Two step tuberculin skin testing (Mantoux testing) for high risk groups

The tuberculin skin test (Mantoux test)

A tuberculin skin test (TST) is a simple and safe test. A small amount of Tuberculin 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 or vaccinated with BCG who may test negative to tuberculin testing initially, but who show a strong reaction to tuberculin if the same procedure is repeated 1 - 2 weeks later. The 2 step test is important to establish the true baseline reaction when further tuberculin testing is required as part of contact tracing or monitoring of high risk groups.[1]

The 'booster effect' represents bolstering of waned cellular immunity by an initial negative TST such that a second test at any time from 1 week to 1 year later produces a greater, more accurate response. This effect will only be observed in individuals with prior cellular immunity to PPD (whether from *Mycobacterium tuberculosis*, BCG or Nontuberculous Mycobacteria) and is more common in the elderly (age >55 years). Because the proteins in PPD are small in size, repeated skin testing with standard doses of tuberculin will not induce a positive skin test reaction in individuals who have no cellular immunity to the antigens in PPD.

'Two-step' testing is used to avoid interpreting the effect of boosting as a new infection. If the first test is <10mm (and no TST has been done in the previous 12 months), it is repeated 1-3 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 2 step skin test?

- People who have chronic renal insufficiency.
- People who have lowered immunity such as HIV infection or certain medical conditions.
- The elderly who are entering care facilities.
- Baseline two-step testing should be routinely offered for pre-employment testing of health care workers and staff of high risk workplaces (eg. prisons, alcohol and drug rehabilitation centres and nursing homes).
- People about to undergo organ donation.

What happens after the tuberculin skin test is read?

If the test is negative, it is recommended that you undergo yearly or second yearly TST 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 TB disease.

Ongoing screening of employees at increased risk of TB

A baseline two-step TST will make subsequent skin testing much easier to interpret and minimise the chance that people will be inappropriately diagnosed and unnecessarily given 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 TST 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 mean that he or she has TB disease. This 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 not sick and is unlikely to be aware that he or she is infected.

1. ATAGI. The Australian Immunisation Handbook. October 2008. 9th Edition

Tuberculin skin testing for Health staff and those in designated risk groups

• Initial TST ≥10mm refer to p36 TB Guidelines
• Initial TST <10mm (no previous TST within the past 12 months)
• Repeat TST in 2-3 weeks
• Second TST <10mm repeat 1-2 yearly
• Second TST ≥10mm refer p36 TB Guidelines

For further information contact the TB Clinic in your region

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