Mantoux tuberculin skin test

1 Administration

For each patient, conduct a risk assessment that takes into consideration recent exposure and clinical conditions that increase risk for TB disease if infected, to determine if the skin test should be administered. The goal of testing is to identify these individuals who could benefit from treatment of Latent TB Infection.

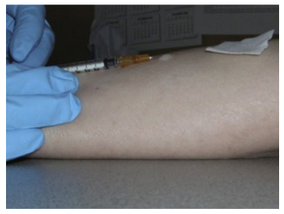
1 *Handling the solution*

- The purified protein derivative (PPD) should be stored between 2° and 8 °C and never frozen. Discard the solution if it freezes.
- Remove the tuberculin solution from the vial under aseptic conditions. A little more than 0.1 mL of PPD solution should be drawn into the TB syringe. Hold the syringe upright and lightly tap out the air, then expel one drop. Check that a full 0.1 mL remains in the syringe.
- Do not transfer the solution from one container to another, as the potency of the PPD may be diminished.
- Draw up the solution just before injecting it. Do not preload syringes for later use as the potency of the PPD may be diminished.
- The solution can be adversely affected by exposure to light. PPD should be stored in the dark except when doses are actually being withdrawn from the vial.
- Use the solution within one month after opening, as the potency of the solution may be diminished. Label each bottle with the discard date when it is opened.

2 *Preparing the person to be tested*

- Seat the person comfortably and explain the procedure.
- Use the inner aspect of the forearm, preferably the nondominant arm (where administration and reading of the reaction is easiest), about 10 cm (4 inches) below the elbow; avoid areas with abrasions, swelling, visible veins or lesions. If there is a localized rash, a burn or localized eczema, avoid this area.
- If neither forearm is suitable, use the outside of the forearm or the upper arm. In this case mark the location clearly in the record.
- Cleanse the area to be injected with an alcohol swab and let the area dry.
- Do not use EMLA® cream (or similar local anesthetic cream), as application of this cream has been reported to cause localized edema, which could easily be confused with a positive TST result.

3 *Injecting the PPD tuberculin solution*



Source: Canadian Tuberculosis Standards

- Use a 0.6 to 1.3 cm (¼ to ½ inch), 26- or 27-gauge needle with a disposable plastic tuberculin syringe.
- Position the bevel of the needle so that it opens facing up.
- While holding the skin of the inner aspect of the forearm taut, insert the needle at a 5°-15° angle to the skin without aspirating. The tip of the needle will be visible just below the surface of the skin. The needle is inserted until the entire bevel is covered.
- Administer the PPD by the slow intradermal injection of 0.1 mL (5 tuberculin units).
- A discrete, pale elevation of the skin (a wheal) 6-10 mm in diameter should appear. The wheal will typically disappear in 10-15 minutes. The size of the wheal is not completely reliable, but if a lot of liquid runs out at the time of injection and there is no wheal, then repeat the injection on the opposite forearm, or on the same forearm as before, but at least 5 cm from the previous injection site.
- A drop of blood may be seen — this is normal. The person tested should be offered gauze to remove the blood but should be advised not to massage the site in order to avoid squeezing out the PPD and disrupting the test.
- Do not cover the site with a bandage.
- Tell the patient that they should not scratch the site but may perform all normal activities, including showering or bathing.
- Place uncapped disposable needles and syringes in appropriate puncture-resistant containers immediately after use.
- If the TST is accidentally given as a subcutaneous or an intramuscular injection, this should not pose a serious risk of harm. It is possible that tuberculin-sensitive persons may have localized inflammation, which should be self-limited. It would not be possible to take a measurement of, or clinically interpret, any such reaction, so the TST should be administered again immediately using proper intradermal technique on the volar surface of the forearm. After administration, record the following:
  Date of injection, Dose of PPD (5 tuberculin units, 0.1 mL), PPD manufacturer, PPD lot number, Expiration date of the PPD reagent, Site of injection
  Person administering the TST.
- In settings where TST administration may be unsupervised or performed by persons with minimal experience, the quality of TST administration may be assessed by following mobile TST (mTST) protocols,17,18 whereby photos of the wheal created after administration are taken and evaluated by an experienced reviewer.

Note: Reliable administration and reading of the tuberculin skin test involves standardization of procedures, training, supervision, and practice. Always follow your institution's policies and procedures regarding infection control, evaluation, and referral. Also remember to provide culturally appropriate patient education before and after administration, reading, and interpretation of the skin test.

For more information on tuberculosis, visit: www.healthunit.org/professionals/
To report a positive Tuberculin skin test contact the Health Unit at:
613-345-5685 or 613-283-2740

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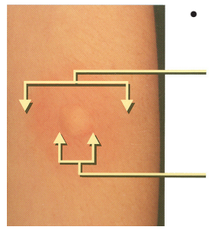
2 Reading

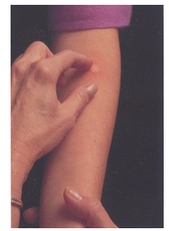
The skin test should be read between 48 and 72 hours after administration. If the test is not read within the specified time frame, the test will have to be repeated.

1 *Inspect site*



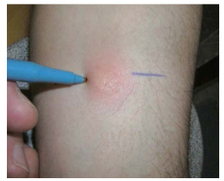
- Visually inspect site under good light
- Erythema (reddening of the skin) – do not measure
- Induration (hard, dense, raised formation)

2 *Palpate induration*



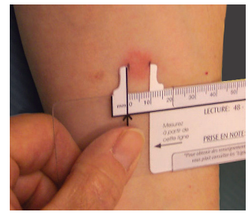
- Use fingertips to find margins of induration

3 *Mark induration*



- Mark the border of induration by moving the tip of a pen at a 45˚ angle laterally toward the site of the injection

4 *Measure induration (not erythema)*



- Place "0" ruler line inside left dot edge
- Read ruler line inside right dot edge (use lower measurement if between two gradations on mm scale)
- Record the result in millimetres (mm)

3 Interpretation

The **size** of the reaction is only one element of interpreting a positive Tuberculin Skin Test (TST). Consideration should be given to the size of induration, positive predictive value and risk of development of active TB disease.

TST result	Situation in which reaction is considered postitive
<5 mm	• In general, this is considered negative
≥5 mm	• People living with HIV • Known recent (<2 years) contact with a patient with infectious TB disease • Fibronodular disease on chest x-ray (evidence of healed, untreated TB) • Prior to organ transplantation and receipt of immunosuppressive therapy • Prior to receipt of biologic drugs, such as tumor necrosis factor alpha inhibitors, or disease-modifying antirheumatic drugs • Prior to receipt of other immunosuppressive drugs, such as corticosteroids (equivalent of ≥15 mg per day of prednisone for at least one month) • Stage 4 or 5 chronic kidney disease (with or without dialysis
≥10 mm	• Recent (<2 years) conversion of TST from negative to positive • Diabetes (controlled or uncontrolled) • Malnutrition (<90% of ideal body weight) • Current tobacco smoker (any amount) • Daily consumption of >3 alcoholic drinks • Silicosis • Hematologic malignancies (lymphomas and leukemia) and certain carcinomas (such as cancers of head, neck, lung and/or gastrointestinal tract) • Any population considered at low risk of disease.

Public Health Agency of Canada, Canadian Lung Association, Canadian Thoracic Society, Canadian Tuberculosis Standards (8th Edition), 2022.