

## Evaluating Patients with BCG Vaccination Histories for Tuberculosis Infection

The national Advisory Committee for the Elimination of Tuberculosis and the Centers for Disease Control and Prevention strongly recommend tuberculin skin testing and treatment for latent tuberculosis infection (LTBI) as indicated for persons from countries with high rates of tuberculosis (TB) as soon after arrival in the United States as feasible<sup>1</sup>. Many of these persons have a history of vaccination with Bacille Calmette-Geurin (BCG). This vaccine is used to prevent disseminated and other life-threatening manifestations of TB infection in young children. BCG immunization does not prevent infection with *Mycobacterium tuberculosis*. Since vaccination with BCG can lead to the acquisition of tuberculin sensitivity, BCG vaccination can complicate interpretation of the skin test.

In general, **it is recommended to ignore the possibility of BCG vaccination when interpreting a tuberculin skin test (TST) to make decisions about treatment for LTBI.** The majority of TB occurring in the United States is in persons born in countries that rely heavily on BCG vaccination for TB control. As part of our national TB control strategy, all health care providers should perform TSTs on individuals from high incidence countries as soon as possible after they arrive in the United States. We are aware of a number of instances in which TB developed in persons with a positive TST result for whom treatment for LTBI was withheld because of previous BCG vaccination. We hope that there will be fewer such incidents in the future, and that we can increasingly prevent the development of TB in the foreign born.

The degree of tuberculin sensitivity induced by BCG is highly variable and not easily predicted. It depends on the vaccine strain used, vaccine dosage, method of vaccine administration, age at vaccination, nutritional status of the patient and other factors known to influence the reaction to TSTs. The persistence of tuberculin sensitivity after BCG vaccination is also highly variable. It may vary with the frequency of tuberculin testing after vaccination, the frequency of repeat vaccinations, exposure to non-tuberculous mycobacteria and infection with *M. tuberculosis*. Within several years after administration of BCG, however, tuberculin sensitivity is usually less than 10 mm induration. Furthermore, although a person may have come from a country, which routinely uses BCG, that person may never have received BCG vaccination. Given these considerations, the simplest strategy for interpreting a TST in the setting of possible BCG vaccination is to discount the possibility of the influence of BCG on skin test size.

There are two new blood tests available for the diagnosis of LTBI. The tests are the Quantiferon Gold or Quantiferon Gold In-Tube and the T-Spot.TB. These tests measure either the release of interferon gamma from white blood cells that have been incubated with antigens from the *M. tuberculosis* bacterium or count the number of activated T helper lymphocytes producing interferon gamma. One of the advantages of these tests is that they do not cross react with BCG, which means that a positive test in a person with a history of BCG vaccination indicates true infection with *M. tuberculosis*. In a recent immigrant ( $\leq 5$  years in the US) with a documented history of BCG vaccination, consideration can be made to performing one of these tests instead of the TST, especially if the result would assist in making a decision for treating the patient for LTBI. These tests are available from commercial laboratories in the state.

Of note, if the tested person is a recent close contact to an infectious case of TB, any reaction of  $\geq 5$  mm induration after a TST should be considered to represent true LTBI and managed accordingly.

For additional information or if you have questions, please call the TB Control Program office at (860) 509-7722.

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1 Centers for Disease Control and Prevention. Controlling tuberculosis in the United States: recommendations from the American Thoracic Society, CDC, and the Infectious Diseases Society of America. MMWR 2005;54 (No. RR-12):45-50.