
Lab Dept: Microbiology

Test Name: BLOOD CULTURE

General Information

Lab Order Codes: BC

Synonyms: Culture, Blood; BC

CPT Codes: 87040 – Culture, bacterial; blood, with isolation and presumptive identification of isolates

The following testing may be added if appropriate based on findings for organism identification (multiple additions are possible if more than one organism is identified) and to aid in patient treatment management.

87076 – Anaerobic isolate, additional methods required for definitive identification of isolates

87077 – Aerobic isolate, additional methods required for definitive identification, each isolate (if appropriate)

87106 – Culture, fungi, definitive identification, each organism, yeast (if appropriate)

87107 – Culture, mold, definitive identification, each organism, mold (if appropriate)

87147 – Culture, typing; immunologic method, other than immunofluorescence (e.g., agglutination grouping), per antiserum. (if appropriate)

87150 – Culture, typing, identification by nucleic acid (DNA or RNA) probe, amplified probe technique, per culture or isolate, each organism probed (if appropriate)

87184 – Susceptibility studies, disk method, per plate (if appropriate)

87185 – Enzyme detection (eg, beta lactamase), per enzyme (if appropriate)

87186 – Susceptibility studies, microdilution or agar dilution, each multi-antimicrobial, per plate (if appropriate)

87206 – Smear, primary source with interpretation, fluorescent and/or acid fast stain for bacteria, fungi or cell types (if appropriate)

Test Includes: Aerobic and anaerobic culture with isolation and identification of isolates. Susceptibility testing will be performed on significant isolates. Positive Blood Cultures will be reflexed to the BioFire Film Array Blood Identification Panel. All positive results are reported immediately by phone to the physician or patient's nurse.

Logistics

Lab Testing Sections: Microbiology

Phone Numbers: MIN Lab: 612-813-5866

STP Lab: 651-220-6555

- Test Availability:** Daily, 24 hours
- Turnaround Time:** Preliminary results are available at 24 hours. All positive blood cultures are reported when received. Negative cultures are final at 5 days.
- Special Instructions:** Draw blood before starting antimicrobial therapy. **Specific site and date/time of collection** are required for specimen processing. Specify organism suspected. If [mycobacteria \(AFB\)](#) or [yeast/fungi](#) are suspected, see separate listings.
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Specimen

- Specimen Type:** Whole blood
- Container:** The blood culture set consists of 2 bottles, BACTEC™ PEDS PLUS/F aerobic medium (pink cap) and Lytic/10 Anaerobic/F medium (purple cap)
- Volume:** 4-11 mL of blood per set; inject 1 – 3 mL in aerobic bottle and 3 - 8 mL in anaerobic bottle using the following guidelines:

Weight	Volume Aerobic bottle (mL)	Volume Anaerobic bottle (mL)
<1.5 Kg / <3.3 lbs.	1 mL	3 mL
1.5 - 3.9 Kg / 3.4 - 8.6 lbs.	1 mL	3 mL
4.0 - 13.9 Kg / 8.7 - 31 lbs.	2 mL	5 mL
>14 Kg / >31 lbs.	3 mL	8 mL

Geisinger Med. Ctr., Danville, PA

- Sampling Time:** Draw 2-3 sets of blood cultures per febrile episode at least 60 minutes apart. Do not draw more than 3 sets in a 24-hour period. This provides maximum recovery of microorganisms in patients with intermittent bacteremia, and documentation of persistent bacteremia in patients with intravascular infections (e.g., endocarditis, intravenous catheter site infections).

Collection:

BLOOD:

Venipuncture:

Prep with Prevantics Chlorhexidine Gluconate (3.15%) & Isopropyl Alcohol (70%) Antiseptic Wipe

*Use with care in premature infants or infants under 2 months of age. These products may cause irritation or chemical burns.

1. Remove the protective cap from the bottle, disinfect the stopper of the bottle with 70% alcohol, remove wipe from bottle and allow to dry.
2. Open the Prevantics antiseptic wipe, do not unfold wipe.
3. Apply the Prevantics antiseptic wipe to the procedure site, using a back-and-forth friction scrub for 15 seconds. Maximum treatment area is 2.5 by 2.5 inches.
4. Allow the area to dry for 30 seconds. Do not blot, blow, wipe or wave the area.
5. If the site must be touched during venipuncture, disinfect the gloved fingers.
6. Collect 4-11 mL of blood per set and aseptically inoculate the bottles using a blood transfer device.
7. If ≤ 3 mL blood is obtained, inoculate only the aerobic (pink) bottle only.

Line Draw:

1. Prep catheter port by scrubbing the hub for 30 seconds using Prevantics antiseptic wipe and allowing to dry.
2. Aseptically collect 4-11 mL of blood through the injection port. Blood may be collected without first drawing a discard.
3. Aseptically inoculate the bottles using a blood transfer device.

Transport/Storage:

- Transport to the Microbiology Laboratory as soon as possible at room temperature. **Do not refrigerate** or incubate.
- If cultures become soiled during collection, clean the tip of the bottle using an alcohol pad before transporting.
- If sending bottles through the pneumatic tube system, package bottles separately to avoid breakage. Use of plastic bottle holders are recommended.
- Delays in entering blood culture vials into the continuous-monitoring instrument may delay or impede detection of growth. BD recommends that every effort be made to transport and enter room temperature vials in the instrument as soon as possible. Testing was performed by the manufacture to demonstrate recovery of organisms within practical limits at 12, 24 and 36 hours delays. Recovery was 100% for all organisms tested up to 36 hours from collection.

Delayed Vial Entry Results

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BACTEC™ Blood Culture Media	Plastic Culture Vial Catalog Number	Incubation Temperature(°C)	Delay Conditions (Hours)	Recovery (%)
Plus Aerobic/F	442023	Control/no delay	N/A	100%
		33-37	12	100%
		20-25	24	100%
		20-25	36	100%
Plus Anaerobic/F	442022	Control/no delay	N/A	100%
		33-37	12	100%
		20-25	24	100%
		20-25	36	100%
Peds Plus™/F*	442020	Control/no delay	N/A	100%
		33-37	12	100%
		20-25	24	100%
Lytic/10 Anaerobic/F	442021	Control/no delay	N/A	100%
		33-37	12	100%
		20-25	24	100%
		20-25	36	100%

- Samples will be accepted after 36-48 hours from collection with a comment stating that results could be affected.

Sample Rejection:

Specimen with a transit time exceeding 48 hours after collection; specimen not submitted in appropriate transport container; improperly labeled specimen; insufficient volume; external contamination. If an unacceptable specimen is received, the physician or nursing station will be notified and another specimen will be requested before the specimen is discarded.

Interpretive**Reference Range:**

No growth

Critical Values:

- Any bacterial isolate should be considered significant and evaluated clinically. All positive results will be called to the physician or patient's nurse. Susceptibilities will be performed on significant isolates.
- Infection Prevention will be notified with gram stain results that appear to be gram-negative cocci/diplococci.

Limitations:**Factors influencing culture results:**

- Volume of blood directly influences recovery rate. A single negative culture does not rule out infection. The likelihood of a false negative result with a single blood culture is approximately 20%. Although a relationship between the volume of blood cultured and detection of pathogens is relevant for low-level bacteremia, the volume of blood removed can be important in children and especially in neonates, whose blood volumes are limited.
- Skin preparation prior to collection is critical to avoid contamination with skin flora. Blood culture contamination (i.e., false-positives) cause substantial negative financial impact that includes laboratory costs, hospital stay, pharmaceutical costs, and associated side effects of inappropriate therapy.
- Yeast often is isolated from routine blood cultures. However, if yeast or fungi are suspected, a separate fungal culture should be drawn. Refer to [Blood Culture, Fungus](#).
- Previous antimicrobial therapy may delay the growth of organisms.
- Other considerations: Patients suspected of having brucellosis, tularemia, leptospirosis, AFB, viruses or cell wall deficient bacteria must be indicated on requisition. These organisms cannot grow in basic media and require special processing or inoculation into specially formulated or supplemented media.
- If *Streptobacillus* species is suspected, consider inoculating twice the recommended amount of blood or joint fluid into the bottles to enhance the recovery of the organism

Methodology:

BACTEC™ FX Fluorescent Series
BioFire Film Array (if appropriate)

References:

Cook, JH, and M Pezzlo (1992). Specimen receipt and accessioning. Section 1. Aerobic bacteriology, 1.2.1-4. In HD Isenberg (ed) Clinical Microbiology Procedures Handbook. American Society for Microbiology, Washington DC

Miller, J Michael (1999) A Guide To Specimen Management in Clinical Microbiology, American Society for Microbiology, Washington DC

Miller, J Michael, and HT Holmes (1999) Specimen Collection, Transport, and Storage In PR Murray et al, (ed), Manual of Clinical Microbiology, 7th edition, American Society for Microbiology, Washington DC, pp 33-104

Updates:

3/2/2009: Updated collection information for venipuncture options.
3/23/2010: CPT Updates
6/16/2010: Line draw preparation update
3/7/2011: CPT Updates
6/20/2012: Critical Value statement updated
9/16/2013: Collection table update
12/17/2013: Turnaround time, sample rejection transport time, updates
2/27/2019: Added info for BioFire Film Array
4/30/2021: Collection procedure update.
1/24/24: added Transport information

