

## Targeted Tuberculin Testing and Interpreting Tuberculin Skin Test Results

### Introduction

Targeted tuberculin testing is used to focus program activities, provider practices, and financial resources on groups at the highest risk for latent tuberculosis infection (LTBI). Once TB disease has been ruled out, those who would benefit from treatment of LTBI should be offered this option regardless of their age.

Every effort should be made to test only those persons at the highest risk, interpret tuberculin skin test (TST) reactions accurately, and ensure appropriate treatment and completion of the recommended regimen.

### Persons at Risk for Developing TB Disease

Generally, persons at high risk for developing TB disease fall into two categories: those who have been recently infected, and those with clinical conditions that increase the risk of progression from LTBI to TB disease.

Recent infection should be suspected in the following:

- Close contacts of a person with infectious TB
- Persons who have immigrated from areas of the world with high rates of TB
- Children  $\leq 5$  years of age who have a positive TST result
- Recent converters (those with an increase of 10 mm or more in size of TST reaction within a 2-year period)
- Groups with high rates of *M. tuberculosis* transmission, such as homeless persons, injection drug users, and persons with HIV infection
- Persons who work or reside with people who are at high risk for TB in facilities or institutions such as hospitals, homeless shelters, correctional facilities, nursing homes, and residential homes for those with HIV

Clinical conditions that increase the risk of progression from LTBI to TB disease:

- HIV infection
- Radiographic evidence of prior TB
- Low body weight ( $\geq 10\%$  below ideal)
- Silicosis
- Diabetes mellitus
- Chronic renal failure or being on hemodialysis
- Gastrectomy
- Jejunioileal bypass
- Solid organ transplant
- Head and neck cancer
- Prolonged use of immunosuppressive agents (e.g., prednisone, TNF- $\alpha$  antagonists)

### Criteria for Classifying Positive TST Reactions

Reaction of  $\geq 5$  mm of induration is considered positive in

- HIV-infected persons
- Recent contacts of infectious TB cases
- Persons with fibrotic changes on chest radiograph consistent with prior TB
- Organ transplant recipients
- Persons who are immunosuppressed for other reasons (e.g., taking the equivalent of  $>15$  mg/day of prednisone for 1 month or more, taking TNF- $\alpha$  antagonists)

Reaction of  $\geq 10$  mm of induration is considered positive in

- Recent immigrants (within last 5 years) from high-prevalence countries
- Injection drug users
- Residents or employees of high-risk congregate settings
- Mycobacteriology laboratory personnel
- Children  $< 4$  years of age, or children or adolescents exposed to adults at high risk
- Persons with clinical conditions previously mentioned

Reaction of > 15 mm of induration is considered positive in

- Persons with no known risk factors for TB\*

\* Although skin testing programs should be conducted only among high-risk groups, certain individuals may require TST for employment or school attendance. An approach independent of risk assessment is not recommended by CDC or the American Thoracic Society.

### Special Considerations

Questions often arise about the interpretation of TST results in persons with a history of Bacille Calmette-Guérin (BCG) vaccine, HIV infection, and recent contacts to an infectious TB case.

BCG vaccine is currently used in many parts of the world to protect infants and children from severe TB disease, especially TB meningitis. It does not confer lifelong immunity, and its significance in persons receiving the TST causes confusion in the medical and lay community.

- History of BCG vaccine is NOT a contraindication for tuberculin testing
- TST reactivity caused by BCG vaccine generally wanes with time
- If more than 5 years have elapsed since administration of BCG vaccine, a positive TST reaction is most likely a result of *M. tuberculosis* infection

Persons who are HIV infected have a much greater risk for progression to TB disease if they have LTBI.

- Individuals with HIV infection may be unable to mount an immune response to the TST and may have false-negative TST results
- Usefulness of anergy testing in TST-negative persons who are HIV infected has not been demonstrated

Persons with a positive TST result who are contacts of an individual with infectious TB should be treated regardless of age.

- Some TST-negative persons should also be considered for treatment (i.e., young children, immunosuppressed)
- Repeat TST in 8–12 weeks if initial test result is negative. A delayed-type hypersensitivity response to tuberculin is detected 2–12 weeks after infection

### References

ATS/CDC. Targeted tuberculin testing and treatment of latent tuberculosis infection. *MMWR* 2000;49 (No. RR- 6).

<http://www.cdc.gov/mmwr/preview/mmwrhtml/rr4906a1.htm>

ATS/CDC. Update: Adverse Event Data and Revised American Thoracic Society/CDC Recommendations Against the Use of Rifampin and Pyrazinamide for Treatment of Latent Tuberculosis Infection.

*MMWR* 2003; 52 (No. 31).

<http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5231a4.htm>

CDC. Tuberculosis Associated with Blocking Agents Against Tumor Necrosis Factor - Alpha - California, 2002–2003. *MMWR* 2004; 53 (No. 30).

<http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5330a4.htm>

ATS/CDC. Treatment of tuberculosis. *MMWR* 2003; 52(No. RR-11).

<http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5211a1.htm>

### Additional Resources

#### Websites:

TB Education and Training Resources

<http://www.findtbresources.org/>

World Health Organization (WHO)

<http://www.who.int/>

The following resources can be viewed and downloaded from the CDC website at [www.cdc.gov/tb](http://www.cdc.gov/tb).

#### Slide Set:

Targeted Tuberculin Testing and Treatment of Latent Tuberculosis Infection, 2005: Applying CDC/ATS Guidelines in Your Clinical Practice

#### Fact Sheets:

Treatment of Latent Tuberculosis Infection:  
Maximizing Adherence

Treatment Options for Latent Tuberculosis Infection