WOMEN'S HEALTH AND PAEDIATRICS

MATERNITY UNIT

Intrapartum Pyrexia and Sepsis Guideline

Amendments			
Version	Date	Comments	Approved by
	June 2020	• Review in line with NHS/PSA/R/2014/015 Addition of venous lactates in management of labour • Addition of Sepsis six pathway Additional guidance on commencing sepsis six pathway • Addition of Amber/Red Flag Signs of Sepsis • Addition of the Microguide in view of Antibiotics requirements	

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Ratified by: Perinatal Governance Guideline Group

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Target audience: All health professionals within the maternity services

Equality impact assessment: Perinatal Governance Guideline Group

Comments on this document to: Perinatal Governance Guideline Group

Contents

Abbreviations

CEMACE	**Confidential Enquiry into Maternal Deaths**
CRP	**C-reactive protein**
CTG	**Cardiotocograph**
CXR	**Chest x-ray**
DVT	**Deep vein thrombosis**
FBC	**Full blood count**
ECG	**Electrocardiogram**
GAS	**Group A Streptococci**
IV	**Intravenous**
LFT's	**Liver Function Tests**
LMWH	**Low Molecular Weight Heparin**
MC&S	**Microscopy, Culture and Sensitivity**
PROM	**Prolonged rupture of membranes**
PPROM	**Pre-term pre-labour rupture of membranes**
NNU	**Neonatal Unit**
SIRS	**Systemic Inflammatory Response Syndrome**
U&E's	**Urea and electrolytes**
UOP	**Urine Output**

Intrapartum Pyrexia and Sepsis Guideline

1.0 Introduction

Sepsis in pregnancy remains an important cause of maternal death in the UK. In 2003–2005 there were 13 direct deaths from genital tract sepsis in pregnancy, five related to pregnancy complications prior to 24 weeks of gestation and eight related to sepsis from 24 weeks of gestation, arising before or during labour

Between 2006 and 2008 sepsis rose to be the leading cause of direct maternal deaths in the UK, with deaths due to Group A streptococcal infection (GAS) rising to 13 women.

Sepsis with acute organ dysfunction has a mortality rate of 20%, which increases to 40% if septic shock develops. Studies in the non-pregnant population have found that the survival rates following sepsis are related to early recognition and initiation of treatment.

We should aim to prevent sepsis with the use of prophylactic antibiotics and recognise sepsis and treat sepsis promptly using the sepsis six bundle.

2.0 Definitions

- **Sepsis** defined as life threatening organ dysfunction caused by dysregulated host response to infection.

- **Septic shock** is defined as a subset of sepsis with particularly profound circulatory, cellular, and metabolic abnormalities associated with a greater risk in mortality than sepsis alone.
  The diagnostic criteria of septic shock are a vasopressor requirement required to maintain mean arterial pressure (MAP) >65mmHg and a serum lactate ≥2.0mmol/L in the absence of hypovolaemia

Severe sepsis with acute organ dysfunction has a mortality rate of 20 to 40%, which increases to >40% if septic shock develops.

3.0 Intrapartum pyrexia and immediately postpartum (<6 hours postpartum)

Intrapartum pyrexia is defined as a temperature in labour of 38.0◦C or above on a single reading or

37.5◦C or above on 2 consecutive readings 1 hour apart.

Intrapartum pyrexia can be caused by infectious and non-infectious means.

Risks factors for intrapartum pyrexia: -

- Nulliparity
- Prolonged rupture of membranes
- Prolonged labour
- Induction of labour
- Epidural analgesia

- Misoprostol use – pyrexia only with misoprostol use does not indicate the presence of infection and should be managed with regular paracetamol

Continuous electronic fetal monitoring should be commenced for all women with a pyrexia in labour

Consider IV paracetamol but this is not a treatment for sepsis and should not delay investigation if sepsis is suspected

Take FBC, CRP and a lactate. If other features of sepsis then use sepsis six bundle.

For management of intrapartum pyrexia – See appendix 1

4.0 Chorioamnionitits

Diagnose clinical chorioamnionitis is there is: -

Maternal pyrexia (as defined in section 3.0) and 2 or more of the following: -

- Maternal tachycardia >110bpm
- Fetal tachycardia >160bpm
- Tender/irritable uterus
- Foul smelling liquor
- Purulent discharge
- Meconium
- Raised inflammatory markers - WCC >15 and CRP > 30
- Consider clinical chorionamniotis if there is meconium stained liquor, fetal tachycardia/other CTG abnormalities especially in early labour

Management of clinical choriomanionitits: -

- There should be discussion with MDT including Cons Obstetrician, shift leader and Anaesthetists regarding timing and type of delivery as this will be dependent upon the whole clinical scenario
- Ensure continuous CTG monitoring is commenced if not already
- Inform Obstetric Consultant
- Inform NNU
- Obtain blood cultures
- Regular paracetamol oral or IV, consider tepid sponging and a cooling fan
- Prescribe and give IV antibiotics as per Microguide for Chorioamnionitis
- Consider giving IV fluids
- Chase any outstanding microbiology investigations
- None of the above should delay expedition of delivery as these babies often have chronic hypoxia

5.0 Risk factors for maternal sepsis

Non- Pregnant	Pregnancy Related Risk Factors
Obesity	Multiple pregnancy
Impaired glucose tolerance/diabetes	Cervical cerclage
Anaemia	Amniocentesis or other invasive intrauterine procedures
Group A Streptococcus (GAS) infection in close contacts of family members	History of Group B Stretococcus (GBS) infection
History of Pyelonephritis/UTI	Prolonged rupture of membranes (PROM)
History of pelvic infections	Pre-term pre-labour rupture of membranes (PPROM)
Immunocompromised status e.g. HIV, immunosuppressive medication including biological treatment	Operative vaginal delivery
Pre-existing medical problems e.g. haematological, renal disorders, heart failure	Vaginal trauma
	Wound haematoma
	Caesarean section (with PROM/PPROM/Chorioamnionitis, uterine angle tear, difficult delivery of infant, ureter/bladder damage, bowel perforation, multiple adhesions)
	Retained products of conception after miscarriage, termination of pregnancy
	Manual removal of placenta
	Continued vaginal discharge or offensive vaginal discharge

6.0 Maternal History and Examination

When taking a maternal history it is important to consider these causes and associated features for the cause of sepsis

Condition	Associated features
Pyelonephritis	Dysuria, frequency, loin pain, haematuria, catheterisation
Chorioamnionitis	PROM, long labour, abdominal pain, offensive discharge, intra-uterine death
Wound infection	Erythema, induration, discharge
Pneumonia	Cough, sputum, chest pain, crepitations
Influenza	Cough, myalgia, headacahe
Meningitis	Headache, neck stiffness, photo/phonophobia, maculopapular rash, confusion, seizures, epidural
Appendicitis	Abdominal pain (not necessarily at McBurney's point), nausea, vomiting, anorexia
Cholecystitis	Right upper quadrant pain, vomiting
Pancreatitis	Epigastric pain radiating to the back, vomiting
Necrotising fasciitis	Pain, tenderness out of proportion to physical signs
Breast abscess	Erythema, sweeling, discharge, fluctuant mass
DVT	Swelling, tenderness, erythema, heat
Gastroenteritis	Vomiting, diarrhoea

Consideration should also be given to these factors: -

- Recent travel
- Any medications
- Immunosuppression
- Recent surgical procedures
- Indwelling prosthesis
- Previous hospitalisation

Examination of the patient

This should be a systematic examination of the patient from top to toe to try and identify the cause of sepsis

7.0 Clinical features suggestive of sepsis

The UK Sepsis Trust uses a warning light system to indicate level of risk from organ dysfunction and death. This is also implemented by NICE.

Amber Flag Criteria	Red Flag Criteria
Relatives concerned about mental status	Responds only to voice or pain/unresponsive
Acute deterioration in functional ability	Systolic BP ≤90mmHg (or drop >40mmHg from normal)
Respiratory rate 21-24 OR breathing hard	Heart rate >130bpm
Heart rate 100-130bpm OR new arrhythmia	Respiratory rate ≥ 25 per minute
Systolic BP 91-100mmHg	Needs oxygen to keep SaO_2 ≥92%
Not passed urine in the last 12-18hours	Non blanching rash, mottled/ashen/cyanotic
Temperature <36°C	Not passes urine in last 18 hours
Immunosuppressed/diabetes/gestational diabetes	Urine output less than 0.5ml/kg/hr
Has had invasive procedure in last 6 weeks (e.g. CS, forceps, ERPC, cerclage, CVS, miscarriage, termination)	Lactate ≥2mmol/L
Prolonged rupture of membranes	
Close contact with GAS	
Bleeding/wound infection/vaginal discharge	
Non-reassuring CTG/fetal tachycardia>160bpm	

One RED flag criteria = START SEPSIS SIX pathway NOW – see appendix 1

Any AMBER criteria = Send bloods, call Registrar for review, make antimicrobial prescribing decision within 3 hours.

If AKI present with one Amber criteria then start SEPSIS SIX pathway NOW

8.0 Investigations when sepsis suspected

Immediate Investigations	Additional investigations – if indicated	Consider additional Imaging
Venous blood tests to include • FBC • CRP • U&E's • LFT's • Clotting • Lactate • Group and Save (consider cross match)	• CXR • ECG	If source unknown and/or no improvement after initial treatment consider these investigations after discussion with Obstetric Consultant: - • Abdo/pelvis USS • CT chest abdo/pelvis • MRI abdo/pelvis
Blood Cultures x 2 sets	Throat swab – viral and bacterial, consider COVID swab	
Low vaginal swab	Wound swab for MC&S	
Midstream sample of urine for microscopy, culture and sensitivity (MSU) /catheter specimen of urine (CSU)	Placental swab for MC&S Consider sending placenta for histology if clinical chorioamnionitis	

9.0 Treatment of Sepsis

Surviving Sepsis Campaign is recommended when looking after patients with sepsis or septic septic shock. This is a time critical bundle and treatment should be instigated within the **first hour**.

Both sepsis and septic shock should be viewed as a medical emergency requiring rapid diagnosis and immediate intervention.

If sepsis is suspected then this should be escalated to the LW registrar for immediate review and the Consultant Obstetrician should be informed

Follow Appendix 2 for Sepsis Six Bundle – this should be started within the 1st hour of presentation

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1. **Administer oxygen** – aim to keep SaO_2 >94%
2. **Take blood cultures** – at least a peripheral set, consider MSU, sputum, vaginal, breast milk culture, throat swab. Think source control and timing of delivery of baby – start CTG
3. **Give IV antibiotics** in line with trust protocol, consider allergies before administration – see Microguide and consider paracetamol
4. **Give IV fluids** – if hypotensisve/lactate>2mmol/L, 500ml stat (can repeat up to 30ml/kg). Ask doctor regarding IV fluids if not hypotensive and lactate normal. Ask anaesthetist regarding IV fluids if patient has pre-eclampsia
5. **Check serial lactates** – corroborate high VBG lactate with arterial sample. If lactate >4.0mmol/L, call Critical Care and recheck after each 10ml/kg fluid challenge
6. **Measure urine output** – may require urinary catheter. Ensure fluid balance chart commenced and completed hourly.

- **Ensure TED's and LMWH prescribed**

10.0 Multi-disciplinary Team Working

The Consultant Obstetrician, Consultant Obstetric Anaesthetist and the Consultant Microbiologist should all be involved in the decision making of this patient if there is no response to initial antibiotics or additional imaging is required to identify the source.

11.0 Source Control

All means should be undertaken to identify the source of the infection

Further imaging may be required (see Section 8.0) to help identify the source

An essential part of source control is consideration under the MDT

Source control encompasses all those physical measures used to control a focus of invasive infection and to restore the optimal function of the affected area.

Source-control measures:

1. Drainage; surgical or interventional radiology
2. Debridement and washout should be considered in post-operative or suspected intra-abdominal infection

12.0 Indications for ITU/Outreach Review

The decision to transfer to ITU should be made by critical care in conjunction with the Obstetric Consultant and Consultant Obstetric Anaesthetist.

System	Indication
Cardiovascular	• Hypotension or raised serum lactate despite appropriate fluid resuscitation
Respiratory	• Mechanical ventilation • Airway Protection
Renal	• Kidney injury requiring renal support
Neurological	• Significantly decreased conscious level
Miscellaneous	• Multi-organ failure • Uncorrected acidosis • Hypothermia

References

1. RCOG Green Top Guidelines 64B/64A April 2012 Sepsis in Pregnancy and following Pregnancy (Bacteria)
2. The Sepsis Manual 4th Edition 2017-2018 by The UK Sepsis Trust
3. NICE guideline (NG 51) July 2016 (Last updated Sept 2017) Sepsis : Recognition, Diagnosis and Early Management
4. NICE Guidance (CG 190) Dec 2014 (Last updated Feb 2017) Intrapartum care for healthy women and Babies
5. NICE Guidance (NG 121) Mar 2019 (Last updated Apr 2019) Intrapartum care for women with existing medical conditions or obstetric complications and their babies
6. Keeley A et al. The recognition and management of sepsis and septic shock: a guide for non-intensivists. *Postgrad Med J* 2017;**93**:626-634

APPENDIX 1 - Initial Assessment and Management of Maternal Pyrexia in Labour or the immediate Postpartum Period

Maternal Pyrexia in labour of 37.5°C x2 or >38°C x1 or Postnatal Pyrexia >38°C

ASSESS THE PATIENT

Take into account the full clinical picture including full MEOWS score and the overall maternal and fetal wellbeing

Assess for an UNDERLYING SOURCE of Infection:

- **Chorioamnionitis:** Offensive liquor, prolonged ruptured membranes >24 hrs, known GBS carrier
- **Urinary Tract Infection:** Symptoms e.g. dysuria, frequency, positive urinalysis for leucocytes/nitrates
- **Mastitis:** Breast engorgement, redness, localised abscess
- **CNS – Meningo-encephalitis:** Non blanching rash, headache, photophobia, neck stiffness
- **Pneumonia:** Productive cough, sputum, SOB
- **Other apparent or confirmed source**

Assess for COVID 19 risk factors / symptoms:

- New persistent dry cough
- Shortness of breath
- Recent exposure to confirmed COVID 19 case
- Recent self-isolation or household isolation

MANAGEMENT

- **Patient HAS an apparent source of infection e.g. chorio/UTI etc and does NOT meet criteria for COVID 19 testing as per above questions:** DO NOT Test for COVID 19
- Follow Sepsis 6 pathway and do not delay antibiotic therapy
- Reassess if the clinical situation changes, e.g. patient develops a cough

Patient DOES meet criteria for COVID 19 testing as per above questions OR does not meet above criteria BUT no other apparent source of infection:

- Test for COVID 19
- Manage as suspected case
- Follow Sepsis 6 pathway
- Continue investigations to diagnose source
- Consider starting broad spectrum antibiotics depending on the overall condition

APPENDIX 2 - FLOWCHART FOR SEPSIS 6 BUNDLE

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Equality Impact Assessment Summary

Name and title: Intrapartum Pyrexia and Sepsis Guideline

Background • Clinical midwifery managers • Consultant obstetrician
Methodology • This guideline will be applied to all women who are pregnant • The guideline was informed by NICE and RCOG guidance • The guideline was reviewed by the multidisciplinary team
Key Findings • This guidance ensures that any woman who has concerns regarding fetal movements receives evidence based care that involves the multidisciplinary team.Describe the results of the assessment
Conclusion • This guideline will ensure that all pregnant women who have concerns regarding fetal movement receive a multidisciplinary evidence based approach to their care.
Recommendations • The guidance should be updated three yearly or as when new evidence is discovered