

PROTOCOL FOR TUBERCULIN TESTING

There are two types of tests used to identify persons infected with *Mycobacterium tuberculosis*. Through screening, infected persons are identified so they can receive treatment to prevent the development of disease and persons with disease are detected so they can be treated. In a setting where persons are grouped together in a relatively closed environment, the possibility of transmission of tuberculosis (TB) infection is far greater than in the general population.

REMINDER: Any suspected case of tuberculosis disease (active) and all positive *M. tuberculosis* cultures (regardless of site) are reportable to the local health department within 24 hours. Any case of tuberculosis infection (latent) and all positive TB skin or blood tests are reportable to the local health department within one week.

TB Skin Test

The Mantoux tuberculin skin test (TST) is performed by the intradermal injection of 0.1ml of tuberculin purified protein derivative (PPD) into either the volar or dorsal surface of the forearm. The injection should be made with a disposable tuberculin syringe. The injection should be made just beneath the surface of the skin with the needle bevel facing upward to produce a discrete, pale elevation of the skin (a wheal) 6mm to 10mm in diameter.

The tuberculin test should be read 48 to 72 hours after the injection. A patient who does not return within 72 hours will need to be rescheduled for another skin test. The reaction should be measured in millimeters of the induration (palpable, raised, hardened area or swelling). The reader should not measure erythema. The diameter of the indurated area should be measured across the forearm (perpendicular to the long axis). Reactions are to be recorded by date, type of skin test, and the measurement of induration in millimeters; no reaction would be recorded as 0mm.

The tuberculin skin test must be given and read by a professional who has been trained to do this, and has been informed of the most recent guidelines in tuberculosis control. Never allow anyone other than a nurse or physician to read a tuberculin skin test. The patient and his/her family must not be depended upon to interpret the results of these tests since an incorrect reading can result in a false sense of security and may adversely affect the health of the patient and the control of tuberculosis. If a patient is given proper documentation (including date, site, type of test and by whom), the skin test may be read by a professional other than the one who gave the test.

An **induration of 5 or more millimeters** is considered positive in:

- HIV-infected persons
- A recent contact of a person with TB disease
- Persons with fibrotic changes on chest radiograph consistent with prior TB
- Patients with organ transplants
- Persons who are immunosuppressed for other reasons (e.g., taking the equivalent of >15 mg/day of prednisone for 1 month or longer, taking TNF-a antagonists)

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An **induration of 10 or more millimeters** is considered positive in:

- Recent immigrants (< 5 years) 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
- Children < 4 years of age
- Infants, children, and adolescents exposed to adults in high-risk categories

An **induration of 15 or more millimeters** is considered positive in any person, including persons with no known risk factors for TB. However, targeted skin testing programs should only be conducted among high-risk groups.

Two-step testing (one to three weeks apart) should be used for the initial skin testing of adults who will be retested periodically, such as health care workers and nursing home residents, to establish a baseline and avoid misinterpretation of a boosted reaction. Then routine screening would consist of one test as often as indicated by risk assessment.

Vaccination with live viruses may interfere with TST reactions. For persons scheduled to receive a TST, testing should be done as follows:

- Either on the same day as vaccination with live-virus vaccine or four to six weeks after the administration of the live-virus vaccine
- At least one month after smallpox vaccination

TB Blood Tests

TB blood tests (also called interferon-gamma release assays or IGRAs) measure how the immune system reacts to the bacteria that cause TB. An IGRA measures how strong a person's immune system reacts to TB bacteria by testing the person's blood in a laboratory. There is no problem with repeated IGRAs.

Two IGRAs are approved by the U.S. Food and Drug Administration (FDA) and are available in the United States:

1. QuantiFERON®–TB Gold In-Tube test (QFT-GIT)
2. T-SPOT®.TB test (T-Spot)
 - **Positive IGRA:** This means that the person has been infected with TB bacteria. Additional tests are needed to determine if the person has latent TB infection or TB disease
 - **Negative IGRA:** This means that the person's blood did not react to the test and that latent TB infection or TB disease is not likely

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IGRAs are the preferred method of TB infection testing for the following:

- People who have received bacille Calmette–Guérin (BCG). BCG is a vaccine for TB disease
- People who have a difficult time returning for a second appointment to look for a reaction to the TST

When a TB test is positive, the person is to have a chest x-ray and clinical exam. The major justifiable reason for continued screening is to find infected individuals and to prevent disease in persons found infected. Therefore, preventive therapy for infected persons must receive as high priority as the actual screening program. Medication for this is supplied by the Division of Tuberculosis Elimination, through local health departments.