I. Purpose:

Blood culture is one of the most important procedures performed by the laboratory. Proper specimen collection is vitally important to the success of this culture. Guidelines regarding timing, steps to minimize contamination, and perhaps most important of all adequate volume, must be followed closely. Rapid detection and recovery of organisms in the blood is critical to the management of the septic patient.

CAUTION: All specimen material should be considered potentially hazardous and thereby handled following Universal Precautions.

II. Responsibility:

All healthcare workers collecting blood cultures.

III. Materials:

Lawson #	Collection Equipment
203523	Blood Transfer Device
183680	Chloroprep
314296	Gauze
137559	Syringe 20ml
385977	Alcohol Prep
314269	Bandage
196479	Biohazard Bag
455068	Green Aerobic Blood Culture Bottle
455069	Orange Anaerobic Blood Culture Bottle
362817	Butterfly Needle 21 gauge
214256	Tourniquet – Latex Free

Note: Chlorhexidine gluconate is not recommended for children less than 2months old.

For fungal cultures: Yellow isolator tube

IV. Procedure:

A. Timing and Numbers of Cultures Collected

If the physician does not specify the time of collection, but instead orders "Blood Cultures times 2 or 3," draw each specimen one hour apart. If the one-hour interval is not possible, collect the specimen no less than ½ hour apart.

NOTE: Filling multiple sets of blood culture bottles from blood collected by a single venipuncture, or from multiple venipunctures performed less than five minutes apart will be considered a single draw.

B. Blood Culture Bottles

The blood culture system used at UC Health is the BacT/ALERT. Two bottles: the BacT/ALERT FA (green label) which is intended for culture of aerobes and the BacT/ALERT FN (orange label) which is intended for culture of anaerobes should be used for each set of cultures drawn.

Infants and Children—(refer to procedure for collecting blood from pediatrics SC027.1) collect a maximum of 4 mL of blood. Inoculate the BacT/ALERT FA (green label) which is intended for culture of aerobes and the BacT/ALERT FN (orange label) which is intended for culture of anaerobes should be used for each set of cultures drawn.

Blood for Fungus and/or AFB--blood for these cultures must be collected in a yellow isolator tube. Collect the full 10 mL of blood and mix the contents of the tube by inverting 4 - 5 times. Do not collect this specimen in BacT/ALERT bottles.

Note: For infants collect 1.5 mL blood and use Isolator tube.

Patient	Aerobic Bottle	Anaerobic Bottle	Blood Volume
Adult	BacT/ALERT FA Green label bottle	BacT/ALERT FN Orange label	20 mL maximum of 10 mL in each bottle
Adult--low volume draw less than 5 mL	BacT/ALERT FA Green label bottle	None	Less than 5 mL use aerobic bottle only
Infant or small child	BacT/ALERT FA Green label bottle	BacT/ALERT FN Orange label	1-4 mL

C. Preparation of the Site

The two most important factors to remember when collecting blood for culture are careful preparation of the phlebotomy site to avoid contamination and collection of an adequate volume of blood.

1. Cleanse the top of each blood culture bottle with a clean 70% alcohol swab prior to transferring the blood into the bottles.
2. Apply the tourniquet. Palpate the area and select site of vein for venipuncture. Remove tourniquet.
3. Using the Chlorhexidine gluconate applicator completely wet the area and scrub the puncture site using repeated back and forth motion for at least 30 seconds. Allow 30 seconds for the area to completely air dry. Do not blot or wipe away. This removes skin cells (that harbor contaminating bacteria) and natural oils. In addition, it kills surface bacteria.

Note:

For infants or young children, use an alcohol pad, not Chlorhexidine gluconate.

Wipe the area for at least 30 seconds with the alcohol pad. With a fresh alcohol pad, wipe the puncture site in a circular motion, moving concentrically outward for at least 30 seconds. Allow the area to dry completely, 30-60 seconds. Repeat if necessary.

For patients with an allergy to chlorhexidine gluconate or isopropyl alcohol use a betadine swab to clean the area. Remember to allow sufficient time for the betadine to dry before proceeding with collecting the blood culture.

D. Venipuncture Method

1. Attach a 21-gauge winged Push button butterfly to a 20 ml syringe

2. Re-apply the tourniquet. To avoid contamination - Do not touch/palpate the cleansed site. If you must search for the vein, clean the tip of the finger of your gloved hand with a chlorhexidine gluconate. Let it dry, and then palpate the site.

3. Perform the venipuncture per policy.

4. Activate the push button safety device.

5. Disconnect the butterfly from the syringe.

6. Attach the angel wing transfer device to the syringe.

7. Following the chart below transfer blood into the blood culture bottles.

8. Do not change the transfer device between bottles.

9. Ideally 10 ml of blood is placed in the aerobic bottle first and then 10ml in the anaerobic bottle. If less than 20 ml total blood is obtained, refer to chart on page 6 for proper amount of blood in the blood culture bottles.

10. Discard the syringe with the transfer device into a sharps container. In addition discard the winged butterfly used to collect the blood into a sharps container.

Line Method (FOR NURSING STAFF ONLY)

1. This method is not considered optimal for collection of blood cultures and should be used only as a last resort or at the request of the physician (See procedural Notes). Per hospital policy only nurses or physicians are permitted to draw blood from lines.

2. Cleanse the top of each blood culture bottle with a clean 70% alcohol swab.

3. After choosing a suitable port of entry, cleanse the port per hospital policy.

4. Any blood or fluid resident in the line must be removed and discarded. This is to assure that the blood being sampled is coming directly from the patient's circulation.

5. If the line is contaminated or the entry site is likely a means of infection, the value of a sample through the line is low and may only reveal an organism colonizing the entry site.

6. Use a syringe and withdraw enough blood to be certain you have removed all of the fluid in the line and brought blood from peripheral circulation to the syringe. The amount to be collected varies from line to line (average amount needed: 3-5 mL). Discard this sample.

7. Attach a second syringe and withdraw a sample of blood.

8. Attach an angel wing transfer device to the syringe of blood then transfer the blood according to the chart below.

9. Do not change the transfer device in-between bottles.

E. Labeling of bottles

Label both bottles with:

a. The patients first and last name
b. Date of birth or medical record number
c. Date and time of collection
d. Collectors initials
e. Collection site (R arm, L hand, Central line, Hickman catheter, Swan Ganz catheter, A – line, etc.). Do not make marks on or cover the barcode on the bottle. If computer labels are available, apply them to the bottle in same direction as barcode on bottle North to South. Do not cover the other barcode label.
f. The amount of blood distributed into each bottle.

BLOOD CULTURE DISTRUBUTION GUIDELINES FOR PHLEBOTOMISTS

TOTAL BLOOD DRAWN (ML)	AEROBIC BOTTLE (Green label)	ANAEROBIC (Orange label)
20	10	10
19	10	9
18	10	8
17	10	7
16	10	6
15	10	5
14	10	4
13	9	4
12	8	4
11	8	3
10	7	3
9	6	3
8	6	2
7	5	2
6	4	2
5	5	0
4	4	0
3	3	0
2	2	0
1	1	0

F. Procedural Notes:

The drawing of Blood Cultures from intravascular catheter lines is discouraged.
When blood is drawn from a catheter, it is difficult to differentiate catheter colonization from infection with or without bacteremia.

Unless a blood culture is specifically drawn to evaluate a possible episode of catheter-related sepsis, blood cultures should not be drawn through an indwelling catheter.

When catheter-related sepsis is suspected, peripheral blood cultures should be drawn through venipuncture to document bacteremia or fungemia.

V. References:

Dunne, Jr., W. M., F. S. Nolte, and M. L. Wilson April 1997. Blood Cultures III.J. A. Hindler (coordinating ed.), Cumitech 1B. American Society for Microbiology, Washington, D. C.

Ernst, D.J. 2002, Q&A – Site preparation for infant blood cultures, MLO 34, No.1.

Package insert: ChloraPrep® One-Step Frepp,® mrk-251-11/00, 2000. Medi-Flex Hospital Products, Inc. Overland Park, KS 66210. 1-800-523-0502.

Package insert: ChloraPrep® One-Step 3 mL Applicator, mrk-403-9/02, 2002. Medi-Flex Hospital Products, Inc. Overland Park, KS 66210. 1-800-523-0502.

Sewell, D. L. (ed.) 1992. Processing and Interpretation of Blood Cultures. pp. 1.7.1-1.7.11. *In*: H.D. Isenberg (ed.), Clinical Microbiology Procedure Handbook vol. 2. American Society for Microbiology, Washington, D. C.