

Department Laboratory/Nursing  
**Laboratory Laboratory System**  
 Site(s) FV Clinics, FLMC, FNMC, FRH, FSH, FRMC& Clinics, UMMC/UMMCH, UMHMG, CSC  
 Section Collection  
 Document # S:2105 COLL V22

**Subject BLOOD COLLECTION FOR CULTURES (BACTERIAL, FUNGAL, VIRAL)**

**Purpose** Ensure blood collected for cultures is free from contamination (from patient or personnel); precautions are taken for skin preparation as well as collection tube preparation.

**Policy** This procedure is for the additional collection of Blood Cultures. Follow the **Blood Collection by Venipuncture, Blood Collection by Vascular Access Devices (VAD), and Patient Identification and Laboratory Specimen Labeling** procedures for all other steps.

**Index** **Equipment/Supplies**  
**Procedure**  
**References**

**Equipment/Supplies/Reagents** 1. Prepare for Collection  
 Complete initial steps for venipuncture or VAD collection, including identify patient, identify site/lumen, put on gloves, assemble supplies, etc.

**CAUTION: Always use gloves and observe Standard Precautions when collecting biologic specimens.**

**CAUTION: BACTEC™ bottle septa contains dry natural rubber.**

2. Additional Supplies
  - a. Chlorhexidine gluconate scrub (such as ChlorPrep®) **or**
  - b. Povidone-Iodine swabstick or ampule (required if patient less than 2 months of age)
  - c. Culture bottles or tubes. The laboratory maintains records showing that each shipment of purchased blood culture bottles is examined for breakage, contamination, appearance, and evidence of freezing or overheating.
  - d. Alcohol prep pads
  - e. Access or transfer device

Procedure            3. Select Appropriate Culture Bottle/Tube

BACTERIAL Note: A routine adult blood culture order includes both aerobic and anaerobic bottles. UMMC East and pediatric exception: Only an aerobic bottle is collected unless anaerobic bottle is specified in order.		Opt (mL)	Min (mL)
<ul style="list-style-type: none"> <li>Adult Do <u>not</u> substitute peds bottle for adult minimum collection. (In the rare event the appropriate adult volume will not otherwise be obtained, sample should be placed in a pediatric aerobic bottle.)</li> </ul>	<ul style="list-style-type: none"> <li>BACTEC Plus Aerobic w/resin (gray cap) bottle</li> </ul>	8-10	3
	<ul style="list-style-type: none"> <li><b>Northland only:</b> BacT/Alert SA Aerobic (blue cap) bottle</li> <li><b>Range only:</b> BacT/Alert FA Aerobic (green cap)</li> </ul>	8-10	5
	<ul style="list-style-type: none"> <li>If indicated, BACTEC lytic anaerobic (purple cap) bottle</li> </ul>	8-10	3
	<ul style="list-style-type: none"> <li><b>Northland only:</b> If indicated, BacT/ALERT Anaerobic w/ activated charcoal (orange cap) bottle</li> <li><b>Range only:</b> BacT/Alert FN Anaerobic bottle (orange cap)</li> </ul>	8-10	5
<ul style="list-style-type: none"> <li>Pediatric (&lt;18 y)</li> </ul>	<ul style="list-style-type: none"> <li>BACTEC Peds Plus Aerobic w/resin (pink cap) (first priority) bottle</li> </ul>	3	1
	<ul style="list-style-type: none"> <li><b>Northland, and Range only:</b> BacT/ALERT Pediatric w/ activated charcoal (yellow cap)(first priority) bottle (aerobic culture)</li> </ul>	2-4	1
	<ul style="list-style-type: none"> <li>If indicated, BACTEC Lytic Anaerobic (purple cap) bottle</li> </ul>	8-10	3
	<ul style="list-style-type: none"> <li><b>Northland only:</b> If indicated, BacT/ALERT Anaerobic w/ activated charcoal (orange cap) bottle</li> </ul>	8-10	5
<b>AFB (Mycobacteria)</b>			
<ul style="list-style-type: none"> <li>Adult or Pediatric</li> </ul>	<ul style="list-style-type: none"> <li>SPS (liquoid yellow) tube or</li> </ul>	3-5	1
	<ul style="list-style-type: none"> <li>Isolator™ (yellow/black) tube</li> </ul>	7.5-10	6
<b>YEAST</b>			
<ul style="list-style-type: none"> <li>Adult- Routine Yeast Do <u>not</u> substitute peds bottle for adult minimum collection</li> </ul>	<ul style="list-style-type: none"> <li>BACTEC Plus Aerobic w/resin (gray cap) bottle (routine aerobic bottle acceptable; second bottle not needed)</li> </ul>	8-10	3
	<ul style="list-style-type: none"> <li><b>Northland, and Range only:</b> BacT/ALERT Aerobic w/ activated charcoal(green cap) bottle (Routine aerobic bottle is acceptable; 2nd bottle not needed)</li> </ul>	8-10	5
<ul style="list-style-type: none"> <li>Pediatric- (&lt;18 y) Routine Yeast</li> </ul>	<ul style="list-style-type: none"> <li>BACTEC Peds Plus Aerobic w/resin (pink cap) bottle (routine aerobic bottle acceptable; second bottle not needed)</li> </ul>	3	1
	<ul style="list-style-type: none"> <li><b>Northland, and Range only:</b> BacT/ALERT Pediatric w/ activated charcoal (yellow cap) bottle (Routine aerobic bottle is acceptable; 2nd bottle not needed)</li> </ul>	2-4	1

<b>FUNGAL</b>		<b>Opt (mL)</b>	<b>Min (mL)</b>
<ul style="list-style-type: none"> <li>Adult or Pediatric Fungal, Histoplasma, Blastomyces, Coccidioides, Crypto or HIV Patients</li> </ul>	<ul style="list-style-type: none"> <li>Isolator™ (yellow/black) tube or</li> <li>If less than 6 mL is available, collect SPS (liquoid yellow) tube.</li> </ul>	7.5-10 3.3	6 1
<ul style="list-style-type: none"> <li>Infants (&lt;11 lb or 5 kg) Malassezia/Histo/HIV</li> </ul>	<ul style="list-style-type: none"> <li>SPS (liquoid yellow) tube</li> </ul>	1.5	1
<b>VIRAL</b>			
<ul style="list-style-type: none"> <li>Adult or Pediatric</li> </ul>	<ul style="list-style-type: none"> <li>EDTA (purple) tube</li> </ul>	5	1

4. Prepare Culture Bottle/Tube

a. Bacterial & Routine Yeast Culture

- BacT/Alert Bottles: Assure bottom of bottle indicator has not turned yellow. Bottom of bottle should appear blue-green in color.
- Remove protective cap from bottles and cleanse with alcohol prep pad and allow to air dry.

b. Viral, AFB (Mycobacteria), or Fungal (Histoplasma, Blastomyces, Coccidioides, Crypto or HIV Patients) Culture

- Cleanse top of tube with alcohol prep pad and allow to dry.

5. Apply Tourniquet

Apply tourniquet to locate vein. Release tourniquet.

6. Cleanse the Site

- Cleanse vein site to destroy microorganisms on the skin and prevent microbial contamination of specimen. Failure to carefully disinfect the venipuncture site can introduce skin surface bacteria into the blood culture bottles and interfere with interpretation of results.
- The following do NOT require a ChloroPrep or Povidone-Iodine triple prep:
  - Viral cultures (use routine alcohol prep)
  - Blood culture specimens from vascular access devices
- If the patient is less than 2 months of age, triple prep vein site with Povidone-Iodine swabsticks or ampules.
  - Scrub site for 60 seconds with Povidone-Iodine swabstick or ampule with back and forth friction.
  - Repeat application with 1-2 additional Povidone-Iodine swabsticks or ampules.
  - Povidone-Iodine may be removed with alcohol pad if color interferes with vein location.
  - If the puncture site must be touched prior to venipuncture, cleansing steps should be repeated. A gloved finger used to palpate just above the puncture site should first be cleansed in same manner as site.
  - Remove all Povidone-Iodine once collection is complete.
- For all patients more than 2 months of age, prep the site with ChloroPrep.
  - Pinch the wings on the applicator once to break the ampule to release the

- antiseptic. Do not touch the pad.
- Gently press the sponge against the selected site until liquid is visible on the skin.
  - Apply the ChloroPrep with side to side strokes and scrub for at least 30 seconds.
  - Allow to air dry for 30 seconds. Do not blot or wipe away.
  - If the puncture site must be touched prior to venipuncture, cleansing steps should be repeated. A gloved finger used to palpate just above the puncture site should first be cleansed in same manner as site.
7. Re-Apply the Tourniquet  
Reapply tourniquet being careful not to contaminate site.
8. Perform the Collection  
Perform venipuncture or vascular access device collection using one of the following methods. **Note: Optimum recovery of isolates will be achieved by adding the optimal volume of blood. Use of lower or higher volumes may adversely affect recovery and/or detection times. Volume is monitored on the blood culture instrument and correct collection volume compliance will be monitored. Check Lab Guide for volume requirements for each type of blood culture collected.**
- a. Evacuated system, collecting blood directly into culture bottle(s) or tube(s). Mark approximate optimal fill volume on side of bottle prior to collection and fill in the upright position to assure correct collection volume and to prevent risk of broth medium reflux back into vein. Do not under or over fill.
  - b. Syringe system, transferring blood by attaching syringe to transfer device. Insert blood culture bottle(s)/tube(s) and fill to optimal volume. Do not under or overfill.
9. Collection from Vascular Access Devices
- a. Replacing the added catheter end piece (Examples: One-Link, MicroClave®) immediately prior to the culture collection is recommended to reduce potential contamination of the sample.
  - b. The initial fluid withdrawn from a central catheter (commonly referred to as “waste”) may be included with the blood withdrawn for culture bottle inoculation.
  - c. Note that blood cultures obtained from vascular access devices are associated with greater contamination rates than those obtained by venipuncture.
  - d. Blood cultures collected from vascular access devices should be paired with another blood culture collection by venipuncture to assist in interpretation in event of a positive result.
10. Fill the Bottles/Tube  
Assure that air is not transferred into the anaerobic bottle:
- Avoid air bubbles from a syringe during sample transfer to bottle.

- Avoid air from butterfly tubing/holder by filling the aerobic bottle before the anaerobic bottle.
- Avoid possible backflow of bottle contents by holding culture bottle in an upright position during collection.

#### 11. Label the Bottles/Tube

- a. Label bottles/tube appropriately. This includes indicating date, time of collection and collector's identification.
- b. Identify each specimen container with appropriate body site.
- c. If collected from a vascular access device, specify the specific catheter site on the specimen container.
- d. Do not cover the manufacturer's barcode on the bottle.

#### 12. Multiple Collection Sets

At least two sets are optimal. When more than one set is ordered for collection at the same time, the second set should be obtained from a separately prepared site on the opposite arm. However, in cases where the "second site" blood culture cannot be obtained from the opposite arm, cleanse and collect two different sites on the same arm/hand, using a different vein if possible. The second collection is to substantiate the credibility of any positive and aid in interpretation of the results by showing that two different collections gave the same result.

CLSI states that the timing of the collection may be performed simultaneously (or over a short time frame) unless indicated by the physician. Collection of blood at intervals is only indicated when it is necessary to document continuous bacteremia in patients with suspected infective endocarditis or other endovascular (e.g. catheter-related) infections. The physician may request that the collections be spaced at 5-10 minute intervals.

#### 13. Storage and Transport

Keep bottles at room temperature and protected from direct sun light. Avoid disinfectants incompatible with polycarbonate surfaces to prevent bottle deterioration.

Each hospital site that receives shipment of blood culture bottles inspects and documents successful receipt of shipments and maintains these documents for 6 months. Outlying clinics that hospital sites supply blood culture bottles to sends the Transfer of Media Documentation Form accompany that inventory. Receiving clinic sites will document date and initials of inspected and acceptable inventory from the hospital site and store documents for 6 months. **<Transfer of Media Documentation Form>**

- References
1. McCall RE, Tankersley CM. Phlebotomy Essentials, 4th edition. Lippincott Williams and Wilkins, 530 Walnut Street, Philadelphia, PA 19106. 2008.
  2. Strasinger SK, Di Lorenzo MA. The Phlebotomy Workbook, 2<sup>nd</sup> edition. FA Davis

- Company, 1915 Arch Street, Philadelphia, PA 19103. 2003.
3. ChloraPrep® One-step Training Manual. Medi-Flex Hospital Products, Inc. 8717 W. 110<sup>th</sup> Street, Overland Park, KS 66210-1129. 9/01.
  4. CLSI. *Collection of Diagnostic Venous Blood Specimens*. 7<sup>th</sup> ed. CLSI standard GP41. Wayne, PA: Clinical Laboratory Standards Institute; 2017.
  5. CLSI. Principles and Procedures for Blood Cultures; Approved Guideline. CLSI document M47-A. Wayne, PA : Clinical Laboratory Standards Institute; 2007.
  6. BacT/ALERT® FA and BacT/ALERT® FN package insert, BioMérieux, Inc. 2010.
  7. Infusion Nursing Standards of Practice. Lippincott Williams and Wilkins, Philadelphia, PA, 2011.

Associated Documents

**WorkAid – BACTEC Blood Culture Bottle Conversion power point 2017**  
**Blood Collection by Venipuncture**  
**Blood Collection by Vascular Access Devices**  
**Patient Identification and Laboratory Specimen Labeling**  
**Transfer of Media Documentation Form**

Effective Date

12/1983

Summary of Changes

Updated bottle types for Fairview Range in section Adult.  
 11/2018 No change to document; Adding new Maple Grove medical director signature

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