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**Lab Dept:** Microbiology

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

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**General Information**

**Lab Order Codes:** AFBB

**Synonyms:** Culture: Acid-Fast Culture; Culture, AFB; Culture, TB; TB Culture; *Mycobacteria* Culture, *Nocardia* 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)  
87150 – Id, Mtb complex Rapid 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 detection and identification of *Mycobacterium* species, *Nocardia* species, and other aerobic actinomycetes. Drug resistance studies can be added 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.

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**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:** Smear results are available within 24 hours or 1 day.

Positive cultures are reported when detected, negative cultures in 42 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.

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***Specimen***

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

**Container:** Sterile container

**Volume:** See Collection

**Collection:**

Specimen Type	
Quantity	Special Instructions
<b>Body Fluids</b>	
1 mL	Collect aseptically in sterile container
<b>Bone marrow</b>	
Bone marrow: 1-3 mL	Green top (Lithium or Sodium) top tube.
<b>Bronchial wash</b>	
3 mL	Sterile Container  Collect 3 respiratory specimens in patients with clinical and chest x-ray findings compatible with TB.  These 3 specimens should be collected at 8-24 hour intervals and should include a least 1 first morning specimen.
<b>Gastric Fluid</b>	

5 - 10 mL	<p>Sterile container</p> <p>In lab, specimen will be neutralized with 1.5 mL of sodium bicarbonate within 4 hours of collection. Refrigerate.</p>
<b>Sputum</b>	
3 mL	<p>Sterile Container</p> <p>Collect 3 respiratory specimens in patients with clinical and chest x-ray findings compatible with TB.</p> <p>These 3 specimens should be collected at 8-24 hour intervals and should include a least 1 first morning specimen.</p>
<b>Stool</b>	
5 - 10 gm	Sterile container
<b>Tissue</b>	
5 – 10 mm	Aseptic collection into sterile container.
<b>Urine</b>	
20-50 mL	<p>Sterile container</p> <p>Collect a random urine specimen</p>
<b>Swab Specimens:</b>	
Wound, tissue or body fluid	<p>Culture Transport swab (non-charcoal) culturette or Eswab with adequate specimen volume.</p> <p><b>Collection instructions:</b></p> <ol style="list-style-type: none"> <li>1. Before collecting specimen, wipe away any excessive amount of secretion or discharge, if appropriate.</li> <li>2. Obtain secretions or fluid from source with sterile swab.</li> <li>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.</li> </ol>

**Special Processing:**

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

**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.

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**Interpretive****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:**

- 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 *Mycobacterium genavense* is suspected, as this species requires addition of mycobactin J to the culture medium for optimal growth.

**Smears:**

- 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 *M. tuberculosis*; other species in the genus *Mycobacterium* will stain acid-fast.
- Definitive identification requires mycobacterial culture or detection with molecular methods. *Mycobacterium tuberculosis* complex PCR is a sensitive and rapid method for detecting *Mycobacterium tuberculosis* 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](#) August 2023

**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.

8/16/2023: updated specimen collection table