



Two-step Mantoux testing

Mantoux Testing (tuberculin skin testing) for high risk groups

The Mantoux test (tuberculin skin test)

A Mantoux test, also known as a tuberculin skin test (TST), is a simple and safe test. A small amount of tuberculin purified protein derivative (Tubersol®) is injected just under the top layer of skin on a person's arm using a small sterile needle and syringe. The skin reaction (lump) is measured 2-3 days later and the result recorded.

Boosted reactions and two-step skin testing

Two step testing is given to detect individuals previously infected with TB who may test negative to Mantoux testing initially, but who show a stronger reaction to tuberculin if the same procedure is repeated 1-2 weeks later. The two-step test is important to establish the true baseline reaction when further Mantoux testing is required as part of contact tracing or monitoring of high risk groups.¹

The 'booster effect' represents bolstering of waned cellular immunity of an initially negative Mantoux test by a second test at any time from 1 week to 1 year later. This may produce a more accurate Mantoux response. This booster effect will only be observed in individuals with prior cellular immunity to *Mycobacterium tuberculosis*, BCG or nontuberculous mycobacteria (NTM) and is more common in those age >55 years. Repeated Mantoux testing with standard doses of Tubersol® will not induce a positive skin test reaction in individuals who have no cellular immunity to *Mycobacterium tuberculosis*, BCG or NTM.

Two-step testing is used to avoid interpreting the effect of boosting as a new infection. If the first test is <10mm (and no Mantoux test has been done in the previous 12 months), it is repeated 1-2 weeks later and the second test is interpreted as measuring the true degree of reactivity.

Possible side effects

Side effects are uncommon. However, a person who has been exposed to TB germs may occasionally have a sizeable reaction, which may cause some discomfort. This swelling should disappear in about 2 weeks.

Who needs a two-step skin test?

- People who have chronic kidney disease
- People who have lowered immunity such as HIV infection or certain medical conditions
- Patients starting on long term steroids or other immunosuppressive drugs
- Patients with certain cancers may be offered a two-step Mantoux or a Mantoux test and an Interferon-Gamma Release Assay (IGRA)
- People about to undergo organ donation
- Pre-employment testing
- Baseline two-step testing should be routinely offered for pre-employment testing of health care workers and staff of high risk workplaces (e.g. prisons, detention centres, alcohol and drug rehabilitation centres and nursing homes)

What happens after the Mantoux test is read?

If the two-step Mantoux test is negative, in some patients it is recommended that you undergo yearly or second yearly Mantoux testing.

If the test is positive, a chest X-ray and physical examination will be needed to ensure there is no sign of active disease. If there are no signs of active TB the doctor will discuss the possibility of taking medication to prevent the development of TB disease. The benefits of taking the medication depend on the person's age, health and underlying risk of progressing to TB disease.

Ongoing screening of employees at increased risk of TB

A baseline two-step Mantoux test will make subsequent skin testing much easier to interpret and minimise the chance that people will be inappropriately diagnosed and given unnecessary treatment for latent tuberculosis infection (LTBI). Because there is biological variation and unavoidable differences in even the most carefully performed tests, small increases in reaction size on post-employment testing may not be meaningful.

Therefore, for persons with a Mantoux test regarded as not indicating LTBI initially, an increase in reaction size of less than 10 mm within a period of 2 years should not generally be regarded as evidence of recent infection with TB. In selected circumstances, increases in reaction size of 6-10 mm within 2 years in people at particularly high risk may warrant consideration of treatment for LTBI. If in doubt, these people should be referred to the TB Control Unit for individualised assessment.

Requirements for screening of health care workers and other at-risk staff are outlined further in the *Guidelines for the Control of Tuberculosis in the Northern Territory*.

What does a positive test mean?

It means that the person is infected by TB germs, but does not necessarily mean that he or she has TB disease. The person cannot pass TB onto anyone else unless they progress, at some later date, to active TB disease.

How can a person be infected and not have TB disease?

After TB germs enter the body, in most cases, body defences control the germs by building a wall around them, the way a scab forms over a cut. The germs can stay alive inside these walls for years in an 'inactive' state. While TB germs are inactive, they cannot harm the person and they cannot spread to other people. The person is infected but without any signs or symptoms and therefore well and not aware that he or she is infected.

Mantoux testing for health staff and those in designated risk groups

• Initial Mantoux ≥ 10 mm refer to <i>Guidelines for the Control of Tuberculosis in the Northern Territory</i>
• Initial Mantoux < 10 mm (no previous Mantoux within the past 12 months) Repeat Mantoux in 1-3 weeks (except in HIV positive, children < 5 years with no BCG, children < 5 with a BCG and a contact or from high risk group). If their Mantoux is ≥ 5 mm it is considered positive and repeat is not recommended)
• Second Mantoux < 10 mm repeat 1-2 yearly (depends on employment risk category)
• Second Mantoux ≥ 10 mm refer to <i>Guidelines for the Control of Tuberculosis in the Northern Territory</i>

For further information contact the TB Clinic in your region:

Alice Springs	8951 7548	Darwin	8922 8804
Katherine	8973 9049	Nhulunbuy	8987 0282
Tennant Creek	8962 4259		
or www.nt.gov.au/health/cdc			

¹ ATAGI. *The Australian Immunisation Handbook. January 2014. 10th Edition page 413*