

CHILDREN'S

Why focus on “Newborns at Risk for Sepsis”?

This CPM focuses on the identification and treatment recommendations for the Newborn at Risk for Early Neonatal Sepsis. The evidence-based recommendations outlined below address maternal screening and prophylaxis in the setting of a positive maternal Group B Streptococcus (GBS) infection, screening and prophylaxis for possible or suspected Intraamniotic Infection (formally chorioamnionitis), and the evaluation and treatment of the newborn at risk for early onset sepsis. GBS is known to be the leading cause of morbidity and mortality in infants with signs of sepsis presenting within the first 24-48hrs. The initial diagnosis of sepsis can be difficult to determine because the early signs and symptoms of infection can be subtle. With the introduction of maternal antibiotic prophylaxis and appropriate neonatal screening and treatment, the incidence of invasive GBS disease has dramatically diminished over time.¹ Although there is a need for early intervention and treatment, antibiotics carry risk when administered unnecessarily. Within this CPM, we seek to outline the evidence-based guidelines around evaluating and treating the Newborn at Risk for Early Onset sepsis as well as address antibiotic stewardship in the neonate when appropriate.

Executive Summary

RISK FACTORS FOR INFECTION

| Category and associated risk factor |
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| Maternal – antepartum <ul style="list-style-type: none">• Inadequate prenatal care• Low socioeconomic status• Recurrent abortion• Chronic disease• Substance abuse |
| Maternal – intrapartum <ul style="list-style-type: none">• Group B Streptococcus infection, as confirmed by a vaginal culture• Prolonged rupture of membranes (longer than 18 hours)• Intraamniotic Infection (also known as chorioamnionitis)• Prolonged or difficult labor• Premature labor• Urinary tract infection• Invasive intrapartum procedures• Maternal fever• Maternal tachycardia• Fetal tachycardia |
| Neonatal <ul style="list-style-type: none">• Prematurity (less than 37 weeks)• Birth weight less than 2,500 g• Low Apgar score or need for resuscitation at the time of delivery• Difficult delivery |

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- Birth asphyxia
- Meconium staining
- Congenital anomalies (spine and abdomen)
- African American descent
- Male
- Multiple birth
- Sibling with history of GBS disease

SIGNS OF INFECTION:

| | |
|---|--|
| <ul style="list-style-type: none">• Temperature instability• Resting tachycardia• Hypotonia• Reduced activity level• Increased irritability• Inconsolable cry• Flushing or mottling, cyanosis, and cool, dusky extremities• Hypoglycemia | <ul style="list-style-type: none">• Poor feeding• Respiratory distress• Petechiae or Bruising• Bleeding• Hepatosplenomegaly• Hypotension• Seizures• Opisthotonic positioning• Bulging fontanelle |
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I. INTRAAMNIOTIC INFECTION PREVENTION AND TREATMENT ^{1,2}

A. Indications for GBS Screening:

- All pregnant women should be screened for rectovaginal GBS colonization at 35-37 weeks of gestation.
- Women who present in preterm labor, with preterm rupture of membranes, or both, should be screened for GBS colonization. If the woman does not give birth within 5 weeks of screening, GBS screening cultures should be repeated when in true labor, or at 35-37 weeks of gestation.
- Women with GBS bacteriuria or GBS urinary tract infection in the current pregnancy and women with a prior infant affected by GBS disease should be considered GBS-colonized and do not require further GBS testing.

B. Indications for Intrapartum Antibiotic Prophylaxis Administration:

- Women in labor with documented GBS colonization
- Women with preterm labor (less than 37 weeks gestation), or preterm premature rupture of membranes, or both, pending determination of true labor and GBS screening results
- Women in labor at term (greater than 37 weeks gestation) with unknown GBS status if specific risk factors arise, including rupture of members at 18 hours or more; maternal intrapartum temperature of 100.4°F or greater; or if determined to be GBS positive by intrapartum nucleic acid amplification testing
- Women experiencing an isolated temperature of 100.4°F or greater within 1 hour of delivery and no other explanation of onset of fever

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C. Antibiotics for Intrapartum Antibiotic Prophylaxis (IAP):

Penicillin or ampicillin are the preferred antibiotics for intrapartum antibiotic prophylaxis

Refer to the "OB Intraamniotic Infection" Subplan for antibiotic regimens

II. NEWBORN RISK ASSESSMENT AND MANAGEMENT ^{1,3,7} (See Algorithms for details)

Care of the Well-Appearing Newborn at Risk for Sepsis in the setting of a Mom with GBS:

- The treatment algorithm for care of the well-appearing infant born to a mom with GBS is based on several risk factors. These risk factors include inadequate intrapartum antibiotic prophylaxis (IAP), gestational age ≤ 37 weeks gestation and/or rupture of membranes (ROM) > 18 hrs.
- Newborn evaluation for this population at risk for sepsis in the setting of maternal GBS and additional risk factors as outlined above includes collection of a blood culture within 2 hrs of birth and CBC with diff within 6-12hrs of birth.
- Discharge Criteria for the Well-Appearing Newborn in the setting of maternal GBS:
 - If Adequate IAP without risk factors: May consider discharge at 24 hours of age if discharge criteria met and there is ready access to medical follow up care.
 - If Inadequate IAP without risk factors: observation for at least 48 hours is recommended prior discharge.

Care of the **Well-Appearing Newborn** in the Setting of *Possible or Suspected Intraamniotic Infection*:

- A **Possible or Suspected Intraamniotic Infection** is defined by the ACOG Committee Guidelines and diagnosed by the OB provider.²
- Treatment will be dependent on the Kaiser Calculator Tool Recommendations. The Kaiser Calculator has been described in the literature as a validated Early Onset Sepsis Risk Prediction Model.^{4,5,6}

<https://neonatalesepsiscalculator.kaiserpermanente.org/>

- The probability of neonatal early-onset sepsis is based on maternal risk factors and the infant's clinical presentation. With evidence showing the need to decrease antibiotic use, the Kaiser Calculator can help decrease the number of infants who receive a sepsis work-up and prophylactic antibiotics. The calculator uses objective perinatal parameters to assess the infant's individual risk for sepsis that include: gestational age; highest maternal temperature; GBS status; and if antibiotics were given to the mother during labor. The risk is stratified based on the infant's clinical appearance and recommendations for treatment of the infant vary based on the findings. This tool can assist in calculating the risk of early-onset sepsis in an infant born greater or equal to 34 weeks gestation.

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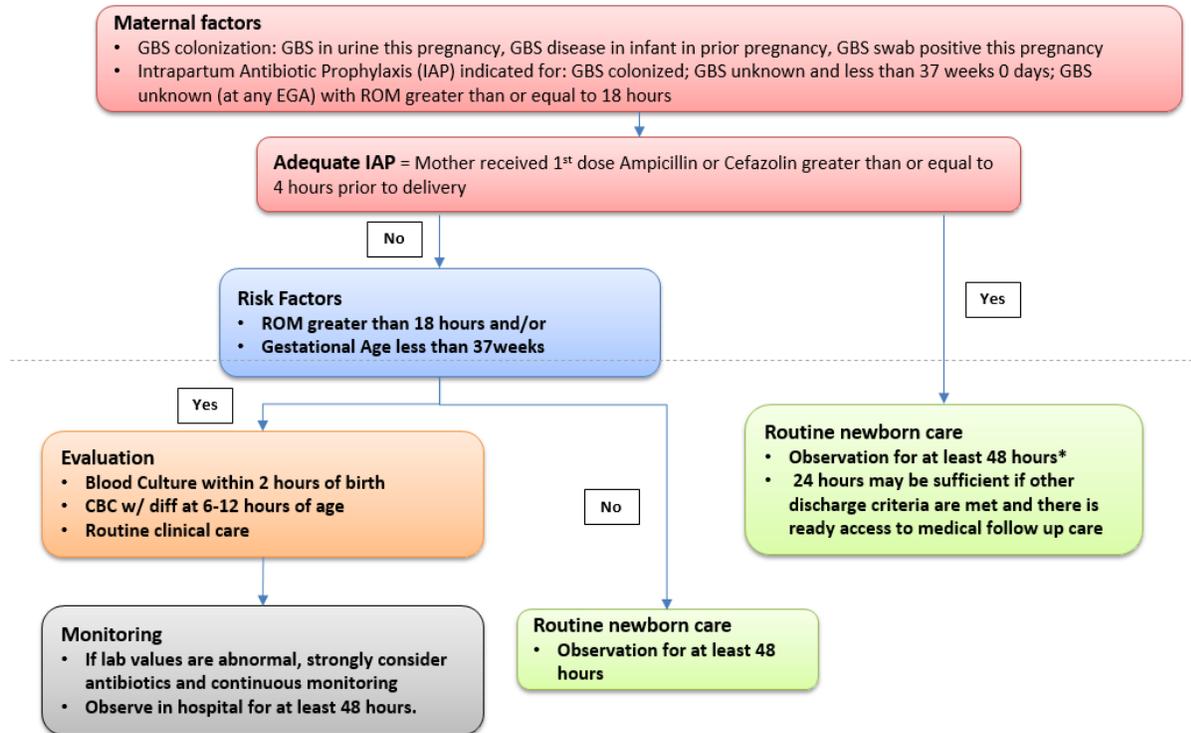
- The goal of using this tool is to decrease unnecessary exposure to antibiotics in the newborn, but also to decrease unnecessary procedures, optimize resource utilization and promote breastfeeding by decreasing separation of mother and infant.

Care of the **Ill-Appearing Newborn** in the setting of a *Possible or Suspected Intraamniotic Infection*:

- Immediate transfer to the NICU is recommended at the time of delivery to assure blood culture and initiation of antibiotic therapy performed within 1 hour of delivery.
- Duration of treatment to be determined based upon NICU evaluation and plan of care recommendations.

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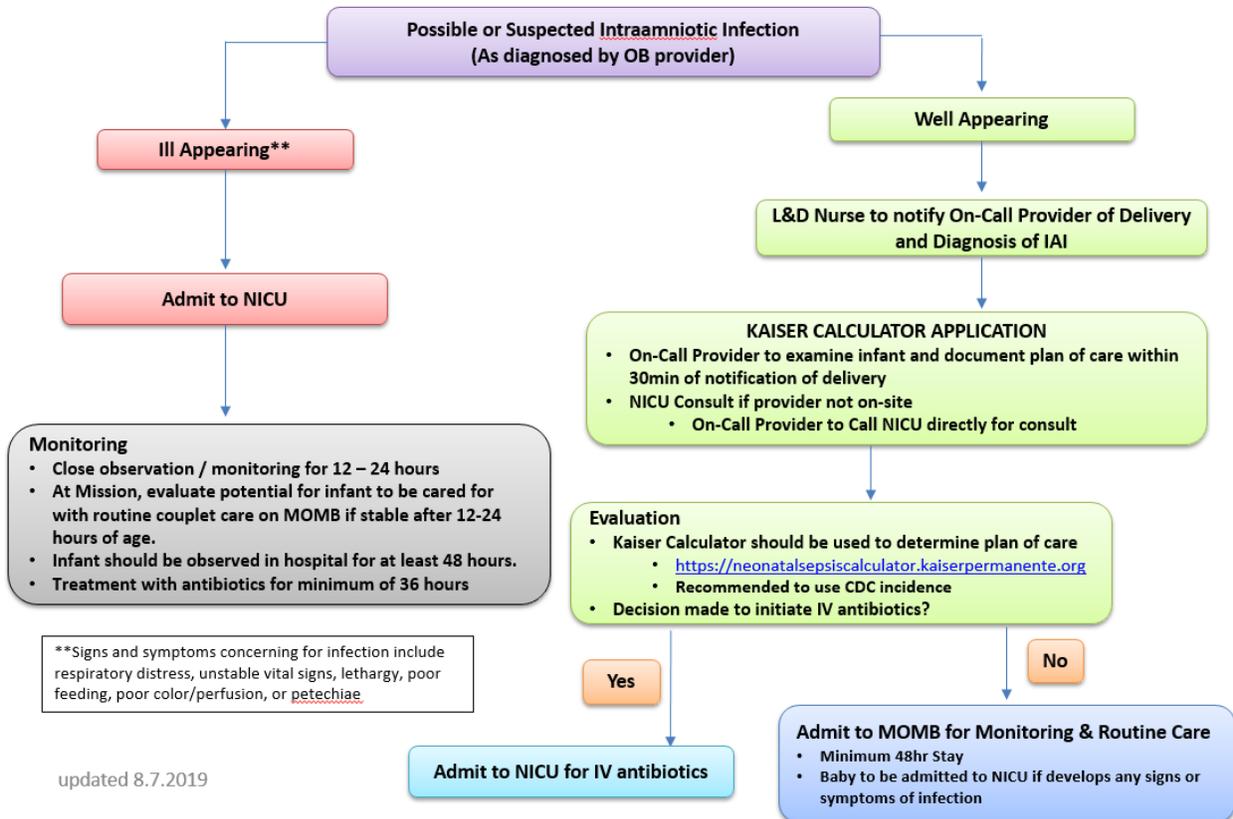
Care of the Well-Appearing Newborn at Risk for Sepsis In the Setting of GBS Positive or GBS Unknown Status



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Care of the Newborn at Risk for Sepsis In the Setting of Possible or Suspected Intraamniotic Infection



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METRICS

These metrics are to serve as important elements in the creation of the templates in the electronic medical record and will be collected and reported as they become available in our information systems.

The following metrics will be used by Mission Health as a measure of the quality care we provide. These measures are based on national standards of care and signal critical points in the care of newborns at risk for sepsis.

Average Length of Stay (LOS): Calculated by dividing the sum of inpatient days by the number of patient admissions with a diagnosis of sepsis.

Average Cost per Case: Calculated by dividing the sum of costs for patients with a diagnosis of newborn sepsis by total number of patient admissions

Readmission Rate: All cause readmissions within 30 days of discharge in patients discharged with a diagnosis of newborn sepsis

Neonatal Mortality

Number of Babies who should have been treated for CPM recommendations and did not receive SOC treatment

RESOURCES

During the newborn hospital stay, health care personnel should provide educational activities that include information explaining the rapid changes in physiology that occur in the newborn. Parents should be familiar with normal and abnormal changes in wake/sleep patterns, temperature, respiration, voiding, stooling, and the appearance of the skin, temperature, and become familiar with the behavior, temperament, and neurologic capabilities of the newborn.

Additional resources for families with infants who appear healthy but have risk factors which could make them become ill during the first 24 hours of life:

- **Your new baby is at risk of becoming sick**

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9/28/2019/28/2019

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2. Committee Opinion No. 712 Summary: Intrapartum Management of Intraamniotic Infection. *Obstet Gynecol.* 2017 Aug;130(2):490-492.
3. Jan IA, Ramanathan R, Cayabyab RG. Chorioamnionitis and Management of Asymptomatic Infants ≥ 35 Weeks Without Empiric Antibiotics. *Pediatrics.* 2017;140(1):e20162744.
4. Kuzniewicz MW, Walsh EM, Li S, Fischer A, Escobar GJ. Development and Implementation of an Early-Onset Sepsis Calculator to Guide Antibiotic Management in Late Preterm and Term Neonates. *Jt Comm J Qual Patient Saf.* 2016 May;42(5):232-9.
5. Warren S, Garcia M, Hankins C. Impact of neonatal early-onset sepsis calculator on antibiotic use within two tertiary healthcare centers. *J Perinatol.* 2017 Apr;37(4):394-397. doi: 10.1038/jp.2016.236. Epub 2016 Dec 22.
6. Kuzniewicz MW, Puopolo KM, Fischer A, Walsh EM, Li S, Newman TB, Kipnis P, Escobar GJ. A Quantitative, Risk-Based Approach to the Management of Neonatal Early-Onset Sepsis. *JAMA Pediatr.* 2017 Apr 1;171(4):365-371. doi: 10.1001/jamapediatrics.2016.4678.
7. Brady MT, Polin RA. Prevention and management of infants with suspected or proven neonatal sepsis. *Pediatrics.* 2013;132(1):166-168.