Bassett Healthcare Network

Blood Culture Collection v2.1
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# 148355.547 Blood Culture Collection

**Copy of version 2.1 (approved and current)**

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| **Printed By** | Michelle Stepp Laboratory Support Technician (M16653) |
| **Organization** | Bassett Medical Center Lab |

**Author**
Connie Hulbert

**Comments for version 2.0 (last major revision)**
Reviewed by Phlebotomy Supervisors; Step 1 and 2 Section D. Steps 1 and 5 Section E. #7 title and step e under #7 #8 step E and H #10 Section G. Section H. Step 5,6 and 7

**Comments for version 2.1** (this revision)
'providone' (povidone) typo corrected throughout procedure



**Approval and Periodic Review Signatures**

| Type | Description | Date | Version | Performed By | Notes |
|---|---|---|---|---|---|
| Approval | Lab Director | 12/19/2022 | 2.0 | Samantha Davenport MD Service Line Chief (M03764) | |
| Approval | Lab Director | 12/12/2022 | 2.0 | John Fisk MD Clinical Laboratory Director (M08480) | |
| Approval | Lab Director | 12/9/2022 | 2.0 | Valerie Bush PhD Clinical Laboratory Director (M05512) | |
| Approval | Lab Director | 12/9/2022 | 2.0 | Timothy Chapman MD Clinical Laboratory Director (M11669) | |
| Approval | Lab Director | 12/9/2022 | 2.0 | Ghazala Nathu MD Clinical Laboratory Director (S00134) | |

**Version History**

| Version | Status | Type | Date Added | Date Effective | Date Retired |
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| 2.1 | Approved and Current | Minor revision | 7/26/2023 | 7/26/2023 | Indefinite |
| 2.0 | Retired | Initial version | 12/9/2022 | 12/19/2022 | 7/26/2023 |

# BLOOD CULTURE COLLECTION

## PURPOSE

The likelihood that a positive blood culture represents infection rather than contamination is a function of skin antisepsis at the time of blood collection. Because of the organisms that constitute normal microflora of the skin (e.g., coagulase negative Staph), and because of the seriousness of the misinformation resulting from contamination of blood cultures, it is essential that blood culture collection be performed aseptically. Scrupulous adherence to proper procedure is imperative.

## PRINCIPLE

Antiseptic agents, such as chlorhexidine, tincture of iodine or an iodophor, are used to kill normal skin flora. Then blood is aseptically obtained, using sterile venipuncture equipment, and placed into appropriate culture media or transport device.

## MEDIA SELECTION

a. For routine adult bacteria culture: use one set (aerobic and anaerobic) of bioMerieux BacT/Alert bottles. The aerobic bottles (SA) have blue flip-tops, and anaerobic bottles (SN) have magenta flip-tops.
b. For routine pediatric blood culture: use one aerobic (SA) bioMerieux BacT/Alert bottle only.
c. For fungal or AFB blood culture: use one DuPont 10 isolator tube.
d. For quantitative blood culture: use one DuPont 10 isolator tube. (Consult ID physician.)
e. For special requests: consult Microbiology Lab.

## SUPPLIES

1. KURIN device kit or Sterile 20-ml syringe with needle, or blood collection adapter cap and insert with Luer connector collection set
2. Vacutainer apparatus (for isolator collection)
3. Appropriate media
4. Alcohol preps
5. Chlorhexidine swabs/preps /or Povidone Iodine if Chlorhexidine is not available(note: **contraindicated in children under two months of age**: use Povidone Iodine instead)
6. Gloves
7. Gauze, Band-Aid (for post-venipuncture care)
8. Safety Transfer Device: COVIDIEN 20G1 Hypodermic Safety Needle



## COLLECTION PROCEDURE

1. Wash hands. Wear properly-fitting gloves.
2. Select the venipuncture site.
3. Determine if patient is allergic to chlorhexidine, or is under two months of age. If so, use Povidone Iodine prep and proceed to step 5 below.

### CHLOROSCRUB PROCEDURE

**Note:** Chloroscrub is contraindicated in children under two months of age; use Povidone Iodine instead. Cleanse skin with chlorhexidine swab/prep as follows.

1. Cleanse skin with 70% to 90% alcohol. Start at puncture site, use a circular motion with overlapping strokes, and work toward periphery until an area of approximately 4 inches in diameter is cleansed.
2. Allow prepped area to dry for **30 seconds** (use a watch or clock).

3. Tear open chlorhexidine package, remove swab (do not unfold swab). Hold swab between thumb and index finger.
4. Starting at puncture site, apply swab to skin using repeated back and forth strokes for **15 seconds** (use a watch or clock) Treatment area for one swab is 2 ½ X 2 ½ inches.
5. Allow prepped area to dry for **30 seconds** (use a watch or clock).

***OR***

**POVIDONE IODINE PROCEDURE**

1. Cleanse skin with 70% to 90% alcohol. Start at puncture site, use a circular motion with overlapping strokes, and work toward periphery until an area of approximately 4 inches in diameter is cleansed.
2. Immediately follow in same manner with Povidone Iodine, using the same "clean-to-dirty" circular motion.
3. Allow Povidone Iodine to remain on skin for **no less than one full minute**, so that viable flora is maximally reduced.
4. After the minimum one full minute, remove the Povidone Iodine with 70% to 90% alcohol, employing the same "clean-to-dirty" manner. Allow to completely dry prior to venipuncture.
5. Flip tops from blood culture bottles: The rubber stopper should be cleaned with alcohol and allowed to dry completely (30-60 seconds). If using Wampol Isolator, cleanse stopper with Povidone Iodine, allow to dry completely.

**KURIN DEVICE / BUTTERFLY NEEDLE & VACUTAINER DRAWS**

1. Remove butterfly and tubing from the package [Be careful not to touch the rubber cover to prevent contamination.]
2. Connect the vacutainer holder or hub to the butterfly
3. Perform venipuncture and insert the needle with the rubber cover directly into the aerobic BacT/Alert bottle. The needle and vacutainer holder must be held down to keep the needle from popping out of the vial.
4. Obtain required amount of blood, ideally 8 to 10 mL of blood.
5. Repeat with the anaerobic bottle and additional blood culture tubes as orders require.

6. After performing the venipuncture, remove the anaerobic bottle from the hub. The safety mechanism must be activated while the needle is still in the patients' vein by depressing a small button located on the top of the butterfly. If activated correctly there is no risk of an accidental needle stick since the needle is never exposed.
7. Place gauze pad over venipuncture site. Apply pressure to site (have patient do this, if capable) for two minutes, or until bleeding stops.

**KURIN DEVICE/ BUTTERFLY NEEDLE & SYRINGE DRAW**
**PREFERRED FOR PEDIATRIC PATIENTS**

1. Remove butterfly and tubing from the package [Be careful not to touch the rubber cover to prevent contamination.]
2. Connect the butterfly and the syringe with a Luer lock connector collection set
3. Perform venipuncture
4. Allow bottles to fill to the desired volume. Only the aerobic (SA) bottle should be used for pediatric patients.
5. The amount of blood up to 10 mL is acceptable for pediatric patients. Refer to table 1.

6. After performing the venipuncture, activate the safety mechanism while the needle is still in the patient's vein by depressing a small button located on the top of the butterfly. If activated correctly there is no risk of an accidental needle stick since the needle is never exposed.
7. Place gauze pad over venipuncture site. Apply pressure to site (have patient do this, if capable) for two minutes, or until bleeding stops.
8. Remove and discard the needle and attach the hub of the syringe to the safety transfer device.
9. Dispose of all venipuncture equipment in puncture-proof container as per Universal Precautions guidelines.
10. Carefully label the blood culture bottle(s) (DO NOT COVER UP THE BAR-CODE LABEL) and requisition with patient's full name, medical record number, date, time of sample, and initials of person drawing the culture. Computer generated labels may be used; place these on bottles lengthwise. Blood drawn through intravascular catheters, arterial, or cord blood should be specifically identified as such.
11. Transport inoculated cultures to laboratory promptly. If there is a delay in transport to lab, keep bottles at room temperature (approximately 25 degrees C). DO NOT refrigerate. Bottles must be received in the Microbiology laboratory within 24 hours of collection time.

**TIMING AND NUMBER OF BLOOD CULTURES**

The clinician makes the ultimate decision as to timing and number of cultures to be collected, and should specify accordingly. Standard timing between blood cultures is 15 minutes or more. No more than 3 sets in 24hrs are recommended. If acutely ill (SIRS, Hemodyamic instability), it is advisable to collect two separate blood culture specimens from two different sites within 5 minutes before starting therapy. The two blood cultures help determine the duration of bacteremia and help to clarify if positive cultures represent true pathogens vs. contaminants.



**QUANTITY OF BLOOD TO BE DRAWN**

Due to the relatively low numbers of bacteria present in the blood during most adult bacteremias, the amount of blood drawn for each culture is critical. Based on numerous studies, it is strongly recommended that, ideally, 20 ml of blood per SET (10 ml per bottle) be drawn. The Biomerieux BacT/Alert bottles are designed to give the appropriate blood-to-broth ratio, with 10 ml of blood per bottle. DO NOT ADD MORE THAN 10 ml OF BLOOD PER BOTTLE: This will exceed the optional blood-to-broth ratio. (Wampole isolators draw at 7.5ml: lesser amounts are unacceptable. The absolute minimum that should be considered for culture, for adults, is 5 ml per bottle. The less blood drawn, the less chance of recovery of bacteria. For children, the amount of blood drawn should be a function of the per cent of their total blood volume, which is weight dependent. Refer to Table 1.

**Table 1. Blood Volumes Suggested for Cultures from Infants and Children**

| Weight of patient (lb.) | Total blood volume (mL) | Recommended Vol of blood for culture (mL) | | | | Total volume for culture (mL) | % of total blood volume |
|---|---|---|---|---|---|---|---|
| | | 1st set | | 2nd set | | | |
| | | mL | Bottle | mL | Bottle | | |
| <=2.2 | 50-99 | 2 | SA | N/a | none | 2 | 4 |
| 2.2-4.4 | 100-200 | 2 | SA | 2 | SA | 4 | 4 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 4.5-27 | >200 | 4 | SA | 2 | SA | 6 | 3 |
| 28-80 | >800 | 10 | SA | 10 | SA | 20 | 2.5 |
| >80 | >2,200 | 20 | SA and SN | 20 | SA and SN | 40 | 1.8-2.7 |

SA=aerobic SN= anaerobic
Chart modified from reference 2

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