KAISER PERMANANTE SEPSIS RISK CALCULATOR

Based on https://neonatalsepsiscalculator.kaiserpermanente.org

This guideline should be used in conjunction with:
NICE CG149 Antibiotics for early onset neonatal infection updated December 2016 and
NICE Early onset neonatal infection pathway updated March 2019

INTRODUCTION

The Kaiser Permanante Sepsis Risk Calculator (KP-SCR**)** is an on-line calculator which can be used to determine whether well babies who meet the NICE criteria for treatment for possible early onset neonatal infection should receive antibiotics.

Inclusion criteria

- Babies who meet the criteria for antibiotic treatment as defined by NICE (See **Infection in the first 72 hours of life** guideline) **and:**
- are ≥34 weeks' gestation **and**
- are ≤12 hrs old **and**
- are clinically well

Exclusions

- Follow **Infection in the first 72 hours of life** guideline if
- antibiotics not recommended by NICE **or**
- baby clinically unwell **or**
- baby < 34 weeks' gestation **or**
- baby >12 hrs old **or**
- confirmed Group B streptococcal sepsis or neonatal death in a previous pregnancy and mother has not receive adequate intrapartum prophylaxis (see **Group B streptococcal colonisation of mother** guideline) **or**
- co-twin meets criteria for antibiotics

If baby clinically unwell, treat with antibiotics within 1 hour and follow **Infection in the first 72 hours of life** guideline

APPLICATION OF THE KP-SRC

If KP-SRC not available follow **Infection in the first 72 hours of life** guideline

Identification of babies

- Midwife to alert neonatal team immediately if baby meets NICE criteria for antibiotics
- Neonatal team to assess the baby and determine baby's status as Well/Equivocal/Clinical Illness using the table below

Clinical Examination	Description
Well appearing	No persistent physiological abnormalities
Equivocal	Any one of the following persisting ≥ 4 hrs after birth * • Tachycardia (HR ≥ 160) • Tachypnoea (RR ≥ 60) • Temperature < 36.5^{0}C or ≥ 38^{0}C • Respiratory distress (grunting, nasal flaring or chest recessions) not requiring supplemental oxygen Two or more of the following lasting ≥2 hrs after birth* • Tachycardia (HR ≥ 160) • Tachypnoea (RR ≥ 60) • Temperature <36.5^{0}C or ≥ 38^{0}C • Respiratory distress (grunting, nasal flaring or chest recessions) not requiring supplemental oxygen * Abnormalities can be intermittent * If any observations abnormal for two consecutive hours- arrange registrar review and consider commencing antibiotics
Clinical Illness	• Persistent need for CPAP/HFNC/ mechanical ventilation (outside of the delivery room) • Haemodynamic instability requiring fluid bolus or inotropes % • Neonatal encephalopathy / Perinatal depression • seizure • Apgar score < 5 @ 5 minutes • Need for supplemental oxygen ≥ 2 hrs to maintain SpO_2 >90 • Any other symptoms of serious illness – clinician determined • The following should also be classified as clinical illness • equivocal state persisting >2 hrs • onset of symptoms at >4 hrs after an asymptomatic period

Application of the sepsis risk score

- Access the sepsis risk calculator via one of the following websites https://neonatalsepsiscalculator.kaiserpermanente.org
- Enter **2/1000** live births as the incidence of Early-Onset Sepsis
- This is now available through Maternity Badger by searching for Early Onset Sepsis Calculator
- Calculate Sepsis Risk Score to determine individual infant's risk for EOS and follow recommendations for management based on KP-SRC
- Please note the following **West Midlands modification of KP-SRC**
- **If KP-SRC recommends blood culture, treat the baby with antibiotics until culture results are available and follow Infection in the first 72 hours of life guideline**
- If KP-SRC recommends observations for 24 hours- observe the baby for at least 36 hours
- The SRC can be re-applied based on infant's clinical status at any time up to 12 hours of age.
- Print copy of the EOS risk score calculated by KP-SRC, attach patient label on print out and file in baby's notes or upload a screenshot or scan to the maternity EPR
- Further guidance is given in the table below

Calculator Input	Value to be entered	Notes
Incidence of Early-Onset Sepsis	**2**/1000 live births	Based on local incidence
Gestational Age (GA)	GA in weeks and days	Weeks range 34-43 Days range 0-6
Highest Maternal Intrapartum Temperature (^{0}C)	Units ^{0}**Celsius** Use highest intrapartum maternal temperature including up to 1 hr following delivery	Use whole number or number with single decimal place *e.g.*: 37, 37.1, 37.0 ***Note*: Midwives to document and inform neonatal team, if postpartum temperature within 1hr of birth is ≥ 0.5°C above intrapartum temperature**
ROM (hours)	***Use entire duration of rupture of membranes to delivery, not just pre-labour duration**	Round value to single decimal place. e.g. enter ROM 4 hrs 30 min as 4.5 hours, 4 hrs 55 min as 5.0 hrs
GBS	Enter maternal GBS screening result in current pregnancy if available. If not known enter 'unknown'	
Type of Intrapartum Antibiotics **and** **Interval From First Dose to Birth**	• ***GBS-specific antibiotics*** are defined **ONLY as Benzyl-Penicillin.** This should apply only to mothers who are GBS positive or GBS unknown • **If erythromycin, clindamycin or vancomycin ALONE are given for GBS prophylaxis, choose the option *No antibiotics or any antibiotics given < 2 hours prior to delivery*** • ***Broad-spectrum antibiotics (BSAB)*** are defined as two or more antibiotics given in combination when there is concern for the mother developing chorioamnionitis. • ***Timing*** of administration of **GBS-specific antibiotics** or ***BSAB administration*** = interval between the first dose of Benzyl-Penicillin or the second antibiotic in the combination to the time of birth. **e.g:** Cefuroxime at 2:00pm, Metronidazole at 3:30pm, birth at 4:30pm so 2nd antibiotic given 1 hr prior to delivery. Choose ***No antibiotics or any antibiotics given < 2 hours prior to delivery*** • ***If mother given BOTH GBS-specific antibiotics and BSAB – of the 4 possible options, select the category with the longest duration of treatment*** **e.g.:** Benzyl-Penicillin at 8pm & and 12:00pm for GBS +ve then develops fever to 38.3^{0}C at 2:00pm so Cefuroxime given at 3:00pm. Benzyl-Penicillin given at 4:00p, birth is at 4:30pm. GBS-specific antibiotics were given >4 hrs prior to delivery, but BSAB were given only 1½ hrs prior to delivery. Choose ***GBS specific antibiotics given >2 hours prior to birth***	

OBSERVATIONS:

All infants on whom KP-SRC has been applied should have regular observations as below:

Clinical Status	**Well Appearing**	**Equivocal**	**Unwell**
Observation schedule	Routine observations at 1 hour, 2 hours and then every 2-hourly until 12 hours of age. Thereafter continue observations every 4 hourly until the end of observation period till 36 hours (despite KP-SRC recommending observations for only 24 hours in some).	Hourly until all observations within normal range X 2 Thereafter, follow guidance for well appearing child. **Ask for registrar review and consider commencing antibiotics if any two consecutive observations are abnormal or equivocal.**	Admit to NICU and observation as directed by clinician

SUBSEQUENT MANAGEMENT

- If baby appears unwell at any time or in equivocal state for more than 2 hours, treat baby with antibiotics following **Infection in first 72 hours of life** guideline
- If antibiotics are started, take blood for CRP, FBC and blood culture then follow the **Infection in the first 72 hours of life** guideline
- Give parents a 'Screening for infection in newborn babies -information for parents' leaflet

DISCHARGE

- All infants on KP-SRC observation pathway should be observed for at least 36 hours in hospital and should be re-examined by the neonatal team before discharge to confirm well-being.