Northern Arizona Healthcare Flagstaff Medical Center	LABORATORY **DEPARTMENTAL** GUIDELINES OF PRACTICE	**NUMBER:** NGENL 3.7D Page 1 of 3 **DATE OF ORIGIN:** April 22, 1995 – FMC December 14, 2016 - NAH

TITLE:

BLOOD CULTURE PATIENT PREPARATION AND BLOOD DRAW

PURPOSE

Sepsis occurs when bacteria or fungi overcome the host's normal defense mechanisms and enter the blood stream, causing severe illness. In addition, the by-products of their metabolism can lead to septic shock. Rapid recognition and immediate institution of appropriate treatment are essential.

~~Blood~~ Either blood or other sterile body fluid is drawn and placed into liquid culture media ~~to isolate~~ for the detection of ~~bacteria~~ microorganisms (bacteria or yeast) present in the specimen. ~~causing septicemia.~~ Samples are drawn from patients and inoculated directly into BACTEC culture bottles.

SPECIMEN REQUIREMENTS

Anaerobic Culture Vials
- ~~5-7~~8-10 mL whole blood – optimum
- 3 mL whole blood – minimum

Aerobic Culture Vials
- 8-10 mL whole blood – optimum
- 3 mL whole blood – minimum

Pediatric Culture Vials
- 1.0-3.0 mL whole blood – optimum
- 0.5 mL whole blood – minimum
- 5.0mL whole blood maximum

REAGENTS

BACTEC Culture Bottles (Plastic or glass): Standard 10 Aerobic/F, Anaerobic/F, and Peds Plus/F.

WHEN TO DRAW BLOOD CULTURES

1. Although drawing blood cultures before or during a fever spike is optimal for recovery, volume is more important. Blood culture bottles should be filled to optimum volume when possible. ~~Blood cultures should routinely be drawn from separate sites, however, if the patient is a difficult draw, blood culture volume is more critical for detection of sepsis than site.~~
2. Two blood culture sets ~~are~~ should be drawn ~~with~~utilizing both an aerobic and anaerobic cultures bottle, consecutively from two different sites. ~~Each set should ideally be obtained from a different site~~
3. **If the patient is a child 8 6 years or younger** draw 1 mL per year of age total, divided between two blood culture bottles/sites and inoculate into pediatric bottles. For example, for a 3 year old, draw 1.5 mL from each of two sites, for a ***total*** of 3 mL and inoculate 2 pediatric blood culture bottles. Note: 2 separate sites may not be possible if neonate. ~~use a Pedibact bottle~~.
4. ~~If the~~ **For patients weighing 14-36 Kg:** Draw 5-10 mL blood from first site and divide between the two bottles of first set. From the second site, draw 5-10 mL of blood and divide between the two bottles of second set (for a total blood draw volume of 10-20 mL). ~~is older than 8 years old and a difficult draw and only enough blood for one culture is obtained use an aerobic (blue cap) bottle.~~
5. **For patients weighing >36Kg:** Draw 10-20 mL blood from first site and divide between the two bottles of the first set. From the second site, draw 10-20 mL of blood and divide between the two bottles of the second set (for a total blood draw volume of 20-40 mL). ~~If the patient is spiking a temperature, blood cultures should be drawn about an hour before the temperature spike is expected.~~

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6. Blood cultures should be drawn prior to the administration of antibiotics. If antibiotics have already been initiated, draw cultures at the antimicrobial trough. ~~Discussion of disease states and more detailed information is contained in the referenced fascicle.~~

7. If poor access requires that blood for culture be drawn through a port of an indwelling catheter, the second culture ***MUST*** ideally be drawn from a peripheral site.

   a. NOTE: Ultrasound may need to be consulted for extremely difficult draws. Blood draw volumes of <3 mL should be inoculated into pediatric blood culture bottles.

PROCEDURE

1. Obtain one aerobic and one anaerobic BACTEC blood or Peds Plus/F (for low volume draws)~~Pediatric patients~~ culture bottle for each blood culture ordered.
2. Vials displaying turbidity, contamination, or discoloration should not be used.
3. Perform Hand Hygiene prior to patient contact.
4. **To prepare the venipuncture site**, vigorously cleanse with 70% isopropyl alcohol swab to remove any dirt or oils. Allow to dry.
5. **Sterilize the venipuncture site** by cleaning with Chloraprep blood culture prep kit. Scrub for 35 seconds using a circular scrubbing motion moving outward from the center of the site.
6. Allow to dry for 35 seconds before performing venipuncture. DO NOT touch the site with fingers once the site has been disinfected.
   a. Note: If iodine is used for this step, dry time must be increased to allow for complete drying, up to 2 minutes.
7. Prepare the blood culture bottles by removing the top and disinfecting the ~~tops~~ septum of the blood culture bottles with 70% alcohol swab and allow to dry. Do not use iodine on the top of the bottles as it damages the rubber septum.
8. Label each blood culture bottle with time, date, initials/Lawson #, **draw site**, and patient information label placed vertically down the side of the bottle. Time stamp should be accurate to the hour and minute the blood leaves the body for each draw. The time stamps should be different when drawing two sets of cultures. Ensure the patient label does not cover up the Bactec barcode and that the blood inside is visible.
   a. **Note: If *any* of the above information is missing from the blood culture bottles when received in the laboratory, the lab personnel should contact the nursing unit to have the nursing staff come and properly label the bottle(s).**
9. Prepare a syringe and needle (or butterfly system) for blood collection. Apply tourniquet, then put on sterile gloves and draw blood. Place approximately 10 mL of blood into each of the aerobic and anaerobic ~~bottles standard aerobic bottle, 7 mL for anaerobic bottle~~ and 1.0-3.0 mL for Pedibact bottles. Mix by inversion. There are 5 mL increment marks on each bottle. DO NOT OVERFILL! The bottle does not automatically stop at 10 mL for Aerobic and Anaerobic bottles. Note: Fill aerobic bottle first, followed by anaerobic bottle.
10. Bandage as necessary.
11. **For port draws performed by nursing:** using two separate alcohol preps, scrub the catheter hub connection for 15 seconds each and allow to air dry. Attach syringe to collect discard blood (3 mL for adults and 0.2 mL for pediatric patients.) ***Do not use this discard blood for culture.***
12. Draw Blood cultures according to nursing protocol.

    ~~Remove any pooled blood on the stoppers of the blood culture bottles with 70% alcohol.~~
13. Return blood culture bottles to the lab. Inoculated culture vials should be placed in the BACTEC fluorescent series instrument as soon as possible, stored at room temperature only. Do not refrigerate.

HAZARDS

Use Universal Precautions when obtaining blood specimens.

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NOTES

1. Proper blood collection techniques reduce contamination to less than 3% of all blood cultures.
2. Contamination draw rates will be supplied for each unit for quality monitoring and process improvement initiatives.
3. SPS additive is an anticoagulant and increases yield of growth because of its anticomplementary activity, antiphagocytic activity, as well as inhibiting aminoglycoside polymyxin and antibiotics. SPS should not be used in cases of possible meningococcal or gonococcal septicemia as it inhibits growth of these organisms.
4. ~~See referenced fascicle for more information~~ If fungal septicemia is suspected, order a fungal blood culture and inoculate 8 mL of blood into an SPS tube (yellow vacutainer) for send out testing.

RELATED DOCUMENTS N/A

REFERENCES

BACTEC Culture Bottles Inserts, Becton Dickinson and Company; version 2012-06 and 2010/02.

Versalovic, J., Carroll, K., Funke, G., Jorgensen, J., Landry, M., Warnock, D. (2011). *Manual of Clinical Microbiology, 10th Edition.* ASM Press.

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