KAISER PERMANENTE SEPSIS RISK CALCULATOR ● 1/5

Based on https://neonatalsepsiscalculator.kaiserpermanente.org

This guideline should be used in conjunction with:
Infection in the first 72 hours of life *guideline and* NICE NG195 Neonatal infection: antibiotics for prevention and treatment *updated April 2021*

INTRODUCTION

The Kaiser Permanente Sepsis Risk Calculator (KP-SRC) is an online calculator used to determine which well babies meeting 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**:
- ≥34 weeks' gestation **and**
- aged ≤12 hr **and**
- 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 aged >12 hr **or**
- confirmed Group B streptococcal (GBS) 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 hr 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 (see Flowchart: Application of KP-SRC for a baby who meets the criteria for antibiotics)

- If baby meets NICE criteria for antibiotics midwife/nursery nurse to alert neonatal team immediately
- Neonatal team to assess baby and determine baby's status as well/equivocal/clinical illness using **Table 1**

KAISER PERMANENTE SEPSIS RISK CALCULATOR ● 2/5

Table 1

Clinical examination	Description
Well appearing	• No persistent physiological abnormalities
Equivocal	**Any one of the following persisting ≥4 hr after birth*** • Tachycardia (HR ≥160 bpm) • Tachypnoea (RR ≥60) • Temperature <36.5°C or ≥38°C • Respiratory distress (grunting, nasal flaring or chest recessions) not requiring supplemental oxygen **≥2 of the following lasting ≥2 hr†** • Tachycardia (HR ≥ 160 bpm) • Tachypnoea (RR ≥ 60) • Temperature <36.5°C or ≥38°C • Respiratory distress (grunting, nasal flaring or chest recessions) not requiring supplemental oxygen * Abnormalities can be intermittent † If any observations abnormal for 2 consecutive hours – arrange middle grade 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 at 5 min • Need for supplemental oxygen ≥2 hr to maintain SpO_2 >90% • Any other symptoms of serious illness – clinician determined • Following should also be classified as clinical illness ◦ equivocal state persisting >2 hr ◦ onset of symptoms at >4 hr after an asymptomatic period

Application of sepsis risk score

- Access the sepsis risk calculator via maternity **BadgerNet** – early onset sepsis calculator or via web https://neonatalsepsiscalculator.kaiserpermanente.org
- Enter **2/1000** live births as incidence of early-onset sepsis (EOS)
- Calculate sepsis risk score to determine individual baby's risk for EOS and follow recommendations for management based on KP-SRC
- Note the following West Midlands modification of KP-SRC:
  - if KP-SRC recommends blood culture: treat baby with antibiotics until culture results available and follow **Infection in the first 72 hours of life** guideline
  - if KP-SRC recommends observations for 24 hr: observe baby for ≥36 hr
- SRC can be re-applied based on baby's clinical status at any time up to aged 12 hr
- If KP-SRC accessed via web, then print copy of EOS risk score calculated by KP-SRC, attach patient label to print out, file in baby's notes or scan/upload screenshot to the maternity EPR
  - this is not required if KP-SRC accessed via **BadgerNet**. Further guidance given in **Table 2**

Table 2

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 (°C)	Units °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: If postpartum temperature within 1 hr of birth is ≥0.5°C above intrapartum temperature, midwives to document and inform neonatal team**
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 hr 30 min as 4.5 hr, 4 hr 55 min as 5.0 hr
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 penicillin G. ampicillin is an acceptable alternative. Penicillin-allergic women with no history of anaphylaxis, angioedema, respiratory distress, or urticaria after administration of penicillin or a cephalosporin should receive cefuroxime • 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 hr prior to delivery'** • **'Broad-spectrum antibiotics (BSAB)'** defined as ≥2 antibiotics given in combination when concern for the mother developing chorioamnionitis • **'Timing'** of administration of '**GBS-specific antibiotics'** or '**BSAB administration'** = interval between first dose of penicillin G or second antibiotic in the combination to the time of birth • e.g.: cefuroxime at 2:00 pm, metronidazole at 3:30 pm, birth at 4:30 pm, so 2nd antibiotic given 1 hr before 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.: penicillin G at 8:00 pm and 12:00 pm for GBS positive, then develops fever to 38.3°C at 2:00 pm so cefuroxime given at 3:00 pm. Penicillin G given at 4:00 pm, birth at 4:30 pm. GBS-specific antibiotics were given >4 hr before delivery, but BSAB were given only 1.5 hr before delivery. Choose '**GBS specific antibiotics given >2 hours prior to birth'**	

KAISER PERMANENTE SEPSIS RISK CALCULATOR ● 4/5

OBSERVATIONS:

All babies on whom KP-SRC has been applied should have regular observations as shown in table below

Table 3

Clinical status	Observation schedule
Well appearing	• Routine observations at aged1 hr and aged 2 hr, **then** • 2-hrly until aged 12 hr, **then** • 4-hrly until aged 36 hr (despite KP-SRC recommending only 24 hr in some)
Equivocal	• Hourly until all observations in normal range for 2 consecutive measurements. Then follow guidance for well appearing baby • If any 2 consecutive measurements abnormal or equivocal request middle grade assessment and review need for antibiotics
Unwell	• Admit to NICU and observation as directed by clinician

SUBSEQUENT MANAGEMENT

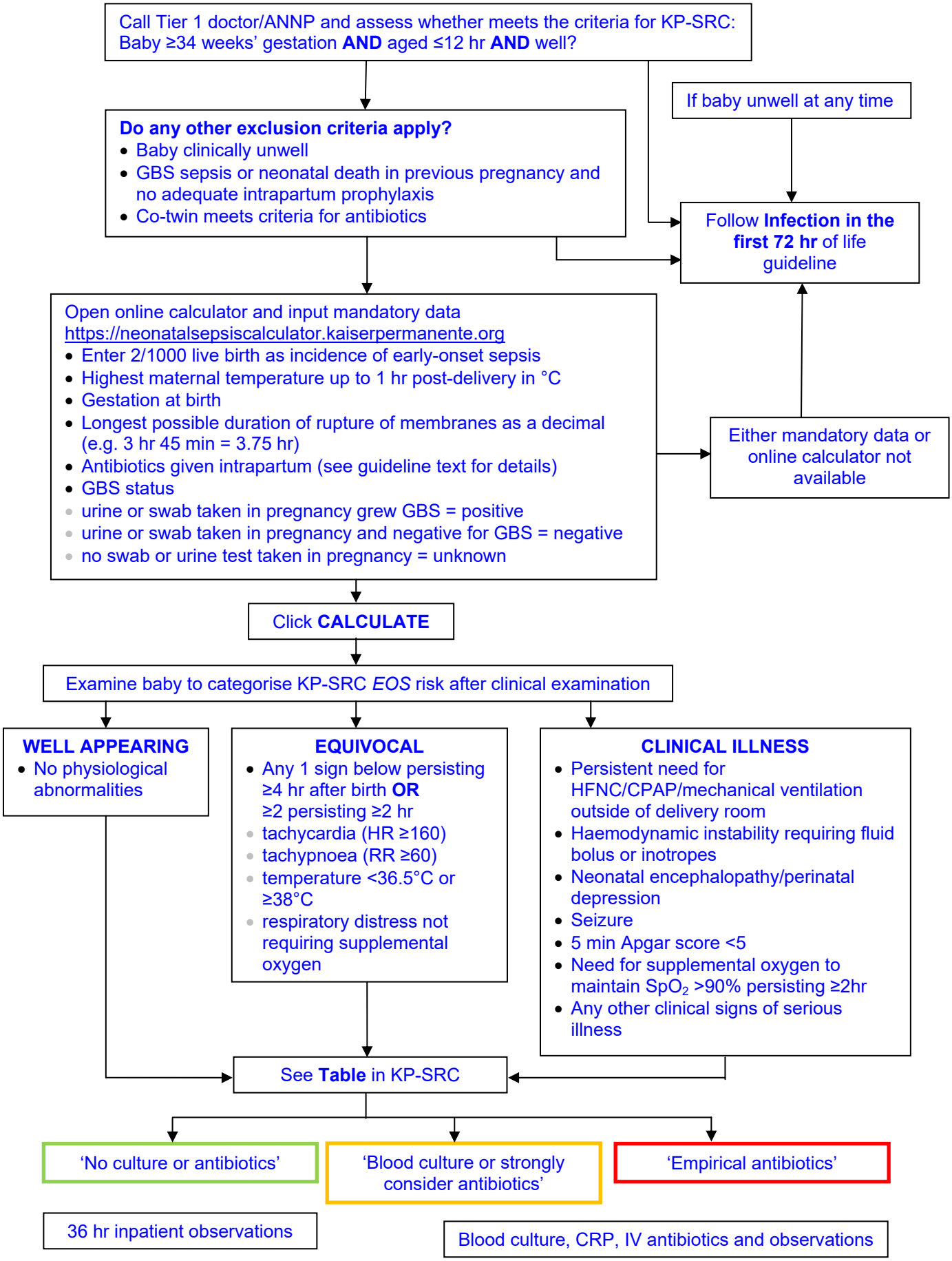
- If baby appears unwell at any time or in equivocal state for >2 hr, treat baby with antibiotics following **Infection in first 72 hours of life** guideline

DISCHARGE

- All babies on KP-SRC observation pathway to be observed for ≥36 hr in hospital and re-examined by neonatal team before discharge to confirm well-being

KAISER PERMANENTE SEPSIS RISK CALCULATOR • 5/5

APPLICATION OF KP-SRC FOR A BABY WHO MEETS THE CRITERIA FOR ANTIBIOTICS



Refer to text of guideline for details of observations