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Owner:	Susan Conroy: Laboratory Supervisor
Policy Area:	Laboratory - Phlebotomy
References:	Laboratory

Blood Culture Collection

Purpose

Blood Cultures are ordered when there is a fever of unknown origin (FUO) or reason to suspect bacteremia or septicemia (pathogenic bacteria or yeast in the blood). Blood Cultures promote the growth and recovery of microorganisms, which further allows us to identify the effectiveness of antibiotic treatment. Bacteria are present in the blood intermittently and thus multiple Blood Culture collections are usually requested.

Scope

Phlebotomists and Clinical Laboratory Scientists deemed competent can collect Blood Cultures from peripheral sites. Nurses deemed competent can collect Blood Cultures from lines, ports and difficult to collect patients.

Materials

1 set of BD Bactec Plus blood culture bottles (aerobic and anaerobic) ,or single Bactec Peds plus bottle for pediatrics patients.

- Butterfly needle (BD Vacutainer Push Button Blood Collection Set or equivalent)
- BD Vacutainer Blood Transfer Device or equivalent
- Alcohol prep pads
- 2 x 2 gauze sponge
- ChloroPrep One Step Applicator (2% CHG &70% isopropyl alcohol) or equivalent
- Tourniquet
 - Other supplies: Gloves, patient labels and requisition, 20 mL syringe (adults), 3-10 mL (pediatrics), PVP Iodine if Chlorhexidine contraindicated.

Criteria for Rejection

Improperly labeled (mismatched names) or unlabeled bottles are unacceptable. Cracked, turbid, expired or leaking bottles should be discarded. Blood cultures should not be collected without an order to collect.

Specimen Collection

Skin antisepsis is the most important aspect of blood culture collection.

Collect two sets unless otherwise specified by the physician. Note the time of collection of each set even if it

may only be a few minutes apart when collected from the same site. If doing direct draw, carefully observe direction of blood flow when starting sample collection to avoid reflux of bottle contents into the patient. Keep the blood culture bottle lower than the collection site to avoid backflow and prevent culture media from contacting needle or stopper. Monitor collection volume of blood as vacuum will exceed 10ml - use 5-ml graduations on the side of bottle as a reference. Bottle must be held with caps facing upward during collection in order to measure. Blood Cultures are usually collected in sets of two: one aerobic and one anaerobic bottle. Blood Cultures are always collected first in the order of draw when other tubes are being collected simultaneously.

Procedure

1. Place tourniquet, find a suitable venipuncture site, and then release tourniquet.
2. For patients with NO contraindication for use of chlorhexidine products: Cleanse the venipuncture site with Chloraprep OneStep using a back and forth motion for at least 30 seconds. Allow to air dry. NOTE: If skin is soiled, clean with 70% isopropyl alcohol before using Chloraprep.
For patients with a contraindication to Chlorhexidine products DO NOT USE CHLORAPREP. Follow this procedure: Clean skin of venipuncture site with 60-second friction scrub of 70% isopropyl alcohol to a 5 cm circular area. Apply 10% PVP Iodine to venipuncture site skin in a circular motion to a 5 cm area starting in the center. Allow to air dry. Following the venipuncture, remove residual iodine from patient's skin with 70% isopropyl alcohol.
3. Remove plastic cap of each bottle and scrub top of each bottle with 70% alcohol prep pad.
4. Assemble Safety-Lok butterfly needle and syringe. Avoid touching needle and syringe ends. Put on gloves.
5. Re-apply tourniquet. Do not re-palpate puncture site once cleansed.
6. Collection:
 - a. For adults, perform venipuncture and collect 20 mL of blood (10 mL for each bottle). If less than 20 mL is obtained, divide volume in half for each culture bottle.
 - b. For Pediatrics, perform venipuncture and collect blood sample amount according to volume guidelines listed below or by weight:
1 – 5 kg = 1 mL for each bottle/1.5 mL if aerobic only
15 – 40 kg = 3 mL for each bottle
5 – 15 kg = 1.5 mL for each bottle >40 kg = 5 mL for each bottle
7. Release tourniquet; remove the needle from the patient's arm and activate Safety-Lock device.
8. Disassemble the syringe from the needle, attach syringe to the Adaptor, and place needle into nearest sharps container.
9. Holding the syringe plunger for control of draw, press and hold adapter down over the top of the aerobic bottle and fill with half of the blood obtained (see step #7 for pediatric minimums). Do not add more than 10 mL into each bottle. Remove adapter and syringe from aerobic bottle and fill anaerobic bottle with remaining blood. Do not aspirate air into the anaerobic bottle. Gently invert bottles to mix contents.
10. Label each bottle with the blood culture label or the patient's name and second identifier (date of birth or medical record number). Do not cover bar code with label.
11. Note date/time/initials of collector or record in mobilab or LIS.
12. Note collection site in comments, i.e. right arm, line draw by RN, etc.

13. Transfer without delay to Microbiology.

Specimen Volume

Adults: Collect 20cc of blood (10cc for each bottle). If less than 20cc is obtained, divide volume in half for each blood culture bottle. Do not add more than 10cc to each bottle. Do not use a pediatric bottle for adults.

Children (6-12 Years): 3-10 cc in each bottle or a maximum of 5 cc in a single pediatric bottle.

Under 5 Years: 1.5-5.0 cc, placing up to 5 cc in single pediatric bottle. If MD requests anaerobic draw, place a minimum of 3 cc in anaerobic bottle.

Infants: 1.5cc in pediatric bottle only.

Note: Collection of lower or higher volumes may adversely affect recovery or detection times of bacteria.

Special Considerations

- Infant Blood Culture collection site is cleaned with a 10 % Povidone-Iodine solution applicator (not Chloraprep). Wipe away solution with alcohol prep.
- AFB Blood Culture requires special bottles obtained from Microbiology.
- Line draws are performed only by an RN. The first 5cc of blood should be discarded. Note "Line Draw" in comments when receiving.
- Treat any spill or disposal of Blood Culture bottles (whether inoculated or not) as biohazardous waste.
- When a butterfly is used for collection, the aerobic bottle should be filled first because the air in the tubing will be drawn into that bottle rather than the anaerobic bottle.
- Safety devices must always be used when transferring blood from a syringe to the blood culture bottle. Do not inoculate bottles directly with a needle.
- For adults, it is preferable to collect two sets from separate sites and to collect at least one set from a peripheral site.
- Do not collect blood cultures without an order to collect. Samples collected in anticipation of a blood culture order will be rejected.
- Blood cultures collected and processed off site should be transported at ambient temperature (19-27 degrees centigrade) for workup at QVMC. The original bottle and all subcultures will be processed and reported by QVMC staff per QVMC Blood Culture Policy.
- Fungal blood cultures require pathologist approval. Fungal blood cultures are indicated only for *Histoplasma capsulatum*, however, bone marrow is the preferred specimen for this organism.
- Yeasts such as *Candida* grow well in routine blood cultures and a specific 'fungal culture' order is unnecessary for detecting yeasts.
- *Aspergillus* and other molds will not grow in blood cultures; a tissue specimen is required for these organisms.

References

1. Gradwohl's Clinical Laboratory Methods and Diagnosis, 6th ED.
2. Advance, Better Blood Cultures, Lillian V. Lee MS, SM (AAM-ASCP), May 1997
3. BD Bactec Culture Vial inserts, 2004.
4. Phlebotomy Essentials, Third Edition, Ruth E, McCall & Cathee M. Tankersley, Lippincott, Williams and Wilkins, 2003.

5. UCSF Blood Culture Collection Procedure

Attachments:

Approval Signatures

Step Description	Approver	Date
Laboratory Medical Director	Brady Feliz: Physician, Laboratory Medical Director	08/2019
Laboratory Admin Director	Olive Romero: Director of Laboratory Services	08/2019
	Susan Conroy: Laboratory Supervisor	08/2019

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