

Taking Blood Cultures

A summary of best Practice

Objective

This procedure has been written to improve the quality of blood culture investigations and reduce the risk of blood sample contamination.

Aim

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 procedure will improve the quality and clinical value of blood culture investigations and reduce the incidence of sample contamination and 'false positive' readings when taking blood cultures. This will help improve patient care.

These recommendations aim to ensure that blood cultures are taken:

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

Introduction

Contamination of blood samples during the process of taking blood produces a significant level of false positive readings which complicates patient care

A false positive is defined as 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 patients 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.

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

Blood cultures are taken to identify patients with bacteraemia. There are many signs and symptoms in a patient which may suggest bacteraemia and clinical judgement is required, but the following indicators should be taken into account when assessing a patient for signs of bacteraemia or sepsis:

- Core temperature out of normal range
- Focal signs of infection

- Abnormal heart rate (raised), blood pressure (low or raised) or respiratory rate (raised)
- Chills or rigors
- Raised or very low white blood cell count, and
- New or worsening confusion

NB: Signs of sepsis may be minimal or absent in the very young or the elderly.

Blood cultures should be taken after identification of possible bacteraemia or sepsis and before the administration of antibiotics. If a patient is on antibiotics, blood cultures should ideally be taken immediately before the next dose, with the exception of paediatric patients.

All blood cultures should be documented in the patient's notes, including date, time, site and indications.

B. Competence

Blood cultures should only be collected by members of staff (medical or nursing) who have been trained in the collection procedure and whose competence in blood culture collection has been assessed and documented.

C. Always make a fresh stab

In patients with suspected bacteraemia, it is generally recommended that two sets of cultures be taken at separate times from separate sites. **Do not** use existing peripheral lines/ cannulae or sites immediately above peripheral lines. Identify a suitable venepuncture site before disinfecting the skin. Avoid femoral vein puncture because of the difficulty in adequate skin cleansing and disinfection.

D. Blood cultures from central lines

Blood **may** be taken from this **and** from a separate peripheral site when investigating potential infection related to the central line, the peripheral vein sample should be collected first. Blood should be taken from each channel of the central line using the guidance in HHT policy: Care of Central Venous Catheter: Taking Blood. If multiple blood samples are being collected, inoculate the blood cultures first. Follow closed method for preparation and inoculation of bottles.

Monitoring

The Microbiology department will produce blood culture contamination data 6 monthly and this will be discussed with clinical teams as necessary

Blood culture protocol

Always use the safe needle collection system

NEVER USE THE NEEDLE AND SYRINGE METHOD

Always wash hands before taking blood cultures

If blood is being taken for other investigations, always take blood cultures first

Only take blood cultures if a patient is for active treatment with antibiotics

Procedure

- Wash hands
- Collect blood culture pack
- Remove contents and place in clean tray
- Check all items to be used are within the expiry date
- Don non-sterile gloves
- Apply single use patient tourniquet
- Clean appropriate vein site with 2% chlorhexidine gluconate and 70% isopropyl alcohol applicator (Chlor prep Sepp/ Frepp) for 30 seconds.
- Leave to dry for 30 seconds
- Do not repalpate vein
- Remove caps from blood culture bottles and clean bottle tops with a 2% chlorhexidine with 70% alcohol wipe (PDI).
- Leave to dry for 30 seconds
- Gain venous access with the winged blood collection set. If require, secure the device with surgical tape
- Hold the culture bottle at a position below the patient's arm with the bottle in an upright position (stopper uppermost). Insert into adapter cap to gain sample (approx 10 mls). Fill blue (aerobic) bottle first and then red (anaerobic) bottle
- Release the tourniquet as soon as the blood starts to flow into the culture bottle, or within two minutes of application
- Do not allow the culture bottle contents to touch the stopper or the end of the needle during the collection procedure. A contaminated culture bottle could contain positive pressure and may cause reflux into the patient's vein.
- Invert bottles thoroughly to mix specimen
- Fill other bottles as required
- Activate safety needle mechanism before removing from vein
- Ensure needle is fully locked by withdrawing it fully until an audible click is heard
- Once removed, dispose of into sharps container
- Remove gloves and wash hands
- Complete blood culture label and form. Ensure the barcodes on the bottles are not re- covered by additional labels and that any tear off barcode labels are not removed
- Record taking of blood culture in patient's notes
- There is no need to contact the on-call person out of hours as the bottles will be dealt with routinely when they reach the laboratory. The bottles are fine at room temperature but should not be refrigerated if there is any delay transporting them to the laboratory.