

## Special Considerations Using TST

### Interpretation When Serial (Repeated) TST Is Performed

#### Nonspecific Variation

Because of differences in the technique of administering or reading the TST or because of biologic differences in response, there may be differences in the same individual from test to test of as much as 5mm in reaction size. Therefore, **6mm** has been selected as the criterion to distinguish a **real increase** from nonspecific variation.

#### Conversion

Conversion is defined as the development of a delayed hypersensitivity reaction with a TST in individuals with no history of previous TB infection. Conversion occurs when exposed to *M. tuberculosis*, NTM or with BCG vaccination. People who have undergone skin test conversion may be referred to as converters or positive converters describing the increase in reaction size of 6–10mm or more within a 24 month period. (See example.)

##### Conversion

July 2008 – 0mm

June 2010 – 10mm

True TST converters are classified as having a new or recent infection. However, due to the booster phenomenon it can be mistaken as a true test conversion when it actually is not. The two-step TST can help discern between these root causes of TST reactions.

The most helpful guide in distinguishing conversion from the booster effect described in the next section is the clinical situation. If there has been recent exposure, such as close contact with an active case or occupational TB exposure, conversion will be more likely than when there has been no exposure. Conversion is defined as a TST of 10mm or greater when an earlier test resulted in a reaction of less than 5mm. If the earlier result was between 5 and 9mm, the definition of conversion is more controversial. There are at least two criteria in use, although neither have strong supportive evidence:

1. An increase of 6mm or more – this is a more sensitive criterion, recommended for those who are immunocompromised, or in the context of an outbreak.
2. An increase of 10mm or more – this is a less sensitive but more specific criterion. In general, the larger the increase, the more likely that it is due to true conversion.

All available experimental and epidemiologic evidence consistently shows that TST conversion occurs within 8 weeks of exposure. Therefore, adopting 8 weeks as the maximum interval for conversion following exposure allows newly infected contacts to be identified a month sooner. It is also more practical for casual contacts, who can be tested once only after 8 weeks, and it results in fewer problems of interpretation because of the booster effect.

## Booster Phenomenon

When individuals are sensitized to *M. tuberculosis*, it usually persists throughout life and should reflect in every subsequent TST test done. However, some people will experience a decrease in the size of the reaction to the point it disappears. For these people, there is waning of their immune response to TB over time. The *booster phenomenon* occurs when a person's immune response has waned. **They will have an increased TST reaction not caused by a new infection but by the stimulation of their immune response to the TST.** Yet, it could be incorrectly interpreted as a recent conversion with TB. A careful risk (medical and social) assessment should be done with the client to determine whether the benefits of treatment of LTBI outweigh the risks of not treating. For clients who have had BCG vaccination after age one, consider testing with IGRA.

The *booster effect* has been described in the following individuals:

- Older adults
- BCG vaccinated populations
- Individuals with prior exposure to NTM

## Reactor

If a person has a history of being infected with TB but the positive TST result is undocumented or a negative TST result is documented more than 2 years ago with a current positive TST result due to an unknown history of exposure, they are referred to as a reactor.

### Reactor

2005 0mm TST  
2013 17mm TST

## Two-Step TST: Distinguishing Between the Booster Phenomenon and Conversion

To help discern between the booster phenomenon and conversion reactions, a *two-step TST* can be done. It provides an accurate baseline for individuals who will have repeated testing or who may have exposure to an infectious TB case (e.g. health care practitioners). The two-step TST requires the administration of two TSTs using the same techniques described in previous sections. A two-step TST is appropriate for the following situations:

- Subsequent skin testing will be done regularly (e.g. health care practitioners)
- Residents in long term care facilities on admission, should have a two-step TST (if no previous 2 two-step)
- Staff who might be working with TB positive patients or clients (e.g. staff in correctional facilities)

Two-step TSTs are:

- Performed once and documented for future reference
- Never repeated but subsequent one step TST can be done if appropriate
- Never done during a contact investigation. See **Section 10, Role of Public Health in TB Prevention and Control in the NWT.**