

What You Need To Know About Testing Sputum Samples:

TB Drug Susceptibility Testing Edition

I. What is TB drug susceptibility testing?

- This test is ordered for confirmed TB cases with a positive culture.
- TB drug susceptibility testing determines whether the patient's current medications will be effective against the patient's TB bacteria.

II. Why do we run TB drug susceptibility testing?

- TB bacteria can mutate. When mutations occur, some TB medication may not work against a patient's TB.
- Drug susceptibility testing lets us know which medications will cure the patient.
- A resistant TB strain will impact a patient's TB regimen.
 - Second-line medications may be used (ie. amikacin, cycloserine, moxifloxacin)
 - Duration of treatment is longer

III. How does the laboratory run this test?

1. Once *Mycobacterium tuberculosis* (MTB) complex is identified, a TB drug susceptibility test will be performed using a MGIT 960 tube.
2. The MGIT 960 tube containing the positive patient specimen will be placed in the third drawer of the MGIT 960 machine.
3. The RIPE drug susceptibility tests will be incubated in the third drawer to see which medications effectively treat the patient's TB.
 - a. Rifampin (RIF)
 - b. Isoniazid (INH)
 - c. Pyrazinamide (PZA)
 - d. Ethambutol (EMB)



MGIT 960 machine



MTB Drug Susceptibility Set Up for MGIT 960

IV. Results: What to Expect?

- Results are usually reported to TB Control within 28 days of submitting a sputum as:
 - **Susceptible** to a specific medication: The medication will stop the TB bacteria from growing.
 - **Resistant** to a specific medication: The medication will not stop the TB bacteria from growing.
- Resistance can occur in one or more TB medications.
 - Drug-resistant TB (DR): Resistant to one medication
 - Multidrug-resistant TB (MDR): Resistant to INH + RIF
 - Extensively Drug-resistant TB (XDR): Resistant to INH + RIF + any fluoroquinolone + one second-line injectable drug
- When resistance occurs, the patient's drug regimen and duration of treatment will change.
 - Drugs with more toxic side effects will be used.
 - Treatment will last longer.
- A contact to a drug-resistant TB case may see a change in the preventative treatment regimen.

V. Next Steps

The MTB culture will be sent to the Texas Department of State Health Services Laboratory. From there, the culture will be forwarded to the California Department of Health Services Microbial Disease Laboratory for genotyping.

Example: If the TB case is INH-resistant, the contact will take RIF treatment.