Name of Policy: Blood Culture Policy

Effective From: 11/10/2012

| Date Ratified | 27/07/2012 |
| Ratified | Infection Prevention and Control Committee |
| Review Date | 01/07/2014 |
| Sponsor | Director of Nursing and Midwifery/ DIPC |
| Expiry Date | 26/07/2015 |
| Withdrawn Date | |

This policy supersedes all previous issues.
## Version Control

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<th>Ratified by/Authorised by</th>
<th>Date</th>
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<td>SafeCare Committee</td>
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1 Introduction

Each year over 9000 sets of blood cultures are taken within the Trust. Taking blood for culture is an important procedure as blood cultures are used to detect the cause of an infection leading to bacteraemia bloodstream infection. The results are important because they help guide appropriate treatment. However microorganisms are present on the skin surface of patients, staff and the immediate patient environment which can result in contamination of blood cultures. Contamination can cause confusion and potentially, inappropriate treatment because it is sometimes difficult to determine if a positive blood culture is due to genuine bacteraemia or if it is a false positive result caused by contamination.

A false positive is defined as a growth of bacteria in the blood culture bottle that were not present in the patient’s bloodstream and were introduced during sample collection. Contamination can come from a number of sources: the patient’s skin, the equipment used to take the sample and transfer it to the culture bottle, the hands of the person taking the blood sample or the general environment.

Contaminated blood cultures also affect mandatory surveillance data. This can affect the Trust’s targets, such as the achievement of reductions in MRSA bacteraemia. It is important to take blood cultures correctly in order to minimise the risk of this contamination occurring. This policy details how to take blood cultures correctly.

The aim is that blood cultures should be taken:

1. Only when there is an appropriate indication.
2. At the correct time.
3. Using the correct technique in order to prevent contamination of the sample and minimise risk to patients and staff.

2 Policy scope

This policy applies to all clinical staff employed in the trust. Clinical staff must comply with the relevant local policy and guidelines and must be used in conjunction with:

IC 4  Hand Hygiene Policy
IC 2  Personal Protection Clothing in Clinical Practice Policy
IC 9  Waste Disposal and Recycling Policy
OP 41 Central Venous Policy

3 Aim of policy

This policy aims to aid all professionals in applying best practice for blood culture sampling within the setting of Gateshead Health Foundation Trust.
4 Duties - roles and responsibilities

The Chief Executive has responsibility for ensuring the Trust has robust and effective Infection and Prevention Control Policies.

Trust Board has a responsibility to ensure that the risk of infection to patients, staff and visitors is minimised to its lowest potential and therefore supports the full implementation of this policy.

The Directors of Infection Prevention and Control have executive responsibility for Infection Prevention Control and oversee Infection and Prevention Control activity via the Infection and Prevention Control Committee.

Consultant Microbiologist - will give advice against this policy and follow up all positive blood cultures with clinical staff.

Head of Infection Prevention and Control - will give advice against this policy and ensure that all staff have access to this policy via the Trust Intranet and ensure that it is updated every two years or in line with current national guidance.

The Infection and Prevention Control Team – will give advice and support on management and policy interpretation.

The Infection Prevention and Control Committee - is responsible for the ratification of Trust wide infection prevention and control policies, procedures, and guidance, providing advice and support on the implementation of policies and monitoring the progress of the annual infection control programme.

Heads of Department - Must ensure that appropriate training is available and that staff understand and comply with the Blood Culture Policy.

Managers – will ensure that all staff are aware of and follow this policy and are aware of their own roles and responsibilities to ensure safe practice.

All Trust staff - have a responsibility to adhere to Trust policy and ensure that appropriate measures are taken to reduce risks associated with infection. All Trust staff have a responsibility to ensure they attend phlebotomy/blood culture training, annual training in infection Prevention and Control and attend phlebotomy/blood culture updates thereafter.

5 Definitions - False positives

Contaminants

- False positive is defined as a growth of bacteria in the blood culture bottle that were not present in the patient’s bloodstream and were introduced during sample collection.

- Contamination can come from a number of sources: the patient’s skin, the equipment used to take the sample and transfer it to the culture bottle, the hands of the person taking the blood sample or the general environment.

- CVAD – Central Venous Access Device/Central line

- Competency – for the purpose of this policy competency is deemed having assessed the relevant knowledge skills and framework to take blood culture samples.
6 Blood Cultures

6.1 Appropriate Indications For Taking Blood Cultures

Only take blood for culture when there is a clinical need to do so and not as a routine.

Blood cultures should only be taken when there is a reason to suspect infection. Reasons to suspect an infection and to consider taking blood cultures include:

- The core temperature is outside of the normal range. (pyrexia)
- Tachycardia.
- Breathlessness or tachypnoea.
- Chills or rigors.
- Unexplained deterioration in the patient’s condition.
- Development of unexplained confusion.
- There are focal signs of infection.
- The white blood cell count is outside of the normal range.

Not all patients with some of the above symptoms will require blood cultures (e.g. low grade fever within 24 hours of surgery is not very specific for bacteraemia). Conversely this list is not exclusive and blood cultures will be required in some patients who do not have any of the above symptoms. In the very young and in the elderly signs of infection may be absent or minimal. Clinical judgement is required to decide when there is a reasonable possibility that a patient has an infection where blood cultures may be useful. The decision to take blood cultures should always be made by a qualified doctor. It is not however necessary for the procedure of taking blood cultures to be performed by a doctor. This can be performed by a qualified staff member who have attended trust training and who have been deemed competent in performing the procedure. Blood culture competency must be assessed and maintained.

MRSA STATUS

If the MRSA status of the patient has not been confirmed within the last 7 day period an MRSA screen must be taken with relevant devices e.g. peg site and urinary catheter specimens also submitted.
6.2 **Timing Of Blood Cultures (see also Trust Adult Antimicrobial Guidelines: Blood Stream Infection/Septicaemia)**

Blood cultures should be taken as soon as bacteraemia is suspected and before the administration of antibiotic therapy. If a patient is already receiving antibiotics then blood cultures should usually be taken before the next dose is given. The taking of blood cultures should be documented in the patient’s notes including the date, time, site taken from and the specific indication(s). The person collecting blood cultures should give relevant clinical information and state clearly on the request form accompanying the specimen their name, position and time of specimen collection. **Blood cultures should not be left for phlebotomists or health care assistants to take.**

6.3 **Technique for Taking Peripheral Blood Cultures (See Appendix 1a and 1b)**

**Always make a fresh stab.**

- Blood cultures should always be taken using a new venepuncture site.
- Blood cultures should not be taken from existing central or peripheral venous cannula. The only exception to this is if it is believed that a central line may be the source of bacteraemia. It is then appropriate to take blood from both the central cannula and from the peripheral vein. The peripheral vein sample should be collected first.
- Blood cultures should not be taken from veins which are immediately proximal to existing venous cannula. Blood cultures should not be taken from the femoral vein as it is very difficult to disinfect the skin adequately, so there is a high risk of contamination.
- The correct procedure for taking blood cultures is detailed in appendices 1a, 1b and 2.

6.4 **Performance Indicators**

Use of the blood culture kit which contains equipment required to perform an adult blood culture set is mandatory. The number of kits used should correspond to the number of Trust adult blood culture sets taken.

Ongoing competency assessment records for staff performing blood cultures and root cause analysis for each Staphylococcus aureus, including MRSA bacteraemia will enable the Trust RCA Divisional leads to monitor policy compliance and action plan accordingly.

Using the current surveillance reporting system contaminant rates will be disclosed for each Division. In addition the indications for collection and timing and appropriateness of antimicrobial chemotherapy will be audited via the Trust Root Cause Analysis process for Staphylococcus aureus including MRSA bacteraemias.
7 Training

Blood culture training is incorporated in the trust wide phlebotomy formal training programme on a monthly basis. All trust staff that carry out this procedure will need to be competency assess prior to blood culture sampling. On-going education and training is available via the PDT.

8 Equality and diversity

This policy applies to all staff and patients regardless of age, disability, gender, race, ethnicity, religion/belief or sexual orientation.

9 Process(s) for monitoring compliance with the policy

Surveillance will be carried out on a continual basis by the IPC nurses and likely contaminants will be addressed with individual practitioners. Escalation to line managers will be initiated where additional education and support does not resolve poor practice issues. National expectations from the Department of Health suggest an acceptable contamination rate of 3%. As some patients may be unable or unwilling to cooperate this is always acknowledged within any statistical data. Weekly review of blood culture contaminants and exceptions noted from individual education and training by IPC Nurses are discussed and minuted at weekly IPC surveillance meetings and Infection Prevention & Control Committee meetings.

10 Consultation and review

Members of Infection Prevention and Control Team (IPCT) and Infection Prevention and Control Committee (IPCC)

11 Policy implementation (including awareness raising)

All members of staff will be informed via e mail and individual team meetings when due for review.

12 References


13 Associated documentation

The ‘Saving Lives’ programme to reduce healthcare-associated infections includes guidance on taking blood cultures. This policy is based on that guidance and should be read and implemented in conjunction with the following infection, prevention and control policies:

IC 2 Personal Protective Equipment
IC 4 Hand Hygiene
IC 6 Isolation
IC 18 MRSA
IC 7 Guidance for Clinical Healthcare Workers ‘Sharps’ Policy

Back to contents
Appendix 1a       HOW TO TAKE BLOOD CULTURES

Prior to any phlebotomy procedure an explanation should be given to the patient and verbal consent should be obtained.

HOW TO COLLECT BLOOD USING A WINGED VACUTAINER COLLECTION METHOD

Step 1: Skin preparation

✓ Wash your hands with soap and water and dry them.
✓ Clean any visibly soiled skin at the proposed site of venepuncture with soap and water and then dry.
✓ Apply a disposable tourniquet and palpate the vein.
✓ Clean the skin with a 2% chlorhexidine in 70% isopropyl alcohol impregnated swab and allow to dry. This is a vital step within the process. This will take at least 30 seconds.
✓ If a blood culture is being collected from a central venous catheter, disinfect the access port with a 2% chlorhexidine in 70% isopropyl alcohol and allow to thoroughly dry.
✓ Apply skin prep for a minimum of 30 seconds, then allow 30 seconds to dry. This provides a sterile area and a vital step within the process.

Step 2: Kit preparation

✓ Remove the cover from the top of the culture bottles and clean the rubber part of the top with a 2% chlorhexidine in 70% isopropyl alcohol impregnated swab and allow thorough drying.

Step 3: Taking the sample

✓ Wash and dry your hands again (or use alcohol hand rub) and don non-sterile gloves.
✓ Attach the winged blood collection set to the blood collection adapter cap.
✓ Insert the needle. Do not palpate the vein again after cleaning the skin.
✓ Place the adapter cap over the blood culture bottle and pierce the rubber bung/ septum.
✓ Inoculate the aerobic culture bottle first and then the anaerobic culture bottle so that any oxygen trapped in the tubing will not be transferred to the anaerobic bottle.
✓ Hold the bottle upright and use the bottle graduation lines to gauge the sample volume being collected. Monitor the direct draw process at all times to assure proper flow is obtained and to avoid flow of the bottle contents into the adapter tubing.
✓ Hold the culture bottle at a position below the patient’s arm with the bottle in an upright position (stopper uppermost).
✓ To prevent over inoculation, monitor the 5ml incremental markings on the bottle (graduation lines). (BioMerieux 2010)
✓ If blood is being collected for other tests always inoculate the blood culture bottles first.
✓ Collect the sample and release the tourniquet.
✓ Do not allow the culture bottle contents to touch the stopper or the end of the needle during the collection procedure.
✓ Discard the winged collection system in a sharps container at the point of use.
✓ Cover the puncture site with an appropriate dressing.
✓ Remove gloves and wash hands with soap and water.
✓ Label the bottles with the appropriate patient information and complete the ICE request/ card remember to print and sign your name. Bleep numbers also if held. Ensure additional labels do not cover the bottle barcodes and that the tear off barcode labels are not removed.
✓ Record the procedure in the patient’s medical notes including indication, date, time, site of venepuncture and any complications.
✓ Record if this sample has been difficult to access.

SJH/VA/JT AB 09.07.08
REVIEWED JULY 05 2010
Amended/ reviewed July 14 2011
Appendix 1b

Technique for Taking Blood Cultures from Central Venous Access Device (Central Line)

Blood cultures should not be taken from existing central or peripheral venous cannula. The only exception to this is if it is believed that a central line may be the source of bacteraemia is it then appropriate to take blood from both the peripheral vein and the Central Venous Access Device (CVAD). The peripheral vein sample should be collected first. See pictorial guide.

1. Explain and discuss the procedure with the patient.
2. Clean hands thoroughly with soap and water using correct hand hygiene technique and apply apron and non sterile gloves.
3. Clean trolley - open the dressing pack products and place all sterile cleaning equipment onto sterile field. Empty 10ml of saline into sterile pot and 2 10ml syringes.
4. Remove old gloves (non sterile)
5. Wash hands. Put on sterile glove and draw up 10mls saline into one 10ml syringe and leave other 10ml syringe empty.
6. Place sterile drape under the CVC.
7. Swab the bionecter with impregnated 2% chlorhexidine in 70% isopropyl alcohol on gauze and allow to dry for minimum of 30 seconds.
8. Draw back 5 -10mls of blood from distal or next accessible port and discard.
9. Draw 10mls of sample blood required for blood culture (5ml each sample).
10. Remove bottle top and clean sample bottles with impregnated 2% chlorhexidine in 70% isopropyl alcohol.
11. Attach sterile green needle to sample syringe and inject 5 ml sample into blue blood culture bottle and 5 ml into pink.
12. Remove and discard safely as per Sharps Policy.
13. Attach 10ml syringe with saline to central line port.
14. Use a push pause method (inject 1ml at a time) inject saline contents to create turbulence in order to flush catheter correctly leave 0.5ml in syringe.
15. Remove syringe.
16. Clean the port site with a fresh sani wipe.
Blood culture, to detect bacteraemia, is an important investigation with major implications for the diagnosis of patients with infection and the selection of appropriate treatment. This advice, if followed, will improve the quality and clinical value of blood culture investigations and reduce incidence of sample contamination. This will help improve patient care and contribute towards reducing the number of wrongly reported MRSA infections.


1) Prepare blood collection kit

Gather all materials before beginning the procedure. Ensure the blood cultures bottles are within date and the sensor is blue/green in colour. Discard bottles with a yellow sensor.

4) Wash hands, wear gloves

Wash hands again or apply an alcohol hand rub and apply clean examination gloves. Sterile gloves are not necessary.

7) What not to do

The use of blood collection adapters without blood collection sets is not recommended.

2) Prepare bottles for inoculation

Wash hands with soap and water then dry. Remove the plastic ‘flip cap’ from the blood culture bottles and disinfect the septum using a fresh 2% chlorhexidine in 70% isopropyl alcohol impregnated swab for each bottle. Allow bottle tops to dry in order to fully disinfect.

5) Venepuncture

Attach a winged blood collection set to a collection adapter cap. To prevent contaminating the puncture site do not re-palpatate the prepared vein before inserting the needle. Insert the needle into the prepared site.

8) Other blood tests

If blood is being collected for other tests place an insert into the adapter cap. The insert is used to guide blood collection tubes onto the needle. If other blood tests are required always collect the blood culture first.

3) Prepare venepuncture site

Confirm the patient’s identity. If skin is visibly soiled clean with soap and water. Apply a disposable tourniquet. Palpate to identify the vein and cleanse using 2% chlorhexidine in 70% isopropyl alcohol swab. The venepuncture site is not fully clean until the disinfectant has fully evaporated.

6) Culture bottle inoculation

Place the adapter cap over the aerobic bottle and press down to pierce the septum. Hold the bottle upright and use the graduation lines to accurately gauge sample volume. Add up to 10mls of blood per ‘adult’ bottle and up to 4mls of blood to ‘paediatric’ bottle. Once the aerobic bottle has been inoculated remove the adapter cap and repeat the procedure for the anaerobic bottle.

9) Finish the procedure

Discard the winged collection set into a sharps container and cover the puncture site with an appropriate dressing. Remove gloves and wash hands before recording the procedure including indication for culture, time, site of venepuncture, and any complications. Ensure additional labels do not cover the bottle barcodes and that the tear off barcode labels are not removed.
## Appendix 3 Blood Culture Equipment

### Microbiology

**Name:** ROBERT TESTING  
**Hospital No:** 7777777

**Address:** QUEEN ELIZABETH HOSPITAL, GATESHEAD, TYNE AND WEAR, , NE16 6SX.

**Consultant:** Consultant RJA ALLCOCK  
**Patient No:** 01914546484

**Sex:** Male  
**Blood Group:** AB

**Consultant Details:** Ward 4  
**Blood Culture pair (Adult)**

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**Investigations Requested:** Blood Culture pair (Adult)

**Collection Data/Time:** 27/12

**Category:** NHS

**SPECIMEN COLLECTION INSTRUCTIONS**

For these investigations you require the following sample: **Sample Tainer:**

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**http://marc-t/dotnet/icedeskton/PrintManager/PrintManagerHub.axm... 07/09/2011**
**Appendix 4**

**Phlebotomy Competencies**

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<tr>
<td>Engages in a partnership of care with patients and when appropriate carers/parents sharing knowledge and information</td>
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<tr>
<td>Demonstrates understanding of practitioner responsibilities and accountability in terms of phlebotomy/blood culture</td>
<td>State which/ both</td>
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<tr>
<td>Demonstrates knowledge of related policies e.g. control of infection</td>
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</tr>
<tr>
<td>Practices with a non-touch technique in preparation of self and equipment</td>
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</tr>
<tr>
<td>Adapts a point of care approach in managing waste</td>
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</tr>
<tr>
<td>Demonstrates knowledge of management of needlestick injuries, spillages and breakages</td>
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</tr>
<tr>
<td>Demonstrates an understanding of the reasons behind common blood test requests</td>
<td></td>
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<tr>
<td>Demonstrates rationale of vein choice</td>
<td></td>
</tr>
<tr>
<td>Considers equipment available and makes a rational choice regarding their use</td>
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<tr>
<td>Collects the specimen's correctly interchanging sample bottles as necessary</td>
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<tr>
<td>Ensures the request form and specimen container is labelled correctly and confirm the identity of the patient</td>
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<tr>
<td>Demonstrates sensitive knowledge surrounding the identification and processing of high risk specimens</td>
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This is to confirm that

- Attended theoretical training on:
  - Name of trainer
  - Signature of trainer

This is to confirm that

- Had undergone a period of **supervised practice, is deemed competent at phlebotomy** and has **completed the theoretical workbook** as at:
  - Name of assessor
  - Signature of assessor

Upon completion of the above competencies please send this form to the Clinical Practice Development Matron, Trust HQ, Queen Elizabeth Hospital whereupon a certificate will be issued. Please state where you would like the certificate to be sent:

AB Final formatting 24.09.12