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Owner: *Nitu Patel: Manager Clinical*

Area: *Lab-Reference & Specimen
Collection*

References:

Blood Culture Collection Procedure

INTRODUCTION

The blood culture is the most valuable test for the laboratory diagnosis of bacteremia and sepsis. The volume of blood collected is the most important variable in the detection of agents of septicemia. The introduction of bacteria normally present on the skin into the blood culture media can lead to a positive blood culture due to contamination. Proper preparation of the skin, the bottle and the volumes of blood drawn are important in the detection of blood pathogens. This procedure includes alternate skin preparation and cleansing methods for use when Chloraprep, One Step Frepp applicator is not available due to supply shortages.

EQUIPMENT AND SUPPLIES

Routine venipuncture supplies using the following collection techniques in order of decreasing preference:

- 21 gauge Butterfly collection set (other sizes may be used) with direct inoculation into Bactec media.
- 20 ml syringe and needle with transfer to Bactec media (for difficult draws)

Blood culture media – one of the following in order of preference:

- One each Bactec Plus Aerobic/F and Bactec Lytic/10 Anaerobic/F culture vials.
- One Bactec Peds Plus/F culture vial – this media is used for pediatric patients age 12 and under. It may be used for extremely difficult to draw adult patients when there is no other alternative in getting an 8-10 ml collection.

Blood Culture Prep Kit containing:

- Chloraprep One-step Frepp applicator
- Alcohol prep
- Gauze
- Adhesive bandage
- Alternate Prep
 - Providone-Iodine Swabstick
 - Alcohol Prep

PROCEDURE

Preparation

1. Identify the patient using two approved patient identifiers. Patient name and medical record number, financial number, or date of birth from patient armband must be compared to request information.
2. Introduce yourself and explain the procedure.
3. Gather supplies and transport to patient bedside.
4. Wash/cleanse hands and put on gloves.

Prep the Skin

1. Apply the tourniquet and determine optimal venipuncture site.
2. Release the tourniquet prior to prepping the site.
3. Make sure the skin is free from surface dirt and oils by vigorously cleansing the draw site with 70% isopropyl alcohol.
4. Open the chloraprep package. Do not touch the sponge surface.
5. Immediately place the sponge against the venipuncture site and pinch the handles to activate the solution into the sponge. Saturate the sponge by gently pressing it against the treatment area. Using a back and forth scrubbing motion, completely wet the area:
 - 30 second scrub for a dry area
 - 2 minute scrub for a wet area
6. Allow the chlorhexidine to dry for at least 60 seconds prior to venipuncture. The solution must air-dry. Do not blot or wipe the solution away. Discard the applicator after single use. Take care not to recontaminate the site prior to venipuncture. Do not touch the venipuncture site after it has been cleaned.
Note: Do not use chloraprep on children < 2 months of age. Use Betadine prep if child is < 2 months of age.

Alternate Prep (Chloraprep not available)

1. Apply the tourniquet and determine optimal venipuncture site.
2. Release the tourniquet prior to prepping the site.
3. Make sure the skin is free from surface dirt and oils by vigorously cleansing the draw site with 70% isopropyl alcohol.
4. **If the patient is not allergic to Betadine, proceed to step 5**
5. Open the Povidine-Iodine swabstick. Do not touch the swab surface.
6. Immediately place the swab against the venipuncture site and swab in a circular pattern.
7. Allow the betadine to air dry. Discard the applicator after single use.
8. Once dry, thoroughly remove the betadine using an alcohol pad. Follow the same circular pattern for removal. discard the alcohol pad.
9. Repeat with fresh alcohol pad. Allow alcohol to air dry before venipuncture

10. Take precautions to not contaminate the site prior to venipuncture. Do not touch the venipuncture site after it has been cleaned.
11. **If patient is allergic to Betadine, follow the instructions below.**
12. Cleanse the area with 3 alcohol pads/swabs, following the same circular pattern described above.
13. Discard each alcohol pad after use.
14. Allow the area to air dry before performing phlebotomy
15. Take precautions not to contaminate the site prior to venipuncture. Do not touch the site after it has been cleaned.

Vial Preparation

1. With a pen or marker, using the media meniscus as a guide, mark the vial label to indicate how much blood should be collected to achieve an optimum amount. Each hatch mark on the label is approximately 5ml. Volume is important in the detection and recovery of agents of septicemia. Optimum recovery of isolates will be achieved by collecting 8-10ml of blood. Use of lower volumes will adversely affect recovery and detection times of organisms. In the case of difficult to draw adult patients, volumes as low as 3ml are acceptable, however, recovery will not be as great as with larger volumes. Further draws on these types of patients should be collected in a pediatric bottle, where lower volumes are acceptable, unless anaerobic septicemia is suspected.

Vial	Optimum Amount
Aerobic vial	8-10 ml blood
Anaerobic vial	8-10 ml blood
Pediatric vial	1-3 ml blood

The mark you made on the vial will enable you to monitor the amount of blood going into the vial during venipuncture.

2. While chlorhexidine is drying, remove metal cap on Bactec bottle. Inspect the vial for cracks, contamination, excessive cloudiness, and bulging or indented septums. Do not use if any defect is noted. Before inoculating, swab the septum with alcohol. Do not use iodine on the rubber septum.

Perform the Phlebotomy

1. Do not touch the venipuncture site prior to collection. The specimen must be collected using aseptic techniques to reduce the chance of contamination. Reapply the tourniquet and perform venipuncture using butterfly winged infusion set or a 20 ml syringe.
2. Obtain sample.
 - a. Aerobic vial should be filled first. Aerobic organisms represent a large percentage of bacteria isolated.
 - b. If Bactec vials are inoculated directly with butterfly, fill Aerobic vial, Anaerobic vial, then collect other laboratory specimens. **IMPORTANT: Hold BACTEC media vials below puncture site. Never allow media to backflow into circulation.**

Document Collection/Specimen Labeling

1. Sign computer generated labels with date, time drawn, department, username, and draw site before leaving patient. If no computer labels are available, label each vial with patient's name, medical record number, date and time collected, department, username, and draw site.
2. Place label on vial. **Do not cover the barcode** on the vial.
3. Blood culture vials should be taken to Microbiology as soon as possible.

Timed Draw

Blood cultures may be ordered at timed intervals, by different sites, or both. Blood cultures will be drawn at the time intervals and methods as ordered by the physician. In cases where time intervals are not specified by the ordering physician, 2 sets may be drawn from 2 different sites or if only one site is possible, different sets must be drawn at least 15 minutes apart.

Intermittent bacteremia (occurs with abscesses, septic involvement of an organ, meningitis, osteomyelitis, arthritis, acute untreated bacterial pneumonia or fever of unknown origin) will have a maximum number of circulating organisms occurring about one hour before chills and fever spikes. The recommended time interval of one hour will result in better bacterial yield on systemic and localized infections.

With continuous bacteremia, such as bacterial endocarditis, timing does not influence the percent recovery of organisms. Generally shorter time intervals of 15 minutes or more apart are ordered, so antibiotic therapy may be initiated.

Blood cultures must be drawn before administering antibiotics, if at all possible.

Mnemonic for blood culture draw

Four "P's" of the blood culture draw:

1. **Palpate** the vein; then release the tourniquet
2. **Prep** the site; scrub back and forth for 30 seconds in a 2 ½ in. area
3. **Prepare** the bottle; mark the volume needed, pop the top and wipe the top with alcohol
4. **Perform** the venipuncture; reapply the tourniquet, keep scrubbed area sterile, and perform venipuncture.

References

1. Chloraprep.
2. Package insert, Bactec Plus Culture Vials, Becton Dickinson and Company, Sparks, MD, 04-2015.

Attachments

No Attachments

Approval Signatures

Step Description	Approver	Date
	Chad Linder: Pathologist	Jan 11, 2023
	Nitu Patel: Manager Clinical	Jan 11, 2023
	Kimberly Schrader: Core Lab Supervisor	Jan 11, 2023

Older Version Approval Signatures

	Chad Linder: Pathologist	Jan 11, 2021
	Dorothy Bayne: Director	Dec 16, 2020