

Trust Guideline for the Management of: Peripartum Pyrexia and Sepsis

Document Control:

For Use In:	Norfolk and Norwich University Hospital Foundation Trust (NNUHFT)		
	Maternity Services		
Search Keywords	Pyrexia, screening and management for sepsis in labour		
Document Author:	Mr Charles Bircher, Consultant Obstetrics and Gynaecology, NNUH; Mr Richard Haines, Consultant, Obstetrics and Gynaecology, NNUH Updated by: Mr Charles Bircher, Consultant Obstetrics and Gynaecology, NNUH; Bryony Tomlinson, ST2, NNUH; Ourania Kakisi, Microbiology Consultant, NNUH		
Document Owner:	Women and Children's Division		
Approved By:	Maternity Guidelines Committee Clinical Guidelines Assessment Panel (CGAP)		
Ratified By:	Clinical Safety and Effectiveness Sub-Board		
Approval Date:	23 rd February 2024	Date to be reviewed by: This document remains current after this date but will be under review	23 rd February 2027
Implementation Date:	N/A		
Reference Number:	855		

Version History:

Version	Date	Author	Reason/Change
6	06/06/2020	Mr C Bircher and Mr R Haines	Addition of ESBL antibiotic on flow chart, and the oral penicillin allergic antibiotic.
6.1	02/11/2020	Mr C Bircher and Mr R Haines	Reviewed, and minor amendments made
6.2	14/12/2020	Mr C Bircher and Mr R Haines	Minor changes made.
7	28/05/2021	Mr C Bircher, Dr B Tomlinson, Dr O Kakisi	Change of i.v. antibiotics for sepsis non pen allergic. Change of teicoplanin dose. Addition of ongoing antibiotic doses in sepsis care bundle, and recommendation for oral antibiotic choice in penicillin

Trust Guideline for the Management of: Peripartum Pyrexia and Sepsis

			allergy.
8	17/06/2021	Mr C Bircher, Dr B Tomlinson, Dr O Kakisi	Instructions on slightly different ongoing antibiotics if penicillin allergic, using oral metronidazole after iv if possible and using meropenem instead of cef and met for ESBL (not as well as).
9	03/02/2022	Mr C Bircher, Dr B Tomlinson	Change of metronidazole and clarithromycin route to oral. Update on pyrexia bundle use outside of labour
10	29/05/2022	Mr C Bircher and Mr Richard Haines	Changes made are: To give gentamicin last when administering antibiotics. Inform NICU within 1 hour of birth, not 1 hour of diagnosis. Swabs do not need to be done within 1 hour.
11	21/08/2023	Joely Simeoni, Practice Development Midwife	New Template Change to neonatal management in line with implementation of Newborn Sepsis Risk Calculator
11.1	14/02/2024	Mr C Bircher	Check lactate on gas machine, and does not need confirming with lab test

Previous Titles for this Document:

Previous Title/Amalgamated Titles	Date Revised
None	Not applicable

Distribution Control

Printed copies of this document should be considered out of date. The most up to date version is available from the Trust Intranet.

Consultation

The following were consulted during the development of this document:
Charles Bircher, Consultant Obstetrician (NNUHFT)
Caroline Hallam, Specialist Pharmacist, Antimicrobials (NNUHFT)

The original guideline was written by the author on behalf of the Obstetrics and Gynaecology Directorate Clinical Guidelines Committee. Dr Catherine Tremlett (Consultant Microbiologist) kindly advised on the antibiotic treatment recommended in this guideline. The guideline was reviewed by the R+R committee and hospital sepsis lead.

Ourania Kaksisi, Antimicrobial Group Chair (NNUHFT) was consulted during addition of antibiotics for instrumental delivery change.

This version has been endorsed by the Maternity Guidelines Committee.

Trust Guideline for the Management of: Peripartum Pyrexia and Sepsis

Monitoring and Review of Procedural Document

The document owner is responsible for monitoring and reviewing the effectiveness of this Procedural Document. This review is continuous however as a minimum will be achieved at the point this procedural document requires a review e.g. changes in legislation, findings from incidents or document expiry.

Relationship of this document to other procedural documents

This document is a clinical guideline applicable to the Norfolk and Norwich University Hospital Foundation Trust; please refer to local Trust's procedural documents for further guidance, as noted in Section 4.

Inclusivity

Within this document we use the terms pregnant women, her/she. However, It is important to acknowledge that it is not only people who identify as women for whom it is necessary to access care. Maternity services and delivery of care must therefore be appropriate, inclusive and sensitive to the needs of those individuals whose gender does not identity does not align with the sex they were assigned at birth.

Trust Guideline for the Management of: Peripartum Pyrexia and Sepsis

Contents Page

Quick reference 1A: Obstetric Pyrexia: Treatment and first dosing chart.....	5
Quick reference 1B: Obstetric Care Bundle for Pyrexia.....	6
Quick reference 2A: Obstetric SEPSIS treatment and first dosing chart.....	7
Quick reference 2B: Obstetric SEPSIS care bundle (complete within 1 hour) ...	8
1.Introduction.....	9
1.1.Rationale.....	9
1.2.Objective.....	9
1.3.Scope.....	10
1.4.Glossary.....	10
2.Responsibilities.....	10
3.Processes to be followed	10
3.1.Diagnosis of Pyrexia.....	10
3.2.Diagnosis of Sepsis.....	11
3.3.Antibiotic Regimen First Dosing.....	11
3.3.1.Ongoing Antibiotic Dosing in Patients on the SEPSIS Care Bundle.....	11
3.4.Step Down Antibiotics.....	12
4.Related Documents	12
5.References	13
6.Monitoring Compliance.....	14
7.Equality Impact Assessment (EIA)	15

Trust Guideline for the Management of: Peripartum Pyrexia and Sepsis

Quick reference 1A: Obstetric Pyrexia: Treatment and **first** dosing chart

Plus	Clinical Indication	Plus
Teicoplanin 6mg/kg IV	MRSA	Nil else
Clindamycin 1.2g IV	Suspected / confirmed Group A strep	Clindamycin 1.2g IV
Teicoplanin 6mg/kg IV	Suspected Listeriosis	Nil else
Clarithromycin 500mg IV/PO	Pneumonia	Clarithromycin 500mg IV/PO
Replace Cefuroxime and Metronidazole with Meropenem 1gr IV STAT	ESBL risk : ESBL or high risk ie travel or hospitalisation abroad	Consult Microbiology for advice

Trust Guideline for the Management of: Peripartum Pyrexia and Sepsis

Quick reference 1B: Obstetric Care Bundle for Pyrexia

Diagnosis of pyrexia $\geq 38^{\circ}\text{C}$ on an occasion with no red flags or $\geq 37.5^{\circ}\text{C}$ on two or more consecutive occasions an hour apart. Pyrexia in labour is common with a multitude of causes and hence should be identified and managed in a timely fashion in order to avoid clinical deterioration. If identified at home, to attend hospital for clinical assessment.

Record date dd/mm/yyyy and time in 24-hour clock

Date: Time: Print staff name: Bleep:			
Diagnosis:			
	Time	Initials	Result or reason not done
1. Send FBC / CRP / random glucose / lactate (can be done on blood gas machine and does not need confirming with lab lactate)			
2. Send blood cultures			
3. Send MSU			
4. Send HVS or LVS			
5. IV resuscitation using 1000ml crystalloid e.g. Hartmann's – rate to be determined by clinical situation			
6. 1g Paracetamol IV / PO 6 hourly			
7. Cool sponge for symptomatic relief			
8. Continuous CTG monitoring if still pregnant			
9. Complete neonatal risk assessment within 1 hour of birth and refer as appropriate			
10. Empirical IV Antibiotics if no "maternal red flags" according to Pyrexia treatment and first dosing chart			
11. Start MEOWS chart Observations 4 hourly minimum			
Stop IV antibiotics after one dose postpartum (consider longer IV/oral course ONLY if clinically indicated)			

Trust Guideline for the Management of: Peripartum Pyrexia and Sepsis

Quick reference 2A: Obstetric SEPSIS treatment and first dosing chart

Plus	Clinical Indication	Plus
Teicoplanin 6mg/kg IV	MRSA	Nil else
Clindamycin 1.2g IV	Suspected/confirmed Group A strep	Clindamycin 1.2g IV
Nil else	Suspected Listeriosis	Nil else
Clarithromycin 500mg IV/PO	Pneumonia	Clarithromycin 500mg IV/PO
Replace metronidazole and Gentamicin with Meropenem 1gr IV STAT	ESBL risk : ESBL or high risk ie travel or hospitalisation abroad	Consult Microbiology for advice

Trust Guideline for the Management of: Peripartum Pyrexia and Sepsis

Date: Time: Print staff name:			
Bleep: Designation.....			
	Time	Initials	Result or reason not done
1. Give high-flow oxygen: • Reservoir mask at 10 -15L/min.			
2. Take blood cultures and ensure IV access • 2 x cannulas (1x16G and 1 any other size) • U&Es, CRP (yellow top) • Glucose (grey top) • Lactate (blood gas machine) • Haemoglobin (purple top) • Coagulation (blue top) • G&S (pink top) • Arterial / Venous Blood Gas			
3a. Prescribe IV antibiotics • Check patient allergies • Prescribe antibiotics from Sepsis treatment and first dosing chart.			
3b. Administer IV antibiotics within 1 hour • Administer gentamicin last to allow			
4. Give a fluid challenge • If systolic BP < 90: 20mL/kg Hartmann's stat • If not hypotensive: at least 500mL Hartmann's			
5. Measure lactate • Can be venous/arterial blood gas (and processed on labour ward machine) • If > 2mmol/L: give 20mL/kg Hartmann's			
6. Measure accurate urine output: • Insert a urinary catheter • Commence fluid chart and hourly urine output			
7. Start MEOWS chart			
8. Complete neonatal risk assessment within 1 hour of birth and refer as appropriate			
9. Consider: • Vaginal swab, Wound swab, Throat swab (bacterial and viral) • Urinalysis and MSU • Breast milk culture • Swabbing baby • Viral swab of active vaginal lesions Ideally prior to antibiotics, but do not delay antibiotics. Not mandatory within 1 hour			
10. Continue IV antibiotics and review every 24 hours <i>Record date dd/mm/yyyy and time in 24-hour clock</i>			

Quick reference 2B: Obstetric SEPSIS care bundle (complete within 1 hour)

One or more of

- Pyrexia
 - Fetal tachycardia >160
 - High clinical suspicion of infection
- } **Plus** at least one Maternal red flag

Trust Guideline for the Management of: Peripartum Pyrexia and Sepsis

1. Introduction

1.1. Rationale

Peripartum pyrexia, especially in labour, is a common occurrence. Therefore differentiating it from sepsis, which is potentially very serious, is important. Prompt recognition and antibiotic treatment of the febrile and septic woman reduces morbidity.

Global antibiotic resistance is a serious problem that is facing health care, it is therefore vital that we use antibiotics appropriately^{1,2}. By using the most appropriate type and duration of antibiotics we can have a positive impact by reducing hospital admissions and length of stay^{3,4}, without compromising patient care and outcome⁵.

Maternal temperature can rise in normal labour, rising from 37.1°C at the beginning of labour to 37.4°C after 22 hours⁶. Infection of the fetal membranes and amniotic cavity (chorioamnionitis) occurs in 1-5% of all term pregnancies and many will present with pyrexia in labour.

Risk Factors for pyrexia in labour
Prolonged rupture of membranes (3-25% if >24 hours) Multiple vaginal examinations Group B streptococcus carrier, E-coli and Bacteroides Prolonged labour Preterm labour Nulliparity and young age Be mindful of epidural effect (non-infection). 5-20 fold increase in risk of moderate pyrexia in labour
Clinical Presentation
Purulent or offensive liquor Pyrexia Maternal Tachycardia Maternal Tachypnoea Uterine tenderness Fetal tachycardia
Maternal Consequences
Dehydration Dysfunctional labour Increased obstetric intervention PPH Endometritis Septic shock Organ failure Death
Neonatal Consequences
5-10% will develop pneumonia or bacteraemia GBS and E-coli highest risk Cerebral palsy

1.2. Objective

To reduce maternal and neonatal morbidity and mortality associated with infection of the fetal membranes and amniotic cavity causing fever in labouring women.

Trust Guideline for the Management of: Peripartum Pyrexia and Sepsis

To reduce the impact of drug resistant bacteria and hospital admission duration by using the most appropriate timing, duration and type of antibiotic treatment.

1.3. Scope

To be used for all pregnant women with a pyrexia, especially in labour, or when there are clinical concerns regarding an infective process regardless of whether there is a pyrexia.

1.4. Glossary

The following terms and abbreviations have been used within this document:

Term	Definition
CGAP	Clinical Guidelines Assessment Panel
IV	Intravenous
MEOWS	Maternal Early Obstetric Warning Score
NNUHFT	Norfolk and Norwich University Hospital Foundation Trust

2. Responsibilities

It is the responsibility of maternity and obstetric staff providing maternity care in all settings to keep updated with local guidance and ensure it is implemented. It is the responsibility of obstetric and midwifery leads to ensure training allows staff to remain updated.

3. Processes to be followed

Record a full set of observations including maternal temperature and MEOWS score on admission.

- In labour observations every 4 hours recorded on the partogram.
- Antenatally and postnatally the frequency of observations will be determined by clinical condition but should be at a minimum of every 12 hours, including a MEOWS score. If a patient is pyrexial, observations and MEOWS should be completed at least every 4 hours.

Women who meet the **PYREXIA care bundle** criteria should receive IV antibiotics from diagnosis up until 1 dose postnatally. They do not require an oral stepdown of antibiotics unless the clinical assessment suggests on-going infection.

Women who meet the **SEPSIS care bundle** criteria should have their antibiotics reviewed every 24 hours.

The patient's community teams should be informed of any antibiotic treatment during their hospital admission^{5,6}.

3.1. Diagnosis of Pyrexia

Maternal temperature $\geq 38^{\circ}\text{C}$ on one occasion or $\geq 37.5^{\circ}\text{C}$ on 2 consecutive occasions, an hour apart, with no red flags.

Pyrexia in labour is common and has a multitude of causes. It can be a sign of sepsis, and early recognition of sepsis is vital. Therefore once a woman has been diagnosed as pyrexial (one temp ≥ 38 or TWO temps ≥ 37.5 as above) then paracetamol can be given. However, in order to avoid masking a pyrexia, do not give

Trust Guideline for the Management of: Peripartum Pyrexia and Sepsis

paracetamol for a single temperature between 37.5 and 37.9 or temperatures below 37.5.

Follow the Obstetric PYREXIA treatment and first doses chart and Obstetric PYREXIA care bundle.

3.2. Diagnosis of Sepsis

This is made with a high clinical suspicion of infection, often manifest by pyrexia (as defined above) combined with a systemic response leading to organ dysfunction or ultimately organ failure. It remains one of the leading causes of maternal death and has significant morbidity and mortality for newborns. The diagnosis of a systemic inflammatory response in the pregnant population is difficult as pregnant women often don't show signs and symptoms until they are very unwell. For this guideline the definition of maternal peripartum sepsis is:

One or more of:

- Pyrexia.
- Fetal tachycardia >160.
- High clinical suspicion of infection.

Plus at least one Maternal red flag (see pyrexia and sepsis flow charts at the beginning of this guideline).

Follow the Obstetric SEPSIS treatment and first doses chart and Obstetric SEPSIS care bundle.

3.3. Antibiotic Regimen First Dosing

See Quick Reference Flow Chart and Care Bundles at the beginning of this guideline

This is the FIRST dose(s) of antibiotics which MUST be given as soon as possible. Once the first dose has been given, then the antibiotic regime to be continued should be considered in the light of the initial response, further clinical information and results. The regime must be reviewed regularly and modified appropriately.

3.3.1. Ongoing Antibiotic Dosing in Patients on the SEPSIS Care Bundle

Non-penicillin allergic	True penicillin allergic
<p>Benzylpenicillin 1.2g IV QDS</p> <p>Metronidazole 400mg PO TDS (use 500mg IV TDS only where there are concerns about oral absorption)</p> <p>Gentamicin ongoing doses to be guided by gentamicin levels taken 6-14 hours post the first dose and gentamicin nomogram as per hospital Gentamicin policy, trust i.d. 1299 (http://intranet/antimicrobial_resources/htm/index.htm)</p>	<p>Teicoplanin 6mg/kg 12 hourly for 3 doses, then 6mg/kg once daily. (If treatment continues beyond 3 days then Teicoplanin must be changed to Vancomycin –see Trust guideline for dosing)</p> <p>Metronidazole 400mg PO TDS (use 500mg IV TDS only where there are concerns about oral absorption)</p> <p>Gentamicin ongoing doses to be guided by gentamicin levels taken 6-14 hours post the first dose and gentamicin nomogram as per hospital Gentamicin policy, trust i.d. 1299</p>

Trust Guideline for the Management of: Peripartum Pyrexia and Sepsis

(http://intranet/antimicrobial_resources/html/index.htm)

3.4. Step Down Antibiotics

Research assessing the use of intrapartum and postpartum antibiotics has concluded that the use of intrapartum antibiotics has a positive effect on maternal and neonatal outcomes. There were no significant differences when comparing dose and regimens of antibiotics. There were no significant differences in maternal or neonatal outcomes when a shorter duration of antibiotics was used^{5,7}. However, there was a significant reduction in the length of hospital admission^{3,4}.

With this in mind, if a woman is treated for intrapartum **pyrexia**, they should receive one IV dose of antibiotics **postnatally**. Following this oral antibiotics are not required.

Where pyrexia is diagnosed outside of labour (i.e. in the antenatal or postnatal periods), please consider whether there is a potential source of infection and whether ongoing oral antibiotics are required.

If treated for **sepsis**, the duration of IV and subsequent oral antibiotics should be a clinical decision, but in general they should be continued for a minimum of 24 hours. When a clinical decision is made to step down to oral antibiotics, it would be usual to switch to Cefradine 500mg QDS and Metronidazole 400mg TDS. For true penicillin allergic patients, this would instead be Metronidazole 400mg TDS and Clindamycin 450mg TDS. Further options for other known intolerances/allergies or ESBL will need to be discussed with Microbiology prior to discharge.

4. Related Documents

[Newborn babies at increased risk of developing neonatal infection, trust docs 9998](#)

Trust Guideline for the Management of: Peripartum Pyrexia and Sepsis

5. References

1. World Health Organization. Antibiotic resistance. www.who.int/news-room/fact-sheets/detail/antibiotic-resistance
2. Llor C and Bjerrum L, Antimicrobial resistance: risk associated with antibiotic overuse and initiatives to reduce the problem. *Therapeutic Advances in Drug Safety* 2014, 5(6), 229-241
3. Chapman E, Reveiz L and Cosp XB, Antibiotic regimens for management of intra-amniotic infection. *Cochrane Systematic review – Intervention – Protocol*; April 2014
4. Gibbs RS, Dinsmoor MJ, Newton ER, Ramamurthy RS. A randomized trial of intrapartum versus immediate postpartum treatment of women with intra-amniotic infection. *Obstet Gynecol* 1988; **72(6)**:823-828.
5. Black L, Hinson L, Duff P. Limited Course of Antibiotic Treatment for Chorioamnionitis. *The American College of Obstetricians and Gynaecologists* 2012, Vol. 119, No. 6
6. Schouten FD, Wolf H, Smit BJ, Bekedam DJ, de Vos R, Wahlen I. Maternal temperature during labour. *Br J Obstet Gynaecol* 2008; **115**:1131-1137.
7. Fishman S, Gelber S. *Evidence for the clinical management of chorioamnionitis*. Seminars in Fetal and Neonatal Medicine 17 (2012) 46-50.
8. Royal College of Obstetricians and Gynaecologists. *Bacterial sepsis in pregnancy*. Green-top guideline No. 64a. London: RCOG Press; April 2010
9. Royal College of Obstetricians and Gynaecologists. *Bacterial sepsis following pregnancy*. Green-top guideline No. 64b. London: RCOG Press; April 2010
10. Royal College of Obstetricians and Gynaecologists. *Prevention of early onset neonatal group B streptococcal disease*. Green-top guideline No. 36. 3rd edition. London: RCOG Press; September 2017.
11. Impey L, Greenwood C, MacQuillan K, Reynolds M, Sheil O. Fever in labour and neonatal encephalopathy: a prospective cohort study. *Br J Obstet Gynaecol* 2001; **108**: 594-597.
12. Wu YW, Escobar GJ, Grether JK, Croen LA, Greene JD, Newman TB. Chorioamnionitis and Cerebral Palsy in Term and Near-Term Infants. *JAMA* 2003; **290**: 2677-2684.
13. Royal College of Obstetricians and Gynaecologists. Scientific Advisory Committee Opinion Paper 3. Intrauterine infection and perinatal brain injury. London: RCOG Press, November 2002.
14. Barks JDE, Silverstein FS. Inflammation and Neonatal Brain Injury. In: Donn SM, Sinha SK and Chiswick ML (Eds) *Birth Asphyxia and the Brain*. Basic science and clinical implications. Futura Publishing Company, Inc. 2002 pp71-88.
15. Segal S. Labor Epidural Analgesia and Maternal fever. *Anesth Analg* 2010; **111(6)**:1467-1475.
16. National Collaborating Centre for Women's and Children's Health. Intrapartum care: care of healthy women and their babies during childbirth. Clinical Guideline 190, December 2014. RCOG Press: London.

Trust Guideline for the Management of: Peripartum Pyrexia and Sepsis

17. UK Sepsis Trust: Sepsis Six and Red Flag Sepsis

18. Singh S, McGlennan A, England A, Simons R. A validation study of the CEMACH recommended modified early obstetric warning system (MEOWS)*. *Anaesthesia* 2012, 67, 12–18

6. Monitoring Compliance

Compliance with the process will be monitored through the following:

Key elements	Process for Monitoring	By Whom (Individual / group /committee)	Responsible Governance Committee /dept	Frequency of monitoring
Administration of antibiotics within 1 hour of a diagnosis of sepsis	Audit	Maternity Risk team	Maternity Risk team	Annual
Use of correct proforma for sepsis and / or pyrexia	Audit	Maternity Risk team	Maternity Risk team	Annual

The audit results are to be discussed at the Maternity Clinical Governance meetings to review the results and recommendations for further action. Maternity Clinical Governance will ensure that the actions and recommendations are suitable and sufficient.

Trust Guideline for the Management of: Peripartum Pyrexia and Sepsis

7. Equality Impact Assessment (EIA)

Type of function or policy	Existing
-----------------------------------	----------

Division	Women and Childrens	Department	Maternity
Name of person completing form	Joely Simeoni, Practice Development Midwife	Date	16/08/2023

Equality Area	Potential Negative Impact	Impact Positive Impact	Which groups are affected	Full Impact Assessment Required YES/NO
Race	No	No	n/a	No
Pregnancy & Maternity	No	No	n/a	No
Disability	No	No	n/a	No
Religion and beliefs	No	No	n/a	No
Sex	No	No	n/a	No
Gender reassignment	No	No	n/a	No
Sexual Orientation	No	No	n/a	No
Age	No	No	n/a	No
Marriage & Civil Partnership	No	No	n/a	No
EDS2 – How does this change impact the Equality and Diversity Strategic plan (contact HR or see EDS2 plan)?				

- **A full assessment will only be required if: The impact is potentially discriminatory under the general equality duty**
- **Any groups of patients/staff/visitors or communities could be potentially disadvantaged by the policy or function/service**
- **The policy or function/service is assessed to be of high significance**

IF IN DOUBT A FULL IMPACT ASSESSMENT FORM IS REQUIRED

The review of the existing policy re-affirms the rights of all groups and clarifies the individual, managerial and organisational responsibilities in line with statutory and best practice guidance.