

COMMENTARY

Newborn Early-Onset Sepsis Guidelines: The Not So Simple Truth

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The truth is rarely pure and never simple.

—Oscar Wilde

How can we criticize a guideline when the proof of its success is abundant and evidence-based? One truth is that the Centers for Disease Control and Prevention (CDC) guidelines for preventing perinatal Group B Streptococcal (GBS) disease have been exceptionally successful. Since the guidelines were first introduced 2 decades ago and have now been widely implemented, there has been a dramatic decline in the incidence of early-onset GBS disease in newborns.^{1,2} The cornerstones of the CDC guidelines are prenatal GBS screening and intrapartum maternal antibiotics.³ As the authors of the current CDC guideline state, early-onset GBS disease in newborns is now “relatively uncommon.”¹

But there is 1 aspect of the CDC guideline that many frontline newborn clinicians find frustrating. Just say the 3 short syllables “chorio” and our blood pressures rise. Intra-amniotic infection (chorioamnionitis) is diagnosed clinically by obstetric clinicians in an estimated 2% to 4% of term deliveries and a greater proportion of preterm deliveries.⁴ The current CDC guideline recommends a limited evaluation, including a complete blood cell count, blood culture, and empirical antibiotics in every infant born to a mother with this highly subjective clinical diagnosis. Sounds simple, right? Yet, the aftermath of this management approach is all too familiar to those of us who take care of newborns: the pain of blood draws and the separation of many well-appearing newborns from their mothers, the potential alterations in the newborn microbiome from exposure to antibiotics, and the confusion resulting from contaminant cultures. All of these interventions represent the cost of screening. Thus, it is no surprise that there is variability in practice with respect to this recommendation. In our institution, we found that newborn clinicians only followed CDC recommendations for infants born to women diagnosed with intra-amniotic infection 65% of the time.⁵

Given the downsides to screening and the uncertainty around the clinical diagnosis, it should also be no surprise that the introduction of multivariable risk prediction models for the management of early-onset sepsis is a hot topic and has been implemented in some newborn nurseries.^{6,7} Measures associated with early-onset sepsis that inform the risk estimates are readily obtainable, evidence-based, and take into account the clinical status of the newborn,⁸ but the path to implementing risk models for early-onset sepsis is not an easy one. In this issue of *Hospital Pediatrics*, Dhudasia et al⁹ describe the implementation of a Web-based sepsis risk calculator in

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a large academic birth hospital. Their efforts required multidisciplinary collaboration among a team of obstetric, neonatal, and information technology staff. They were highly successful at recording sepsis risk estimates at birth and at monitoring infant vital signs, and they saw a substantial reduction in antibiotic use and laboratory testing.

The authors report logistic challenges, including staff education to minimize variation in recording risk scores and establishing appropriate risk estimate cutoffs. Newborn clinicians are likely to be well aware of those challenges and several others, including the many other questions you have to ask and answer before you ever make it to staff education and risk cutoffs, such as the following:

- How close is close observation in your newborn unit?
- Do all of the newborn clinicians adequately understand the strengths and limitations of the risk prediction model?
- How should obstetric and newborn providers discuss the plan of care with families?
- Is everyone involved in care prepared to act swiftly when an infant manifests signs and symptoms of sepsis, regardless of their risk score?

No guideline or risk prediction model can answer these questions.

There are other truths we have to consider. GBS is still the most frequent but not the only pathogen responsible for early-onset

sepsis.² Obstetric providers have stepped up efforts to better categorize concern for intra-amniotic infection.¹⁰ A maternal GBS vaccine, not yet licensed, could have the potential to prevent up to 70% of neonatal GBS infections.¹¹ We all welcome advances in diagnosis and prevention that would help us make better management decisions. The reality we face is that we have to use the best available evidence, as well as our own critical thinking, to care for our patients right now. Implementing evidence-based decision support tools can help keep us on this path.

REFERENCES

1. Verani JR, McGee L, Schrag SJ; Division of Bacterial Diseases; National Center for Immunization and Respiratory Diseases; Centers for Disease Control and Prevention (CDC). Prevention of perinatal group B streptococcal disease—revised guidelines from CDC, 2010. *MMWR Recomm Rep*. 2010; 59(RR-10):1–36
2. Baker CJ, Byington CL, Polin RA; Committee on Infectious Diseases; Committee on Fetus and Newborn. Policy statement—recommendations for the prevention of perinatal group B streptococcal (GBS) disease. *Pediatrics*. 2011;128(3):611–616
3. Vergani P, Patanè L, Colombo C, Borroni C, Giltri G, Ghidini A. Impact of different prevention strategies on neonatal group B streptococcal disease. *Am J Perinatol*. 2002;19(6):341–348
4. Newton ER. Chorioamnionitis and intraamniotic infection. *Clin Obstet Gynecol*. 1993;36(4):795–808
5. Shakib J, Buchi K, Smith E, Young PC. Management of newborns born to mothers with chorioamnionitis: is it time for a kinder, gentler approach? *Acad Pediatr*. 2015;15(3):340–344
6. Mukhopadhyay S, Taylor JA, Von Kohorn I, et al. Variation in sepsis evaluation across a national network of nurseries. *Pediatrics*. 2017;139(3):e20162845
7. Cotten CM. Antibiotic stewardship: reassessment of guidelines for management of neonatal sepsis. *Clin Perinatol*. 2015;42(1):195–206
8. Escobar GJ, Puopolo KM, Wi S, et al. Stratification of risk of early-onset sepsis in newborns \geq 34 weeks' gestation. *Pediatrics*. 2014;133(1):30–36
9. Dhudasia M, Mukhopadhyay S, Puopolo KM. Implementation of the sepsis risk calculator at an academic birth hospital. *Hospital Pediatrics*. 2018; 8(5)
10. Higgins RD, Saade G, Polin RA, et al; Chorioamnionitis Workshop Participants. Evaluation and management of women and newborns with a maternal diagnosis of chorioamnionitis: summary of a workshop. *Obstet Gynecol*. 2016;127(3): 426–436
11. Cortese F, Scicchitano P, Gesualdo M, et al. Early and late infections in newborns: Where do we stand? A review. *Pediatr Neonatol*. 2016;57(4):265–273

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