



BLOOD CULTURE COLLECTION

PRINCIPLE: Under normal conditions, blood is sterile. Blood is cultured to isolate the causative agents of septicemia, bacterial endocarditis, and other conditions associated with bloodstream invasion by microorganisms. Blood should be drawn using aseptic technique to reduce the possibility of contaminating the blood culture with skin organisms. The Peds Plus/F and Plus Aerobic/F Bactec media contain resins to neutralize antimicrobial activity.

MATERIALS:

Plus Aerobic/F (grey cap) Bactec bottle	70% alcohol prep
Lytic Anaerobic/F (purple cap) Bactec bottle	20 cc sterile syringe
Peds Plus/F (pink cap) Bactec bottle	Sterile needles
Blood Transfer Device (BD 364880)	
ChloraPrep SEPP applicator (2% Chlorhexidine gluconate/ 70% isopropyl alcohol; MediFlex 260449)	

SAMPLE REQUIRED:

ADULT BLOOD CULTURE VOLUMES

Blood Volume Drawn(venous)	Blood Culture Bottle(s)
Optimum: 20 ml	10 ml in Lytic Anaerobic/F 10 ml in Plus Aerobic/F Note: Inoculate anaerobic bottle first to prevent entry of air from syringe. Do NOT overfill bottles (maximum: 10 ml for Aerobic and Anaerobic bottles.)
10-20 ml	Divide evenly between: Lytic Anaerobic/F Plus Aerobic/F
4.1-9 ml	Plus Aerobic/F
1.5-4.0 ml	Peds Plus/F (aerobic) Note: Use Peds Plus/F only in cases where it is extremely difficult to obtain a larger volume of blood, as the more blood drawn, the greater the recovery of organisms. Do NOT overfill bottle (maximum 4.0 ml/Peds bottle).
Less than 1.5 ml	Unsatisfactory for adult.

PEDIATRIC BLOOD CULTURE VOLUMES

Pediatric Patient Weight	Blood Volume Drawn	Blood Culture Bottle(s)
<4 kg	1 ml *	Peds Plus/F
4.0 - 13.9 kg	3 ml *	Peds Plus/F
14 - 24.9 kg	Optimum: 10 ml	Lytic Anaerobic/F (5 ml) Plus Aerobic/F (5 ml)
	4.1-9 ml	Plus Aerobic/F
	1.5-4.0 ml	Peds Plus/F (aerobic)
>25 kg	Optimum: 20 ml	Lytic Anaerobic/F (10 ml) Plus Aerobic/F (10 ml)
	10-20 ml	Divide evenly between: Lytic Anaerobic/F Plus Aerobic/F
	4.1-9 ml	Plus Aerobic/F
	1.5-4.0 ml	Peds Plus/F (aerobic)

*** Less than 1 ml blood accepted, but not optimal, in patients less than 4 years of age. Note volume drawn on bottle. "Suboptimal low volume blood cultured" comment added to report.**

1. Due to the increased risk of contamination, blood cultures should not be drawn through an indwelling intravenous or intraarterial catheter unless it cannot be obtained by venipuncture or upon physician request. Waste 5 ml. of blood.
2. Anticoagulants, such as citrate, oxalate, EDTA, and heparin are toxic for some bacteria.
3. Time and Number of Cultures to be Collected
 - a. Blood should be drawn before therapy is initiated, if possible.
 - b. GENERAL RECOMMENDATIONS:
ADULTS: 2-3 BLOOD CULTURE SETS* AT ABOUT 1 HOUR INTERVALS.

PEDIATRICS: 2-3 BLOOD CULTURE SETS* COLLECTED IMMEDIATELY.

* One set refers to one culture with both aerobic and anaerobic bottles or
a
single Peds bottle.
 - c. No more than 3 sets of blood cultures should be drawn within a 24 hour period, as this does not significantly increase positive results. More than 3 sets requires approval of a Pathologist.
 - d. Acute febrile episode, antimicrobials to be started or changed immediately:
2 blood culture sets from two different sites before initiation of therapy, all within 10 minutes.
 - e. Nonacute disease, antimicrobials will not be started or changed immediately:
2-3 blood culture sets within 24 hr, ≥ 3 hr apart (before antimicrobials).

- f. Fever of unknown origin:
2-3 blood culture sets \geq 1 hr. apart, within 24 hr.
If negative at 24-48 hr, 2-3 more blood culture sets.
- g. Acute bacterial endocarditis:
3 blood culture sets during first 1 - 2 hours before antimicrobial therapy.
- h. Subacute bacterial endocarditis:
3 blood culture sets \geq 1 hr apart, within 24 hr.
If negative at 24 hr, 2-3 more blood culture sets.

TECHNIQUE:

1. EACH BLOOD CULTURE SET MUST BE A SEPARATE VENIPUNCTURE. EACH SITE MUST BE PREPARED INDIVIDUALLY, even if more than one blood culture is to be drawn at the same time.
2. Remove FLIP OFF cap of each bottle.
Sterilize the exposed rubber septum using a 70% alcohol prep.
3. Apply tourniquet to patient's arm and select vein.
4. Prepare venipuncture site.
 - a. Hold the ChloroPrep SEPP applicator with sponge tip facing downward and gently squeeze to break the ampule. Do not touch the tip.
 - b. Saturate the tip with ChloroPrep by gently pressing it against the treatment area.
 - c. Using a back and forth friction scrubbing motion, completely wet the treatment area for 30 seconds.
 - d. Allow the prepped area to dry completely, approximately 30 seconds.

Note: Do not blot or wipe the solution away, or fan or blow on the site, as this may result in contamination of the blood culture.
 - e. Discard the applicator after a single use.
5. Blood must be drawn with a syringe and butterfly or a syringe and needle. The vacuum in the Bactec bottles is not predictable and the volume markings on the bottles are inaccurate, so do NOT draw the blood directly into the bottle.

SPS vacutainer tubes or Isolator tubes should NOT be used to draw the blood, as the additional anticoagulants in these tubes may be detrimental to organism recovery.
6. After the venipuncture site has been disinfected, the vein may not be palpated again. If further palpation of the vein is necessary during aspiration, a sterile glove should be worn.
7. Withdraw 20 ml blood.
For pediatric patients, see Pediatric Blood Culture Volume chart.
8. Release tourniquet, place a cotton ball on the needle, and withdraw the needle from the vein while gently compressing the cotton.

9. DISCARD NEEDLE AND ATTACH BD BLOOD TRANSFER DEVICE TO SYRINGE. (Utilize one Transfer Device to inject both bottles.)
10. Inject 10 ml of blood into the Lytic Anaerobic/F bottle first to prevent entry of air from the syringe. Then inject 10 ml of blood into the Plus Aerobic/F bottle.

For volumes of blood less than 20 ml, see "Sample Required" for inoculation of Bactec media.

Note: **In adults, collection of less than 20 ml of blood per blood culture may result in false negative results.**

Inoculation of greater than 10 ml blood into the Aerobic or Anaerobic bottle or more than 4 ml into the Peds Plus/F bottle may result in suboptimal blood to media ratios and possible false negative results.

11. After thoroughly mixing contents by gently inverting bottles, place Lab barcode label vertically on the bottle.

Do NOT cover sensor on bottom of bottle.
DO NOT COVER BOTTLE BARCODE.

On the bottle, write tech # or initials of person drawing, time of collection, and site (line, red port, etc) if applicable.
DO NOT WRITE OVER THE BARCODES.

12. Transport to Allina Medical Laboratories within 48 hr. of collection.
Keep at room temperature.