**SUBJECT: BLOOD CULTURE COLLECTION**

1. **Scope:**

This policy applies to all personnel involved in the collection of blood specimens for culture.

1. **Policy:**

This procedure is to be performed by all qualified personnel when testing is requested.

1. **Principle:**

Blood is collected and cultured for isolating, identifying, and determining antibiotic susceptibilities of microorganisms causing septicemia. Because of the relative low number of microorganisms present in most septicemias, and because of the normal bactericidal abilities of blood, the volume of blood cultured and the ratio of blood to media are the most important factors in good recovery rates of microorganisms from blood cultures.

INDICATIONS FOR CULTURING BLOOD:

Sudden increase in pulse

Chills (<36 degrees C.) or temperature (>38 degrees C.)

Hypotension

Prolonged, mild intermittent fever associated with heart murmur (endocarditis)

Leukocytosis (WBC >10,000/ul)

Granulocytopenia (<1,000 polys/ul)

Petechia: skin and mucuos membranes

“Splinter hemorrhages” of nails

Malaise

GENERAL COLLECTION PROTOCOL FOR BLOOD CULTURES:

Endocarditis (intravascular infection) Two cultures over 1-2 hours

Acute sepsis Two cultures from separately prepared veins.

Fever of unknown origin Two cultures at least 1 hour apart;

(if negative at 24 hours, repeat)

1. **Reagents, Supplies, & Equipment Supplies:**

Venipuncture supplies - gloves, tourniquet, gauze pads, syringes, needles, etc.

BacT/ Alert bottles - store at room temperature and protected from light until use.

*Prior to use, the bottles should be checked for evidence of damage or deterioration (discoloration). Do not use bottles that are outdated or show any signs of contamination, such as, turbidity, excess gas pressure, or a yellow sensor on the bottom of the bottle.*

70% isopropyl alcohol

BD ChloroPrep

10% PVP iodine (Sepp) if <2 months of age

1. **Procedure:**-

*The quality of the blood culture depends primarily upon the quality of the skin preparation and the sterile technique employed while collecting the specimen. Any contaminant picked up from the skin or* *from the surface of the rubber stopper, on the blood culture bottle, can be introduced into the blood culture bottle and produce a result that will erroneously appear to show sepsis. This can lead to the patient being unnecessarily treated. If sterile technique is not properly followed, it is also possible to introduce bacteria into the patient’s bloodstream and cause a nosocomial infection*

* 1. In all cases, the physician should specify the collection times and collection intervals.
  2. *Normal protocol is for no more than two sets of blood cultures to be drawn within a 24-hour span. If more than two sets are ordered within 24 hours and it is determined they are not duplicate orders, a pathologist consultation is required. A pathology consult is not required when blood cultures are ordered by a cardiologist or an infectious disease specialist.*
  3. Timing of collections may or may not be critical per the disease process in the patient as bacteremia may be continuous, intermittent, or transient.

USE THE FOLLOWING CHART AS A GUIDE TO SPECIMEN VOLUME:

|  |  |  |
| --- | --- | --- |
| **Age** | **Volume** | **Bottles** |
| Adults (**>**10 years) | 20 ml  (10 ml in each bottle) | Aerobic & Anaerobic |
| Adults  (difficult draws) | 1 - 10 ml | Aerobic only |
| Pediatric (**<**10 years) | 1 ml per age | Aerobic only |
| Pediatric  (difficult draws) | 1 ml | Aerobic only |
| Neonates | 1 - 4 ml | Pediatric only |
| Neonates  (difficult draw) | 1 ml | Pediatric only |

* 1. Flip plastic top off of appropriate blood culture bottles and cleanse stopper(s) with 70% alcohol prep pad. Allow to dry 1 minute.
  2. The bottles have been pre-marked with 5ml increments. Mark the desired fill volume level on the bottle for 10ml. This helps to avoid over/under filling of the bottles.

*As the volume of blood drawn is increased, the yield of positive cultures increases. The optimal volume of blood from an adult is 20ml. (10 ml per bottle). A blood culture request consists of 1 aerobic and 1 anaerobic bottle.*

* 1. Apply tourniquet. Select venipuncture site. Release tourniquet. After palpitation, cleanse the venipuncture site.
  2. For patients >2 month in age, use one BD Chloroprep applicator. See 5.9 if patient is <2 months in age.
     1. Saturate the sponge by gently pressing and releasing the sponge against the treatment area until liquid is visible on the skin.
     2. Completely wet the treatment area with antiseptic.
     3. Using a back and forth scrubbing motion with slight friction for 30 seconds, completely wet the venipuncture area for 30 seconds for dry sites or 2 minutes for wet sites.
     4. Allow the prepped area to dry for at least allow the solution to completely dry for a minimum of 3 minutes on hairless skin; up to 1 hour in hair).
        1. Do not blot or wipe the solution away.
        2. Discard the applicator after a single use.
        3. Do not palpate the venipuncture site after this point unless the gloved finger has been likewise cleansed.
  3. For Neonates patients (<2 months of age), BD Chloraprep should NOT be used. Instead, the site should be prepped with 70% alcohol and 10% PVP iodine (Sepp).
     1. Clean skin well with 70% alcohol.
     2. Swab site with 10% PVP iodine solution in concentric circles starting at the venipuncture site and working outward.
     3. Allow the iodine to activate a minimum of 1 minute or until it dries.
     4. Reapply tourniquet and perform venipuncture using acceptable techniques.
  4. Needle & syringe collection method
     1. Inoculate appropriate bottles, filling the anaerobic bottle first. This will keep any oxygen trapped in the syringe from being introduced into the anaerobic bottles.
     2. Do not change needles prior to inoculating blood culture bottles.
  5. BacT/Alert collection adapter with use with butterfly collection needle method
     1. Fill the aerobic bottle first, so any oxygen trapped in the adapter tubing will not be introduced to the anaerobic bottle.
  6. Invert bottles gently to mix.
  7. Apply LIS label in a vertical position on the bottle.
  8. Transport to lab ASAP for processing. Do not refrigerate.

1. **Procedural notes:**
   1. After collection of blood culture bottles, store specimens at ROOM TEMPERATURE. DO NOT VENT aerobic bottles.
   2. Transport to SRMC site with next available courier pick-up or arrange a pick to allow blood cultures to be at room temperature <12 hours prior to being incubated.
      1. If JIC blood culture bottles are collected, store at room temperature until an order is possibly received
   3. Blood cultures can be collected from indwelling access devices, but are shown to be twice as likely to have contaminants. If drawn from an indwelling access device, it should be paired with another blood culture obtained by venipuncture. This should be noted on the request in the “site” field.
2. **References**

Manual of Clinical Microbiology, 11th Edition, ASM, 2015.

Rubin, Sally Jo, Clinical and Pathogenic Microbiology, p.216-219, The C.V. Mosby Company, St. Louis, 1987.

Wegner, Dennis L., Bacteriology Procedure Manual, Laboratory Control, LTD, Ottumwa, Iowa, 1990.

Koczman, C.L., Young, C.L., and Pierson, C.J. University of Michigan Medical Center, Ann Arbor, MI. Abstract C-14 Effect of Delayed Entry on Seeded

BacT/ALERT and FAN Bottles, ASM General Meeting Abstracts, Washington, D.C. 1995..

Bact/Alert Culture bottle package insert, OrganonTeknika Corp., Durham, NC, 2008.

ChloraPrep instructional poster, Medi-flex Hospital Products, Overland Park, KS, 1/02

Collection of Blood Cultures Policy, Children’s Medical Center, Dayton, Ohio

**Policy Review:** Michele R. Homan

Support Services Team Lead

**Date:** 10/1/24

**Policy Approval:** Dr. Patrick Feasel M.D.

Laboratory Medical Director

**Date:** 10/2/24