CAREPATHrx™
Specialty Pharmacy & Infusion Solutions

BLOOD CULTURE COLLECTION

Section: Nursing
Compliance: ACHC Infusion Pharmacy
ACHC Standards: N/A
URAC Standards: N/A
TJC Standards: NPSG.01.01.01 EP 1, 2
Policy ID: NUR004
Effective: 1/1/21
Reviewed: 5/1/21, 5/1/22, 2/1/24
Revised: 9/1/21, 2/1/24
Approved by: Kathleen Patrick, President, 1/1/21, 9/1/21, 5/1/22, 2/1/24

I. POLICY

Blood cultures are collected in accordance with specific physician orders. Blood cultures detect the presence of bacteria in the blood by sampling in both anaerobic medium and aerobic medium bottles. The blood samples are then incubated, with 67% pathogen identification within 24 hours and 90% pathogen identification within 72 hours.[2] At least two patient identifiers will be used when collecting blood samples for clinical testing.

Blood cultures are collected and inoculated in a set of two (2) bottles, one (1) for aerobic bacteria and one for (1) anaerobic bacteria. When ordered, obtain 2 sets of blood culture samples from different sampling/venipuncture sites to increase the sensitivity for detecting organism growth.[1] Physician orders regarding one (1) versus two (2) sites are essential before beginning procedure. Caution and accuracy of procedure must be adhered to when obtaining blood cultures to avoid false negative and false-positive results and to reduce incorrect classification as a Catheter Associated Blood Stream Infection (CABSI).

When possible, blood cultures should be drawn before starting antimicrobial therapy and collected by peripheral site.

Avoid drawing blood cultures from a peripheral catheter (either at insertion or during dwell).

When blood cultures are drawn with other blood samples, blood cultures should be drawn first. Refer to CarepathRx' s policy on *Blood Sampling* for additional instruction on order of laboratory tube order and general blood sampling procedure.

Blood samples drawn from Central Venous Access Devices (CVADs) are associated with higher false positive rates. [1, 2] Blood cultures should be obtained from the CVAD when the CVAD is suspected to be the source of the bacterial infection, with a second set being drawn by peripheral puncture to confirm Blood Stream Infection (BSI).[1] CABSI is diagnosed with differential time to positivity (DTP), by comparing equal volume specimens drawn peripherally and CVAD-drawn with the catheter sample positive within two (2) hours peripheral venipuncture blood culture sample.[1] Blood

cultures may also be drawn from the CVAD in the presence of difficult venous access and otherwise unable to obtain peripherally. When drawing blood culture specimens from a CVAD, the needle connector should be removed for hub-to-hub collection, if left in place and specimen drawn through the needless connector it may result in a false-positive blood culture result. For multi-lumen CVADs, a sample should be drawn from each lumen and labeled according to the lumen the specimen was collected from. The initial blood volume collected from a CVAD should be included in the blood culture specimen, and not discarded. Should an antimicrobial locking solution be instilled in the lumen, it should be wasted and not collected with the blood culture specimen as it may cause a false negative result.

Before drawing blood culture samples, disinfect the rubber stopper/septum of the blood culture bottles with 70% alcohol by rubbing briskly for 30 seconds and allow to dry for 60 seconds. Iodine is not recommended to disinfect the culture bottles as iodine may degrade the stopper/septum material.

Blood Culture sampling volumes for each bottle:

- **Adults:** 10 mL per bottle (minimum of 5 mL per bottle required). Volume is required for each bottle per set of cultures drawn (i.e., 2 sets of blood cultures would be #4 - 10 mL specimens, or 40 mL blood volume total)
- **Pediatrics and Neonates:** Weight-based volume, with no more than 1% of total body blood volume

Blood cultures are to arrive at the laboratory within 2 hours for processing. Do NOT refrigerate or put on ice during transport, as this may kill bacteria.

All equipment and supplies are to be inspected for expiration, defects, and compromised integrity.

II. PROCEDURES

A. Venipuncture Blood Draw:

1. Supplies:

    a. Chloraprep (povidone iodine for patients with allergies to chloraprep)
    b. Sterile alcohol swabs
    c. Tourniquet
    d. Labels and slips/requisition
    e. Gloves
    f. Vacutainer with winged butterfly needle set
    g. 2 X 2 gauze pad
    h. Blood culture bottles (aerobic and anaerobic, one set per ordered culture.) The culture bottles should be specific to the laboratory being used
    i. Tape/band-aid
    j. Sharps container
    k. Laboratory biohazard transport bags
    l. Hard plastic transport containers if transporting specimen to the laboratorExplain the procedure to the patient

2. Wash hands thoroughly.
3. Don gloves

4. Assemble supplies, including connecting winged butterfly needle set to vacutainer
5. Inspect supplies for expiration, defects and compromised integrity.
6. Swab the rubber stoppers of the blood culture bottles with 70% alcohol for 30 seconds and allow to dry for 60 seconds.
7. Cleanse selected venipuncture site with Chloraprep (povidone iodine for patient with allergy to Chloraprep) as per policy with a 2–3-inch circumference for 30 seconds. Allow to dry for 60 seconds. Do NOT palpate site to avoid microorganism contamination of the venipuncture site. Sterile gloves are to be donned if site palpation is necessary.
8. Reapply the tourniquet. Do not re-palpate the vein.
9. With the bevel up, insert the winged needle into the vein at a 15–30-degree angle. Secure wings with tape if needed.
10. Insert the aerobic bottle into the vacutainer in the upright position and collect 10 mL blood sample and remove bottle from the vacutainer. Then insert the anaerobic bottle into the vacutainer in the upright positions and collect 10 mL blood sample and remove bottle from the vacutainer.

    NOTE: follow manufacturer instructions for blood sample volume. Some blood culture tubes recommend additional volume.

11. Release the tourniquet
12. Remove the needle from the vein and immediately apply gentle pressure to the site with a sterile gauze for 2 -3 minutes or until the bleeding stops. Be sure not to touch the needle with the gauze. Cover the site with a small bandage or band-aid.
13. Dispose of the winged butterfly needle in the sharp container.
14. Invert both specimen bottles 8 to 10 times.
15. Label the blood specimen bottles with date, time, site collected from, and patient and physician names in the presence of the patient.
16. If a second peripheral blood culture has been ordered, repeat steps 6 – 17 from a different peripheral site. If a second blood culture has been ordered to be drawn from patient's central line, follow procedure below for CVAD blood culture sampling procedure.
17. Place the samples in a laboratory biohazard bag, along with the laboratory requisition form.
18. Discard gloves and perform hand hygiene.
19. Store at room temperature until transport to the laboratory. Specimen to arrive at the laboratory within 2 hours of lab draw.
20. Document procedure

B. Blood Cultures from CVAD:

1. Supplies

    a. 10 ml syringes
    b. 1-20 ml syringe
    c. Needleless transfer device
    d. 2 Sterile Injection caps
    e. Povidone iodine swabs
    f. Blood culture bottles (aerobic and anaerobic, one set per ordered culture). The
    g. culture bottles should be specific to the laboratory being used.
    h. Labels/slips
    i. Gloves

j. Biohazard sharps container
k. Prefilled normal saline syringe. Amount varies according to catheter type. Refer to CarepathRx policy on Flushing *and Locking Catheters.*
l. Prefilled heparin syringe. Amount varies according to catheter type. Refer to CarepathRx policy on Flushing *and Locking Catheters.* (Groshong catheters do not require heparin)
m. Plastic bags and hard plastic transport containers if transporting the specimen
n. to the laboratory

2. Verify provider order

3. Confirm patient identity with 2 identifiers

4. Explain procedure to the patient

5. Wash hands thoroughly. Don gloves

6. Assemble supplies

7. Inspect supplies for expiration, defects and compromised integrity.

8. Clamp catheter lumen

9. Swab the rubber stoppers of the blood culture bottles with 70% alcohol for 30 seconds and allow to dry for 60 seconds.

10. Thoroughly cleanse the injection cap and catheter hub connection with 70% alcohol for 30 seconds and allow to dry for 60 seconds.

11. Remove injection cap

12. While holding the catheter to prevent contamination, vigorously scrub the lumen with 70% Alcohol swab for 30 seconds, and allow to dry for 60 seconds

13. Collect 20 – 30 mL sample:

    a. Collection with syringe METHOD

        1) Connect the 20 ml syringe to the catheter hub
        2) Unclamp the catheter lumen
        3) Withdraw the required amount of blood for the specimen, (15-20 ml)
            a. NOTE: do not waste the initial volume
        4) Clamp the catheter lumen
        5) Disconnect syringe
        6) Attach a new sterile injection cap to the catheter hub according to CarepathRx policy on *Vascular Access Device Dressing and Needleless Connector Change.*
        7) Flush lumen saline as ordered, using the push pause method
        8) Attach the needleless transfer device to the blood sample syringe.
        9) Insert into the aerobic bottle into the needless transfer device first and inject ½ of obtained specimen.

10) Withdraw the bottle from the needleless transfer device and insert the anaerobic bottle into the needleless transfer device.
11) Inject the remainder of the collected specimen.
12) Withdraw the bottle and dispose of the syringe and needleless transfer device.

b. Collection with slip tip vacutainer METHOD

1) Attach the needleless slip tip vacutainer to the lumen hub, positioning the lumen up and the vacutainer down. NOTE: do not waste the initial volume
2) Insert into the anaerobic bottle into the vacutainer, holding the bottle upright to prevent reflux of the broth medium into the CVAD and vein.
3) Withdraw the bottle from the vacutainer after specimen collected.
4) Insert the aerobic bottle into the vacutainer, holding the bottle upright to prevent reflux of the broth medium.
5) Withdraw the bottle from the vacutainer once the specimen is collected.
6) Dispose of the syringe and vacutainer
7) Clamp the catheter lumen.
8) Remove the needleless slip tip vacutainer from the catheter lumen.
9) Attach a new sterile injection cap to the catheter hub according to CarepathRx policy on *Vascular Access Device Dressing and Needleless Connector Change.*
10) Flush lumen saline as ordered, using the push pause method.

14. Resume any infusions as appropriate, or flush/lock catheter lumen with heparin if ordered.

15. Invert both specimen bottles 8 to 10 times.

16. Label the containers for blood specimens with date, time, site collected from, and patient and physician names in the presence of the patient.

17. If a second CVAD blood culture has been ordered, repeat steps f – o from a different lumen if available. In the presence of a single lumen catheter repeat steps f – o from the same lumen.

18. Place the samples in a laboratory biohazard bag, along with the laboratory requisition form.

19. Discard gloves and perform hand hygiene.

20. Document procedure. Documentation should include:

a. Date and time of specimen collection
b. The volume of blood collected
c. Specific laboratory tests collected
d. For venipuncture, document skin antiseptic preparation technique
e. Sites of specimen collection
f. Patient's tolerance and response to the procedure
g. Teaching provided to the patient, and any other individuals taught if appropriate. Also, document understanding of teaching and any follow up education required.
h. The laboratory specimens were taken to and any directions relative to reporting the results

21. Store at room temperature until transport to the laboratory. Specimen to arrive at the laboratory within 2 hours of lab draw.

References:

Infusion Nurses Society. 8th Edition (2021). Infusion Therapy Standards of Practice. Journal of Infusion Nursing, Volume 44.

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