TRAINING UPDATE

Lab Location:	SGMC and WAH	**Date Implemented:**	8.15.2017
Department:	Phlebotomy	**Due Date:**	9.11.2017

DESCRIPTION OF PROCEDURE REVISION

Name of procedure:

Blood Culture Protocol, Phlebotomy

Description of change(s):

Procedure was updated to align with formatting of current phlebotomy procedures.

No significant content changes were made to this procedure.

Electronic Document Control System

Document No.: SGAH.P25[2]
Title: Blood Culture Protocol, Phlebotomy
Owner: LESLIE BARRETT
Status INWORKS
Effective Date: 06-Sep-2017

Next Review Date:

Non-Technical SOP

Title	**Blood Culture Protocol, Phlebotomy**	
Prepared by	Leslie Barrett	Date: 10/19/2009
Owner	Ron Master	Date: 10/19/2009

Laboratory Approval		
Print Name and Title	**Signature**	**Date**
Refer to the electronic signature page for approval and approval dates.		
Local Issue Date:	Local Effective Date:	

Review:		
Print Name	**Signature**	**Date**

Form revised 3/31/00

TABLE OF CONTENTS

1. PURPOSE

To describe the process to collect blood culture specimens.

2. SCOPE

This document applies to all personnel who collect blood cultures.

3. RESPONSIBILITY

It is the responsibility of trained Phlebotomy staff members to collect blood cultures and comply with this procedure.

4. DEFINITIONS

Blood Culture

The detection of viable organisms in a patient's blood has great diagnostic and prognostic importance. When bacteria or fungi multiply at a rate that exceeds the capacity of the reticuloendothelial system to remove microorganisms, bacteremia or fungemia results. Persistent bacteremia occurs with failure to localize a bacterial infection in the extravascular tissues or failure to remove, drain, or adequately treat a focus of infection.

The major pitfall in interpretation of blood cultures is their contamination by microbial flora of the skin. This problem is overcome best by **meticulous** preparation of the skin with a bactericidal agent (ChloraPrep / tincture of iodine). Since infective enodcarditis, especially on prosthetic heart valves, may be caused by microorganisms indigenous to the skin, contamination of blood cultures during collection must be reduced to a minimum. **Blood for culture should not be drawn through indwelling intravenous or intra-arterial catheter unless it cannot be obtained by venipuncture or unless it is being drawn to specifically evaluate a potential catheter–related infection, in which case blood should be simultaneously drawn by venipuncture from another site.**

Orders

- Blood cultures for routine workup should be drawn in aerobic and anaerobic blood cultures bottles or Pediatric bottles if a child.
- Blood cultures to rule out Fungus or Mycobacteria (AFB) should be drawn in a Myco/ F Lytic blood culture bottle. Only one bottle is required.

Blood Volume

A blood culture is defined as the blood withdrawn from a single venipuncture, whether that blood is inoculated into one or multiple bottles. The volume of blood withdrawn per culture is the single most important variable in recovering organisms from the blood of bacteremic patients.

Patient	Media	Draw Total	Optimum/bottle	Minimum/bottle
Adult	Aerobic (blue)	16-20 ml	8-10 ml	8 ml
Adult	Anaerobic (purple)	16-20 ml	8-10 ml	8 ml
Children	Peds (pink)	1-5 ml	1-3 ml	0.5 ml
	Myco/ F Lytic (white)	3-5 ml	3-5 ml	3 ml

Number and Timing of Cultures

Multiple bottles (aerobic and anaerobic) filled from a single venipuncture should be regarded as a single blood culture. In practice, blood cultures are usually obtained after the onset of fever or chills. Since bacteria are rapidly cleared from the blood it is imperative that blood cultures be drawn as soon as possible after the onset of fever or chills. Blood should be obtained for culture prior to the administration of systemic antimicrobial therapy

Transport

Blood culture bottles should be transported immediately to the laboratory. Bottles can be kept at room temperature for short periods of time without affecting microbial recovery; they should **never** be refrigerated. If blood cultures must be held before being transported to the laboratory prior to being place in automated instruments, they should be kept at room temperature.

Contamination Rates

False-positive blood cultures may be associated with increased length of stay and charges, increased pharmacy costs, and increased laboratory charges. If blood cultures are collected properly no more than 2-3% of all blood cultures should be contaminated. Blood cultures obtained from catheters are more often contaminated than blood cultures obtained from venipuncture.

Quality Control

Each case of media has a manufacturer's Quality Control certificate indicating the organisms tested and the acceptability of those tests. These certificates must be maintained as quality assurance/quality control documentation. Deliver certificates to Microbiology whenever a case of blood culture bottles is opened.

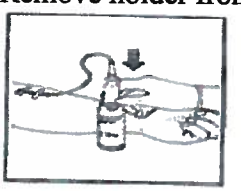
5. PROCEDURE

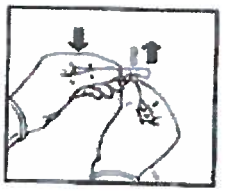
Step	Action
1	Laboratory staff members are only allowed to collect blood specimens with a valid order. Refer to the Patient Identification and Specimen Labeling procedure for additional details.
2	Introduce yourself to the patient using AIDET technique (Acknowledge, Introduce, Duration, Explanation, Thank you). Ensure the patient is awake before starting a venipuncture procedure.
3	Wash hands and don latex-free gloves.
4	Identify the patient per procedure.
5	After the patient has given consent for blood collection, examine the patient arm for previous venipuncture, scars, IV lines, wounds, etc. Select the proper site for venipuncture.
6	Assemble the supplies needed for the venipuncture in the presence of the patient. Do not place supplies directly on the patient or patient's bed. A. Blood Culture Bottles a. Aerobic bottles (blue top) b. Anaerobic bottles (purple top) c. Pediatric bottles (pink top) d. Myco F/Lytic Bottle for AFB and Fungus (white top) B. Blood collection sets – 21 or 23 gauge winged set (butterfly) C. Single use holder D. Blood transfer device E. Syringe F. ChloraPrep applicators (primary method) or Tincture of iodine applicators (secondary method) G. 2x2 sterile gauze H. Alcohol prep pads (70% alcohol) I. Tourniquet J. Gloves K. Tape L. Blood culture bottle carrier M. Biohazard ziplock bags
7	Inspect blood culture bottles for expiration date and discard any vials showing evidence of contamination, damage, or deterioration (chipped bottle, turbid media, etc.). Notify supervisor before discarding.

Step	Action
8	Prepare the skin for blood collection. Note: Do not use product on premature infants or infants under 2 months of age because of the potential for excessive skin irritation and increased drug absorption. Use 70% Isopropyl Alcohol scrubs, two times and allow to air dry in place of ChloraPrep applicator. Perform the skin preparation procedure using one of the following methods. A. <u>ChloraPrep (Primary Method)</u>: a. Inquire if the patient has a known allergy to Chlorhexidine gluconate (CHG). If so, use 70% isopropyl alcohol scrubs two times and allow to air dry in place of ChloraPrep applicator. b. Locate the vein to be used by palpitation. c. Clean the venipuncture site with ChloraPrep by pinching the wings on the applicator to break the ampule and release the antiseptic. Do not touch the applicator tip.  d. Press the applicator tip against the treatment area until liquid is visible on the skin. Use a back and forth motion to scrub the site for at least 30 seconds. Completely empty the antiseptic from the applicator.  e. Allow the site to air dry for 30 seconds. Do not blot or wipe away. f. DO NOT touch or palpate the area after cleansing.

Step	Action
8 Cont	B. <u>2% Tincture of Iodine (Secondary Method)</u>: a. Inquire if the patient has a history of adverse reaction to iodine. If so, use 70% isopropyl alcohol scrubs two times and allow to air dry in place of iodine. b. Locate the vein by palpitation. c. Clean the venipuncture site with alcohol and let dry for 30 seconds.  d. Hold the applicator in a downward position and squeeze until the iodine ampule within is crushed to release the iodine. e. Apply the iodine to the venipuncture site starting at the center and moving outward in concentric circles to periphery for 30 seconds. Allow to air dry.  f. Do not touch or palpate the area after cleansing. C. <u>70% Alcohol (Alternate/Neonate Method)</u>: a. Wipe the patient arm using a 70% alcohol prep pad. Begin at the venipuncture site and rub outward in concentric circles. b. Allow the alcohol to air dry completely. c. Repeat this process (steps a and b) a second time.
9	Remove the flip-off caps from the blood culture vials. Wipe the tops of the bottles with a single alcohol swab and allow to dry for 1 minute.
10	Prepare the blood collection set. A. Peel apart the package and remove the winged set (butterfly). B. Thread the luer end of the tubing set into the Vacutainer holder. C. Remove the sheath covering the needle at wings. 

Form revised 3/31/00

Step	Action
11	Apply the tourniquet midway between the elbow and the shoulder (3-4 inches above the venipuncture site). A. Ask the patient to close his/her hand gently; do not allow the patient to pump the hand. B. Place the patient's arm in a downward position to prevent reflux or backflow from the tube into the vein. C. Remove the tourniquet if there will be any delay in performing the following steps. Reapply the tourniquet when the venipuncture procedure will commence.
12	Puncture the patient's vein. A. Hold the wings of the needle (do not hold the needle by grasping the safety shield). B. Orient the needle so the bevel is facing upward. C. Hold the skin taut with the non-dominant hand. D. Align the needle with the vein. Always hold the needle assembly in the dominant hand. E. Insert the needle at a 15 to 30 degree angle with the skin. F. Release the skin (let go with the non-dominant hand). G. Never reuse a needle. 
13	Fill the blood culture bottles. A. **Fill aerobic bottle first.** a. Hold the bottle upright. b. Push and hold the Vacutainer holder over the top of the vial to puncture the septum. c. Collect blood to the desired fill level on the vial. Monitor to ensure proper blood flow and fill level. d. Remove the holder from the bottle and immediately push and hold holder onto the second bottle to collect blood to the desired fill level on the second bottle. e. Remove holder from the bottle.  **Note: If only one bottle can be filled, the aerobic bottle should be utilized for adults.** B. Collect any additional (non-blood culture) specimens after both blood culture bottles have been filled.

Step	Action
14	Release the tourniquet and instruct the patient to open his/her hand before the last tube is filled.
15	Place gauze above the puncture site and remove the needle. A. Apply pressure to the gauze with your non-dominant hand as soon as the needle is removed. B. Do not put pressure on the gauze while the needle is in the patient's vein.
16	Immediately activate the needle safety assembly with your dominant hand. A click will sound when the safety assembly is secure. Immediately discard the needle into a biohazard sharps container. 
17	Continue to hold pressure on the venipuncture site for 3-5 minutes or until bleeding completely stops. The patient can assist with this task if he/she is able.
18	Cover the venipuncture site with gauze and tape or a Band-Aid after the bleeding has stopped.
19	Label the blood culture bottles per procedure. A. Do not write or place labels over the barcode on the blood culture bottle. B. Document the site of draw (right arm/vein, forearm, dorsal side of left hand, etc.) on each bottle.
20	Recheck the tube labeling by comparing the name and MRN on each tube to the name and MRN on the patient's wristband.
21	Place the specimens in a biohazard bag and seal. A. Do not put more than one patient's specimens in a bag. B. Never transport specimens that are not contained in a biohazard bag.
22	Clean the work area by discarding all used materials in the appropriate waste container. Do not leave any trash behind.
23	Thank the patient and wish him/her a good day.
24	Wash your hands and proceed to the next assignment.

Step	Action
25	Deliver the specimens to the laboratory via hand-delivery or pneumatic tube. Blood culture bottles must be placed in designated blood culture carriers if they are sent via pneumatic tube.

6. RELATED DOCUMENTS

SOP: Patient Identification and Specimen Labeling
SOP: Venipuncture

7. REFERENCES

1. Baron, E. J., M. P. Weinstein, W. M. Dunne, Jr., P. Yagupsky, D. F. Welch, and D. M. Wilson. 2005. Cumitech 1C, Blood Cultures IV. Coordinating ed., E. J. Baron. ASM Press, Washington, D.C.
2. Bactec 9000 Series User Training Guide
3. Washington, J. A. 1975. Blood cultures: principles and techniques. Mayo Clin. Proc. 50:91-95.
4. Weinstein, M. P., L. B. Reller, J. R. Murphy, and K. A. Lichtenstein. 1983. The clinical significance of positive blood cultures; a comprehensive analysis of 500 episodes of bacteremia and fungemia in adults. I. Laboratory and epidemiologic observations. Rev. Infect. Dis. 5:35-53.
5. Reisner, B. S. & Woods, G. L. 1999. Times to detection of bacteria and yeasts on Bactec 9240 blood culture bottles. Journal of Clinical Microbiology, June 1999, p. 2024-2026.
6. www. ChloraPrep.com

8. REVISION HISTORY

Version	Date	Reason for Revision	Revised By	Approved By
		Supersedes SOP P026.001		
000	7/16/2013	Section 4: Add Myco/F Lytic bottle to volume table Section 5: Add transfer device, single use holder and ChloraPrep to part A. Add steps for ChloraPrep as primary product and iodine as alternate product. Section 6: Add website ChloraPrep.com	SKhandagale	R Master N Cacciabeve
001	8/7/2017	Header: Added WAH Section 4: Simplified number and timing Section 5: Updated formatting and steps to align with venipuncture SOP; delete comments pertaining to syringes Section 7: Updated references Footer: Version # leading zero's dropped due to new EDCS in use as of 10/7/13	SCodina RMaster	NCacciabeve

9. ADDENDA AND APPENDICES

None