

Blood Culture Sampling in Patients receiving Haemodialysis

This guidance does not override the individual responsibility of health professionals to make appropriate decision according to the circumstances of the individual patient in consultation with the patient and /or carer. Health care professionals must be prepared to justify any deviation from this guidance.

INTRODUCTION

Blood cultures provide vital information in the diagnosis and treatment of patients with bacteraemias. Saving lives: reducing infection, delivering clean and safe care, DH, October 2007, provides advice on how trusts should review their policies on sampling for blood cultures. Patients receiving haemodialysis often require blood cultures to be taken differently to most other patients, because of the access or areas of the body that could be the focal sepsis point. For this reason blood cultures are to be taken in a specific manner and extra samples taken to correctly identify the source of the infection or confirmation of a false positive. Contamination of blood samples during the process of taking blood for cultures produces a significant level of false positive readings which falsely effects the bacteraemia rates and complicates the treatment and patient care delivered. It is thought that false positive contaminated results account for 10% of all results. A false positive is defined as the growth of bacteraemia present in a blood culture bottle which is not present in the patients bloodstream, and therefore introduced during sample collection.

Contamination can come from a number of sources: the patients skin, equipment used to sample followed by the transfer of the sample into the blood culture bottle, the hands of the person taking the blood sample or just the general environment.

THIS GUIDELINE IS FOR USE BY THE FOLLOWING STAFF GROUPS :

Lead Clinician(s)

Liz Wittich

Lead Nurse Renal Services

Approved by Clinical Effectiveness Committee
on:

May 2010

Extension approved by Trust Management
Committee on:

22nd July 2015

Review Date:

8th April 2020

This is the most current document and is to be
used until a revised version is available

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Key amendments to this guideline

Date	Amendment	By:
27.03.2012	Extended for three years. No changes made.	M Ferring
06.08.2015	Document extended for 12 months as per TMC paper approved on 22 nd July 2015	TMC
17.08.2016	Document extended for 12 months as per TMC paper approved on 22 nd July 2015	TMC
August 2017	Document extended for 12 months as per TMC paper approved on 22 nd July 2015	TMC
December 2017	Sentence added in at the request of the Coroner	
June 2018	Document extended for 3 months as per TLG recommendation	TLG
January 2020	Document extended for 3 months whilst undergoing approval process	Dr Martin Ferring

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Blood Culture sampling in Patients Receiving Haemodialysis

INTRODUCTION

Blood cultures provide vital information in the diagnosis and treatment of patients with bacteraemias. Saving lives: reducing infection, delivering clean and safe care, DH, October 2007, provides advice on how trusts should review their policies on sampling for blood cultures. Blood cultures require two samples an aerobic bottle (pink), (where bacteria are provided with an environment containing oxygen to grow in) and anaerobic (blue) (where the environment medium is starved of oxygen).

DETAILS OF GUIDELINE

It appears there are many variations in practice among NHS staff in taking blood for cultures, most likely because there has been little consistent and definitive advice available. Contamination of blood samples during the process of taking blood for cultures produces a significant level of false positive readings which falsely effects the bacteraemia rates and complicates the treatment and patient care delivered. It is thought that false positive contaminated results account for 10% of all results. A false positive is defined as the growth of bacteraemia present in a blood culture bottle which is not present in the patients bloodstream, and therefore introduced during sample collection.

Contamination can come from a number of sources: the patients skin, equipment used to sample followed by the transfer of the sample into the blood culture bottle, the hands of the person taking the blood sample or just the general environment.

The guideline will aim to ensure that blood cultures are taken:

- For the correct indication
- At the correct time
- Using the correct technique in order to prevent contamination of the sample and minimise risk to patients and staff
- Consistency of practice

MONITORING TOOL

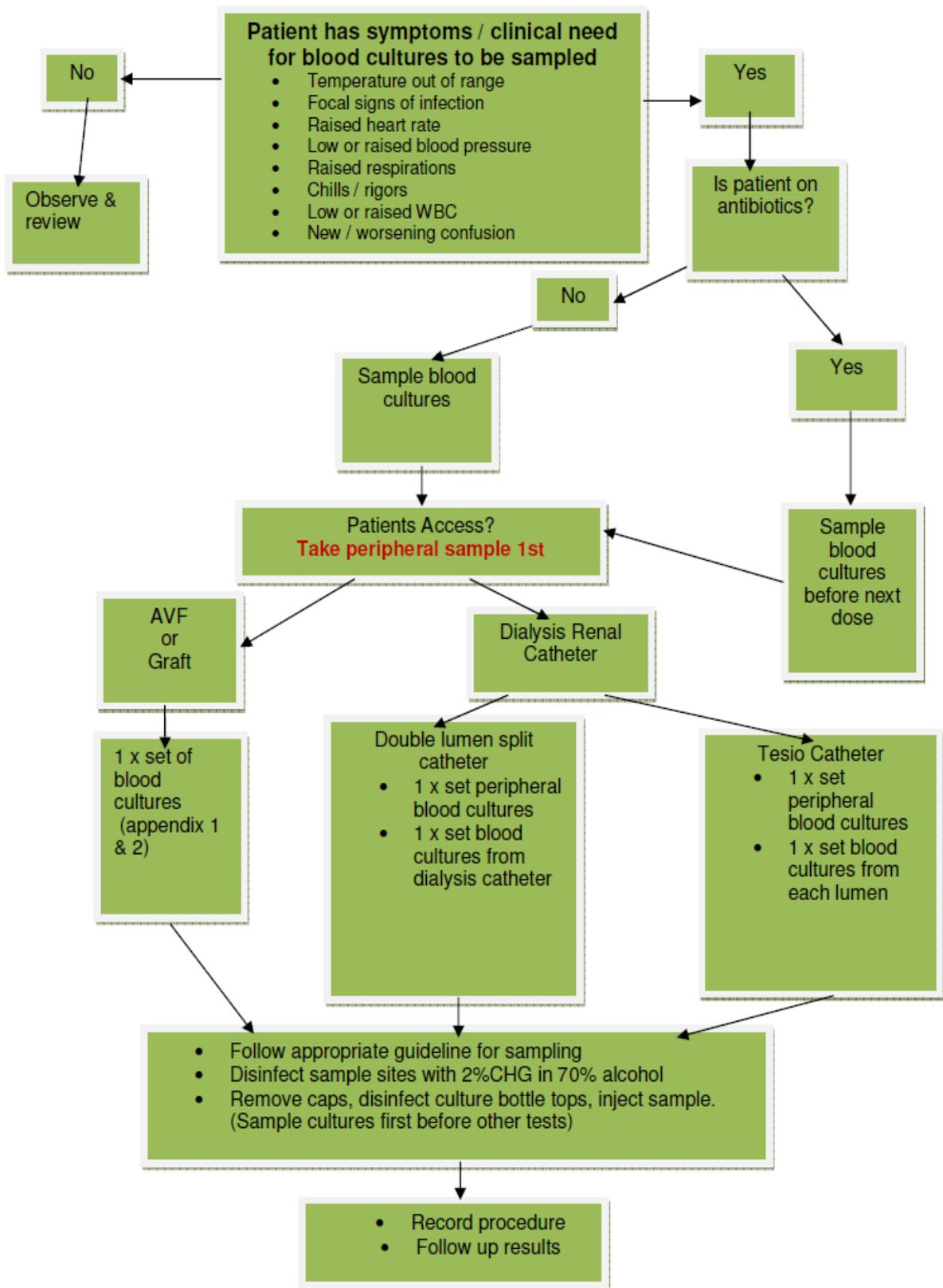
Monitoring will be identified via staffs training & competencies. Auditing of indication, time, technique of blood cultures taken will provide evidence and for any positive results RCA will be conducted within 24 hours of reported results.

The overall objective of the guideline is to ensure blood cultures are sampled correctly and false positive results are eliminated. As the target for bacteraemia's in the directorate is zero, false positive results will affect target figures, effecting the overall reputation of the team and Trust, and could result in the patient receiving unnecessary antibiotics or treatment. Other objectives and guidance has been taken from the: Saving Lives: reducing infection, delivering clean and safe care - Taking blood cultures. A summary of best practice.

STANDARDS	%	CLINICAL EXCEPTIONS
For all blood culture sampling to be taken for the correct reasons and using the correct technique. Standard is for zero bacteraemia within Renal	100	None

Flow Chart

Sampling Blood Cultures



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Guideline Indications

This guideline refers to all patients receiving haemodialysis, with either a fistula or renal dialysis catheter. To analyse and confirm a result from a blood culture medium, two samples are required one from an anaerobic bottle (pink) and one from an aerobic (blue) bottle. Blood cultures are only to be taken when there is clinical need and when the patient shows signs and symptoms of bacteraemia / sepsis being present. Blood cultures should be taken after the identification of possible bacteraemia or sepsis and before the administration of antibiotics, (or if antibiotics are administered then before the next dose and green topped bottles must be used). All blood cultures should be documented in the patients notes, including date, time, site and indications.

Signs & symptoms warranting the need for blood cultures.

- Core temperature $<36^{\circ}\text{C}$ or $>38^{\circ}\text{C}$
- Focal signs of infection
- Heart rate >90 bpm
- Systolic blood pressure <90 mmHg
- Respiratory rate >20 rpm
- Chills or rigors
- White cell count $<4 \times 10^9/\text{L}$ or $>12 \times 10^9/\text{L}$
- New or worsening confusion

Guideline Steps

Blood cultures must only be sampled by trained competent personnel and when the patient shows signs and symptoms of sepsis or a bacteraemia (as in above table). Patients receiving haemodialysis use either an arterio venous fistula (AVF), graft or renal dialysis catheter to access the blood. For those patients with an AVF or graft, one set of peripheral blood cultures will be adequate. In patients with a renal dialysis catheter, additional sampling is required. In these patients with suspected bacteraemia, two sets of blood cultures (4 bottles) are to be taken from two sites. Central lines and dialysis catheters can be sampled and one other peripheral site when investigating potential infection. For Tesio dialysis catheters three sets (6 bottles) of blood cultures are to be sampled as each lumen is a separate catheter tube and requires sampling in addition to a peripheral sample. Strict adherence to the guidelines for Continuing Care of Renal Dialysis Catheters must be adhered to, when accessing the catheter. The peripheral vein sample should always be collected first before any other blood culture sample. Existing peripheral lines / cannulae or sites immediately above a peripheral line are not to be used for sampling. (If the patient has already been prescribed and administered antibiotics then green topped blood culture bottles are to be used)

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Peripheral Sampling

Equipment required

- Sani cloth Plus 70% alcohol wipe
- Apron, visor and disposable gloves
- Renal dialysis pack
- Plaster / dressing
- Blood culture bottles (1 x aerobic and 1 x anaerobic = 1 set)
- Blood culture butterfly collection kit
- Disposable tourniquet
- 2% chlorhexidine in 70% alcohol Chlorap sepp
- 2% chlorhexidine in 70% alcohol wipes (CHG 2%)

Procedure Steps

- Wash your hands with soap and water and dry
- Clean table with sani cloth plus alcohol wipe allow to dry
- Prepare equipment
- Clean any visibly soiled skin on the patient with soap and water then dry
- Apply a disposable tourniquet and palpate to identify vein
- Clean skin with Chloraprep sepp and allow to dry at least 30 seconds
- Remove culture bottle cap and clean bottle bung tops with sani cloth CHG 2% wipes and allow to dry
- Wash hands again or alcohol rub and apply disposable gloves. Do not palpate area to be sampled again
- Using butterfly and vacutainer collection system, withdraw sample release tourniquet.
- Cover the site with an appropriate dressing
- If blood is being collected for other tests, always inoculate the blood culture bottles immediately with equal volumes of blood and do not change the needle, filling the blood culture bottles before any other bottles.
- Discard winged butterfly in sharps container
- Wash hands after removing gloves. Label the bottles ensuring the bar codes are not covered and record the procedure in the patients notes for culture, time, site or venepuncture and any complications. Do not remove bar codes.

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Renal Dialysis Catheter Sampling (sample peripheral first)

- Refer to guideline for Continuing Care of Renal Dialysis catheters

Equipment

- All necessary equipment to access renal catheter as per guideline
- Blood culture bottles (1 set for split regular dialysis catheter and 2 sets for Tesio + set for peripheral sample for both types of catheter)
- 2% Chlorhexidine in 70% alcohol (Sani cloth CHG 2% wipes)
- 1 green needle
- 1 x 5ml syringe (2 for tesio)

Procedure Steps

- Wash hands and prepare equipment and blood culture bottles cleaning top with 2% Chlorhexidine in 70% alcohol sani cloth CHG 2% wipes
- Prepare equipment
- Remove caps from top of blood culture bottles and wipe with CHG wipe
- Access the renal dialysis catheter as per Guideline for Continuing Care of Renal Dialysis Catheters
- Following the guideline, discard 5mls from each lumen length
- Collect sample using a clean 5ml syringe, attach the needle and inject into cleaned blood culture bottle immediately. If taking additional samples at the same time, always inoculate blood culture bottles first.
- Continue caring for the renal catheter following the guideline.
- Discard of sharps safely
- Label bottles and document in patients notes, indication for culture, time, dialysis catheter sample and any complications. Leave bar codes intact.

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REFERENCES

Saving Lives. Department of Health. 2005, 2007 (saving Lives : reducing infection, delivering clean and safe care – Taking blood cultures. A summary of best practice.)

Identifying Sepsis Early. 2006

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