



## GUIDELINE

# Sepsis Calculator – Assessment of Early-Onset Sepsis in Infants > 35 weeks

<b>Scope (Staff):</b>	Nursing and Medical Staff
<b>Scope (Area):</b>	NICU KEMH, NICU PCH, NETS WA, Postnatal Wards KEMH

### Child Safe Organisation Statement of Commitment

CAHS commits to being a child safe organisation by applying the National Principles for Child Safe Organisations. This is a commitment to a strong culture supported by robust policies and procedures to reduce the likelihood of harm to children and young people.

This document should be read in conjunction with this [disclaimer](#)

## Aim

To provide an objective, multi-variable and patient-specific assessment of the risk for early-onset sepsis

## Risk

Briefly describe what the risks are to clients/patients, staff, or the organisation if this Not utilising this objective sepsis risk assessment could result in either missed opportunity for treatment of an infant at high risk or, conversely, of exposing the infant to unwarranted antibiotic therapy.

## Neonatal Sepsis Calculator

- Neonatal Early-Onset Sepsis Calculator. OR
- Sepsis Calc (sepsiscalc.org) <https://www.sepsiscalc.org>
- Set incidence to the **KEMH rate of 0.4/1000 live births.**
- For indigenous infants, set the incidence to **1/1000 live births.**

## Key Points

- This guideline applies to all infants born at  $\geq 35$  weeks, cared for at KEMH and covers early-onset sepsis (EOS) risk with any bacteria.
- Three groups of infants require a blood culture and antibiotic treatment without delay:

- Unwell appearing infants.
- Infants whose sibling had EOS.
- Infants whose mother currently has Group A Streptococcal infection.
- Contact the on-call paediatric staff for any queries or concerns about an infant.
- The EOS risk score should be documented on the neonatal history sheet by
  - Neonatal staff if baby admitted to neonatal unit
  - By the attending midwife if baby remains with the mother
- The **EOS score** should be calculated when the first set of neonatal observations are available.
- Document only the one EOS score along with the management category applicable at the time of assessment.

## Definitions and Parameters used for Assessment of Risk for Neonatal Sepsis

Information required for calculation of EOS score:

- Gestational age.
- Highest maternal **antepartum** temperature (ie between onset of labour to delivery). In case of precipitous delivery or BBA the first available temperature post-delivery may be used.
- Duration of rupture of membranes.
- GBS status.
- Maternal intrapartum antibiotics.

Classification of maternal intravenous antibiotics:

- GBS IAP: Penicillin, Ampicillin, Amoxicillin, Clindamycin, Erythromycin, Cefazolin, Vancomycin.
- Broad-spectrum antibiotics: other Cephalosporins, Fluoroquinolone, Piperacillin/Tazobactam, Meropenem or any combination of antibiotics that includes an Aminoglycoside or Metronidazole.

### Newborn Clinical Presentation:

The EOS risk score then incorporates the clinical presentation of the infant to determine the appropriate management plan. The newborn clinical presentation is assessed as:

- Well appearing.
- Equivocal signs.
- Clinical illness.

## Definition of Equivocal Clinical Signs

Clinical Parameters Assessed	Equivocal Signs
<ul style="list-style-type: none"> <li>• Heart rate &gt; 160/min</li> <li>• Respiratory rate &gt; 60/min</li> <li>• Temperature &gt; 38.0°C or &lt;36.4°C</li> <li>• Respiratory distress (grunting, nasal flaring or costal recessions)</li> </ul>	<p>2 clinical parameters abnormal for &gt;2hrs</p> <p style="text-align: center;"><b>or</b></p> <p>1 clinical parameter abnormal for 4hrs</p>

- Any infant with abnormal clinical parameters requires urgent paediatric review.
- Any infant with equivocal signs requires observation in the neonatal unit.

## Clinical Illness

- Unwell babies will be managed in the neonatal unit.

## Interpretation of EOS Risk Score Results and Infant Management

### Management Plan for GREEN Group:

- Routine care.
- Early discharge possible.

### Management Plan for YELLOW Group:

- Require: BLOOD CULTURE AND OBSERVATION.
- Occasionally, with borderline elevated risk the EOS calculator may indicate 'Yellow – observation only'. Please follow those recommendations.
- No routine full blood count or CRP.
- Infants with equivocal signs require observation in the neonatal unit; when signs have normalised.
- Observations (3 hourly vital signs) may continue on the postnatal wards until blood culture result available.
- Infants with medium risk, but normal exam may be observed (3 hourly vital signs) on postnatal wards until blood culture result available.
- If abnormal clinical parameters develop, the infant requires urgent paediatric review.
- If equivocal signs develop, infant requires transfer to neonatal unit.

### Management Plan for **RED** Group:

- **TAKE BLOOD CULTURE AND TREAT WITH EMPIRIC ANTIBIOTICS.**
- For details, see sepsis treatment guideline and antibiotic monographs.
- With the blood culture, take full blood count and CRP.
- Repeat CRP next morning (usually no earlier than 8-12 hours after first CRP).
- Unwell infants and those with equivocal signs will be treated in the neonatal unit until stable and may then continue treatment and observation on the postnatal wards.
- Well infants requiring antibiotics may be treated on the postnatal wards and require 3 hourly vital signs until blood culture result available.

### Documentation of EOS Risk and Clinical Assessment in Medical Notes

- **One** EOS score after clinical exam should be documented on the neonatal history form:
  - Date/time.
  - 'EOS risk score: [**insert calculated score**]'.
  - Management category, i.e. green, yellow or red.
- If the EOS risk score was not completed in the birth room/theatre, then this should be performed at the earliest opportunity and the result documented as above.
- Infant management plan based on the EOS risk score and current clinical presentation needs to be documented in the medical notes.
- If baby's clinical presentation changes, the overall EOS risk score and the appropriate management plan may change and this needs to be documented in the medical notes.

### Ceasing antibiotics for >35 weeks infants who are well with a normal CRP (x2)

- Antibiotics may be stopped, and baby discharged at 36 hours if blood culture are negative <sup>5</sup>.
- If a blood culture becomes positive after 36 hours and the baby has been discharged appropriate review may occur in ED as necessary.

### Related CAHS internal policies, procedures and guidelines

[Sepsis: Neonatal](#)

### References and related external legislation, policies, and guidelines

1. Escobar GJ, Puopolo KM, Wi S, Turk BJ, Kuzniewicz MW, Walsh EM, Newman TB, Zupancic J, Lieberman E, Draper D: Stratification of risk of early-onset sepsis in newborns  $\geq 34$  weeks' gestation. *Pediatrics* 2014; 133:30–36.
2. 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;171:365–371.
3. Puopolo KM, Draper D, Wi S, Newman TB, Zupancic J, Lieberman E, Smith M, Escobar GJ: Estimating the probability of neonatal early-onset infection on the basis of maternal risk factors. *Pediatrics* 2011;128:e1155– e1163.
4. Strunk T, Buchiboyina A, Sharp M, Nathan E, Doherty D, Patole S. Implementation of the Neonatal Sepsis Calculator in an Australian Tertiary Perinatal Centre. *Neonatology*. 2018;113(4):379-382. doi: 10.1159/000487298.
5. NICE clinical guideline. Neonatal sepsis

### Useful resources (including related forms)

[Neonatal Early-Onset Sepsis Calculator](#)

[Sepsis Calc](https://www.sepsiscalc.org/) <https://www.sepsiscalc.org/>

[CAHS Think Sepsis](#)

This document can be made available in alternative formats on request.

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