

Blood Culture Guidelines	Clinical Guideline Register No: 07036 Status: Public
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Developed in response to:	Best Practice Health and Social Care Act 2008 Saving Lives: Taking Blood Cultures
Contributes to CQC Core Standard numbers	Outcome 8

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Author/Contact for Information	Infection Prevention and Control Policy Group
Policy to be followed by (target staff)	All Trust staff
Distribution Method	Divisional Managers and Ward Sisters for cascading and Intranet and Website
Related Trust Policies (to be read in conjunction with)	08038 Aseptic Non Touch Technique Policy 04071 Standard Infection Prevention Precautions 10004 Safe Handling and Disposal of Sharps 04088 Waste Management Policy Hand Hygiene Policy Decontamination policy

Review No	Reviewed by	Review Date
1.0 Changes made in accordance with the Savings Lives	Elaine Finn Davies	May 2010
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Index

1. Purpose
2. Introduction
3. Scope
4. Equality and Diversity
5. Responsibilities
6. Signs and symptoms suggestive of a blood stream Infection (BSI)
7. Deep Seated Infections
8. General principles for blood cultures collection
9. Blood culture packs
10. Blood culture from a peripheral stab
11. Blood Culture from a central line
12. Key ANTT principles for blood cultures collection
13. Auditing and Monitoring
14. Training
15. Implementation and Communication
16. References

Appendices

Appendix 1 Reducing the risk of blood culture contamination

Appendix 2 Clinical guideline for blood cultures collection – winged method

1. Purpose

- 1.1 The purpose of this guideline is to improve the quality of detection of BSI (Blood Stream Infections), to enable prompt and appropriate management of the patient and avoid unnecessary investigation and treatment from contaminated blood culture samples.

2. Introduction

- 2.1 Blood cultures are taken to identify patients with blood stream infections (BSI). It is an important investigation with major implications for the diagnosis of patients with infection and the selection of appropriate treatment.
- 2.2 Contaminated blood culture samples can lead to diagnostic uncertainty in clinical management and are associated with increased health care costs due to unnecessary treatment and testing.
- 2.3 Contamination can come from a number of sources; the patient's skin, the equipment used to take the sample, the hands of the person taking the blood sample or the general environment.
- 2.4 Blood culture samples which are contaminated with Meticillin resistant *Staphylococcus aureus* (MRSA) are subject to serious untoward incident investigation and may incur financial penalties for the trust.

3. Scope

- 3.1 This guideline applies to all staff who undertake blood culture collection.
- 3.2 Blood cultures must only be collected by members of staff trained and assessed as competent in the collection procedure.

4. Equality and Diversity

- 4.1 The Trust is committed to the provision of a service that is fair, accessible and meets the needs of all individuals.

5. Responsibilities

5.1 Chief Executive

The Chief Executive has overall responsibility for ensuring that the Trust has the necessary management systems in place to enable the effective implementation of this guideline and overall responsibility for the health and safety of staff, patients and visitors.

5.2 Chief Medical Officer

The Chief Medical Officer has strategic responsibility for ensuring systems are in place to facilitate awareness of this guideline and to ensure that appropriate support is given to enable medical staff in delivering practice as outlined in this guideline.

5.3 Chief Nurse

The Chief Nurse has strategic responsibility for ensuring systems are in place to facilitate the nursing staff's awareness of this guideline and appropriate support is given to enable staff in delivering practice as outlined in this guideline.

5.4 Director of Infection Prevention and Control (DIPC)

The DIPC will:

- have operational responsibility for the effective implementation of this guideline
- include in the monthly DIPC report the number / percentage of blood culture contaminants by ward and for the trust over all
- report any blood cultures positive for MRSA, and advise on the potential for the samples to have been contaminated
- ensure that all MRSA positive blood culture reports are investigated as serious incidents
- share with the following groups, lessons learnt from root cause analysis investigation:
 - Infection Prevention and Control Group
 - Directorate Governance meetings
 - Patient Safety Group

5.5 Infection Prevention and Control Team (IPT)

The IPT will:

- provide training and advice on the correct technique for taking blood cultures in order to prevent contamination of the sample
- work with the DIPC to investigate any contaminated blood culture samples to see if the correct procedure has been followed and offer re- training if appropriate
- facilitate the completion of a root cause analysis (RCA) by the medical and nursing teams involved in the care of a patient who has a positive MRSA blood stream infection in order to identify any issues which may have contributed to this result
- ensure lessons learnt from a root cause analysis investigation (RCA) of a positive MRSA blood stream infection are communicated to the organisation via the following, Directorate Governance meetings, Lead Nurse meetings, Infection Prevention Practitioner Link Meetings, Sisters' meetings

5.6 Line Managers

Line Managers will:

- be responsible for ensuring all staff are aware of this guideline and receive appropriate training and assessment prior to undertaking this procedure.
- ensure that all of the correct equipment and personal protective clothing is readily available and used appropriately.

5.7 Staff who undertake blood culture collection

- Any member of staff undertaking blood culture collection must receive training in aseptic non-touch technique (ANTT), and be assessed as competent to do so in order to prevent contamination of the sample
- Staff undertaking blood culture collection will adhere to these guidelines

6. Signs and symptoms suggestive of a blood stream infection

6.1 The immunocompromised, elderly or very young may not show the signs listed below but should have a blood culture taken if infection is suspected.

6.2 Signs and symptoms suggestive of BSI include the following:

- Core temperature significantly out of normal range - pyrexia, hypothermia or swinging pyrexia
- Focal signs of infection e.g. cholangitis, osteomyelitis, pyelonephritis
- Tachycardia, hypotension and tachypnoea consistent with signs of sepsis
- Chills or rigors
- Raised or very low white blood cell count
- New or worsening confusion

7. Deep seated infections

7.1 If **deep seated infection** including osteomyelitis is suspected or confirmed take two sets of blood cultures from different sites within 24 hours. If the patient is acutely ill it is recommended that the two sets of cultures are taken from different sites over a period of 2 hours.

7.2 If **endocarditis or discitis** is suspected or confirmed or a **prosthetic heart valve** is present take three sets of blood cultures from different sites over a period of 24 hours. If the patient is acutely ill it is recommended that the three sets of cultures can be taken from different sites over a period of 2 hours.

8. General principles for blood culture collection

- Blood for culture should only be taken when clinically indicated and where the patient continues to be for active treatment and where the culture result would benefit the patient.
- Blood cultures should be taken before the administration of antibiotics. If a patient is already on antibiotics, blood cultures should be taken immediately before the next dose
- The use of the blood collection adapter caps without the butterfly connector (i.e. with a hyperdermic needle) is **not** recommended as there is the potential for backflow of blood culture media into the patient's veins.
- It is recommended that blood cultures are taken by a fresh peripheral stab and NOT via a peripheral intravenous cannula
- When investigating potential central line-related infection, blood may be taken from the central line, but a peripheral sample should be collected first (DoH 2007)
- Blood for culture should be taken via a separate stab to other blood samples. If poor venous access does not allow this, the blood culture bottles **must** be inoculated first to prevent contamination of the sample (see section 10.4).
- The aseptic non-touch technique (ANTT) must be used throughout the procedure. Refer to the ANTT Policy on the Trust Intranet site
- A blood culture sticker stating indication, site, date and time, name of the doctor nurse (printed clearly) must be filled in and affixed to patient's medical notes This should also indicate that the appropriate ANTT procedure was followed.
- All blood cultures should be requested using the order comms and printed labels to fix to microbiology form and blood culture bottles

9. Blood culture packs

- Both adult and paediatric blood culture packs are available
- The adult pack consists of 2 blood culture bottles – anaerobic bottle (purple) and aerobic bottle (blue), Chloraprep 1.5 ml applicator (for skin disinfection), Sani-cloth CHG 2% (for disinfecting the tops of blood bottles), disposal tourniquet, blood culture sticker and an adaptor cap
- The paediatric pack consists of 1 blood culture bottle (yellow), Sani-cloth CHG 2% (disinfecting the blood bottle septum), disposal tourniquet, blood culture sticker and adaptor cap (Chloraprep 0.9 mls applicator is available on the wards)
- Gather extra equipment if needed such as sterile gauze, tape and plaster

10. Blood culture from a peripheral stab

10.1 Always make a fresh stab

- 10.2 Do not use existing peripheral lines or sites immediately above peripheral lines. Identify a suitable puncture site before disinfecting the skin.
- 10.3 Avoid femoral vein puncture because of the difficulty in adequate skin cleansing and disinfection of this area and because of frequent contamination of cultures from this site.
- 10.4 **Always take blood for blood cultures first** before taking blood for other tests (if it is not possible to make another stab) to avoid contamination of blood culture.

11. Blood Culture from a Central Line

- 11.1 If a central line, PICC or Hickman line infection is suspected, blood may be taken aseptically from this, provided a peripheral stab is also undertaken.
- 11.2 If there is any sign of infection around the exit site, a swab should be taken for culture and sensitivity. Prior to removal of the line the site should be cleaned with Chloraprep and left to dry so that the line tip (which should be sent to the laboratory) is not contaminated with skin organisms.

12. Key ANTT principles for blood culture collection

- 12.1 A standard ANTT approach should be used for blood culture collection (Refer to ANTT policy 6.10)
- 12.2 Use a non-touch technique when assembling the key-parts (refer to Appendix 1), taking care not to touch the key-parts.
- 12.3 The top of the blood culture bottles must be disinfected using Sani-cloth CHG 2% for 20 seconds and left to dry.
- 12.4 The patient's skin (a key-site) must be disinfected using 2% Chlorhexidine in 70% alcohol (Chloraprep) and left to dry. If there is a need to re-palpate the area the skin will need to be re-disinfected using Chloraprep for another 30 seconds and left to dry once more.
- 12.5 Chloraprep must be primed before use. To do this, the plastic wings must be squeezed together, press the Chloraprep applicator onto the patient skin and rock it from side to side to impregnate the sponge. Clean the skin using an up and down and side to side motion (not circular movements). This should continue for 30 seconds and then be left to dry.
- 12.6 In children **less than 8 weeks old** a dabbing method must be used to apply the 2% chlorhexidine in alcohol; do not allow the alcohol solution to pool
- 12.7 Hand hygiene should follow the six steps outlined in the hand hygiene policy and should be performed before assembling equipment, before donning gloves, and after removal of gloves at the end of the blood sampling procedure.
- 12.8 Once the blood has been taken and the bottles inoculated the safety device on the butterfly needle must be employed and the needle and adaptor cap must be discarded in a sharps container as one unit

13. Auditing and Monitoring

- 13.1 Compliance with this guideline will be audited through the number of contaminated samples reported each month. Results are included in the DIPC report each month and discussed at Directorate Governance meetings and Infection Prevention and Control Group meetings.
- 13.2 Blood cultures reported as MRSA positive are subject to serious untoward incident (SUI) investigation, which will identify if the blood culture has been contaminated. SUI investigations include an action plan to address any issues identified.
- 13.3 The DIPC will include the number and percentage of blood culture contaminants by ward in the monthly DIPC report. This is discussed at Infection Prevention and Control Group meetings and is also fed back through Directorate Governance meetings.

14. Training

- 14.1 Infection prevention including the key principles of ANTT and blood culture collection is delivered at induction for all new medical staff intake in July and August
- 14.2 The IPT assesses competency of new doctors regarding ANTT in respect to blood culture collection.
- 14.3 The IPT will also train and assess specific staff, including nurses where appropriate, nominated to cascade training to others.

15. Implementation & Communication

- 15.1 This document will be issued to the following staff groups to disseminate and ensure their staff are made aware of the guideline:
- Clinical Directors
 - Ward Sisters/Charge nurse
 - Departmental Managers
 - Phlebotomy Manager
- 15.2 This guideline will be issued via the Staff Focus and made available on the Intranet.

16. References

- Department of Health (2008) Health and Social Care Act. DoH.
- Department of Health (2007) Saving Lives: Reducing Infection, Delivering Clean and Safe Care. Taking blood cultures. A summary of best practice.
- Guidelines for Antibiotic Treatment of Endocarditis.
- Report of the Working party of the British Society for Endocarditis Antibiotic Chemotherapy. In Journal of Antibiotic Chemotherapy: 2004: Vol 54:971-918

Appendix 1



Appendix 1 -
Reducing the risk...

Appendix 2



Appendix 2 - Blood
Culture Col...