LABMOEBACK SU 2024

Procedures Manual

First Edition

TECHNICAL PROCEDURE

Title: Blood Culture

Principle: Blood Culture is used to diagnose infections and determine if germs have entered the bloodstream.

Specimen Requirements:

Specimen Type: Whole blood

Specimen Volume: Collection of 8-10 mL of blood is optimal for Aerobic and Anaerobic bottles. 1-3 mL of blood is optimal for a Peds bottle.

Collection Time: At least two (2) sets of blood cultures should be obtained (each set includes one (1) aerobic and one (1) anaerobic bottle). Each blood culture set will be drawn from two separate venipuncture sites at approximately 15 minutes apart.

Reagents or Media, Supplies, Equipment:

Reagents/Media: *BACTEC Bottles*
Aerobic bottle – Plus Aerobic/F (gray label, blue ring top, gray cap)
Anaerobic bottle – Lytic/10 Anaerobic/F (purple label, purple ring top, purple cap)
Pedi bottle – Peds Plus/F (pink label, silver ring top, pink cap)
Green-top tube (heparin) – For fungus and mycobacteria (if warranted by clinical suspicion).

Check bottles for expiration date before using. Do NOT cover the barcode on the bottle with the patient label. Prior to use, inspect each bottle for evidence of contamination, damage, or deterioration. Store BACTEC bottles in a cool, dry place -out of direct sunlight.

Supplies and Equipment:	
Tourniquet	Dressing
Syringes	Pen
70% alcohol swab	Labels
2% Chlorhexidine with 70% isopropyl alcohol applicator	Blood transfer device
Vacuette	Incubator
Butterfly set	Automated blood culture system
Sterile Gloves	

Quality Control:

- Ensure all reagents and media are within their expiration dates.
- Perform regular maintenance and calibration of equipment.
- Use control organisms to verify the performance of the culture media.

Step-by-step Instructions:

Prepare the blood culture bottles:

1. Remove the cap and scrub the top of each blood culture bottle with a separate alcohol swab for 30 seconds.

2. Allow to air dry
    - Do not fan or blow on tops once scrubbed.
    - Do not touch tops once scrubbed.

Patient preparation:

1. Explain the procedure to the patient.
2. Perform hand hygiene.
3. Place tourniquet.
    - The tourniquet should not remain on the patient for longer than 1 minute.
4. Palpate and select the site before cleansing the skin.
5. Remove tourniquet

Obtain the Culture:

1. Collect using a butterfly set and a vacuette.
2. Assemble blood culture drawing equipment and arrange supplies needed.
3. Perform hand hygiene.
4. Put on clean gloves.
5. Place tourniquet.
6. Cleanse skin with 2% Chlorhexidine with 70% isopropyl alcohol applicator for 30 seconds using back and forth scrubbing technique.
    - Allow to dry for at least 30 seconds (skin must be dry before venipuncture).
    - Do not fan or blow on the skin once cleansed.
    - Do not palpate the site once cleansed.
7. Perform venipuncture. Venipuncture should be performed using a butterfly set and a vacuette.
8. Fill the aerobic bottle first then the anaerobic bottles (Appendix A for correct volume appropriateness).
9. Fill until 10mL is obtained in each bottle. Watch the volume as the bottle may overfill.
10. Remove tourniquet.
11. Hold pressure and place dressing.
12. Remove gloves.
13. Perform hand hygiene.
14. Label cultures with a bedside labeling device or handwrite the site of the draw on the label while at the patient's bedside.
15. Send to lab per operational unit policy.

Drawing Blood Cultures from vascular access device (VAD):

Blood should not be drawn from a VAD unless line-related sepsis is suspected. Confirm that MD's order for blood culture specifies a line draw. Blood cultures drawn from lines are more likely to be contaminated therefore adequate precautions should be taken to avoid contamination. If drawing a blood culture from a VAD, it should always be accompanied by a blood culture from a peripheral site.

See appropriate nursing guidelines for drawing blood from VADs. Follow instructions for bottle preparation and blood culture volume as outlined previously. Use alcohol prep to scrub hub connection with 70% alcohol and allow it to air dry. Bottle cannot be drawn directly without the use of an adapter. Contact the laboratory if assistance is needed.

If unable to obtain peripheral blood culture and culture from an IV line needs to be done, these steps must be followed for drawing blood cultures from peripheral IVs, Central Lines, and PICCs:

1. Remove the needleless connector and place a new sterile one.

    - Never draw from an old connector
2. Scrub the hub with a 70% alcohol swab for at least 30 seconds and allow it to dry.
    - Do not fan or blow on the connector once cleansed.
3. Contact the lab for any additional adapters as the bottle cannot be drawn directly from the site.
4. Do not draw more than one set from this access.
5. If another set is needed, wait 15 minutes before changing the needless connector and repeat the process.

Transport to the Lab:

Pneumatic tube: To send blood culture bottles by pneumatic tube, place each bottle in a biohazard bag. Seal the bags and place the requisition slips (if not preordered) in the outside pocket of one of the bags. Place the bottles in the carrier so that the bottoms of the bottles are end to end in the center of the carrier and the necks of the bottles face outward**.** Other specimen tubes may be placed in the carrier with the blood culture bottles as room permits.

Regular courier: Use two specimen bags. Wrap one bottle snuggly with a plastic specimen transport bag and insert the wrapped bottle in another plastic transport bag. Place the second bottle of the set in the bag. Seal the bag and place requisition slips (if not pre-ordered) in the outside pocket.

Instructions for local laboratory sending blood cultures to Core Microbiology laboratory:

If there is no scheduled courier within 4 hours of blood culture receipt in the laboratory, contact A1 cab for transport to the core laboratory. This may require calling an A1 cab more than once per day for blood cultures, particularly during large gaps between scheduled courier runs. Use of an A1 cab for specimen transport can be minimized by strategically scheduling A1 use (for example: schedule an A1 cab to arrive in the middle of an 8-hour gap between scheduled courier runs). If A1 is contacted to pick up blood culture specimens, any additional microbiology specimens pending transport should also be sent along with a batch list.

Calculations: Not typically required for the procedure itself, but may be needed for interpreting results (e.g., colony-forming units per mL).

Reporting Results:

The results of a blood culture test are based on whether any germs were detected. The test report may list the blood culture test as either negative or positive.

- A negative test result means that no germs grew in the culture.
- A positive test result means that one or more germs developed in the dish. A positive result indicates the presence of germs in your blood.

Because a blood culture involves multiple test samples, it is possible for some samples to be positive and others to be negative.

Normally the blood is sterile, which means there should not be bacteria, fungi, or viruses present. For this reason, a positive test result can be a sign of an infection. If the test result is positive, other information may be listed on the test report including:

- How many and which of the test samples were positive
- The specific type of germ or germs that were found
- How quickly the germ or germs developed
- How much the germ or germs grew over a set period

Procedure Notes:

Positive culture results are considered a critical value and notification will be performed upon recognition of positive results.

DO NOT COVER THE BAR CODE LABEL ON THE BOTTLE WITH THE PATIENT LABEL. Place the patient label perpendicular to the bottom of the bottle.

The optimal blood volume for culture is 8-10 mL (1-3 mL for Peds bottle). A suboptimal volume of blood can adversely affect the recovery and/or time of detection of organisms. Interpret results accordingly.

Limitations of Methods:

Reference Range: No growth

Turnaround Time: Negative cultures are held for 5 days.

Methodology: BACTEC FX - continuous monitoring instrument. Positive bottles are sub-cultured and organisms identified using laboratory protocol. Susceptibilities are performed, if appropriate.

Performed: Clinical Microbiology

KEY POINT: Neutropenic (ANC < 1500 µL) or thrombocytopenic (Platelets < 30,000 µL) patients suspected of having a bloodstream infection are to have peripheral blood culture attempted twice before considering drawing a blood culture from a central line or PICC. Cultures in these patients must be drawn within an hour of suspected infection has been identified.

Do not send catheter tips for culture.

Troubleshooting or Back-up Plan:

If contamination is suspected, repeat the blood culture. Use alternative methods like molecular diagnostics if cultures are repeatedly negative but clinical suspicion remains high.

References

Henry Ford Health (Ed.). (2023, July 12). *Blood Culture Collection Procedure*. Retrieved from https://lug.hfhs.org/bloodCult.htm

The University of Texas Medical Branch (Ed.). (n.d.). *Blood Culture Test Results*. Retrieved from https://www.utmb.edu/lsg2/Home/Details?id=1377

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EFFECTIVE DATE
DECEMBER 2024

SIGNATURE OF LABORATORY DIRECTOR
__JANINE TALAN__
Laboratory Director