


Standard Operating Procedure

 Eastern Health Laboratory Medicine	Section: Management System\Eastern Health Laboratories\Client Services\Collection Manual\Procedures\	
	Title: Collection of Blood Culture Specimens	Number: 6972
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Purpose or Principal

This procedure provides instructions for the collection of specimens for blood culture via venipunctures. Blood collection from lines is not included in this SOP.

Materials

Reagents

Not Applicable

Supplies

- Blood Collection Sets-two safety "winged" (butterfly) sets in sizes of 21 g, and 23g
- Plastic Needle Holders-Use a new, unused blood culture adapter cap / insert set ("barrel").
- Blood Culture Bottles
- Disposable Non-latex tourniquet
- Antiseptics chlorhexidine gluconate
- Alcohol prep pad
- Gauze non-sterile 2 x 2
- Band-Aid or Adhesive tape
- Sharps Disposal
- Computer generated labels
- Non-latex Gloves

Equipment

Not Applicable

Sample

- **Blood culture samples must be drawn first** in order to preserve the aseptic field
- The sensitivity for blood cultures increases as the total volume of blood collected increases.

For adults:

- The optimal volume of blood collected per septic episode is 40 ml;
- This should be collected in 2 sets of blood cultures (a set = one 10 ml aerobic bottle, one 10 ml anaerobic bottle) from two separate venipuncture sites at two different time points (two sets can be collected simultaneously or serially separated by a time interval of at least 30 minutes). 20 ml of blood is collected for each blood culture draw (puncture site): 10 ml into the aerobic bottle and 10 ml in the anaerobic bottle. Do not overfill the bottles.

For pediatric patients:

- The optimal volume of blood collected per septic episode is dependent on the patient's weight (see table below);
- The volume of blood should be collected using two independent draws/venipunctures except in neonates and infants where one blood culture set is often all that can be obtained safely.

Blood culture volumes in pediatric patients

* (When ≤10 mL of blood is collected, it should be inoculated into a single aerobic blood culture bottle).

* (Neonates collection volume: consult with physician/nurse).

Patient Weight (kg)	Blood volume (mL) for Site (Set) #1	Blood volume (mL) for Site (Set) #2	Total Collection Volume (mL)	# of Sets
≤1.0	2 (all to one aerobic bottle)	N/A	2	1 (1 bottle/set)
1.1 to 2.0	2 (all to one aerobic bottle)	2(all to one aerobic bottle)	4	2 (1 bottle/set)
2.1 to 12.7	4 (all to one aerobic bottle)	2(all to one aerobic bottle)	6	2 (1 bottle/set)
12.8 to 36.3	10 (all to one aerobic bottle)	10(all to one aerobic bottle)	20	2 (1 bottle/set)
>36.3	20 (10 to one aerobic bottle, 10 to one anaerobic bottle)	20 (10 to one aerobic bottle, 10 to one anaerobic bottle)	40	2 (2 bottle/set)

Special safety precautions

- All patient and laboratory specimens are treated as infectious; blood cultures should be collected following standard precautions.
- Blood culture samples should be collected before antibiotics are given.
- Proper collection and handling of blood specimens will reduce pre-analytical errors associated with these processes and protect the quality of patient results
- The outpatient should be comfortably seated in a blood drawing site with a wide, flat, clean surface for the arm to rest upon. The patient's elbow should be supported so that it remains straight in a declining position.
- Most inpatients will be lying in bed; if the patient is seated in a chair, the patient's arm could be supported by resting it on a pillow (ensure the arm is in a declining position).
- Observe any isolation or precaution signage on the room door or in the room (e.g. over the bed)
- Extensive scarring or healed burn areas should be avoided.
- Specimens should not be obtained from the arm on the same side as a mastectomy; lymphostasis may occur. If no other suitable site is available consult the patient's physician or primary nurse. Document the communication on the requisition comments section in the computer. Include the name of the nurse or physician who gave the approval.
- Avoid areas of hematoma (bruising).
- If an arm has an IV inserted, you must draw below the IV, NEVER above it. Laboratory personnel are NOT permitted to shut off an IV. If nursing staff turns off the IV, specimens can be obtained after waiting for at least 2 minutes and a discard tube is drawn.
- Do NOT obtain specimens from an arm having a cannula, fistula, or vascular graft.
- Do NOT draw blood from a person that is being transfused with blood products until at least 10-15 minutes after transfusion has been completed. Document the information on the requisition (comments section in the computer).
- If the bed rail is lowered to gain easier access to the patient, be sure it is raised following the procedure and before leaving the bedside.

Quality Control

Not Applicable

Procedure

Follow the activities below to obtain blood culture specimens.

1. Gather blood collection materials. Ensure the blood culture bottles are within date. Do not use bottles which show any signs of damage, deterioration or contamination (discolored etc.).
2. Wash hands and don gloves, remove plastic cap from the blood culture bottles and

- disinfect the rubber top of the bottles: using alcohol prep pad (chlorhexidine gluconate); discard pad and allow top of bottle to dry in order to fully disinfect.
3. Remove another of the chlorhexidine/alcohol prep pads from the package and use the pad to firmly wipe the site in an outward circular motion. Allow at least one minute to air dry. The venipuncture site is not fully clean until the disinfectant has fully evaporated.
 4. Attach a winged blood collection set to a collection adapter cap. To prevent contaminating the puncture site, do not re-palpate the prepared vein before inserting the needle.
 5. Insert needle into the venipuncture site.
 6. Place the adapter cap over the aerobic bottle and press down to pierce the septum.
 7. Hold the bottle upright and use the graduation lines on the collection bottle to accurately gauge sample volume. Once the aerobic bottle has been inoculated, remove the adapter cap and repeat the procedure for the anaerobic bottle and second set of culture bottle if required. *It is important that the aerobic bottle is filled first to prevent transfer of air in the device into the anaerobic bottle.*
 8. After inoculation, mix the bottles thoroughly by gentle inversion.
 9. Perform a second venipuncture from the opposite arm if required (at least 30 minutes later). Use aseptic technique and collect blood into one aerobic and one anaerobic bottle. If a sample cannot be obtained from the opposite arm, please ensure label is forwarded to Microbiology lab with a note indicating why it could not be obtained.
 10. Label all bottles at the bedside or chair, recording time of collection, specimen site (left or right arm) and mnemonics of collector on each specimen collected as well as any paper requisitions or documents needed for testing.

Notes:

- This procedure must be performed using strict aseptic technique. Attention should be paid to maintaining sterility of the blood culture bottle tops as well as any needles. Once you have cleansed the venipuncture site, do not touch it. If you have to touch the site you must cleanse it again with a chlorhexidine/alcohol prep pad.
- If the winged set is removed from the package and must be laid down prior to use, it must be placed on a sterile gauze pad.
- Blood cultures must be delivered to the laboratory immediately at room temperature.
- Blood culture bottles should **NEVER** be refrigerated or frozen after they have been inoculated.

Calculations

Not Applicable

Interpretation/Results/Alert values

Not Applicable

Reference intervals

Not Applicable

Method performance specifications/limitations

Not Applicable

Result reporting

Not Applicable

References

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- Garza, D., Becan-McBride, K. Phlebotomy Handbook. Fourth Edition. 1996. Appleton & Lange.
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- Centre for Disease Control. Growth Charts: Birth to 36 months. Length for Age and Weight for Age Percentiles. April 2001. <http://www.cdc.gov/growthcharts>
- Centre for Disease Control. Growth Charts: 2 to 20 Years. Length for Age and Weight for Age Percentiles. November 2000. <http://www.cdc.gov/growthcharts>
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Related procedures

- Collection of Blood Specimens by Venipuncture Orig ID 6975

Documents/Forms/Records

Not Applicable

Document Change Log	
Date	Changes
28/May/2015	Special Safety Precautions updated.
05/Jan/2018	Updated and reviewed
07/Aug/2020	Added Pediatric Reference Chart for Blood Volume Required, updated the number of bottles required.
27/April/2021	Updated References

Maximum Blood Draw Protocol for Pediatric Patients within 24 Hour Period

Weight (kgs)	Weight (lbs)	Total Blood Volume (mL)	Maximum allowable volume (mL) in one blood draw (= 2.5% of TBV)
1	2.2	100	2.5
2	4.4	200	5
3	6.3	240	6
4	8.8	320	8
5	11	400	10
6	13.2	480	12
7	15.4	560	14
8	17.6	640	16
9	19.8	720	18
10	22	800	20
11-15	24-33	880-1200	22-30
16-20	35-44	1280-1600	32-40
21-25	46-55	1680-2000	42-50
26-30	57-66	2080-2400	52-60
31-35	68-77	2480-2800	62-70
36-40	79-88	2880-3200	72-80
41-45	90-99	3280-3600	82-90
46-50	101-110	3680-4000	92-100
51-55	112-121	4080-4400	102-110
56+	123+	4480+	112-120

NOTE:

- A patient's clinical condition may require that bloodwork be drawn at a volume that exceeds this protocol. If a request for blood collection is asked for that exceeds this protocol, the lab staff must obtain permission from the patient's physician or nurse and document the request.

IF	Then
If permission is granted	The phlebotomist must make a note on the requisition or in Meditech indicating the approval, including the physician/nurse's name and the date and time.
If permission is denied	<ul style="list-style-type: none"> • Determine from the physician which tests should be drawn at this time (if any). • Collect only those tests, following the protocol above. • For all other tests that were not collected, indicate in Meditech that - Collection of blood specimens on this patient would exceed the maximum allowable volume for the patient based on weight per volume. Notification given to (physician/nurse's name) by () at (date and time of notification).