Blood Cultures and Bloodstream Infections in Adults - Microbiology Summary Clinical Guideline

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PROCEDURE FOR TAKING A BLOOD CULTURE SAMPLE (printed on the sample collection packs)

Step 1: Equipment preparation

- Wash and dry your hands or use alcohol hand rub.
- Gather all equipment: a blood culture pack, gloves, sharps bin and place on a pre prepared ANTT tray, following ANTT principles
- Ensure that barcodes on the bottles are not covered by additional labels and that any tear-off barcode labels are not removed.
- Check the bottom of the blood culture bottle and do not use if there is a central yellow spot which indicates the bottle is contaminated.

Step 2: Patient preparation

- Positively identify patient as per Trust policy and obtain verbal consent.
- Apply a disposable tourniquet **(included in the pack)** and palpate to identify an appropriate vein.
- Wash and dry hands or use alcohol hand rub and apply clean examination gloves (sterile gloves are not necessary)
- Clean any visibly soiled skin on the patient with soap and water then dry.
- Clean patient's skin with a 2% chlorhexidine in 70% isopropyl alcohol using the non touch pad (**Chloraprep Frepp in the pack**) for 30 seconds and allow drying for 60secseconds.
- If a culture is being collected from a central venous catheter, disinfect the access port with a 2% chlorhexidine in 70% isopropyl alcohol impregnated wipe. Please note blood cultures must only taken from CVCs if blood cannot be obtained from a peripheral vein or when a line related sepsis is suspected, then paired specimens should be obtained.
- Remove plastic caps and clean the top of each culture bottles with a separate 2% chlorhexidine in 70% isopropyl alcohol impregnated wipe (**Sani-cloths in the pack**) and allow to dry.

Step 3: Sample collection

- Attach winged blood collection set **(in the pack)** to a blood collection adapter cap **(in the pack).**
- Insert needle into prepared site. **IMPORTANT:** Do not re- palpate vein again after cleaning.
- Place adapter cap over blood culture bottle **(in the pack)** and pierce septum. **IMPORTANT**: Fill Aerobic bottle first (blue top)
- Hold bottle upright and use the bottle graduation lines to accurately gauge sample volume and collect 10mls into each sample bottle.
- If blood is being collected for other tests, always collect the blood culture samples first. (see local vacutainer guides for order of draw)
- Release tourniquet and dispose.
- Remove the needle from the vein using the in vein activator on the collection set.
- Cover the puncture site with an appropriate dressing.
- Discard winged blood collection set in a sharps container.
- Label the bottles, including the collection site, ie, peripheral.
- Wash hands after removing gloves.
- Record the procedure with indication for culture and any complications in the patient's record. Also complete the audit sticker **(in the pack)** and place in patient record.

Indications for initial blood cultures include:

- Differential diagnoses of:
  - Bloodstream infection, sepsis, or septic shock; or
  - Infective endocarditis; or
  - Central venous catheter infection

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Fluid from the aerobic and/or anaerobic bottles that flag positive is subjected to microscopy with Gram stain:

- With regard to the more common finding of bacteria, the BMS records:
  - The presence of Gram positive/negative/variable bacteria; and
  - Spherical (coccus), rod (bacillus), or coccobacillus shapes; and
  - Resemblance to staphylococci, streptococci, etc
- With regard to the less common finding of fungi, the BMS records:
  - The presence of yeasts

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Microscopy results enable microbiologists to provide guidance regarding:

- Potential foci of infection
- Investigation
- Potential associated pathologies
- Treatment with empiric antibiotics

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Fluid from the aerobic and/or anaerobic bottles that flag positive is cultured:

- Final identifications are released, in general, the day after the microscopy result

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Culture results enable microbiologists to provide further guidance regarding:

- Potential foci of infection
- Investigation
- Potential associated pathologies
- Treatment with empiric antibiotics

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Significant isolates are (or fluid from the aerobic and/or anaerobic bottles that flag positive is) subjected to susceptibility testing:

- Resistances and susceptibilities are detected either by:
  - Disk diffusion; or
  - Concentration gradient
- Antibiograms are released, in general, ≥ 24 hours after the microscopy result

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Susceptibilities and resistances enable microbiologists to provide guidance regarding:

- Rationalisation of therapy
- PO step down
- Duration of treatment
- Narrowing of antimicrobial spectrum
- OPAT options

In general, microbiologists rationalise therapy and reduce antibiotic spectra to the narrowest range of activity

NB Indications for repeat blood cultures include:

- Clinical deterioration (for example, total NEWS2 score of ≥ 5), with concerns re bloodstream infection/sepsis/septic shock, on broad spectrum antibiotics
- Escalation of treatment from one broad spectrum antibiotic to a second line antimicrobial
- A differential diagnosis of infective endocarditis
- A differential diagnosis of central venous catheter infection
- A diagnosis of *Staphylococcus aureus* bloodstream infection, for evidence of clearance
- A diagnosis of *Candida* species bloodstream infection, for evidence of clearance