



MYCOBACTERIUM TIP SHEET

- [Nontuberculous Mycobacterium \(NTM\)](#)
- [Tuberculosis](#)
- [Latent Tuberculosis Infection \(LTBI\)](#)

NONTUBERCULOUS MYCOBACTERIUM (NTM)

BACKGROUND

Nontuberculous mycobacterium (NTM), previously referred to as Mycobacterium other than tuberculosis (MOTT), are any mycobacterium species other than *Mycobacterium tuberculosis* and *M. leprae*. Common examples include *M. avium*, *M. abscessus*, and *M. fortuitum*. NTM are opportunistic pathogens that can infect those with depressed immune systems or underlying lung disease. NTM are naturally found in soil and water but are typically not transmitted person-to-person. While *M. gordonae* is an NTM it is most often a lab contaminant during specimen processing and not actually a cause of infection.

INVESTIGATION

Though NTMs are not reportable conditions in Michigan and do not require case investigation, they often are reported into MDSS and should be classified appropriately to ensure that they are not accidentally counted as tuberculosis cases. The Surveillance and Healthcare-Associated and Resistant Pathogen (SHARP) unit may re-open a case if that pathogen is identified as part of a healthcare-associated investigation.

MDSS CLASSIFICATION

- Review the species in the lab result to ensure the case is an NTM
- Under **Reportable Condition**, select “Nontuberculous mycobacterium”
- Under **Case Status**, select “Confirmed;” if *M. gordonae*, select “Not a case”
- Under **Investigation Status**, select “Review;” the MDHHS TB program will review the lab info and then mark the case and investigation status as appropriate

Note: NTM has a disease-specific Case Detail form in MDSS. Use caution when changing the Reportable Condition from one mycobacterium classification to another since data could be lost.

DEDUPLICATION

- If the case was previously reported with the same Mycobacterium species and less than 24 months have passed, choose “Matches Existing”
- If the case was previously reported with the same Mycobacterium species and 24 or more months have passed, choose “Create New”
- If the case was ever previously reported with a different Mycobacterium species, choose “Create New”



TUBERCULOSIS

BACKGROUND

Tuberculosis (TB) is caused by a bacterium called *Mycobacterium tuberculosis*. The bacteria usually attack the lungs, but TB bacteria can attack any part of the body such as the lymph nodes, eyes, kidney, spine, and brain. Not everyone infected with TB bacteria becomes sick. As a result, two TB-related conditions exist: latent TB infection (LTBI) and TB disease. If not treated properly, TB disease can be fatal.

TB is spread through the air when a person with TB disease of the lungs or throat coughs, sneezes, speaks, or sings. Other people who spend a lot of time near the person with disease may breathe in these bacteria and become infected. The bacteria are not spread through shaking hands or sharing food.

INVESTIGATION

There are two types of tests for TB infection: the TB skin test and the TB blood test.

The TB skin test is also called the Mantoux tuberculin skin test (TST). A TB skin test requires two visits with a health care provider. On the first visit the test is placed; on the second visit the health care provider reads the test.

TB blood tests are also called interferon-gamma release assays or IGRAs. Two TB blood tests are approved by the U.S. Food and Drug Administration (FDA) and are available in the United States: the QuantiFERON®–TB Gold Plus test (QFT-Plus) and the T-SPOT®.TB test (T-Spot).

- **Positive TB blood test:** This means that the person has been infected with TB bacteria. Additional tests and physical examination are needed to determine if the person has latent TB infection or TB disease.
- **Negative TB blood test:** This means that the person's blood did not react to the test and that latent TB infection or TB disease is unlikely.

TB disease is to be treated by taking a combination of U.S. Food and Drug Administration (FDA) TB approved drugs for 6 to 12 months. First-line anti-TB agents that form the core treatment regimen are: Isoniazid (INH), rifampin (RIF), ethambutol (EMB), pyrazinamide (PZA)

TB Contact Investigations are conducted when someone with active TB unknowingly exposes others including: family members, friends, neighbors, co-workers, and others with whom the case spend time while infectious. The purpose of this contact investigation is to protect others and prevent further spread of TB. When the active TB case is a child a source case investigation is conducted to determine who transmitted *M. tuberculosis* to the child.

2009 TB CASE DEFINITION

Clinical Description - A chronic bacterial infection caused by *Mycobacterium tuberculosis*, usually characterized pathologically by the formation of granulomas. The most common site of infection is the lung, but other organs may be involved.

- Clinical Criteria - A case that meets all the following criteria:
 - A positive tuberculin skin test or positive interferon gamma release assay for *M. tuberculosis*.
 - Other signs and symptoms compatible with tuberculosis (TB) (e.g., abnormal chest radiograph, abnormal chest computerized tomography scan or other chest imaging study, or clinical evidence of current disease)
 - Treatment with two or more anti-TB medications



- A completed diagnostic evaluation
- Laboratory Criteria for Diagnosis
 - Isolation of *M. tuberculosis* from a clinical specimen,* OR
 - Demonstration of *M. tuberculosis* complex from a clinical specimen by nucleic acid amplification test,** OR
 - Demonstration of acid-fast bacilli in a clinical specimen when a culture has not been or cannot be obtained or is falsely negative or contaminated.

Case Classification

- Confirmed: A case that meets the clinical case definition or is laboratory confirmed

Notes: case should not be counted twice within any consecutive 12-month period. However, a case occurring in a patient who had previously had verified TB disease should be reported and counted again if more than 12 months have elapsed since the patient completed therapy. A case should also be reported and counted again if the patient was lost to supervision for greater than 12 months and TB disease can be verified again. Mycobacterial diseases other than those caused by *M. tuberculosis* complex should not be counted in tuberculosis morbidity statistics unless there is concurrent tuberculosis.

* Use of rapid identification techniques for *M. tuberculosis* (e.g., DNA probes and mycolic acid high-pressure liquid chromatography performed on a culture from a clinical specimen) are acceptable under this criterion.

**Nucleic acid amplification (NAA) tests must be accompanied by culture for mycobacteria species for clinical purposes. A culture isolate of *M. tuberculosis* complex is required for complete drug susceptibility testing and also genotyping. However, for surveillance purposes, CDC will accept results obtained from NAA tests approved by the Food and Drug Administration (FDA) and used according to the approved product labeling on the package insert, or a test produced and validated in accordance with applicable FDA and Clinical Laboratory Improvement Amendments (CLIA) regulations.

MDSS CLASSIFICATION

Reference: [Process of Reporting Suspect and Active Cases of Tuberculosis](#)

A suspect or confirmed case of TB can be reported to the Local Health Department (LHD) by a laboratory or health care provider (HCP). The MDSS accepts electronic lab reports (ELRs) from the MDHHS lab and many other reference laboratories, and an ELR will automatically trigger a new case report in MDSS. HCPs may also manually enter initial information about a suspect or confirmed case of TB into the MDSS. LHD staff need to be aware of new reports of TB cases in the MDSS that require investigation.

- If entering the case manually, use the MDSS reportable condition “Tuberculosis.” Information should be entered into the MDSS as soon as a specimen has been submitted to a lab or the patient has been started on TB treatment. At this step, leave the Investigation Status as “New.”
- If an electronic lab report is submitted and MDHHS TB Unit staff know the case will be counted, they will add an RVCT number and count date and change the status to “Active.”

LHD staff will then complete the following:

- RVCT (Detail Form) Pages 1-8
- RVCT (Detail Form) Page 15, fields “Submitted By”, “Date”, “Health Department”, “Phone Number” and “Ext.”
- Change the Investigation Status to “Review” to indicate the case is ready for review by MDHHS TB Unit.

At this step, leave the Investigation Status as “Review”. This is the signal for the MDHHS TB Unit to review the case for counting. For any items in the RVCT that are unknown, please mark “unknown” – do not leave necessary questions unchecked.



Within 7 days complete the following sections: Patient Information, Demographics, Clinical Information and Laboratory Information.

Within 30 days complete all other information on pages 1-8.

Seven days after a case is counted by the MDHHS TB Unit, MDHHS TB staff will submit the case to CDC and the investigation status will be set to “Completed - Follow Up” for the duration of therapy. This allows MDHHS and the LHD to continue updating the RVCT form. Updates will be sent to CDC on a weekly basis.

When drug susceptibility information is available, the MDHHS TB Unit will enter the information into Follow-Up 1 Report, page 9, of the RVCT.

LHD staff are responsible for case management of the TB patient for the duration of TB therapy (which should include Direct Observed Therapy or DOT).

- The Follow-Up 2 form of the RVCT should be completed upon completion of therapy, or discontinuation of therapy due to death, not before.
- The investigation status should remain as “Completed - Follow Up” until completed.

When Follow-Up 2 information has been added to the MDSS, LHD staff should change the investigation status to “Review”. MDHHS will review all case information, and once all necessary information is collected MDHHS will mark the case “Completed” for final transmission to CDC.

LATENT TUBERCULOSIS INFECTION (LTBI)

BACKGROUND

Not everyone infected with *M. tuberculosis* becomes sick. People who are not sick have what is commonly called Latent TB Infection (TB Infection). People with TB Infection do not feel sick, do not have any symptoms, and cannot spread TB to others. Nevertheless, some people with TB Infection go on to develop TB Disease. Likelihood of developing TB Disease is variable depending on a number of risk factors.

INVESTIGATION

LTBI is not yet a reportable condition in Michigan. Cases should be investigated as time allows. LHDs may not have time to investigate every case completely but case detail forms should be completed as accurately as possible. Important information to gather includes: US/foreign born status, reason for TB evaluation, TB skin or blood test results, chest imaging results, and culture results (if performed). If known, also record the source of infection, HIV status, and other relevant risk factors such as time spent outside the US. Treatment information should also be documented.

Since the Technical Instructions for TB screening during the immigration medical exam were updated in October 2018, Civil Surgeons have been required to report clients diagnosed with LTBI to the health department. Civil surgeons should report the following to the appropriate health department by creating an MDSS case: client’s name, contact information, IGRA result (or TST if under 2 years of age), and chest imaging results.

TB evaluations for class A and B immigrants and refugees are referred for local health follow-up as LTBI in MDSS (they were previously reported as “Refugee Health Assessment”). Please refer to attached documents in the notes tab for information about the client.



2018 LTBI CASE DEFINITION

Clinical criteria alone are not sufficient to classify a case of TB Infection.

- Laboratory Criteria:
 - A positive tuberculin skin test (TST) **OR** interferon gamma release assay (IGRA)
- Clinical Criteria:
 - No signs or symptoms consistent with TB Disease
AND ONE OF THE FOLLOWING:
 - A. Chest imaging without abnormalities consistent with TB (chest radiographic or CT scan)
 - B. Abnormal chest imaging that could be consistent with TB Disease with microbiologic testing that is negative for MTB Complex and where TB disease has been clinically ruled out
- Criteria to Distinguish a New Case from an Existing Case:
 - A new case is an incident (new diagnosis) TB infection case that meets the suspected or confirmed case criteria that has not previously been diagnosed or treated for TB infection OR previously treated for TB Disease.
- Suspect: A new case that meets one or more of the laboratory criteria and has not previously been reported and classified as “Confirmed” in MDSS
- Probable: Not to be used for LTBI or TB Case Definitions
- Confirmed: A case that meets both the laboratory criteria **AND** the clinical criteria for TB Infection **AND M. tuberculosis** complex was not isolated from a clinical specimen, if a specimen was collected, and has not previously been reported and classified as “Confirmed” in MDSS.

Note: If a case does not meet the laboratory criteria or there is insufficient information to classify as LTBI (e.g. indeterminate QFT result or TST is 7mm and additional testing information is not available), it can be classified as ‘Not a Case’ and closed.

MDSS CLASSIFICATION

Complete LTBI investigations for cases depending on treatment status:

- After Treatment **Initiation:**
 - Verify diagnosis of LTBI and update case status to “Suspect” or “Confirmed”
 - Complete case detail form as time and information is available.
 - Change investigation status to “Completed” then change investigation status to “Completed - Follow Up” to continue to update treatment information
- After Treatment **Completion:**
 - Confirm that treatment stopped (whether or not full course was completed)
 - If patient is lost to follow-up, document in the notes section.
 - Enter “Date Therapy Stopped,” “Reason Therapy Stopped,” and active TB info, if applicable.
 - Change investigation status to “Completed”

LTBI cases do not need to be marked as “Review.”

DEDUPLICATION

- If the case was previously reported as a case of Tuberculosis, choose “Matches Existing”
- If the case was previously reported as “Confirmed” Latent Tuberculosis Infection, choose “Matches Existing”



- If the case was previously reported and classified as “Suspect” and less than 12 months have passed, choose “Matches Existing”
- If the case was previously reported and classified as “Suspect” and more than 12 months have passed, choose “Create New”
- If the case was previously reported and closed as “Not a Case,” choose “Create New”

Additional Guidance is available for LTBI on the MDHHS TB Website and in the following presentation

- TB Nurse Network Meeting January 17, 2018 presentation slides including section by Shona Smith (MDHHS) “[Latent TB Infection: MDSS Guidance](#)”

Resources:

[CDC TB website](http://www.cdc.gov/tb): www.cdc.gov/tb

[MDHHS TB website](http://www.michigan.gov/tb): www.michigan.gov/tb

[MDHHS MDSS website](http://www.michigan.gov/mdss): www.michigan.gov/mdss

[MDHHS TB MDSS Guidance Document](#):

https://www.michigan.gov/documents/mdch/MDSS_Suspect_Active_TB_Case_Reporting_Guide_358940_7.pdf