that even if a mother presents with a penicillin allergy and requires treatment she will be desensitized to penicillin to be treated. However, the increased rates of syphilis have led to an increased demand for penicillin G. The FDA has reported as of 2023, the injectable Penicillin G benzathine products are undergoing a shortage. It is projected that availability will increase in late 2024 and the availability of this product will remain reserved for pregnant women and babies who have contracted congenital syphilis (Shelton, 2023).

Overall, the crucial factors of prenatal care and the availability of adequate treatment are significant determinants of decreasing the risk of congenital syphilis. The devastating outcomes of congenital syphilis, including the rates of fetal demise and lifelong effects, will hopefully decrease as advocacy of prenatal care and reserving treatment for pregnant women and their infants.

### **Purpose of the Study**

The purpose of the study is to evaluate the increased rates of congenital syphilis, including, clinical manifestations, diagnostic approaches, treatment options, and nursing implications. Syphilis, as previously stated, is caused by the bacterium *Treponema pallidum* transmitted during direct contact during sexual intercourse. Syphilis is oftentimes asymptomatic and can go unnoticed by healthcare providers, which is why early testing is effective in-adequate treatment. When syphilis does present with symptoms it has three stages of disease progression. Stage One lasts approximately 21 days and presents as a chancre sore on the genitals, and if untreated, will progress to the second stage. The second stage presents with an itchy rash on the palms and soles of feet along with white-gray-colored lesions in moist areas. The symptoms of the second stage often go away without treatment; however, the lack of adequate treatment causes progression to the third stage. The third stage of syphilis can appear years after the initial

infection, affecting many organs. Syphilis affects several organ systems, leading to neurosyphilis, otosyphilis, and ocular syphilis (CDC, 2023). Symptoms of neurosyphilis include severe headaches, muscle weakness, and changes in mental status. Symptoms of otosyphilis include hearing loss, vertigo, and balance issues. Ocular syphilis symptoms include light sensitivity, vision changes, and “floaters” in the visual field. Considering untreated syphilis is transmissible by the affected person, pregnant women will transmit the disease to their unborn baby. Untreated syphilis is responsible for approximately 40% of stillborn cases. If the unborn baby survives after delivery symptoms may not be present at first but should be treated immediately with penicillin G. If the baby is not affected they are at an increased risk of developmental delays, neurological complications, seizures, anemia, jaundice, meningitis, blindness, and deafness (CDC, 2023). These detrimental adverse effects of congenital syphilis are why treatment, testing, and nursing care of those affected need to be prioritized in health care.

### **Research Question/Aims**

As congenital syphilis has been deemed a new health crisis, evaluating the efficacy of diagnostic measures, treatment options, and nursing implications is of the utmost importance. The research hypothesis of evaluating these options leads to the overall question: What is the state of the science of treatment and nursing care for congenital syphilis? The aims of this research question lead to several changes that need to be made in clinical settings to address the congenital syphilis crisis better.

The first is increasing accessibility of prenatal care, specifically to women in high-risk syphilis communities. Accessibility to prenatal care increases the likelihood of timely testing and treatment with proper documentation. Timely testing and treatment are of the utmost importance

to ensure that the mother is adequately treated with hopes of decreasing transmission rates and contraction of congenital syphilis by the fetus. The next aim of this research question is to ensure healthcare providers are educated on the clinical manifestations of the infant that has contracted congenital syphilis. Considering most infants are asymptomatic at birth but will likely convey clinical manifestations around three months of age, proper education and training on identifying these manifestations will ensure adequate treatment of the infant.

Adequate treatment of the neonate will hopefully reduce the rates of long-term effects of congenital syphilis. Another aim of this research question is to increase the advocacy of the severity of congenital syphilis. Many women of childbearing age may not understand the devastating effects syphilis can have on their pregnancy and their infant. Increasing awareness of this will hopefully encourage women to seek testing whether syphilis is expected or not, ensure treatment is adequate if testing positive, as well as disclosing their sexual health with their partner and provider to ensure proper testing and treatment is completed.

Lastly, another aim of this research question is to evaluate treatment. Routine treatment for syphilis in pregnant women is an injectable dose of benzathine penicillin G, but research is now showing a one-time dose is not as effective. Changing treatment standards is ideal to ensure adequate treatment to decrease transmission rates to the fetus. Overall, increasing rates of prenatal care, educating providers on manifestations of congenital syphilis, addressing the severity of the outcomes, and changing treatment guidelines could significantly help decrease the continuity of rising congenital syphilis cases.

### **Literature Review/Synthesis**

#### **Overview of Missed Opportunities with Diagnosing and Treating Syphilis During Gestation**

Throughout gestation, women are screened for syphilis at their first prenatal visit with repeat testing early in the third trimester around 28-32 weeks. If a woman has a high risk of contracting syphilis based on a previous syphilis case, the region she lives in, or sexual behaviors, testing will be performed again during the delivery. However, proper screening is oftentimes not completed resulting in inadequate treatment and passage of disease to the fetus. The CDC published an article by McDonald et al. (2023) that provided an overview of how congenital syphilis is not adequately prevented due to missed opportunities during testing and treatment. Six classifications of missed opportunities were summarized in the article, which include undocumented testing or non-timely testing, late identification during gestation, no treatment or undocumented treatment, inadequate treatment, and evidence of congenital syphilis without documented maternal diagnoses.

### **Diagnosis and Treatment Barriers**

Overall, the main finding of the article published by the CDC is that congenital syphilis is a multifactorial crisis in the US. Barriers to prevention include anything from substance use to insurance coverage to medication shortages. The increasing rates of syphilis cases directly correlate to these barriers. In the same article published by the CDC, the CDC reported a total of 3,761 congenital syphilis cases were reported in 2022 with the following statistics regarding prenatal care, documentation, and timely testing, “among pregnancies resulting in a congenital syphilis outcome, no prenatal care was documented in 1,426 cases (37.9%). Of the 2,179 cases in which a timely test was obtained during pregnancy, no prenatal care was documented in 445 (20.4%) (Table 2). Among the 1,385 cases of congenital syphilis for which no test or a non-timely test was recorded, no prenatal care was documented for 969 (70.0%),” (2023). This shows the dire need for a change in the recommended routine prenatal testing for syphilis.

### **Recommended Change in Screening Guidelines**

According to the American College of Obstetrics and Gynecologists (ACOG, 2024), a change has been made since previous testing guidelines. All pregnant women are screened serologically at the first prenatal care visit, followed by a universal rescreen in the third trimester and at birth. This is a change from previous testing as it is now a universal rescreen rather than a rescreen based on risk factors. Universal guidelines allow for patients to feel more comfortable discussing their sexual health, thus increasing the likelihood of testing to be completed.

### **Congenital Syphilis in the Neonatal Period**

Despite diagnostic tests and treatment plans, congenital syphilis cases are significantly increasing. Congenital syphilis can have detrimental effects on the fetus if not diagnosed and treated adequately. A study was conducted in South Korea to provide insight into disease progression in congenital syphilis during and beyond the neonatal period. Using the International Classification of Diseases (ICD)-10 codes for the investigation, a total of 548 infants were examined in this study and screened for congenital syphilis through their first year of life. The hypothesis of this study is to identify clinical manifestations in their likelihood of occurring. To gather data, infants were selected less than 1 year old that had nontreponemal and treponemal testing and were diagnosed with congenital syphilis. These infants were then tested 1 year later to identify clinical manifestations of disease progression, including jaundice, hepatosplenomegaly, hearing impairment, and more.

The results of this study were reflected over a 5-year period, showing infants born to a mother with syphilis was 2.8 per 10,000 births, with pre-term rates at 0.5 per 10,000 and term rates being 3.0 per 10,000 births (Lim, et al., 2021). Within the 548 infants studied, it was projected that congenital syphilis was unlikely to occur in 298 infants, highly probably in 148

infants, and probable in 66 infants. Clinical manifestations were prevalent in the results as well. Jaundice resulted in 56%, hearing impairment in 14%, renal disease in 8%, mental retardation in 8%, intrauterine growth restriction in 6%, and neurosyphilis resulted in 14 of the 548 infants (Lim et al., 2021). This study provides a strong insight into the projected rates of congenital syphilis cases as well as expected clinical manifestations.

Another study was conducted in the United States to identify increasing congenital syphilis cases identified in the neonatal period during 2014-2018. The sample size of the study was 3,834 infants, all affected by congenital syphilis; however when further looking into the infant's history, 67 infants were identified as being diagnosed with congenital syphilis beyond the neonatal period. The main findings of this study establish how clinicians and public health resources need to develop a better framework for diagnostic regimens and treatment plans in neonates.

### **Increased Rates in the Neonate**

Congenital syphilis cases increased by 183% during 2014-2018 (Kimball et al., 2021). Of the 3,834 infants diagnosed with congenital syphilis 55.5% are liveborn and asymptomatic, 38.1% are liveborn and symptomatic, 6.4% are stillborn, and 0.4% are unknown. This shows the dramatic increase in reported cases as well as how diagnoses are often made later in disease progression due to the high rates of asymptomatic infants. Pediatric patients diagnosed beyond the neonatal period have more late manifestations such as intellectual disabilities, physical deformities, and Hutchinson's Triad. These clinical manifestations show the dire need to increase clinician skills for early diagnosis and treatment.

### **Methodology**

For the conduction of the research for reviewing the state of treatment and nursing care regarding congenital syphilis, an integrative literature review has been conducted. The integrative review will be guided by the framework established by Whittemore and Knafl (2005). Several sources will be utilized within the integrative literature review; including academic journals, scholarly articles, and peer-reviewed articles. The sources will provide accurate and scholarly information regarding congenital syphilis. The sources used will be studies conducted worldwide within the past five years. This will provide relevant and recently developed information regarding congenital syphilis. Although congenital syphilis is not a new issue it has become more prevalent in today's health issues which is why studies conducted within the past five years are crucial to be considered a relevant source.

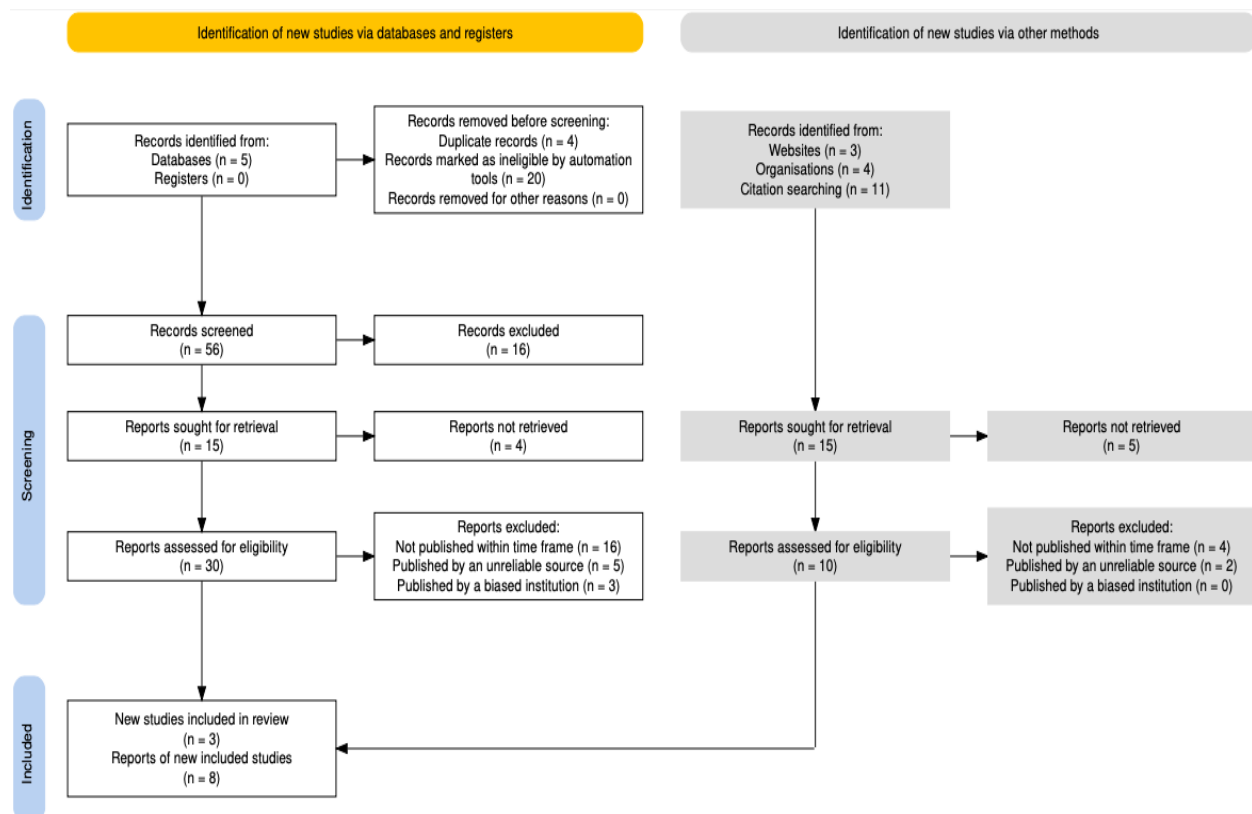
Articles have been retrieved from sources such as PubMed, CDC, NIH, ACOG, and recent studies. When searching for articles key terminology was needed to minimize search results. Key terminology used in the search was congenital syphilis, prenatal care, barriers to prenatal care, neonatal assessments, syphilis treatment, and clinical manifestations of syphilis.

When assessing the articles, the criteria that should be included within the literature to be reviewed is that it is from an accredited institution published by medical professionals who are experts in women's health or neonatal health. Criteria should include different viewpoints such as alterations in care that have been successful as well as unsuccessful, which provides insight into how changes should be made going further with the research conducted through the institution. Criteria to be excluded are outdated studies such as those published longer than the past five years, information provided by an unreliable source, and information from institutions that have a biased advocacy for sexual health and women's health.

Ideally, the studies will highlight the key points of this research, including increasing access to prenatal care, infant physical examination techniques to congenital syphilis clinical manifestations, alterations to traditional treatment methods, and overall promoting advocacy for the severity of the rise of congenital syphilis cases.

## Results

Within the integrative review, I utilized the Prisma model to organize the resources utilized. I utilized 5 records from databases, 3 from websites, 4 from organizations, and 5 from citation searching. I screened a total of 56 records with an attempt to obtain only 15 records. 16 records had to be excluded before assessment and 4 reports were not retrieved. I assessed 30 reports for eligibility but had to exclude 16 that were not within the time frame, 5 were excluded from an unreliable source, and 3 were excluded from a biased institution. In total, there were 3 new studies included in the review and 8 reports of new included studies.



## **Discussion**

The overall goal of this integrative literature review is to provide detailed information that healthcare professionals can utilize in bettering the care of pregnant women with syphilis as well as infants born with congenital syphilis. The interventions to be initiated after conducting the integrative literature review are to provide a recapitulation of the goals and recommendations in future health care to decrease the rise of congenital syphilis cases. The first goal of the interventions is to promote awareness of the importance of prenatal care. When more women begin to receive proper prenatal care timely syphilis testing can be initiated. Universal guidelines for syphilis testing will also increase the likelihood of timely testing as women will be tested in the third trimester and at the time of delivery, regardless of risk factors for syphilis. This intervention will hopefully begin to decrease rates of syphilis cases in pregnant women, which directly correlates with decreasing congenital syphilis rates. However, this will take time to decrease rates, which is why the subsequent intervention is to provide awareness of specific clinical manifestations of congenital syphilis in infants in the neonatal period.

Providing specific cues of clinical manifestations will increase timely interventions and treatment for the neonate decreasing the likelihood of effects occurring across the infant's lifespan. With appropriate interventions and proper data collected, information will be evaluated through collate and contrast of several studies conducted. This allows for a comparison of successful interventions to provide insight into future initiatives to be made. Therefore, with the integrative literature review being conducted I plan to use this data in several courses of action. The first way to use the research conducted is to provide an overview on how significant congenital syphilis cases have increased. By proving the dramatic increase in cases there will be a more successful motive behind the need for nursing implications. Once the importance of the

matter is successfully proven, it is important to use the research gathered to provide knowledge regarding a change in testing and treatment guidelines to improve accuracy and efficacy in not only detecting but treating congenital syphilis as well. Next, once maternal treatment plans have improved, the integrative literature review data gathered can provide insight into specific clinical manifestations seen in the neonate.

### **Conclusion**

With hopes of advocating for specific clinical manifestations, healthcare providers will be able to have a more specific physical examination of the neonate to provide a more efficient treatment plan to prevent adverse effects across the lifespan. Overall, this integrative literature review provides insight into how to better the efficacy of prenatal treatment, changes to be made to routine testing, specific examination of infants affected, and increased awareness of the effects of congenital syphilis.

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