
Lab Dept: Microbiology/Virology

Test Name: AFB CULTURE & SMEAR, OTHER SOURCES
(NON-BLOOD)

General Information

Lab Order Codes: AFBB

Synonyms: Culture: Acid-Fast Culture; Culture, AFB; Culture, TB; TB Culture; *Mycobacteria* Culture
Smear: Acid-Fast Stain; TB Stain; Atypical *Mycobacterium* Smear; *Mycobacterium* Smear

CPT Codes: Culture:
87116 – Culture, tubercle or other acid-fast bacilli any source, with isolation and presumptive identifications of isolates
87015 – Mycobacteria culture, concentration (if appropriate)
87118 – Id MALDI-TOF Mass Spec AFB (if appropriate)
87150 – Mycobacteria Probe Ident, Solid (if appropriate)
87150 – Mycobacteria probe Ident, Broth (if appropriate)
87150 – Id, Mtb Speciation, PCR (if appropriate)
87153 – Mycobacteria Identification by Sequencing (if appropriate)
87176 – Tissue processing (if appropriate)

Smear:
87206 – Smear, primary source with interpretation; fluorescent and/or acid fast stain for bacteria, fungi, parasites, viruses or cell types
87176 – Tissue processing (if appropriate)
87015 – Mycobacterium culture, concentration (if appropriate)

Test Includes: Culture for acid-fast bacilli, identification, and drug resistance studies when appropriate. When this test is ordered, a reflex test may be performed and charged.

Smear: Auramine-rhodamine fluorochrome stain prepared and read with fluorescent microscope.

Refer to [Blood Culture, Acid-Fast](#) for blood specimens. All positive results are reported immediately by phone to the physician or patient's nurse.

Logistics

Lab Testing Sections: Microbiology

Referred to: Mayo Medical Laboratories (MML: CTB and SAFB)

Phone Numbers: MIN Lab: 612-813-5866

STP Lab: 651-220-6555

Test Availability: Daily, 24 hours

Turnaround Time: Positive cultures are reported when detected, negative cultures in 60 days.

Special Instructions: **Specific site** and **date/time of collection** are required for specimen processing. Do not submit specimens on swabs if other sample types are possible. Negative results from swab specimens are unreliable.

Specimen

Specimen Type: Specimens may include body fluids, bone marrow, aspirates (abscess), bronchial wash, bronchoalveolar lavage, gastric aspiration/wash, skin, sputum, tissue, and stool. Note: Swab specimens are not recommended.

Container: Sterile container

Volume: See Collection

Collection:

| Specimen Type | |
|--------------------------|---|
| Quantity | Special Instructions |
| Aspirate, Abscess | |
| As much as possible | Collect aseptically. Remove needle and cap syringe with sterile Luer cap before transport. |
| Body Fluids | |
| >1 mL | Collect aseptically, using SPS (yellow top) tubes for bloody specimens. |
| Bone marrow | |
| Bone marrow: 1-3 mL | Green top (Lithium or Sodium) top tube. Isolator™ 1.5 mL tube (bone marrow). Do not refrigerate |
| Bronchial wash | |
| 3 mL | Avoid contaminating bronchoscope with tap water. |
| CSF | |
| >1.5 mL | Aseptic collection. |

| Gastric Fluid | |
|----------------------|---|
| 5 - 10 mL | <p>Collect early morning specimen before patient has eaten.</p> <ol style="list-style-type: none"> 1. Introduce nasogastric tube orally or nasally into stomach 2. Perform lavage with 20-30 mL of sterile, distilled water. 3. Recover specimen and place in sterile, leakproof container. 4. Before removing tube, release suction and clamp it. 5. In lab, each 35-50 mL of gastric washings of the specimen will be neutralized with 1.5 mL of sodium bicarbonate within 4 hours of collection. Refrigerate. 6. Three specimens collected on three successive days are desirable. Include a first morning specimen if possible. |
| Skin | |
| As much as possible | <p>Collect as follows:</p> <ol style="list-style-type: none"> 1. Cleanse collection site with 70% alcohol. Allow to dry. 2. Submit biopsy material. 3. Please note if infection was acquired in a foreign country. |
| Sputum | |
| 3 mL | <p>Collect from an early morning, deep cough on at least 3 consecutive days. For follow-up of patients on therapy, collect at weekly intervals beginning 3 weeks after initiation of therapy. Do not pool specimens. Optimal specimens have a PMN to squamous epithelial cell ratio of >2:1.</p> <ol style="list-style-type: none"> 1. Have patient rinse or gargle with water. 2. Instruct patient to cough deeply to produce a lower respiratory tract specimen. Collect in sterile container. 3. For pediatric patients unable to produce sputum, respiratory therapist should collect via suction. |
| Stool | |
| 5 - 10 gm | Collect specimen directly into a leakproof container not contaminated with urine, residual soap, or disinfectants. |
| Tissue | |
| 5 – 10 mm | Aseptic collection. |

| Urine | |
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| 2 mL | <p>Collect first morning specimen. 24-hour pooled specimens are not acceptable.</p> <p>Catheterized specimen: Straight Catheter</p> <ol style="list-style-type: none"> 1. Thoroughly cleanse the urethral area with povidone - iodine and water. 2. Aseptically insert catheter into the bladder. 3. Allow ~10 mL to pass, then collect 1 - 10 mL into a sterile tube. 4. After urine is collected, pull catheter out of the cap of the tube, tighten cap, and depress spout. 5. Transport to the lab. <p>Clean-catch, Mid-stream specimen:</p> <p>Males:</p> <ol style="list-style-type: none"> 1. Clean glans with soap and water. 2. Rinse area with wet gauze pads. 3. While holding foreskin retracted, begin voiding. 4. After several mL have passed, collect midstream portion without stopping flow of urine. 5. Transfer specimen to a leak-proof sterile container. <p>Females:</p> <ol style="list-style-type: none"> 1. Thoroughly clean urethral area with soap and water. 2. Rinse area with wet gauze pads. 3. While holding labia apart, begin voiding. 4. After several mL have passed, collect midstream portion without stopping flow of urine. 5. Transfer specimen to a sterile leak-proof container. |
| Swab Specimens: | |
| Wound, tissue or body fluid | <p>If collected, use Culture Transport (non-charcoal) culturette with adequate specimen volume.</p> <p>Collection instructions:</p> <ol style="list-style-type: none"> 1. Before collecting specimen, wipe away any excessive amount of secretion or discharge, if appropriate. 2. Obtain secretions or fluid from source with sterile swab. 3. If smear and culture are requested or both, a bacterial culture and Mycobacterial culture are requested, collect a second swab to maximize test sensitivity. |

Special Processing:

- Refrigerate all specimens for mycobacteria.
- Lab will neutralize gastric fluid specimens within four hours of collection.

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| Transport/Storage: | Onsite collections: Transport to the Laboratory immediately. Offsite collections: Specimens must be promptly transported to the laboratory, with the next available courier, not to exceed 24 hours from the time of collection or 4 hours for gastric specimens requiring neutralization. |
| Sample Rejection: | Improperly labeled specimen; specimens with prolonged transit time (see Transport/Storage) specimen not submitted in appropriate transport container; insufficient volume; external contamination; 24-hour urine collections; 24-hour sputum collections; insufficient volume; specimens submitted in viral transport medium (ie, M4, M5 or thioglycolate broth); fixed tissue; swab sources of nasal, sinus, ear, mouth, throat, or scalp. If an unacceptable specimen is received, the physician or nursing station will be notified and another specimen requested before the specimen is discarded. |

Interpretive

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| Reference Range: | Culture: Negative Smear: Negative (reported as positive or negative) |
| Critical Values: | Positive AFB cultures and/or positive AFB smears will be called to the physician or patient's nurse. |
| Limitations: | Cultures: <ul style="list-style-type: none">• Negative results are unreliable on specimens obtained on swabs.• Recovery of mycobacteria is dependent on the number of organisms present in the specimen, specimen collection methods, methods of processing, and patient factors such as the use of antimycobacteria therapy.• The use of BBL MGIT PANTA antibiotic mixture, although necessary for all nonsterile specimens, may have inhibitory effects on some mycobacteria.• Alert the laboratory if <i>Mycobacterium genavense</i> is suspected, as this species requires addition of mycobactin J to the culture medium for optimal growth. Smears: <ul style="list-style-type: none">• Cultures are more sensitive than smears, therefore, negative acid-fast smears do not exclude a diagnosis of mycobacterial disease.• Acid-fast stains are not specific for <i>M. tuberculosis</i>; other species in the genus <i>Mycobacterium</i> will stain acid-fast.• Definitive identification requires mycobacterial culture or detection with molecular methods. <i>Mycobacterium tuberculosis</i> complex PCR is a sensitive and rapid method for detecting <i>Mycobacterium tuberculosis</i> complex organisms directly from clinical specimens.• Acid-fast artifacts may demonstrate non-specific fluorescence and be confused with organisms. |

Methodology:**Culture:**

Automated Detection of Positive Cultures followed by Organism Identification with Rapid Methods, which may include Nucleic Acid Probes, DNA Sequencing, and MALDI-TOF Mass Spectrometry. Identification is performed using Hologic /GenProbe AccuProbes for selected Mycobacteria species, MALDI-TOF mass spectrometry, or 500 base pair 16S rRNA gene sequencing.

Smear:

Auramine-rhodamine stain

References:

[Mayo Medical Laboratories](#) September 2017

Updates:

10/15/2012: Removed notification to Infection Prevention on positive results.

2/28/2013: Swab specimens are not acceptable info added.

11/10/2014: Offsite collections added.

5/9/2016: Testing moved from internal test to Mayo.

9/19/2017: Moved to package code AFBB to order both culture and smear.