



## Microbiology Policy

830 BAYOU PINES WEST • LAKE CHARLES, LA. 70601

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### BLOOD CULTURE COLLECTION

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#### MIC. 22630 MC-108

**Adopted Date:** 7/13/16

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**Purpose:**

To provide information to phlebotomists, medical technologists and other medical personnel regarding the proper collection of blood cultures.

**Policy:**

To provide blood cultures as ordered by the physician with draw times appropriate to recover bacterial organisms and yeast present in the blood.

**Principle:**

When bacteria or fungi overcome the host's normal defense mechanisms and enter the bloodstream through the lymphatics or from extravascular sites, they can quickly disseminate throughout the body causing severe illness. In addition, the by-products of their metabolism can lead to septic shock, among the most serious complications of infectious diseases. Rapid recognition and immediate institution of appropriate treatment are essential. Laboratory diagnosis of bacteremia and fungemia depends on blood cultures. Because the culture methods are so sensitive, the procedure must be carefully controlled beginning at the pre-analytical stage (collection) to avoid the misinterpretation of procurement associated skin commensal microorganism as an agent of infection. Contamination could lead to a specimen being determined positive when a clinically relevant isolate is not actually present.

One blood culture consists of blood from a single venipuncture inoculated into either an aerobic and anaerobic bottle (used for adults) or one pediatric bottle (used for difficult draws or pediatric patients). Optimal blood-to-broth ratios are 1:5 to 1:10. Adequate volume is one of the most important factors in the laboratory detection of microorganisms in the bloodstream.

An understanding of the circumstances in which different types of bacteremia and fungemia are likely to occur is helpful in planning diagnostic studies and interpreting results of blood cultures. The common sources of blood stream infections are intravascular devices (19%), the genitourinary tract (17%), the respiratory tract (12%), the bowel and peritoneum (5%), skin (5%), the biliary tract (4%), intra-abdominal abscess (3%), other known sites (8%), and unknown sites (27%).

## Specimen Collection:

### I. Bottle Preparation

- 1) Inspect each blood culture bottle before use to ensure the integrity of the bottle and that the sensor on the bottom is intact.
  - The sensor is normally a uniform grayish-green color and a yellow color indicates contamination of the broth.
  - Ensure that the bottles have been stored appropriately at room temperature (15-30°C) and protected from direct sunlight.
  - An expiration date is printed on each bottle's label. Do not use the culture bottles beyond the last day of the month indicated.
  - Check the bottles for damage, leakage, or deterioration.
  - Discard any bottle found to be damaged, stored improperly, or with a yellow sensor.  
**Note:** Report bottles found in poor condition to the Microbiology personnel or the Laboratory Manager.
- 2) Remove the plastic flip-top over the cap.
- 3) Sterilize the exposed rubber stopper with a sterile 70% alcohol pad. Allow to air dry.

### II. Site Preparation

- a. Clean the venipuncture area with a Chloraprep swab. 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 the sponge against the venipuncture site until liquid is visible on the skin. Use repeated back and forth strokes for approximately 30 seconds. Allow the area to completely air dry for approximately 30 seconds. DO NOT BLOT OR WIPE AWAY.
- b. Do not touch the venipuncture site with unsterile fingers. If you find it necessary to palpate the site before drawing the blood culture, cleanse the finger used to palpate with an alcohol prep and then Chloraprep swab.

### III. Venipuncture

- 1) Using a syringe or collection device, aseptically draw an appropriate amount of blood for the appropriate bottles being collected.
  - Aerobic and anaerobic bottles require 5-10 mls per bottle (10 mls being preferable).
  - Pediatric bottles require 2-4 mls per bottle (4 mls being preferable).
  - Recommended blood to broth ratio is 1:5 to 1:10. As the volume of blood drawn increases, the yield of a positive blood culture increases. Optimally, a total of 20 mls of blood should be drawn from adults (10 mls per bottle).
  - Do not overfill the bottles, as this may cause false positive readings.
  - Inoculate the blood culture bottles first to avoid contamination, then fill additional blood collection tubes.
- 2) After drawing the appropriate bottles for the patient, carefully apply the patient's label to the bottle as to not cover the bottle's barcode or lot number. Place in the BacT/Alert instrument as soon as possible after collection. Consult the BacT/Alert manual and blood culture bottle package inserts for additional details.

### IV. Timing of Blood Cultures

- 1) **Note:** Although drawing blood cultures before or during the fever spike is optimal for recovery, volume is more important than timing in the detection of agents of septicemia.
  - When acute sepsis or another condition (osteomyelitis, meningitis, pneumonia or pyelonephritis) requires immediate institution of antimicrobial agent therapy, draw blood cultures before starting therapy.
  - For fever of unknown origin, subacute bacterial endocarditis, or continuous bacteremia or fungemia, a maximum of three blood cultures is recommended.

**Materials:**

A “set” of blood cultures is usually described as one aerobic and one anaerobic blood culture bottle drawn together. In infants, young children, and patients who are difficult to draw, a pediatric blood culture bottle may be drawn and considered a “set” of blood cultures.

**Adults** = one aerobic bottle + one anaerobic bottle (5-10 mls of blood in each bottle)

**Infants, Low Volume Draws** = one pediatric bottle (2-4 mls)

**Bottles**

MAROON = anaerobic bottle

GREEN = aerobic bottle [contains charcoal]

**Note:** MAROON + GREEN = ONE (1) ADULT BLOOD CULTURE SET

YELLOW = pediatric bottle [contains charcoal]

**Note:** YELLOW = ONE (1) PEDIATRIC/LOW VOLUME DRAW BLOOD CULTURE SET

**Storage and Stability:**

- Inoculated bottles should be placed into the BacT/Alert System as soon as possible after collection.
- Bottles delayed in entry should be maintained at room temperature and should be placed into the BacT/Alert System within 30 minutes.

**Precautions and Warnings:****Laboratory Diagnosis of Sepsis Caused by a Colonized Indwelling Vascular Catheter**

Indwelling vascular catheters are a cornerstone of modern medical care, enabling administration of fluids, parenteral nutrition and drugs, easy blood sampling, and monitoring of a patient’s physiological parameters. However, even when careful antisepsis is followed during the catheter insertion and maintenance, these devices tend to become colonized by commensal indigenous and pathological skin flora over time, and catheter-related infections (CRI) are now among the most common sources of nosocomial bacteremia. Microorganisms attach to the inner and outer surfaces of the intravenous device, and bacteria such as *Staphylococcus epidermidis* and other species of coagulase-negative staphylococci secrete an excess of extracellular matrix (“slime”) and form a tenacious biofilm that protects the organism from the host immunological response. Flushing of the colonized catheter by intravenous fluid solutions provides nutritional support to residing organisms and contributes to dispersal of the infection through the bloodstream.

**References:**

Manual of Clinical Microbiology, 8<sup>th</sup>, BacT/Alert Procedure Manual, BacT/Alert Bottle Package inserts  
BacT/Alert Blood Culture Collection Procedure – Biomerieux, Clinical Microbiology Procedures Handbook third edition, BacT/Alert blood culture package inserts  
Q-Tracks Blood culture Contamination - College of American Pathologists



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**Adopted Date: 7/13/16**

**Approved By:** *John VanHoose, M.D.*

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I have performed the biennial review of this procedure. A signature and date indicate a review was performed and no changes were necessary. If changes were necessary, see minor or substantial change pages.

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**Minor and or Substantial Change**

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New procedure written to correlate with WCCH lab since all blood cultures are being sent-out.  
7/13/16 WB

Minor Revision: Made several grammatical and format corrections. 11/14/17 BD



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**MC-32**  
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**Substantial Changes made: 7/13/16**

**Approved By:** \_\_\_\_\_

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I have reviewed a substantial revision to this policy.

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I have performed an initial review of this policy.

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|---|------------------------|
| Signature ___ Regina Nunez _____        | Date ___ 7/15/16 _____ |
| Signature ___ Amy Clark _____           | Date ___ 7/15/16 _____ |
| Signature ___ Tressa Latour _____       | Date ___ 7/15/16 _____ |
| Signature ___ Adrianna Poole _____      | Date ___ 7/15/16 _____ |
| Signature ___ Alexandra Potts _____     | Date ___ 7/15/16 _____ |
| Signature ___ Kristi Williams _____     | Date ___ 7/15/16 _____ |
| Signature ___ Tremayne Washington _____ | Date ___ 7/15/16 _____ |
| Signature ___ Tiffany Deason _____      | Date ___ 7/16/16 _____ |
| Signature ___ Shavanna Fields _____     | Date ___ 7/16/16 _____ |
| Signature ___ Janice Comeaux _____      | Date ___ 7/18/16 _____ |
| Signature ___ Suzanne Jones _____       | Date ___ 7/18/16 _____ |
| Signature ___ Kayla Vallery _____       | Date ___ 7/18/16 _____ |
| Signature ___ Lexi Stanley _____        | Date ___ 7/18/16 _____ |
| Signature ___ Rose Oliver _____         | Date ___ 7/18/16 _____ |



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Signature\_\_\_\_\_Terrell Gilbeaux\_\_\_\_\_ Date\_\_\_\_7/18/16\_\_\_\_\_

Signature\_\_\_\_\_Paige Comeux\_\_\_\_\_ Date\_\_\_\_7/18/16\_\_\_\_\_

Signature\_\_\_\_\_Alicia Williams\_\_\_\_\_ Date\_\_\_\_7/18/16\_\_\_\_\_

Signature\_\_\_\_\_Ciara Rodgers\_\_\_\_\_ Date\_\_\_\_7/18/16\_\_\_\_\_

Signature\_\_\_\_Shonterra Jacobs\_\_\_\_\_ Date\_\_\_\_7/19/16\_\_\_\_\_

Signature\_\_\_\_\_Julia Pittman\_\_\_\_\_ Date\_\_\_\_7/19/16\_\_\_\_\_

Signature\_\_\_\_\_Amanda Smith\_\_\_\_\_ Date\_\_\_\_7/19/2016\_\_\_\_\_

Signature\_\_\_\_\_Penni Trahan\_\_\_\_\_ Date\_\_\_\_7/19/16\_\_\_\_\_

Signature\_\_\_\_\_Sarah Goos\_\_\_\_\_ Date\_\_\_\_7/19/2016\_\_\_\_\_

Signature\_\_\_\_\_Lashonda Prudhomme\_\_\_\_\_ Date\_\_\_\_7/19/16\_\_\_\_\_

Signature\_\_\_\_\_Kim O'Rourke\_\_\_\_\_ Date\_\_\_\_7/19/16\_\_\_\_\_

Signature\_\_\_\_\_Shanna Fontenot\_\_\_\_\_ Date\_\_\_\_7/20/16\_\_\_\_\_

Signature\_\_\_\_\_Brittany Lalonde\_\_\_\_\_ Date\_\_\_\_07/22/16\_\_\_\_\_

Signature\_\_\_\_\_Diane Buck\_\_\_\_\_ Date\_\_\_\_07/22/16\_\_\_\_\_

Signature\_\_\_\_\_Nicho Bourque\_\_\_\_\_ Date\_\_\_\_07/26/16\_\_\_\_\_





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