

TUBERCULOSIS (TB) SCREENING AND TESTING

Background: TB is a communicable disease caused by *Mycobacterium tuberculosis*, or the tubercle bacillus. It is spread primarily by tiny airborne particles (droplet nuclei) expelled by a person who has infectious TB. If another person inhales air containing these droplet nuclei, transmission may occur. Although the majority of TB cases are pulmonary, TB can occur in almost any anatomical site. TB can cause disability and/or death if not detected and treated appropriately.

Targeted High-Risk Groups for TB Screening:

- Close contacts of persons with active TB
- Foreign-born persons from areas where TB is common
- Residents and workers in high-risk congregate settings
- Health care workers who serve high-risk clients
- Medically under-served, low-income populations
- Persons with certain medical conditions, such as HIV infection, diabetes, cancer, etc.
- Persons receiving immunosuppressive therapy
- Children exposed to adults in high-risk categories
- Persons who inject illicit drugs
- High-risk racial or ethnic minority populations defined locally as having an increased prevalence of TB

Signs and Symptoms of TB:

Pulmonary symptoms

- Productive, prolonged cough (≥ 3 weeks)
- Chest pain
- Hemoptysis

Systemic symptoms

- Fever
- Chills
- Night sweats
- Loss of appetite
- Weight loss
- Fatigue

Other symptoms may occur depending on the part of the body affected.

Standard TB Skin Testing Method: Mantoux (intradermal). Multiple puncture tests such as “Tine” are not recommended. A Mantoux skin test should only be administered by health care workers that have been trained to perform the intradermal test. Tuberculin Skin Testing (TST) is one of the available testing methods. There is also blood-based interferon-gamma release assays (IGRAs) used for TB testing such as QuantiFERON-TB Gold, QuantiFERON TB Gold In-Tube or T-SPOT. IGRAs have been approved for use in adults in all circumstances where a TST would be used. However, there is a lack of published data related to IGRA use in children and the American Academy of Pediatrics only recommends its use in place of TST in immunocompetent children 5 years of age or older.

Live Vaccines

A TB skin test can be administered before or on the same day as live-virus vaccines (e.g. MMR, varicella). If a live-virus vaccine has been administered recently, the TB skin test should be delayed at least 4 weeks after vaccination.

Reading TB Skin Test Results:

A trained health care worker should read the reaction to the Mantoux test 48 to 72 hours after the injection. Patients should never be allowed to read their own tuberculin skin test results. If a patient fails to show up for the scheduled reading, a positive reaction may still be measurable up to 1 week after testing. However, if a patient who fails to return within 72 hours has a negative test, tuberculin testing should be repeated.

Classifying the Tuberculin Reaction

The Michigan Department of Community Health TB Program along with the Michigan Advisory Committee for the Elimination of TB (MIACET) has issued recommendations based on the Centers for Disease Control and Prevention (CDC) guidelines which are as follows:

≥ 5 mm is classified as positive in:

- HIV-positive persons
- Recent contacts of a TB case
- Persons with fibrotic changes on chest x-ray consistent with old healed TB
- Patients with organ transplants and other immunosuppressed patients (including persons taking a course of oral or intravenous corticosteroids or TNF- α antagonists)

≥ 10 mm is classified as positive in:

- Recent arrivals from high-prevalence countries
- Injection drug users
- Residents and employees of high risk congregate settings
- Mycobacteriology laboratory personnel
- Persons with clinical conditions that place them at high risk (e.g. silicosis, diabetes mellitus, severe kidney disease, certain types of cancer)
- Children < 4 years of age, or

Children and adolescents exposed to adults in high-risk categories

≥15 mm is classified as positive in persons with no known risk factors for TB
TB skin test discouraged in low risk categories

Skin Test Sensitivity:

It may take 2-10 weeks to develop a positive reaction after infection.

Active TB Disease versus Latent TB Infection:

Persons who are infected with tuberculosis, but who do not have TB disease cannot spread the infection to other people. TB infection in a person who does not have TB disease is not considered a case of TB and is often referred to as having latent TB infection (LTBI). In some people, the TB bacilli overcome the defenses of the immune system and begin to multiply, resulting in the progression from TB infection to TB disease. This process may occur soon after or many years after infection. In the United States, unless they are treated, approximately 5% of persons who have been infected with tuberculosis will develop TB disease in the first year or two after infection and another 5% will develop disease sometime later in life.

Reporting Requirements:

Any suspected or confirmed case of TB disease should be reported by the physician to the local health department within 24 hours of diagnosis. Laboratories are also required to report. Individuals with positive TB skin tests that are not infectious (latent TB infection) are not required to be reported.

Laboratory Services Available from Michigan Department of Community Health (these tests are available at no cost):

- sputum smears and/or culture
- drug susceptibilities are performed on all TB specimens
- direct amplification testing

Reminders:

- Persons with a documented history of a positive reaction to TB skin testing should not be re-tested.
- Persons with positive TB skin test results should have a chest x-ray as part of the initial evaluation of their tuberculosis skin test. If negative, repeat chest x-rays are not needed unless symptoms develop that could be attributed to TB. Persons with a history of a positive TB skin test who develop signs and symptoms suggestive of TB should undergo a medical evaluation including a chest x-ray.
- Pregnant women should be targeted for tuberculin skin testing only if they have a specific risk factor for latent TB infection or if they have a risk of progression from LTBI to disease.
- Tuberculin skin testing is not contraindicated for BCG vaccinated persons. A positive reaction as a result of BCG wanes after 5 years.

Resources Available from your Local Health Department:

- TB medication for county residents
- Medical assessment and treatment
- Consultation/advice
- TB skin test training may be available

Recommendations for TB Screening of Health Care Workers (see [Guidelines for Preventing the Transmission of Mycobacterium tuberculosis in Health-Care Settings, 2005](#) MMWR 2005; 54 (No. RR-17, 1-141))

- New employees with a history of negative skin tests:
 - Complete two-step testing
- New employee with a history of a positive TB skin test:
 - Complete a TB health questionnaire
- The employer shall offer tuberculin skin tests (TST) or blood assay *M. tuberculosis* (BAMT) annually to employees/health-care workers in settings where risk assessment has determined that employees/health-care workers will or will possibly be exposed to persons with TB disease or to clinical specimens that might contain *M. tuberculosis*.
- Established employee working in a facility with potential ongoing transmission, offer test every eight to ten weeks until the cause of transmission has been corrected and no additional evidence of ongoing transmission is apparent.
- Established employee with a history of positive test, complete annual health questionnaire (no annual chest x-ray).
- Employee with known exposure to TB, test immediately and again in eight to ten weeks.

Additional Resources:

- MDCH TB Control Program (517) 335-8165 or www.michigan.gov/tb
- www.cdc.gov/nchstp/tb/