Trust Guideline for the Management of: Peripartum Pyrexia and Sepsis

Document Control:

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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

			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 I 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Printed copies of this document should be considered out of date.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.

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.

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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

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Quick reference 1B: Obstetric Care Bundle for Pyrexia

Diagnosis of pyrexia ≥38°c on an occasion with no red flags or ≥37.5°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)			

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

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

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

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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 outcome[5].

Maternal temperature can rise in normal labour, rising from 37.1°C at the beginning of labour to 37.4°C after 22 hours[6]. 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.

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 $\geq 38\,^{o}C$ on one occasion or $\geq 37.5\,^{o}C$ 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

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
Benzylpenicillin 1.2g IV QDS **Metronidazole** 400mg PO TDS (use 500mg IV TDS only where there are concerns about oral absorption) **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)	**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 **Metronidazole** 400mg PO TDS (use 500mg IV TDS only where there are concerns about oral absorption) **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)

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

5. References

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15. Segal S. Labor Epidural Analgesia and Maternal fever. *Anesth Analg* 2010;111(6):1467-1475.
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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.

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.