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Perioperative Brain Health After Stroke: What Are We Missing?

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Stroke is a national and global issue – compounded by an aging patient population with progressive comorbidities such as hypertension, diabetes mellitus, heart disease, and cardiac arrhythmias. Almost 800,000 people suffer acute stroke each year in the United States (*Circulation* 2023;147:e93-621). Many of these patients will require anesthetic care for interventional and diagnostic procedures related or unrelated to this stroke event. As experts in perioperative medicine and patient safety, it is our

responsibility to understand the physiologic aberrations that occur during anesthesia that leave our patients vulnerable to further injury. In this short update, we will describe the current epidemiologic state of stroke, what neurologic risks these patients may incur during the perioperative period, and practices that may optimize this population’s brain health.

For reference, stroke refers to the cerebrovascular disease of acute malperfusion to the central nervous system. There are several types and etiologies of cerebral stroke,

but we will mostly be referencing ischemic stroke for the purposes of this update.

What are the neurologic implications of stroke within the perioperative environment?

Recurrent stroke: Of the 795,000 people who suffer an acute stroke in the U.S. each year, 185,000 are recurrent (*Circulation* 2023;147:e93-621). Prognosis of disability, physical and intellectual morbidity, and mortality rates are higher with recurrent stroke (*Stroke* 1999;30:338-49). In a



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Rising Rates of Congenital Syphilis

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Which of the following statements about syphilis are true?

1. It is not the first topic that you expected to find in the *ASA Monitor*
2. It is often called “the great masquerader”

3. It was likely brought by Columbus and his crew from the Americas to Europe
4. It is named after a fictional shepherd, Syphilus, who angered the god Apollo

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ASA Commercial Conversion Factor Survey Results – 2024

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The ASA Committee on Economics is pleased to present the results of the 2024 commercial conversion factor (CF) survey. Each spring, ASA members are solicited to submit the CFs from their group practice’s five largest commercial contracts. Last year, both the survey methodology and reporting format were simplified with the objective of enhancing participation. The CF and demographic data below represent the national

and regional results reported as being in effect during the 2023 calendar year.

Summary

Based on the 2024 ASA commercial CF survey results, the national average commercial CF was \$80.70, and the national median was \$74.59 (Figure 1, Table 1). The mean and median figures for the past 10 surveys are presented in Table 2. The

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SPECIAL SECTION

Palliative Care: The Unexplored Frontier of Anesthesiology 12-19

Guest Editor: Sandra Sacks, MD, MEd

In the Know: Congenital Syphilis*Continued from page 1*

5. Approximately 0.6% of the world's population has syphilis
6. The treatment of choice is penicillin G
7. Penicillin-resistant strains have not been isolated
8. It is spread through sex
9. Infected mothers transmit syphilis to newborns.

Syphilis has been called “the great masquerader” because:

1. It can be difficult to diagnose (*Int J STD AIDS* 2008;19:145-51)
2. There are four stages: primary, secondary, latent, and tertiary, with very different clinical presentations. Latent and tertiary syphilis may present years after the initial infection
3. It has protean clinical manifestations, many of which spontaneously resolve
4. It is often undiagnosed and untreated (StatPearls [Internet] 2024).

Substantial circumstantial evidence suggests that syphilis was brought by Columbus' expedition from the Americas to Europe (StatPearls [Internet] 2024). The ravages of syphilis spread so rapidly that Fracastoro, a Veronese physician, wrote a poem attributing it to a curse unleashed by Apollo following an egregious affront by the shepherd Syphilus (*Int J Dermatol* 1995;34:735-9).

Approximately 0.6% of the world's population has syphilis (*Sci Rep* 2023;13:11386; *Lancet Infect Dis* 2022;22:541-51). This is shocking. Early syphilis can be cured with a single injection of penicillin G. Penicillin-resistant strains of *T. pallidum* have not been isolated.

Why is an infectious disease readily cured with a single injection of the world's first antibiotic infecting nearly 0.6% of the world's population? The answer may be medical myths (e.g., “just look for a sore that looks like it should hurt but doesn't”), the lure of unprotected sex, lack of health care resources, and inadequate vigilance by medical providers. Sadly, children pay the highest price. Mothers infected with syphilis readily transmit the disease to newborns. The World Health Organization is committed to eliminating mother-to-child transmission of syphilis (asamonitor.pub/4emrnOy). All physicians have a role in this initiative.

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Congenital syphilis

The historical context of congenital syphilis intertwines with medical advancements and public health policies. Dorfman and Glaser's landmark work in 1990 highlighted cases of congenital syphilis presenting beyond the neonatal period. Following publication, congenital syphilis rates declined in the United States from 1991 to 2005 (*Pediatrics* 2021;148:e2020049080). This decline resulted from widespread prenatal screening, access to penicillin, and overall improved health care access (*Pediatrics* 2021;148:e2020049080).

Between 2012-2021, the number of congenital syphilis cases reported in the U.S. surged by 755% (*MMWR Morb Mortal Wkly Rep* 2023;72:1269-74). Factors contributing to this resurgence include shifts in sexual behaviors, limited health care access, barriers to public health education about sexually transmitted diseases, and failure of medical providers to recognize syphilis (*MMWR Morb Mortal Wkly Rep* 2023;72:1269-74).

The initial presentation of syphilis is in a chancre. In women, the most likely location is the cervix, where the diagnosis may be missed (*Int J STD AIDS* 2008;19:145-51). Weeks to months later, signs of secondary syphilis emerge. The most common symptom is a skin rash (*Int J STD AIDS* 2010;21:537-45). The rash is often accompanied by other nonspecific symptoms, including fever, sore throat, myalgia, headache, hair loss, weight loss, lymphadenopathy, and inflammation of joints, muscles, nerves, and internal organs (*Int J STD AIDS* 2010;21:537-45; asamonitor.pub/47msICC). Most patients with secondary symptoms have no history of a primary lesion (*Genitourin Med* 1989;65:1-3). Both primary and secondary syphilis can be cured with a single injection of penicillin G.

Without treatment, the symptoms of secondary syphilis resolve within a few weeks, although about one-fourth of patients have recurrent symptoms over the first year (*Acta Derm Venereol Suppl* 1955;35:3-368; Annex I-LVI). The untreated patient enters a phase of latent syphilis, which may last many years or decades without symptoms (StatPearls [Internet]. 2024).

Tertiary syphilis appears after a decade or more of latency. Tertiary syphilis can affect every organ system (asamonitor.pub/47msICC). Most commonly, tertiary syphilis presents with neurologic symptoms, or disorders of the eyes, ears, or cardiovascular system. Left untreated, tertiary syphilis can be fatal.

Pregnant women with syphilis in any stage can transmit *T. pallidum* to the fetus, whether or not they have symptoms of syphilis themselves. Fetal syphilis may present as intrauterine growth retardation, fetal



hydrops, preterm birth, and intrauterine death (*Clin Perinatol* 2021;48:293-309).

Most infants born with syphilis will show no symptoms at all. As with adult syphilis, those infants will have non-specific symptoms, including rash, irritability, rhinitis, adenopathy, hepatomegaly, and CNS symptoms (*Clin Perinatol* 2021;48:293-309). Symptoms in children more than 2 years of age include abnormal dental development and more advanced signs of CNS disease. There may be radiographic evidence of bone malformation, even in the absence of overt symptoms (*Pediatrics* 2021;148:e2020049080).

Screening for congenital syphilis

The Centers for Disease Control and Prevention (CDC) unambiguously states that “All women should be screened serologically for syphilis at the first prenatal care visit” (asamonitor.pub/3XE18NK). Additionally, “No mother or neonate should leave the hospital without maternal serologic status having been documented at least once during pregnancy.” The CDC also recommends that women with risk factors (intravenous drug use, sexually transmitted infection during pregnancy, multiple sex partners) be screened for syphilis prior to hospital discharge after childbirth.

Despite the CDC recommendation, significant gaps exist in prenatal syphilis screening. Forty-two percent of diagnoses of maternal syphilis occur post-delivery, indicating a missed opportunity for early treatment and prevention of both maternal and fetal complications (*Pediatrics* 2021;148:e2020049080). Missed or late diagnoses can be addressed by improved screening for syphilis and identification of women at high risk (*MMWR Morb Mortal Wkly Rep* 2023;72:1269-74). Strengthening treatment adherence and partner notification is vital, especially since 83% of mothers had at least one prenatal care visit (*Pediatrics* 2021;148:e2020049080). Addressing maternal reinfection or persistent infection requires close monitoring and targeted interventions.

Late-diagnosed cases of congenital syphilis reveal a nuanced racial and ethnic distribution that defies common preconceptions. Non-Hispanic White mothers

represent 37% of cases (*Pediatrics* 2021;148:e2020049080). Non-Hispanic Black mothers, historically burdened by sexually transmitted diseases like syphilis, account for 33% of cases (*Pediatrics* 2021;148:e2020049080).

Geographic trends in late-diagnosed congenital syphilis cases across different U.S. regions highlight broader patterns of congenital syphilis prevalence and underline nationwide challenges in timely detection and intervention. The southern region reported 36% of late-diagnosed congenital syphilis cases, reflecting historical high STI prevalence, socioeconomic disparities, limited access to prenatal care, and cultural attitudes toward STI testing (*Pediatrics* 2021;148:e2020049080). The western region contributed 31% of late-diagnosed cases, reflecting challenges such as urban-rural divides, immigrant population health concerns, and barriers to health care access (*Pediatrics* 2021;148:e2020049080).

Confirming congenital syphilis diagnosis and assessing disease severity heavily rely on laboratory and imaging studies. Elevated nontreponemal titers (e.g., venereal disease research laboratory test [VDRL]), rapid plasma regain) and reactive treponemal test titers (e.g., fluorescent treponemal antibody absorption, treponema pallidum particle agglutination) indicate active infection, corroborating clinical suspicion (*Pediatrics* 2021;148:e2020049080). Cerebrospinal fluid will reveal biomarkers as well, including VDRL or reactive treponemal tests, elevated protein levels, and pleocytosis (*Pediatrics* 2021;148:e2020049080).

In conclusion, it seems crazy that syphilis is ascendent, given accurate laboratory tests, national and global programs to reduce syphilis, and a simple and effective cure. It is particularly shocking that the incidence of congenital syphilis in the U.S. and globally has been rising over the past decade.

To reduce this trend, all caregivers, including anesthesiologists, should appreciate why the diagnosis of syphilis is so easily missed in adults, children, and infants. Education (such as this article in the *ASA Monitor*) can highlight this preventable risk.

Perhaps the CDC can learn something from colleagues at the Transportation Security Administration: “If you see something, say something.” If a patient presents with unexplained, nonspecific symptoms, including rashes or evidence of inflammation, it is easy to recommend that the primary care team test for syphilis. If the patient is a pregnant woman, or an infant, serological testing should be done immediately.

As anesthesiologists, we pride ourselves on our vigilance. Vigilance by all health care providers, including us, can help break the current trajectory of congenital syphilis. ■