



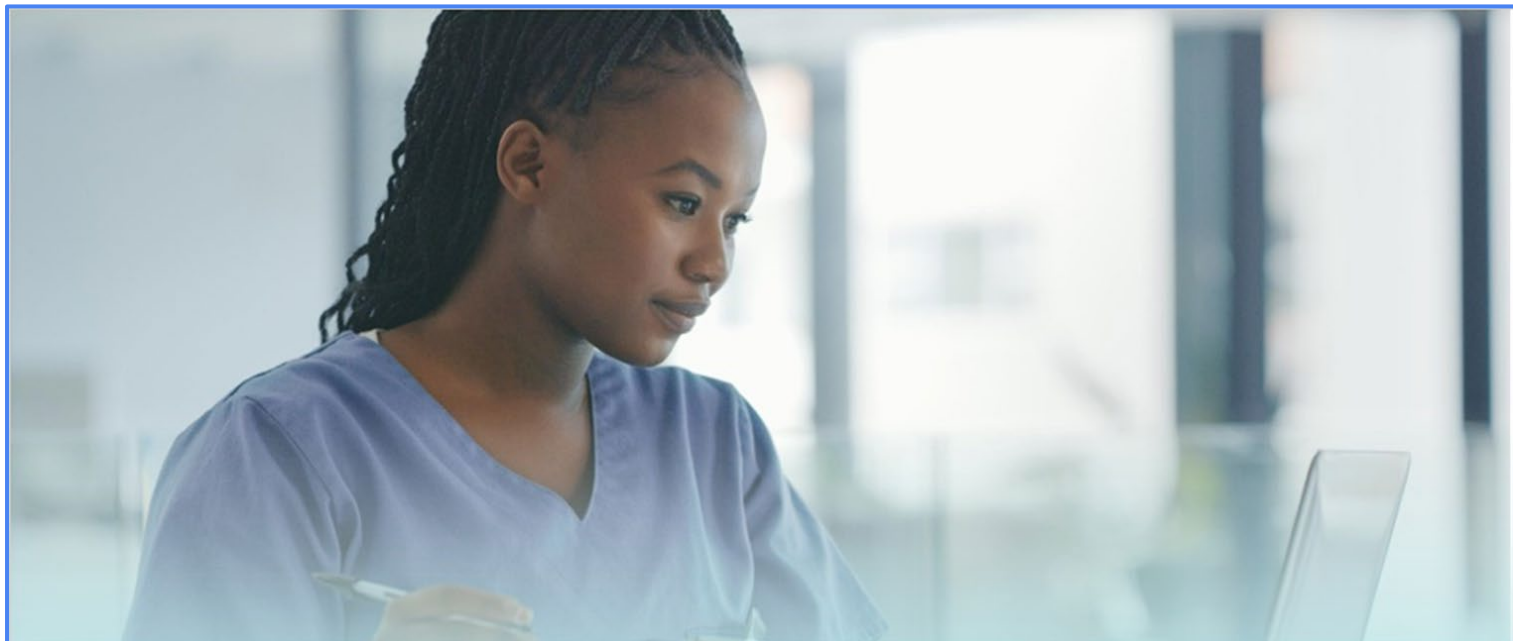
# Understanding Tuberculosis Laboratory Testing for Public Health Nurses

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## **Understanding Tuberculosis (TB) Laboratory Testing for Public Health Nurses**

Let's get started

# Purpose

## What's in it for You

The purpose of this course is to help tuberculosis (TB) public health nurses better understand:

- ✓ Laboratory testing workflow
- ✓ TB testing methods
- ✓ Associated results

**Being familiar with this information will aid effective and timely communication with the patient, clinician, and testing laboratory.**



# Objectives



## Objective 1

Summarize the importance of proper specimen collection, transport, and processing



## Objective 2

Understand a general TB testing workflow and test methods performed



## Objective 3

Define key terms for understanding test requests for TB testing



## Objective 4

Recall the expected turnaround time for laboratory results for specific tests, and the language included on reports


# Objective 1

Summarize the importance of proper specimen collection, transport, and processing

Transcript Resources Glossary Job Aid Menu

## Specimen Collection & Quality

It is important to collect a good-quality **specimen** since results depend on the quality of the specimen received by the laboratory. Poor-quality specimens are less likely to detect or isolate mycobacteria, and thus less likely to provide accurate results that directly impact treatment decisions.



Poor quality Good quality

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## Specimen Transport

Avoid waiting for multiple specimens from a patient before sending

Send as soon as possible after collection

If delayed more than one hour, refrigerate at 4°C




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## Specimen Processing



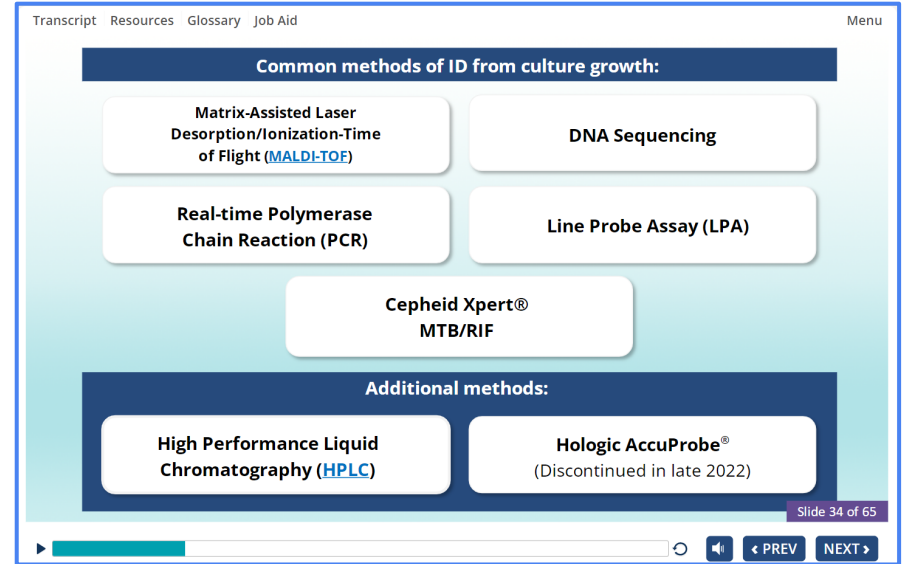
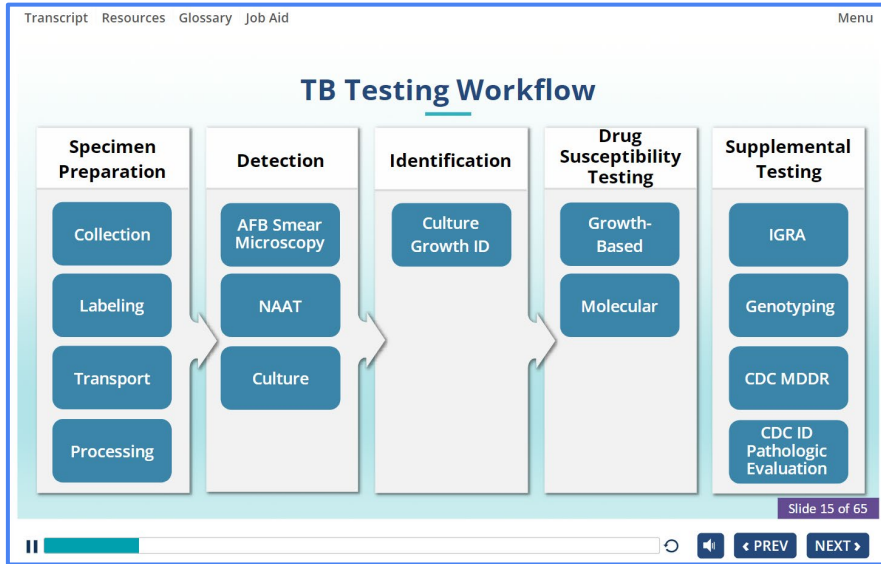
Once the specimen has been accepted and received in the laboratory, it may need processing such as digestion and decontamination.

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# Objective 2

Understand a general TB testing workflow and test methods performed



# Objective 3

Define key terms for understanding test requests for TB testing

## Growth-based DST

- Some **DST** methods test at a **critical concentration**, which is the lowest concentration of an anti-tuberculosis drug that will inhibit growth of most strains of MTBC.

**Minimum Inhibitory Concentration (MIC):** Lowest concentration of an antimicrobial drug that prevents growth of the microorganism. Determination of the **minimum inhibitory concentration (MIC)**, which is the lowest concentration of an antimicrobial drug that prevents growth of the microorganism.

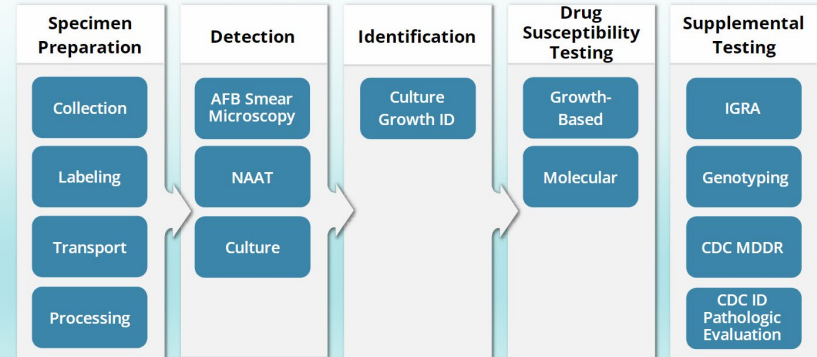
For these methods, typically a categorical result of **"resistant"** or **"susceptible"** is provided.

For these methods, a categorical result of **"resistant"** or **"susceptible"** may not be provided for all drugs tested, but instead the **MIC value is reported**.

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## TB Testing Workflow



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# Objective 4

Recall the expected turnaround time for laboratory results for specific tests, and the language included on reports

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## Identification Result Turnaround Time



**14-21 days**  
from specimen receipt at the laboratory

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## Identification Result Reporting Language

Line Probe Assay Result  
POSITIVE for Mycobacterium tuberculosis complex (Isolate 1)

Comment  
The INNO-LiPA Mycobacteria Line Probe Assay detects the following organisms: M. tuberculosis complex, M. avium complex, M. abscessus, M. chelonae, M. fortuitum complex, M. goodii, M. haemophilum, M. intracellulare, M. kansasii, M. kansasii/gastri, M. marinum/ulcerans, M. malmoense, M. scrofulaceum, M. simiae, M. smegmatis, and M. xenopi. Additional testing will be performed on Mycobacteria not specified by the Line Probe Assay.

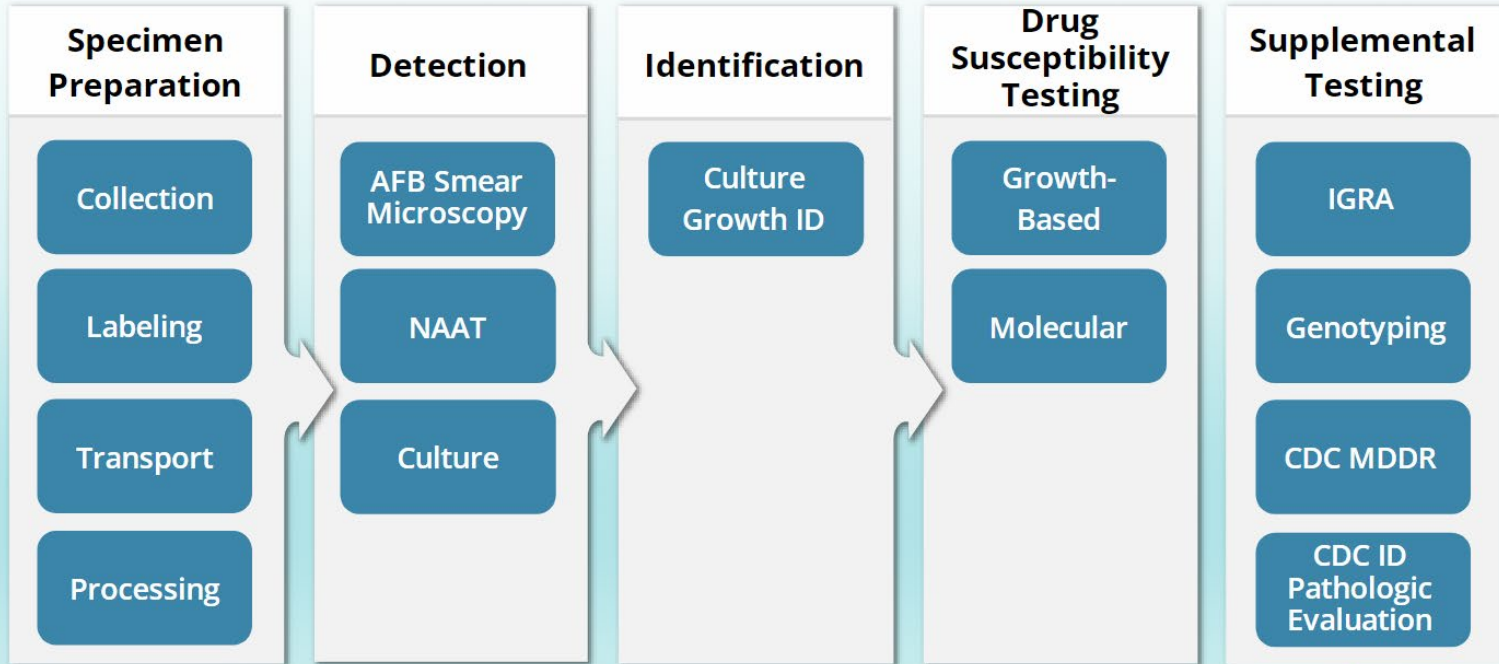
RESULTS		
Test	Result	Testing Completed
Public Health Lab		07/07/2022 09:03
M. tuberculosis complex DNA	MTB DETECTED; Rif Resistance NOT DETECTED	06/28/2022 13:04
Mycobacterium ID conclusion*	Mycobacterium Tuberculosis Complex	07/07/2022 09:03
TB Culture	ACID-FAST BACILLI ISOLATED	07/07/2022 09:00
TB Smear Conclusion	Smear POSITIVE	06/28/2022 15:33
4+ Smear		

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# TB Testing Workflow



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## Understanding Tuberculosis (TB) Laboratory Testing for Public Health Nurses

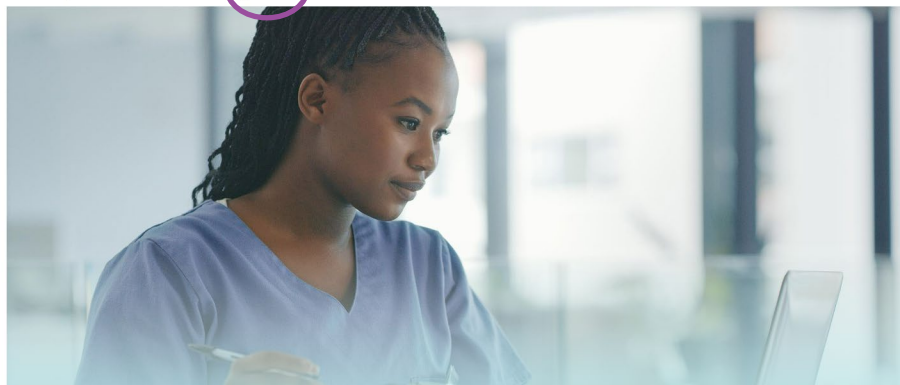
- ▼ Specimen Preparation (10 minutes)
  - Specimen Preparation
  - Specimen Collection & Quality
  - Specimen Labeling
  - Specimen Transport
  - Rejection Criteria
  - Specimen Processing
  - End of Section
- ▼ Detection (10 minutes)
  - TB Testing Workflow
  - Detection
    - Acid-Fast Bacilli (AFB) Smear Microsc...
    - AFB Smear Result Reporting Language
    - AFB Smear Result Turnaround Time
    - Nucleic Acid Amplification Test (NAAT)
    - NAAT Process
    - NAAT Result Reporting Language
    - NAAT Result Turnaround Time

Let's get started

# Job Aid

Transcript Resources Glossary **Job Aid**

Menu



## Understanding Tuberculosis (TB) Laboratory Testing for Public Health Nurses

Let's get started

### Specimen Processing

Specimen processing is a procedure that prepares a specimen for testing and increases the likelihood of mycobacterial detection and growth. The method of specimen processing is based on whether the specimen is collected as sterile or non-sterile.

- Non-sterile respiratory specimens require digestion and decontamination before inoculation to culture media.
- Sterile non-respiratory specimens do not need to be decontaminated and should be inoculated directly to culture media.

See the table below for specimen types, characteristics, and transport conditions.

Specimen Type	Optimum Characteristics	Optimum Transport Conditions
Sputum, including expectorated or induced	<ul style="list-style-type: none"><li>• Minimum volume: 3 mL</li><li>• Early morning specimen preferred (5–10 mL), collect on 3 consecutive days</li><li>• Do NOT pool specimens</li></ul>	<ul style="list-style-type: none"><li>• Sterile, leak-proof container</li><li>• Transport as soon as possible at room temperature</li><li>• Refrigerate (4°C) if transport to laboratory is delayed more than 1 hour</li><li>• Must be tested within 24 hours of collection</li></ul>
Bronchial aspirates, bronchoalveolar lavage (BAL), fine-needle aspirates, lung biopsy	<ul style="list-style-type: none"><li>• Minimum volume: 3 mL</li><li>• Early morning, collect 3 consecutive days</li><li>• Do NOT pool specimens</li></ul>	<ul style="list-style-type: none"><li>• Sterile, leak-proof container</li><li>• Refrigerate (4°C) if transport to laboratory is delayed more than 1 hour</li><li>• Must be tested within 24 hours of collection</li></ul>
Body fluids	<ul style="list-style-type: none"><li>• Minimum volume: 2 mL</li><li>• Aseptically collect as much fluid as possible (15 mL recommended)</li></ul>	<ul style="list-style-type: none"><li>• Sterile, leak-proof container</li><li>• Transport as soon as possible at room temperature</li></ul>
Gastric lavage	<ul style="list-style-type: none"><li>• Early morning collection before patients eat and while still in bed preferred</li><li>• Perform lavage with 25–50 mL chilled, sterile, distilled water</li></ul>	<ul style="list-style-type: none"><li>• Sterile, leak-proof container (e.g., 50 mL conical tube)</li><li>• Transport as soon as possible at room temperature</li><li>• If transport delayed for more than 4 hours, neutralize specimen with 100 mg sodium carbonate within 1 hour of collection and transport as soon as possible at room temperature</li></ul>
Urine	<ul style="list-style-type: none"><li>• Minimum volume: 10–15 mL</li><li>• First morning specimen preferred (40 mL, midstream)</li><li>• Do NOT pool urine specimens or use preservatives</li><li>• 1 specimen per day collected on 3 consecutive days</li></ul>	<ul style="list-style-type: none"><li>• Sterile, leak-proof container</li><li>• Transport as soon as possible at room temperature</li></ul>
Cerebrospinal fluid (CSF)	<ul style="list-style-type: none"><li>• Minimum volume: 2 mL</li><li>• Optimally collect 10 mL CSF, separate samples for chemistry, hematology, and microbiology</li></ul>	<ul style="list-style-type: none"><li>• Sterile, leak-proof container</li><li>• Transport as soon as possible at room temperature</li><li>• Do NOT refrigerate or freeze CSF</li></ul>

# Available on the APHL TB Webpage

The screenshot displays the APHL website interface. At the top, the APHL logo and name 'ASSOCIATION OF PUBLIC HEALTH LABORATORIES' are visible. A search bar is located in the upper right. Below the header is a navigation menu with categories: 'Search for Training and Resources', 'Our Value', 'Our Work', 'Your Resources', 'Your Development', 'I Want To', and 'Follow'. The main content area is titled 'Tuberculosis' and includes a sidebar with 'TB Laboratory Resources' such as 'Self-Assessment Tool', 'National PHL DST Reference Center', 'Mycobacteriology Training Modules', and 'Cooperative Agreement Toolkit'. The main text describes APHL's role in developing TB testing practices and provides information on 'Education and Training' modules. A 'Resources' sidebar on the right lists 'Recent TB Resources' including 'TB NGS Fact Sheet', 'New Tools in the Mycobacterial Identification Toolbox: MALDI-TOF MS', 'TB Training Materials', 'Identifying MTBC and NTM: The New Toolbox', and 'Understanding Tuberculosis (TB) Laboratory Testing for Public Health Nurses'. A large QR code is overlaid on the right side of the page, and a purple arrow points to the 'Understanding Tuberculosis (TB) Laboratory Testing for Public Health Nurses' resource in the sidebar.

## Understanding Tuberculosis (TB) Laboratory Testing for Public Health Nurses

### Free Training Course



The Association of Public Health Laboratories (APHL) is excited to announce a newly developed course, Understanding Tuberculosis Laboratory Testing for Public Health Nurses, now available on our website.



This course will help participants better understand TB laboratory testing workflow, testing methods, and associated results. Being familiar with this information will aid effective and timely communication with the patient, clinician, and testing laboratory.

### AUDIENCE

This course has been designed and developed for public health nurses who collect specimens for TB testing and are responsible for reported TB laboratory results. The course may also be helpful to clinicians and other providers/submitters.

### OBJECTIVES

At the conclusion of the course, the participant will be able to:

- Summarize the importance of proper specimen collection, transport, and processing
- Understand a general TB testing workflow and test methods performed
- Define key terms for understanding test requests for TB testing
- Recall the expected turnaround time for TB laboratory results for specific tests and the language included on reports

### Access the course [here](#) or at:

[https://www.aphl.org/programs/infectious\\_disease/tuberculosis/Understanding\\_TB\\_Lab\\_Test\\_Nurses/story.html](https://www.aphl.org/programs/infectious_disease/tuberculosis/Understanding_TB_Lab_Test_Nurses/story.html)

This course is temporarily available on the APHL website. Once the course has been added to the APHL Training Portal, continuing education credit will be available for completing the course.

APHL is approved as a provider of continuing education programs in the clinical laboratory sciences by the ASCLS P.A.C.E.® Program.

*For more information about this course, please email [erin.estes@aphl.org](mailto:erin.estes@aphl.org)*

Modules are complemented by references and resources. Developed by APHL in collaboration with the Centers for Disease Control and Prevention (CDC).

This course was reviewed by a team of TB care and prevention experts with the assistance of the CDC Centers of Excellence at the Global Tuberculosis Institute Rutgers, The State University of New Jersey and the National Tuberculosis Controllers Association.

# Questions?

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For more information, contact CDC  
1-800-CDC-INFO (232-4636)  
TTY: 1-888-232-6348 [www.cdc.gov](http://www.cdc.gov)

The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

