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Royal Cornwall Hospitals NHS Trust

Sepsis: Management of Maternal Sepsis Clinical Guideline

V3.0

November 2022

1. Aim/Purpose of this Guideline

1.1 To provide guidance for obstetricians, anaesthetists, midwives and nurses enabling prompt diagnosis and management of sepsis in pregnant and postnatal women.

1.2 This version supersedes any previous versions of this document.

1.3 This guideline makes recommendations for women and people who are pregnant. For simplicity of language the guideline uses the term women throughout, but this should be taken to also include people who do not identify as women but who are pregnant, in labour and in the postnatal period. When discussing with a person who does not identify as a woman please ask them their preferred pronouns and then ensure this is clearly documented in their notes to inform all health care professionals.

Data Protection Act 2018 (General Data Protection Regulation – GDPR) Legislation

The Trust has a duty under the Data Protection Act 2018 and General Data Protection Regulations 2016/679 to ensure that there is a valid legal basis to process personal and sensitive data. The legal basis for processing must be identified and documented before the processing begins. In many cases we may need consent; this must be explicit, informed, and documented. We cannot rely on opt out, it must be opt in.

Data Protection Act 2018 and General Data Protection Regulations 2016/679 is applicable to all staff; this includes those working as contractors and providers of services.

For more information about your obligations under the Data Protection Act 2018 and General Data Protection Regulations 2016/679 please see the Information Use Framework Policy or contact the Information Governance Team

Royal Cornwall Hospital Trust rch-tr.infogov@nhs.net

2. The Guidance

2.1. Introduction

Sepsis during pregnancy and the puerperium (i.e. until 6 weeks postnatally) remains the leading direct cause of maternal death in the UK (UKOSS, 2015) Sepsis is a medical emergency and the first hour of diagnosis is crucial in achieving a successful outcome. Each hour of delay in administering broad spectrum intravenous antibiotic is associated with a measurable increase in maternal mortality.

Sepsis is the body's overwhelming and life-threatening response to infection that can lead to tissue damage, organ failure and death.

Signs of severe sepsis in peripartum women, particularly with group A streptococcal infection should be regarded as an obstetric emergency. Symptoms of sepsis may be less distinctive than in the non-pregnant population and are not necessarily present in all cases; therefore, a high index of suspicion is necessary. Bacteraemia can progress rapidly to severe sepsis.

All recently delivered women should be informed of the signs and symptoms of

genital tract infection and how to prevent its transmission[3].

2.2 Risk factors for maternal sepsis in pregnancy and the puerperium

- Obesity
- Impaired glucose tolerance/diabetes
- Impaired immunity/immunosuppressant medication
- Anaemia
- Offensive Vaginal discharge
- History of pelvic infection
- History of group B streptococcal infection
- Amniocentesis and other invasive procedures
- Cervical cerclage
- Prolonged spontaneous rupture of membranes
- Vaginal trauma, caesarean section, wound hematoma
- Retained products of conception
- Group A streptococcus infection in close contacts/family members
- Black or other minority ethnic group origin

2.3 Clinical symptoms suggestive of sepsis

- Fever or rigors
- Diarrhoea and vomiting
- Generalised rash
- Abdominal/pelvic pain and tenderness
- Offensive vaginal discharge
- Productive cough
- Urinary symptoms
- General – nonspecific signs such as lethargy, reduced appetite
- Breast engorgement/redness
- Wound infection

- Delay in uterine involution, heavy lochia (postnatally)
- Impaired mental state

Genital tract sepsis may present with constant severe abdominal pain and tenderness unrelieved by simple oral analgesia. Severe infection may also be associated with preterm labour. Toxic Shock Syndrome caused by staphylococcal or streptococcal exotoxins can produce symptoms including diarrhoea, nausea and vomiting.

2.4 **Clinical signs suggestive of sepsis Includes one or more of the following**:

- Pyrexia (temp >38°C)
- Hypothermia (temp <36°C)
- Tachycardia (>100 bpm)
- Tachypnoea (>20 breaths per minute)
- Hypoxia/requiring O_2 to maintain SATS above 94%
- Hypotension
- Oliguria
- New confusion
- Fetal tachycardia/abnormal CTG particularly in the presence of meconium
- Hyperglycemia, in absence of diabetes (Glucose >7mmol)

These signs, including pyrexia may not always be present and are not necessarily related to the severity of sepsis

2.5 **Recognition of sepsis**

2.5.1 Maternity Early Obstetric Warning Scoring system (MEOWS) is an essential tool for assessing a woman's clinical condition. If infection is suspected, the named midwife must commence a MEOWS chart and fluid balance chart.

2.5.2 If MEOWS score is 5 or more complete the Sepsis Screening Tool (Appendix 3) and transfer to Delivery Suite and manage as per sepsis 6 BUFALO bundle (See appendix 4).

2.5.3 Review the patient within 30 minutes of admission to delivery suite. If the obstetric team are unavailable, it must be clearly documented in the notes why and when a review is expected. The co-ordinator should review the patient to assess the urgency. If a doctor is required urgently, immediate escalation to the Obstetric Consultant on call should take place. Until the review happens the co-ordinator should be kept up to date with any changes.

2.5.4 **Midwives working from the community or Birth Centre's**.

2.5.4.1 Community midwives request a category one ambulance, cannulate if competencies allow and administer IV fluids.

2.5.4.2 When ambulance arrives administer facial O_2 to maintain SATS >94% and if IV fluids administered by midwife document in notes.

2.5.4.3 It is important to remember that some physiological changes in labour such as raised heart rate are normal and may not be related to sepsis.

2.6 General Management of Sepsis

2.6.1 Complete and carry out BUFALO steps initiating broad spectrum antibiotics as per trust policy within the hour.

2.6.2 Consider paracetamol for women in labour with a fever, a temperature of 38°C or above (on a single reading) or 37.5°C or above on 2 consecutive readings (one hour apart) (New 2022).

2.6.3 Be aware that paracetamol is not a treatment for sepsis and should not delay investigation if sepsis is suspected.

2.6.4 Avoid Ibuprofen.

2.7 Management of Sepsis in Labour / suspected Chorioamnionitis

2.7.1 The risk of neonatal encephalopathy and cerebral palsy is increased in the presence of intrauterine infection.

2.7.2 Undertake a multidisciplinary review by obstetrician, anaesthetist, senior midwife, labour ward coordinator and microbiologist.

2.7.3 Document a clear plan with regular review at least every 4 hours (NEW 2022) taking account of the clinical picture and response to treatment.

2.7.4 Involve the woman in decision making regarding mode of delivery (NICE 2019).

2.7.5 When considering mode and timing of delivery consider

- Source and severity of sepsis
- Gestation
- Fetal wellbeing
- Stage and progress of labour
- Parity
- Response to treatment

- Expected time until delivery needs to be considered and expedited with clear communication in context of the whole clinical picture (NEW 2022)

2.7.6 If the woman has a genital tract infection, the birth should be expedited taking account of the above considerations (NICE 2019).

2.8 Change to continuous intrapartum fetal monitoring

Advise continuous CTG with suspected/confirmed sepsis or infection. If an FSE/ST analysis has already commenced, this can continue. If suitable ST analysis would be recommended (NEW 2022)

The whole clinical picture must be assessed and taken into account when considering timing and mode of delivery (New 2022). Vaginal delivery can be considered if:

- Normal CTG
- Making adequate progress. Expected time of delivery needs to be considered and expedited in accordance with the clinical picture (NEW 2022).
- If using STAN analysis, then interpretation of STAN events must be upgraded e.g. In the presence of ST events on an intermediary CTG classify the significance of these using the abnormal CTG threshold. (NEW 2022)
- Be aware that FBS is not recommended, and STAN analysis can be falsely reassuring in the presence of sepsis or suspected chorioamnionitis.
- Maternal preferences should be considered

2.9 Analgesia in labour for women with sepsis

- For women in labour needing antibiotics start antibiotics before inserting needle for regional analgesia (NICE 2019).
- Any concerns about providing a women's choice of regional analgesia should be discussed with the anaesthetic consultant on call.

2.10 Post Natal

Ensure ongoing Multi-Disciplinary Team (MDT) review for first 24 hours.

2.11 Deteriorating Septic Patient

2.11.1 In severe or rapidly deteriorating cases including hypotension and/or a serum lactate >2mmol/l (>4mmol/l if intrapartum) (New 2022) and where there is sign of end organ dysfunction.

- Registrar needs to be in immediate attendance
- On call Anaesthetic Registrar needs to be in immediate attendance

- The on-call Consultant Obstetrician, Consultant Obstetric Anaesthetist (Critical Care Consultant for out of hours) should be involved and in attendance (NEW 2022)
- Refer the woman to the Critical Care Outreach team
- Advice from the Consultant Microbiologist should be urgently sought

2.11.2 Critical Care Outreach team and Critical Care Consultant should be informed if there are any sign of organ dysfunction.

- Altered consciousness
- Hypotension
- Reduced urine output – not responding to treatment
- Need for 40% oxygen to maintain oxygen saturations to above 94%
- Temperature less than 36 °C

2.11.3 Patient will be transferred to Critical Care if deemed appropriate and after MDT discussion.

2.11.4 Accurate record keeping is essential both in the written notes and electronic records.

2.12 **Sources of sepsis in the puerperium to be considered**

2.12.1 All women who are unwell in the puerperium should be assessed clinically, and admission considered. Women may present with sepsis which is not deriving from the genital tract, including (this is list is not exhaustive):

- Mastitis
- UTI
- Pneumonia
- Gastroenteritis
- Pharyngitis /sore throat- Group A streptococcus
- Infection related to regional anaesthetic
- Infective endocarditis
- Retained tissue

3. Monitoring compliance and effectiveness

Information Category	Detail of process and methodology for monitoring compliance
Element to be monitored	• Implementation of new Sepsis Screening Tool • The use of sepsis 6 BUFALO
Lead	Audit Midwives
Tool	Sepsis audit as per trust ongoing audit undertaken by audit midwives
Frequency	As per trust sepsis audit
Reporting arrangements	Maternity Patient Safety Forum
Acting on recommendations and Lead(s)	Any deficiencies identified will be discussed at patient safety meeting or maternity forum. Action leads will be identified, and a time frame set for the action to be completed. The action plan will be monitored by the maternity Patient safety forum
Change in practice and lessons to be shared	Required changes to practice will be identified and actioned within 3 months. A lead member of the team will be identified to take each change forward where appropriate. Lessons will be shared with all the relevant stakeholders

4. Equality and Diversity

4.1. This document complies with the Royal Cornwall Hospitals NHS Trust service Equality and Diversity statement which can be found in the 'Equality, Inclusion and Human Rights Policy' or the Equality and Diversity website.

4.2. Equality Impact Assessment

The Initial Equality Impact Assessment Screening Form is at Appendix 2.

Appendix 1. Governance Information

Information Category	Detailed Information
Document Title:	Sepsis: Management of Maternal Sepsis Clinical Guideline V3.0
This document replaces (exact title of previous version):	Sepsis: Management of Maternal Sepsis Clinical Guideline V2.3
Date Issued/Approved:	November 2022
Date Valid From:	November 2022
Date Valid To:	November 2025
Directorate / Department responsible (author/owner):	Sophie Haynes, Obstetric Consultant
Contact details:	01872 25 2730
Brief summary of contents:	Guidance for obstetricians, anaesthetists, midwives and nurses to enable prompt diagnosis and management of sepsis in antenatal and postnatal women.
Suggested Keywords:	Sepsis, infection, MEOWS
Target Audience:	RCHT: Yes CFT: No CIOS ICB: No
Executive Director responsible for Policy:	Chief Medical Officer
Approval route for consultation and ratification:	Chief Medical Officer
General Manager confirming approval processes:	Maternity Guidelines Group Obs and Gynae Directorate Meeting
Name of Governance Lead confirming approval by specialty and care group management meetings:	Caroline Chappell
Links to key external standards:	Caroline Amukusana
Related Documents:	None required
Training Need Identified?	• NICE Intrapartum care for women with existing medical conditions or obstetric

Information Category	Detailed Information
	complications and their babies NG121 (2019) • Severe maternal Sepsis UKOSS (2015) • The UK sepsis Trust professional resources • RCOG Green Top Guideline No. 64A • NICE recognition diagnosis and early management (2016) • CMACE (2008) Saving Mothers' Lives: Reviewing maternal deaths to make motherhood safer: 2006–2008 Surviving Sepsis (2012) International Guidelines for Management of Severe Sepsis and Septic Shock
Publication Location (refer to Policy on Policies – Approvals and Ratification):	Internet and Intranet
Document Library Folder/Sub Folder:	Clinical / Midwifery and Obstetrics

Version Control Table

Date	Version Number	Summary of Changes	Changes Made by
2nd October 2014	V1.0	Initial Review	Louise Forster Obstetric Registrar
20th May 2016	V1.1	Bufalo sticker appendix added	Sarah-Jane Pedler Practice Development Midwife
4th August 2016	V1.2	Lactate amended to >2 in line with RCHT sepsis guideline	Sarah-Jane Pedler Practice Development Midwife

Date	Version Number	Summary of Changes	Changes Made by
2nd May 2019	V2.0	Reviewed, benchmarked and updated with up to date guidance and sepsis tool updated to reflect PROMPT training, the guideline and MEOWS trigger	Sophie Haynes Consultant Obstetrician Sarah-Jane Pedler Practice Development Midwife
12th June 2019	V2.1	Change to the watermark in Appendix 3	Sarah-Jane Pedler Practice Development Midwife
August 2019	V2.2	Additions to the guideline following Health Service Investigation Branch (HSIB) regarding escalation to the Obstetrician	Sarah-Jane Pedler, Practice Development Midwife
July 2020	V2.3	GDPR template change 1.3 Inclusion statement Appendix 1 updated governance template Appendix 2 updated EIA template Appendix 3 addition of BUFALO record	Sophie Haynes Consultant Obstetrician
November 2022	V3.0	Full review Updated to latest Trust template All amendments noted in text as 'NEW 2022'	Sophie Haynes Consultant Obstetrician

Appendix 2. Equality Impact Assessment

Section 1: Equality Impact Assessment (EIA) Form

The EIA process allows the Trust to identify where a policy or service may have a negative impact on an individual or particular group of people.

For guidance please refer to the Equality Impact Assessment Policy (available from the document library) or contact the Equality, Diversity and Inclusion Team rcht.inclusion@nhs.net

Information Category	Detailed Information
Name of the strategy / policy / proposal / service function to be assessed:	Sepsis: Management of Maternal Sepsis Clinical Guideline V3.0
Directorate and service area:	Obstetrics and Gynaecology
Is this a new or existing Policy?	Existing
Name of individual completing EIA (Should be completed by an individual with a good understanding of the Service/Policy):	Sophie Haynes, Obstetric Consultant
Contact details:	01872 25 2730

Information Category	Detailed Information
1. Policy Aim - Who is the Policy aimed at? (The Policy is the Strategy, Policy, Proposal or Service Change to be assessed)	All staff who care for women in the obstetric setting.
2. Policy Objectives	To support all staff and those in their care who develop sepsis.
3. Policy Intended Outcomes	To ensure that there is clear guidance to follow if a patient becomes septic.
4. How will you measure each outcome?	Using the monitoring compliance tool.
5. Who is intended to benefit from the policy?	All pregnant women who become septic.

Information Category	Detailed Information
6a. Who did you consult with? (Please select Yes or No for each category)	• Workforce: Yes • Patients/ visitors: No • Local groups/ system partners: No • External organisations: No • Other: No
6b. Please list the individuals/groups who have been consulted about this policy.	**Please record specific names of individuals/ groups:** Maternity Guidelines Group Obstetrics and Gynaecology Directorate
6c. What was the outcome of the consultation?	Agreed
6d. Have you used any of the following to assist your assessment?	**National or local statistics, audits, activity reports, process maps, complaints, staff or patient surveys:** No

7. The Impact

Following consultation with key groups, has a negative impact been identified for any protected characteristic? Please note that a rationale is required for each one.

Where a negative impact is identified without rationale, the key groups will need to be consulted again.

Protected Characteristic	(Yes or No)	Rationale
Age	No	
Sex (male or female)	No	
Gender reassignment (Transgender, non-binary, gender fluid etc.)	No	
Race	No	
Disability (e.g. physical or cognitive impairment, mental health, long term conditions etc.)	No	
Religion or belief	No	
Marriage and civil partnership	No	

Protected Characteristic	(Yes or No)	Rationale
Pregnancy and maternity	No	
Sexual orientation (e.g. gay, straight, bisexual, lesbian etc.)	No	

A robust rationale must be in place for all protected characteristics. If a negative impact has been identified, please complete section 2. If no negative impact has been identified and if this is not a major service change, you can end the assessment here.

I am confident that section 2 of this EIA does not need completing as there are no highlighted risks of negative impact occurring because of this policy.

Name of person confirming result of initial impact assessment: Sophie Haynes, Obstetric Consultant

If a negative impact has been identified above OR this is a major service change, you will need to complete section 2 of the EIA form available here:
Section 2. Full Equality Analysis

Appendix 3. Maternal Sepsis Screening Tool

Maternal Sepsis Screening Tool

1. **Has MOEWS been triggered?**
2. **Does the woman look sick?**
3. **Is the fetal heart rate ≥ 160 bpm?**
4. **Could this woman have an infection?**

Common infections include:
- Chorioamnionitis/endometritis
- Urinary tract infection
- Wound infection
- Influenza/pneumonia
- Mastitis/breast abscess

Patient ID

If YES to any of the above, complete the risk assessment

High risk criteria

☐ Respiratory rate ≥ 25

☐ SpO_2 < 92% without O_2

☐ Heart rate > 130

☐ Systolic BP ≤ 90

☐ Altered mental status/ responds only to voice, pain or unresponsive

☐ Blood Lactate ≥ 2.0*

☐ Non-blanching rash/mottled/cyanotic

☐ Urine < 0.5 mL/kg/hr

☐ No urine for 18 hours

*Lactate measurement may be transiently elevated during and immediately after normal labour and birth. If unsure, repeat sample

If ONE criterion is present:

Commence 'Sepsis Six' NOW

Immediate obstetric review (middle grade or above)
Transfer to Obstetric Unit if in the community

Inform Consultant Obstetrician & Consultant Anaesthetist

Commence MEOWS chart

Commence BUFALO sticker

Moderate risk criteria

☐ Respiratory rate 21-24

☐ Heart rate 100-130

☐ Systolic BP 91-100

☐ 1x Temperature <36 or >38°C

☐ 2x temperatures >37.5°C at least two hours apart

☐ No urine output for 12-18 hours

☐ Abnormal CTG or significant rise e.g. > 20bpm above baseline

☐ Prolonged ruptured membranes

☐ Recent invasive procedure

☐ Bleeding/wound infection/offensive vaginal discharge/abdominal or uterine pain

☐ Contact with Group A Strep

☐ Change in mental state

☐ Diabetes/gestational diabetes/immunosuppressed

If TWO criteria are present:

Also consider if only ONE criterion

Send bloods
FBC, lactate, CRP, U+Es, LFTs

Obstetric review (ST3 or higher) within one hour

Consider 'Sepsis Six' or commencing antibiotics if infection but not septic

Low risk criteria

☐ Respiratory rate ≤ 20

☐ Heart rate < 100

☐ Systolic BP > 100

☐ Normal mental status

☐ Temperature 36-37.4°C

☐ Looks well

☐ Normal CTG

☐ Normal urine output

If ALL criteria are present:

LOW RISK OF SEPSIS

Review and monitor for improvement or deterioration and continue MEOWS observations

Consider obstetric need and full clinical picture

Review bloods
If lactate ≥ 2, persistent raised temperature or CTG changes, or Acute Kidney Injury present follow

HIGH RISK / BUFALO

Completed by:
Name: Designation: Time:
Signature: Date:

BUFALO indicated and commenced after Obstetric review ☐

OR

BUFALO not indicated but infection suspected and antibiotics commenced
REVIEW AGAIN IN 2 HOURS
Name: Designation: Time:
Signature: Date:

Appendix 4: 'Sepsis 6 (BUFALO) Care Pathway

To be completed within 1 hour of admission if sepsis is suspected ☐

Patient Label

Date:..... Time:.....

Staff Name:…… Designation:…… Ward:……..

B -Take blood cultures if not already taken Consider sputum, MSU, HVS, MRSA & throat swab	Time	Initial	Reason not done or result
U - Measure hourly Urine Output Catheter if unconscious or retention, otherwise start strict fluid input chart.	Time	Initial	Reason not done or result
F- Give a fluid challenge Hypotensive: Syst BP< 90: STAT 20ml/kg Hartmann's or 0.9% Saline, contact senior immediately. Normotensive: At least 500ml Hartmann's or 0.9% Saline	Time	Initial	Reason not done or result
A- Give IV antibiotics Take blood cultures first According to Trust protocol (from intranet). 48 hour review at latest.	Time	Initial	Reason not done or result
L- Measure lactate (blood gas: ED, ITU) If > 2mmol/l (>4mmol/l if intrapartum): CONTACT Anaesthetist oncall, give 20ml/kg Hartmann's or 0.9% Saline	Time	Initial	Reason not done or result
0- Give high-flow oxygen 15l/minute via reservoir facemask initially. Monitor SATS.Seek expert help if used for > 4hr	Time	Initial	Reason not done or result

Evaluation at 1 hour: MEOWS: Fluid volume given: Antibiotics:

SHO: Inform Registrar (SBAR): situation= 'Confirm Sepsis', Liaise with Microbiologist on call

NO

Continue MEOWS every 30 mins. Reassess for high-risk factors each time condition changes

BP (after initial fluid challenge)	**Syst < 90 / Mean < 65**
Urine output	**< 0.5 ml/kg/hr for 2 hrs**
INR	**> 1.5**
aPTT	**> 60 s**
Bilirubin	**> 34 µmol/l**
O_2	**Needed to keep SpO_2 > 94%**
Platelets	**< 100 x 10^9/l**

YES

This is SEVERE SEPSIS

Call Registrar or Consultant to attend within 30 mins, document sepsis and action plan in notes.

Inform on call Anaesthetist, Critical Care Outreach Team to attend urgently