

BLOOD CULTURE

I. GENERAL CONSIDERATIONS:

Bacteremia is defined as the presence of bacteria in the bloodstream. Although transient bacteremia occurs in every individual (for example, following vigorous tooth brushing), the association of bacteremia with active replication of bacteria in the bloodstream and signs and symptoms of sepsis (septicemia) is a life threatening condition and requires appropriate diagnosis by collection of blood cultures.

The primary blood culture system used in the Microbiology Laboratory at Nationwide Children's Hospital (NCH) is the BacT/Alert (FAN aerobic and standard anaerobic) bottle system.

II. SPECIMEN COLLECTION:

A. Blood Collection Preparation:

1. Identify the correct patient and explain the procedure to the patient and/or family.
Ask the patient or parent/guardian the approximate weight of the patient so that an appropriate amount of blood can be collected (see chart below).

Volume of blood to collect per each blood culture collection (based on patient's weight)					
Patient Weight	< 1kg	1.1-2.0 kg	2.1-12.7 kg	12.8- 36.3 kg	>36.3 kg
	<2.2 lb	2.2- 4.4 lb	4.5- 27 lb	28- 80 lb	>80 lb
Amount of Blood	2 mL (1ml/bottle)	4 mL (2ml/bottle)	6 mL (3 ml/bottle)	10 mL (5ml/bottle)	20 mL (10ml/bottle)
	Divide between the blood bottles unless < 1 mL obtained. If < 1 mL obtained, inoculate all into aerobic bottle	Divide between the blood bottles If < 1 mL obtained, inoculate all into aerobic bottle	Divide between the blood bottles	Divide between the blood bottles	Divide between the blood bottles

2. *Wash hands thoroughly before beginning the collection procedure.*
3. Identify the venipuncture site to be used. Refer to NCH blood collection procedure for specific information regarding venipuncture collections.

4. Gloves must be worn by the phlebotomist when performing a venipuncture collection.
5. Check the blood culture collection bottles for an acceptable expiration date. Clean the rubber septum of the bottles with 70% isopropyl alcohol swabs and allow to air dry. *DO NOT clean the bottles with iodine or Chloraprep swab.*

B. Clean the Collection Site:

Patients less than 2 months of age:

1. After palpating to isolate the vein, clean the venipuncture site with 70% isopropyl alcohol swab. Clean the site using an outward motion and friction. Allow the site to air dry.
2. Using a 10% povidine-iodine swab, clean the site using an outward motion. Allow the site to dry for at least two (2) minutes. Note: If the patient's skin is hypersensitive to iodine, clean the site again with a fresh alcohol swab.
3. Using a new 70% isopropyl alcohol swab, clean the site using an outward motion.
4. DO NOT palpate the vein after the site has been cleaned.

Patients greater than 2 months of age:

1. Check the expiration date and remove the Chloraprep applicator from the package. Avoid touching the sponge.
2. Squeeze the plastic wings of the applicator together to break the ampule, and release the antiseptic.
3. Wet the sponge uniformly by repeatedly pressing the sponge against the collection site until fluid is visible on the skin.
4. Prep the skin by using repeated back and forth strokes with the sponge applicator with moderate pressure for thirty (30) seconds.
5. Allow the skin to dry for thirty (30) seconds. DO NOT blow on or fan the site to dry it.
6. DO NOT palpate the vein after the site has been cleaned.

C. Venipuncture - Gloves must be worn during the procedure:

1. Follow the NCH instructions for venipuncture (see separate procedure).
2. Blood should be drawn with a needle and syringe and distributed evenly into two (2) blood culture bottles (one aerobic and one anaerobic). If the venipuncture is initially unsuccessful, a new needle should be used for each repeat venipuncture. Caution! Because blood culture bottles are evacuated and under negative pressure, *care should be taken not to inject the entire volume of blood* into a single bottle. Hold the plunger of the syringe to prevent the entire volume of blood from being inoculated into the first bottle.
3. Immediately mix contents of the bottles by gently swirling several times.

4. Generally, blood should *not* be collected from indwelling intravascular catheters unless venipuncture is impossible, or catheter-associated infection is suspected. For the latter, separate blood cultures should be collected by peripheral venipuncture and catheter draw.

D. Initial Routine Blood Culture:

1. Collect two sets of BacT/Alert bottles by separate venipuncture - one FAN aerobic (green label) and one anaerobic (purple label) bottle is considered one set. Note: Two sets of blood cultures, collected 15-30 minutes apart, and from separate venipuncture sites, are sufficient to diagnose most cases of septicemia.
2. Refer to the chart in section II-A-1 of this procedure for acceptable blood collection volumes.
3. *The blood should be distributed evenly between the two blood culture bottles, unless the volume collected is <1 mL.* Immediately mix the contents by gently swirling the bottles several times.

Caution! Because blood culture bottles are evacuated and under negative pressure, *care should be taken not to inject the entire volume of blood* into a single bottle. Hold the plunger of the syringe to prevent the entire volume of blood from being inoculated into the first bottle.

If < 1 mL of blood is obtained, inoculate the entire volume into the aerobic FAN (green label) bottle.

4. Label all specimens at the draw station in the presence of the patient. Ask the patient (depends on age/ability) or the parent/guardian to verify the patient's full legal name is on every tube. Standard labeling requirements include:
 - Full Patient Legal Name
 - Test Requisition Barcode, Medical Record Number or Date of Birth
 - Date & time of collection (documented on sample or requisition)
 - Tech code of phlebotomist or Name of phlebotomist, if not an employee of NCH