

HOSPITAL PHYSICIAN®

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Evaluation and Management of the Sick Neonate

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Evaluation and Management of the Sick Neonate

Mark A. Hostetler, MD, MPH

INTRODUCTION

Few clinical scenarios are as anxiety provoking as a severely ill child. Infants under 2 months of age represent a unique category of patients with concerns and differential considerations not commonly seen in other age-groups. The most important differential considerations for a sick-appearing neonate can be grouped into 5 general categories: infectious etiologies, congenital heart disease, gastrointestinal disorders, inborn errors of metabolism, and other less common causes (Table 1). Successful management ultimately requires knowledge of both normal and abnormal fetal physiology as well as a systematic approach to evaluating the neonate. This manual provides a concise review of the most important issues related to the diagnostic and therapeutic management of the sick neonate in the emergency department (ED).

DIFFERENTIAL CONSIDERATIONS IN SICK NEONATES

INFECTIOUS ETIOLOGIES

Overwhelming sepsis is the most common cause of serious illness in neonates. Infants at this age are relatively immunocompromised and are unable to partition off and localize infection due to impaired cell-mediated immunity. Neonatal infections may be acquired from the mother, either during pregnancy or at the time of delivery. Signs of infection include apnea, respiratory distress, feeding intolerance, abdominal distension, lethargy, and hypotension.¹ Fever may or may not be present. Mortality may be as high as 40%.² All toxic-appearing neonates require a full sepsis evaluation, intravenous antibiotics, and admission. Reasonable antibiotic choices during the first 2 months of life include ampicillin and either gentamicin or cefotaxime. In cases where infants are sick or toxic-appearing, antibiotics should be started as soon as possible and not be delayed until positive laboratory results have returned.

Early-onset neonatal sepsis (EONS) presents as a systemic illness within the first 7 days of life and is associated with high rates of morbidity and mortality. EONS occurs at a rate of 1 to 2 cases per 1000 live births in the United States.³ The organisms most commonly associated with EONS include group B streptococcus (GBS) and *Escherichia coli*, which together account for 70% to 80% of positive cultures.¹⁻⁵ Other less common enterococci, such as *Listeria monocytogenes*, also are known to cause disease. Most infants with EONS present within the first 3 days of life, but by definition, there is a range of up to 7 days. The early-onset form accounts for 75% of cases. Less common is the late-onset form of the disease that does not manifest until 2 to 4 weeks of life (range, 1 week–3 months). The median age of onset for late-onset sepsis is 17 days, and it occurs at a rate that is inversely proportional to gestational age and birth weight.^{1,2}

In 1996, the Centers for Disease Control and Prevention, in collaboration with the American College of Obstetricians and Gynecologists and the American Academy of Pediatrics, developed EONS prevention guidelines advocating intrapartum antibiotics for women at high risk for delivering an infant with GBS-related EONS infection.⁴ Following the implementation of these guidelines, there has been an 80% reduction in the rate of GBS-related EONS infection.³ Fortunately, this reduction has not been accompanied by an increase in the incidence of EONS caused by non-GBS or ampicillin-resistant organisms.^{3,5}

Other noteworthy congenitally acquired infections that may be associated with an acutely ill-appearing neonate include toxoplasmosis, syphilis, rubella, cytomegalovirus, and herpes (TORCH). Of these, disseminated herpes infections are perhaps the greatest concern because they have the highest morbidity and mortality. It should be noted that many neonates infected with herpes are born to asymptomatic mothers or to mothers without a history of herpes who are having their first outbreak. Affected infants classically present as a febrile, seizing 7-day-old child with elevated liver enzymes and numerous erythrocytes in the cerebral