

## Division of Laboratory Medicine

### Bacteriology

## Blood Cultures

Bloodstream Infection, Sepsis, Neonatal Sepsis, Infective endocarditis, Prosthetic valve endocarditis (PVE), Bacteraemia.

The Blood Culture system can also be used for small volumes of the following sterile fluids to aid the recovery of fastidious organisms, for example but not limited to, CAPD/peritoneal fluids (Ascites), Joint Fluids (Prosthetic & Natural), and Stem Cell fluids. For all other sterile fluids please refer to the Sterile Fluids (Bacteriology) section.

### General information

**Collection container (including preservatives):** Collect specimens in BD Bactec bottles using aseptic technique. The bottles should be stored at room temperature before use.

**Specimen type:** Venous blood, arterial blood, peripheral blood, sterile fluids



**BD BACTEC bottles**

**Collection:** A blood culture set is defined as one aerobic (Silver/Blue Top) and one anaerobic (Purple top) bottle. This set is also suitable for patients on antibiotics, or where fungaemia is suspected.

For infants and neonates, a single Peds aerobic bottle (Pink top) may be requested.

For small volume sterile fluids such as Pacemaker fluids & Stem cells, a single Peds aerobic bottle (Pink top) should be used.

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Please refer to MFT sepsis pathway for guidance.

Take two consecutive sets from two separate venepuncture sites during any 24hr period for each septic episode. For neonates, take a single low-volume Peds aerobic bottle. Take two sets during the first hour in cases of severe sepsis prior to commencing antibiotic treatment, provided this does not significantly delay antibiotic administration.

Take at least three sets during a 24hr period where the patient has suspected infective endocarditis.

#### **Specimen transport:**

Collect specimens before antimicrobial therapy where possible. Samples should be taken as soon as possible after a spike of fever. Samples should not be refrigerated.

Inoculated bottles should be incubated as soon as possible, and within a maximum of four hours. The four hour turnaround time from collection to incubation for blood culture samples reflects their clinical significance.

#### **Type and volume of sample:**

- Adults – Purple top and Silver/Blue top bottles. Inoculate up to 10mL to each bottle.
- Children – Pink top bottle. Inoculate up to 3mL
- Neonates – Pink top bottle. Inoculate preferably 1-2mL

Do not exceed the manufacturer's recommended maximum volume for each bottle as shown on label. The minimum volume (shown on blood culture bottles) should be met where possible to comply with manufacturer's requirements.

#### **Special precautions:**

- Use aseptic technique.
- Inspect the blood culture bottles for damage.
- Do not use blood culture bottles which are bulging at the rubber seal as this may be a sign of bacterial growth and contamination.
- Ensure that the blood culture bottles have not exceeded their expiry date.
- Do not re-sheath needles.

## Laboratory information

**Measurement units:** Growth detected or not detected

**Biological reference units:** Not applicable

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**Turnaround time for provisional result (working days):** Negative result 2 days

**Turnaround time to final result (working days):** 6 days for final negative results, 7 days for positive results

### Clinical information

**Clinical decision points:** Not applicable

**Factors known to significantly affect the results:** Any recent antimicrobial therapy can have a significant effect on blood culture results by decreasing the sensitivity of the test. This may be of particular importance in those patients receiving prophylactic antibiotics and who are at high risk of bloodstream infections. If patients have received previous antimicrobial treatment, bacteraemia should be considered even if blood culture results are negative. There is a direct relationship between blood volume and yield, with approximately a 3% increase in yield per mL of blood cultured. False negatives may occur if inadequate blood culture volumes are submitted.

**Limitations:** It is estimated that 2-5% of positive samples may be missed if bottles are pre-incubated, these organisms may fail to trip the threshold algorithm of the continuous monitoring blood culture machine. This may occur with Abiotrophia species (nutritionally variant streptococci), *S. pneumoniae* which have undergone a degree of autolysis, and fastidious organisms which are unable to grow on routine solid culture media. Organisms may include:

- Campylobacter species.
- Helicobacter species.
- Capnophilic organisms.
- Slow-growing anaerobes

**(Last updated November 2023)**