Ashford and St. Peter's Hospitals
NHS Foundation Trust

Blood Culture Policy for Neonatal Patients

2019 Reviewers: Amy Smith ANNP

Gemma Finch ANNP

Guideline History		
Date	**Comments**	**Approved By**
2010	New guideline by Dr Jo Morris, Dr Peter Reynolds, Dr Angela Shaw, Sr Morag Farish	Children's clinical governance group
2013	Minor updates	
2018	Reviewed by Anne Beh, minor updates	
2019	Review and reformatted	Neonatal guidelines group

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Contents

Blood culture policy for neonatal patients

1. INTRODUCTION

Blood culture to detect bacteraemia and fungaemia is an important investigation with major implications for the diagnosis of patients with infection and the selection of appropriate treatment

2. PURPOSE

This policy aims to promote good practice in the collection of blood for culture and thus reduce the number of false positive results. False positive results lead to complications in patient safety, quality of care and associated increased cost of care

Early positive results provide information on which appropriate treatment can commence. These recommendations aim to ensure that blood cultures are taken:

- for the correct indications
- at the correct time
- using correct technique in order to prevent contamination of the sample and minimise risk to patients and staff

3. INDICATIONS FOR TAKING A BLOOD CULTURE

Indications for taking blood cultures in Neonates are described in the guidelines for sepsis available on the intranet.

Sepsis in the neonate may not be clinically apparent and a low index of suspicion is required in the absence of clinical signs.

Early Onset Sepsis

Detection of micro-organisms by culture of blood is essential in the diagnosis of early-onset sepsis transmitted from mother to baby, therefore may be indicated following birth when the baby appears well in the presence of maternal or neonatal risk factors. Some examples include:

- Prolonged rupture of membranes (>18 hours)
- Suspected chorioamnionitis
- Raised maternal CRP
- Persistent maternal fever >38ºC
- Maternal Group B Streptococcal infection on HVS / urine culture in this pregnancy
- Proven Group B Streptococcal infection in a previous sibling
- Prematurity
- Any other concerns about possible sepsis

Late Onset Sepsis

Blood cultures are also important in evaluating suspected late onset sepsis – the clinical signs of which may differ from that in older children and are described below.

Blood culture may detect bacteraemia associated with primary infections as well as those associated with indwelling prosthetic materials such as umbilical and long lines. Accurate positive results provide valuable information to guide optimal antibiotic therapy early on which can improve outcome from these conditions. Blood for culture should be taken before antibiotics are started.

Contaminated blood cultures can cause considerable diagnostic confusion and lead to unnecessary or sub-optimal antimicrobial therapy. It may be prevented by careful collection of the blood using an aseptic non-touch technique.

However, caution must be exercised, as the presence of coagulase negative staphylococci in blood cultures may be pathogenic and not contamination.

Note that pyrexia in the neonate is an unreliable sign to indicate sepsis: the blood culture should not be deferred until a pyrexial episode.

Blood cultures should be taken when there are risk factors for sepsis as described above, or to check clearance of a known bacteraemia or fungaemia, or a clinical need to do so in response to any clinical signs suggestive of sepsis and a deteriorating clinical picture including:

Abnormalities in:

- Heart rate, respiratory rate
- Core temperature, increased toe-core gap between central and peripheral temperature, temperature instability
- Perfusion
- Rise in leucocyte count or CRP
- Clinical instability or deterioration
- Abnormal blood sugar levels

Cases should be discussed with the registrar especially where uncertainty exists about whether to take a blood culture. Blood cultures should never be taken as routine or because a sample was easily obtained but **have a low index of suspicion for the presence of sepsis.**

All blood cultures should be documented in the patient's notes, dated and timed.

Single sample blood cultures are normally all that is required

4. COMPETENCE IN ASEPTIC TECHNIQUE

Blood cultures should only be collected by members of staff whose competence in aseptic technique has been assessed. For junior doctors, this involves training during induction of theory followed by direct observation on the unit to ensure competence.

For the Neonatal Unit, the designated leads for aseptic technique are:

- Dr. Yinka Ejiwumni
- ANNP Team

However any senior nursing staff, or registrar who has been trained, can make a formal assessment of another doctor for aseptic technique.

Locum doctors are not exempt from this process, and will be expected to read the theory of aseptic technique at the Trust and be observed for technique, usually by the senior nurse in charge or one of the leads for aseptic technique.

Rarely blood cultures are taken from indwelling umbilical lines. This should be carried out only after discussion with the attending consultant and under strict asepsis conditions.

Doctors should be ready to accept advice on infection control technique from phlebotomy and nursing colleagues.

5. PROCEDURE

1. PREPARE KIT FIRST

- Wash and dry hands
- Prepare the blood culture bottle – use one paediatric bottle only.
- The top of the bottle will be clean but not sterile. Remove the flip-off cap from the bottle and disinfect the top of the culture bottle with a 70% isopropyl alcohol impregnated swab (green packet) for 15 seconds. It is the drying of the alcohol which disinfects the cap. **Leave for 30 seconds.** Use timer as visual aid to self and others.

2. SAMPLE COLLECTION

Volume of blood is the most critical factor in the detection of blood stream infection. For neonates 0.5mls of blood is recommended as a minimum volume.

CANNULA HUB METHOD (Under Aseptic Conditions):

As peripheral cannulation is usually indicated at the same time as the taking of a blood culture it is acceptable to take the sample from the cannula hub. Even if a further cannula is not required you should insert a cannula for blood culture collection and then remove it after the procedure. The first blood out of the hub should be used for culture, not other blood tests. No other method of blood culture taking should be routinely used.

- Wash and dry your hands again and apply sterile examination gloves and apron.
- Clean site with a ChloraPrep Sepp 0.67ml (70% isopropyl alcohol/2% chlorhexidine) cleanser for 15 seconds and **allow the skin to dry for 30 seconds** using timer.
- **Do not palpate the site of insertion after it has been cleaned**.
- Insert the cannula into the vein following technique described in Peripheral Venous Catheter Insertion and Care Policy for Neonates.
- Using a 2ml syringe and a 18G red blunt fill safety needle aspirate 0.5mls of blood from the cannula hub.
- Immediately and without changing or contaminating the needle insert it into the top of the blood culture bottle and allow the blood to flow into the bottle via the vacuum.
- After collecting other required samples secure the cannula according to the recommended technique or remove it if not required.
- Gently invert the culture bottle to thoroughly mix blood with culture media.
- Dispose of sharps in a sharps container.
- Wash hands after removing gloves.

Closed system technique (Under Aseptic Conditions):

Equipment: sterile pack, blue or orange butterfly needle, 5ml syringe, blood culture bottle, cleaning equipment

- Wash and dry your hands again and apply sterile examination gloves and apron.
- Clean site with a ChloraPrep Sepp 0.67ml (70% isopropyl alcohol/2% chlorhexidine) cleanser for 15 seconds and **allow the skin to dry for 30 seconds** using timer.
- **Do not palpate the site of insertion after it has been cleaned**.
- Attach the syringe to the butterfly needle and draw back approximately 1ml of air
- Insert butterfly needle into the vein
- Allow the catheter of the butterfly to passively fill with blood (it does not need to collect in the syringe
- Remove the needle from the vein and insert directly into the blood culture bottle

The "Broken Needle Technique" (breaking the needle hub to obtain blood) poses an additional risk of injury to the child / user and must NOT be used.

6. LABELLING OF BOTTLES

- Clearly label the bottle with appropriate patient information after the blood has been taken and prior to leaving the patient's bedside.
- Include date and time of sample.
- Ensure that barcodes on the bottle are not covered by additional labels and that any tear-off bar-code labels are not removed.

7. TRANSPORTATION TO THE LABORATORY

- Send the inoculated bottle to the laboratory immediately via porters. **Do not send via the POD system.** The bottle must not be refrigerated.
- Include information on recent/proposed antimicrobial therapy and all relevant clinical details on the Pathology Blood Culture Request Form included.

8. BLOOD CULTURE RESULTS

All significant positive blood culture results will be telephoned as soon as they are available. For neonates, the presence of coagulase negative staphylococci does not always represent contamination and should be reported.

It is **NOT** necessary to phone the Laboratory to request blood culture results.

Chase blood culture results at 36 hours to ascertain if antibiotics can be discontinued, and again at 5 days if antibiotic therapy is continuing. Use results in conjunction with CRP results to support decision making.

When culture results are available, complete the 'Sepsis Screen Form' in Blood, CSF and Urine Culture section on Badger for baby and in the Blood Results folder in the clinical area

2. Supporting References

Department of Health High Impact Interventions; July 2010. Taking blood cultures, a summary of best practice

Jawaheer G, Neal TJ, Shaw NJ, Blood culture volume and detection of coagulase negative staphylococcal septicaemia in neonates: Archives of Disease in Childhood - Fetal and Neonatal Edition 1997;76:F57-F58.

3. Supporting relevant trust guidelines

Hand hygiene policy

Aseptic Non Touch Technique

Early Onset Sepsis Guideline

Peripheral Venous Catheter Insertion and Care policy for Neonates

Skin preparation guideline for neonates

4. Guideline Governance

a. Scope

This guideline in relevant to all staff caring for babies across neonatal intensive care, transitional care and maternity.

b. Purpose

i. This guidelines aims to facilitate a common approach to the management of babies admitted under neonatal care. At times deviation from the guideline may be necessary, this should be documented and is the responsibility of the attending consultant.

ii. This guideline is subject to regular review to ensure ongoing evidence based practice.

c. Duties and Responsibilities

- Only doctors and nurses who have been formally assessed as being competent in aseptic technique can take blood cultures (including locum/agency staff)
- Clear indications for blood culture collection must be present and documented
- Procedure only to be carried out as documented in guideline

d. Approval and Ratification

This guideline will be approved and ratified by the Neonatal Guidelines Group.

e. Dissemination and Implementation

i. This guideline will be uploaded to the trust intranet 'Neonatal Guidelines' page and thus available for common use.
ii. This guideline will be shared as part of ongoing education within the Neonatal Unit for both medical and nursing staff.
iii. All members of staff are invited to attend and give comments on the guideline as part of the ratification process.

f. Review and Revision Arrangements

a. This policy will be reviewed on a 3 yearly basis.
b. If new information comes to light prior to the review date, an earlier review will be prompted.
c. Amendments to the document shall be clearly marked on the document control sheet and the updated version uploaded to the intranet. Minor amendments will be ratified through the Neonatal Guidelines Group. A minor

amendment would consist of no major change in process, and includes but is not limited to, amendments to documents within the appendices.

g. Equality Impact Assessment

Background • Who was involved in the Equality Impact Assessment
Methodology • A brief account of how the likely effects of the policy was assessed (to include race and ethnic origin, disability, gender, culture, religion or belief, sexual orientation, age) • The data sources and any other information used • The consultation that was carried out (who, why and how?)
Key Findings • Describe the results of the assessment • Identify if there is adverse or a potentially adverse impacts for any equalities groups
Conclusion • Provide a summary of the overall conclusions
Recommendations • State recommended changes to the proposed policy as a result of the impact assessment • Where it has not been possible to amend the policy, provide the detail of any actions that have been identified • Describe the plans for reviewing the assessment

h. Document Checklist

To be completed (electronically) and attached to any document which guides practice when submitted to the appropriate committee for approval or ratification.

Title of the document:

Policy (document) Author:

Executive Director:

		Yes/No/ Unsure/NA	Comments
1.	**Title**		
	Is the title clear and unambiguous?		
	Is it clear whether the document is a guideline, policy, protocol or standard?		
2.	**Scope/Purpose**		
	Is the target population clear and unambiguous?		
	Is the purpose of the document clear?		
	Are the intended outcomes described?		
	Are the statements clear and unambiguous?		
3.	**Development Process**		
	Is there evidence of engagement with stakeholders and users?		
	Who was engaged in a review of the document (list committees/ individuals)?		
	Has the policy template been followed (i.e. is the format correct)?		
4.	**Evidence Base**		
	Is the type of evidence to support the document identified explicitly?		
	Are local/organisational supporting documents referenced?		
5.	**Approval**		
	Does the document identify which committee/group will approve/ratify it?		
	If appropriate, have the joint human resources/staff side committee (or equivalent) approved the document?		
6.	**Dissemination and Implementation**		

		Yes/No/ Unsure/NA	Comments
	Is there an outline/plan to identify how this will be done?		
	Does the plan include the necessary training/support to ensure compliance?		
7.	**Process for Monitoring Compliance**		
	Are there measurable standards or KPIs to support monitoring compliance of the document?		
8.	**Review Date**		
	Is the review date identified and is this acceptable?		
9.	**Overall Responsibility for the Document**		
	Is it clear who will be responsible for coordinating the dissemination, implementation and review of the documentation?		
10.	**Equality Impact Assessment (EIA)**		
	Has a suitable EIA been completed?		

Committee Approval (Neonatal Guidelines Committee)			
If the committee is happy to approve this document, please complete the section below, date it and return it to the Policy (document) Owner			
Name of Chair		**Date**	
Ratification by Management Executive (if appropriate)			
If the Management Executive is happy to ratify this document, please complete the date of ratification below and advise the Policy (document) Owner			
Date: n/a			