HealthPartners/GHI

Blood Culture Collection Procedure (For Bacteria, Fungus and/or Yeast)	**Attachments** ☐ Yes ☒ No
Key words Phlebotomy, Blood Culture, Blood draw, Sepsis	**Number** **GHP-PC-CLINIC LAB-Procedures-Blood Culture Collection v. 11-2009**
Category Provision of Care	**Effective Date** **March 1995**
Manual Clinic Laboratory Procedure Manual	**Last Review Date** **November 2012**
Issued By Clinic Laboratory Administration	**Next Review Date** **November 2013**
Applicable Clinic Laboratory Staff	**Origination Date** **March 1995**
	Retired Date
Level of Complexity Waived	**Approved Date** **June 2007**
Review Responsibility Laboratory Technical Consultants	**Contact** Laboratory Technical Consultants
APPROVAL(S) Laboratory Medical Director	

PURPOSE/PRINCIPLE

The purpose of blood culture collection is to obtain uncontaminated blood for the purpose of diagnostic laboratory testing.

Bacteremia occurs when the rate of multiplication of bacteria in the bloodstream exceeds the capacity of the reticuloendothelial system to remove the bacteria. The clinical pattern of bacteremia may be transient (manipulation of infected tissue, manipulation of contaminated surfaces early systemic and localized infection), intermittent (urinary tract infections, respiratory infections, meningitis or undrained abscesses) or continuous (bacterial endocarditis).

The blood specimen is inoculated into the appropriate blood culture bottles. The bottles are inserted into the BACTEC fluorescent series instrument for incubation and periodic reading. Each bottle contains a chemical sensor which can detect increases in CO_2 produced by the growth of microorganisms. The sensor is monitored every ten minutes for an increase in fluorescence, which is proportional to the CO_2 present. A positive reading indicates the presence of viable organisms in the bottle. Resins have been added in the BACTEC Plus Aerobic and Peds Plus Bottles to enhance recovery of organisms.

POLICY

Laboratory Staff collecting blood specimens will follow the approved techniques for specimen collection outlined in this procedure.

HealthPartners family of care uses single-use needle and devices for all phlebotomy and blood collection procedures. Should it be necessary to re-stick a patient, a new, single-use needle or device will be used.

PROCEDURES

Specimen for Bacteria:

The specimen must be collected using sterile technique to reduce the chance of contamination. Routinely, two sets of blood cultures are ordered. When multiple cultures are to be collected follow the Provider's instructions or collect at least 15 minutes apart. Do not collect more than 3 blood culture sets per day.

Since most bacteremia is intermittent, several techniques may be necessary to isolate the organism responsible for the bacteremia. The following affect the positivity rate:

1. The volume of blood collected - 20 cc is preferred.
2. The number of blood cultures drawn - 3 sets are recommended to rule out bacteremia.
3. The timing of the blood cultures drawn - optimum collection time is before the onset of chills. Subsequent sampling should be spaced at wide intervals.

Recommended collection is before the initiation of antimicrobial therapy. If antimicrobial therapy was initiated before collection, document when therapy was started in the computer.

Blood volumes are as follows:

Criteria	Total Volume	Bottles	Volume Each Bottle
Adult and older children (> 5yrs) ***Always collect two sets***	16-20 cc *Note: If 10 cc or less collected, inoculate the BACTEC Plus Aerobic bottle only.*	BACTEC Plus Aerobic BACTEC Lytic Anaerobic	8-10 cc 8-10 cc
Children under 5 years old	6-10 cc optimal	BACTEC Peds Plus BACTEC Lytic Anaerobic	3 cc 3-7 cc
Children under 5 years old **If 5 cc or less collected**	*Note: If 5 cc or less collected, inoculate 3 cc in one BACTEC Peds Plus bottle, and if any remaining inoculate into <u>second</u> BACTEC Peds Plus bottle*	BACTEC Peds Plus BACTEC Peds Plus	3 cc 1-3 cc
Infants or Bone Marrow	1-3 cc	BACTEC Peds Plus	1-3 cc

If using a butterfly draw system, carefully observe the direction of blood flow when starting sample collection. The vacuum in the vial will usually exceed 10 cc, so the user must monitor the volume collected by means of the 5 cc graduation marks on the bottle label. If pediatric bottles (pink) are not available, use the adult BACTEC Plus Aerobic bottle.

Materials:	Stock Number
BACTEC Plus Aerobic	#109346
BACTEC Lytic Anaerobic	#109348
BACTEC Peds Plus	#109347

- Store at room temperature and out of direct sunlight.
- Do not use bottles that display evidence of damage or contamination such as leakage, cloudiness, discoloration (darkening), bulging or depressed septum.
- 20 cc for adults and older children
- 10 cc for young children

Chloraprep applicator Order from Central Lab
(isopropyl alcohol 70% v/v and chlorhexidine gluconate 2% w/v)

*2% Iodine tincture amplue Order from Central Lab
(use only for patients with chlorhexidine and/or alcohol allergies)

Latex Intolerance Notice

When a patient states that they are latex intolerant (allergic), the phlebotomist must use a latex free tourniquet or a blood pressure cuff must be used in place of the latex tourniquet. Apply tourniquet over the patients clothing or use a towel as a barrier to the skin (rubber contains latex too!). When using the blood pressure cuff, inflate pressure to 40 mm).

Proper drawing techniques are essential to avoid contamination by skin flora and determining true bacteremia.

1. Apply tourniquet on arm and locate vein. Release tourniquet.
2. Cleanse the venipuncture site with "chloraprep" applicator as follows:
   - Pinch the wings on the applicator to break the ampule and release the antiseptic. DO NOT touch the sponge. Wet the sponge by repeatedly pressing and releasing the sponge against the treatment area until liquid is visible on the skin.
   - Sterilize the phlebotomy site using back and forth strokes of the applicator for no less than 30 seconds. DO NOT blot or wipe dry. Allow the area to dry naturally for approximately 30 seconds.
   - Discard the used applicator.

***NOTE: For allergic patients: 2% iodine tincture ampule may be used for patients with allergies to chlorhexidine and/or alcohol. To use the ampule, swab the site concentrically for 30-60 seconds, starting at the center and working outward. Allow the site to dry before venipuncture**.

3. Reapply tourniquet. If the venipuncture site must be further palpated, a sterile glove must be worn.
4. Prepare the BACTEC vials
   - Remove flip-off caps from the culture vials and wipe tops of vials with an alcohol swab and allow to dry.
   - Mark the BACTEC culture vials at the desired fill level. This is best accomplished by putting the bottle on the table and marking the fluid level on the BACTEC label. Then mark the volume addition (adult or peds) on the volume scale. Draw a line at this level on the bottle. This is the volume to draw into the bottle.

NOTE: The BACTEC bottles have more vacuum than the volume needed, so marking the blood level is very important. Overfilling the bottle may result in false positive results.

5. Perform Blood Collection by Butterfly system or Syringe/Needle system:

   Butterfly system:

   - Push and hold VACUTAINER® holder over top of vial to puncture septum.
   - Collect blood to desired fill level on vial. Monitor to insure proper blood flow and fill level.
   - Remove holder from vial. Immediately push and hold holder onto second vial.
   - Collect blood to desired fill level on second vial. Remove holder from vial. (Note: if more samples are required, additional tubes may be drawn at this time using the VACUTAINER® holder.)

- When final vial or tube is filled, withdraw the needle. Cover the puncture site with a gauze pad and apply pressure.

Syringe/Needle System:

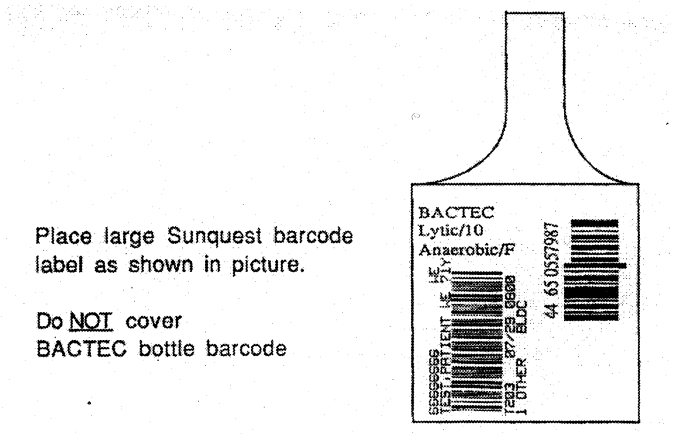
- Insert the needle into the prepared vein and collect 10-20 ml blood in syringe.
- Withdraw needle after collection 10-20 ml blood in syringe.
- Distribute blood equally into aerobic and anaerobic vials.

NOTES:

- ***Adults and older children: Draw 16-20 cc of blood. Place 8-10 cc of blood in each bottle.***
- ***Children under age 5: Draw 6-10 cc of blood. Place approximately 3-5 cc in each bottle.***
- ***Pediatric collections of less than 1 cc of blood are placed in the aerobic bottle only.***
- ***Adult collections of less than 10 cc are placed in the aerobic bottle only.***
- ***Bone marrow: Riverside clinic - See procedure on Bone Marrow.***
- ***Refer to Blood Collection Procedure for complete instruction and tips for venipunctures.***

Specimen Labeling and Transport:

1. Label both blood culture bottles with the patient's name, chart number, date and clinic. DO NOT PLACE LABEL OVER BARCODE. Must use large bar code label on each bottle. See enclosed picture for label placement.



2. Mix the contents 2 or 3 times by gentle inversion. **DO NOT INCUBATE SPECIMENS.**
3. Send both bottles to Regions Hospital for testing via the Re-Route system.

Specimen for Fungus and Yeast

Fungus and/or yeast cultures are sent to Regions Hospital.

Supplies:

2 SPS BD #4960 Sterile Vacutainer Tube (yellow top). Order from Central Lab.

Specimen:

Two yellow top SPS Vacutainer tubes are collected from separate sites. Follow instructions for venipuncture procedure for collection on page 2 of this procedure. Disinfect the vacutainer stopper. Draw whole blood in amounts according to these guidelines:

A.	Infants (up to 18 months)	0.5 ml
B.	Children under age 5	1 - 3 ml
C.	Adolescent & Adults	8 - 10 ml

Labeling:
Label the SPS tubes with the name, chart number, accession number plus date and time of collection.

Storage and Delivery:
Store specimen at room temperature until sent to Regions Hospital. Place tubes in a plastic bag and send same day directly to Regions Hospital. Place specimen and requisition in another plastic bag (double bag). Pack in Styrofoam box with orange label. Call CMS at 651 628-6166 for delivery to Regions.

References:

1. Reller, L.B., Murray, P.R, MacLowry, J.D., 1982. Cumitech IA, Blood Cultures II. Coordinating ed., J.A. Washington II. American Society for Microbiology, Washington, D.C.
2. Product insert: BACTEC Plus Aerobic, September 1993, Becton Dickinson and Company, Maryland, USA.
3. Product insert: BACTEC Peds Plus, December 1995, Becton Dickinson and Company, Maryland, USA.
4. Murray, PR, Baron, EJ, Pfaller, MA, Tenover, PC, Yolken, RN, Manual of Clinical Microbiology, Sixth Edition, American Society for Microbiology, Washington D.C., 1995.
5. Aronson, M.D., Bor, D.H., "Annals of Internal Medicine", 106:246-253, 1987.
6. Regions Hospital Blood Culture Procedure.
7. Mediflex "chloraprep" applicator

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IV. DEFINITIONS

V. COMPLIANCE
Failure to comply with this policy or the procedures may result in disciplinary action, up to and including termination.

VI. ATTACHMENTS

VII. OTHER RESOURCES

VIII. ENDORSEMENT
Laboratory Administration