

## **Internationally Adopted Children Need Evaluation for Tuberculosis**

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Infection with tuberculosis (Tb) is currently uncommon throughout the United States. Most parents are unfamiliar with tuberculosis infection and many excellent pediatricians and family medicine doctors have never encountered a case in their practice. Families who adopt internationally often first learn about tuberculosis at the time of their adoption, and may seek help and information from their primary care physician in the United States, who may not be able to answer their questions.

Tuberculosis infection is caused by a bacteria named *Mycobacterium tuberculosis*. It is estimated that 30% of the world's population is infected. This bacteria is very different from familiar germs such as streptococci, both in the disease that is caused and the type of treatment that is required. Many people infected with *M. tuberculosis* have no symptoms of illness, no signs of infection on a chest x-ray, and are not aware that infection has occurred. This silent form of infection is termed latent Tb. In people latently infected with tuberculosis a reactivation may occur. The person may develop signs and symptoms of the disease, even many years after the initial infection. This reactivation of latent infection is very common in young children, the elderly, patients with other medical conditions such as diabetes and renal failure, and patients with problems with their immune system caused by either disease or medications. 25-40% of children less than one year of age who are latently infected will develop active tuberculosis infection.

Diagnosis of latent Tb infection is important because treatment substantially reduces the likelihood of developing active tuberculosis. In children, the risk of reactivation of latent infection can be reduced 85-90% by treatment with a medication named isoniazid (INH) taken once per day by mouth for nine months. Therapy with INH is very safe, and few children encounter side effects from the medication. The side effects that do occur are usually minor and short-lived. As such, the Center for Disease Control and the American Academy of Pediatrics strongly recommends testing all internationally adopted children for tuberculosis, and treating children who are latently infected with tuberculosis with INH. Children (and adults) with latent tuberculosis infection are not contagious.

Although these recommendations are very clear, families often receive very confusing advice regarding tuberculosis evaluation. The confusion is related to several important issues. Throughout much of the world children receive a vaccine called BCG, which is intended to prevent serious disseminated infection due to tuberculosis. There is scientific disagreement about the value of BCG vaccination. The rate of adult tuberculosis has not significantly decreased in most countries, despite vigorous campaigns to immunize children with BCG. In the United States, BCG is not used because the value of vaccine is considered small and because children are unlikely to contract tuberculosis infection here.

Tuberculosis is most commonly contracted from an actively infected coughing adult. The germ is coughed into the air where it may remain suspended for many hours. Infection occurs when the germ is inhaled into the lungs. The close, crowded living conditions in an orphanage are a frequent setting for transmission of tuberculosis. Close household contact, such as between a mother and

child, which continues for many weeks and months, is also a likely setting for infection transmission. Casual social contact, such as between strangers on the street or in other social settings, is far less likely to transmit infection. Often times, an adult with active tuberculosis will not be seriously ill and may be coughing and contagious for many months. The coughing is often attributed to smoking, bronchitis, viral infections, or other minor health problems.

Most children infected with tuberculosis do not develop any immediate illness, but rather develop latent infection. Unless they receive treatment, they remain at risk for later reactivation of tuberculosis. However, about ten percent of children infected with tuberculosis develop an illness, which may be a very serious, widely disseminated infection; an acute infection limited to the lungs; or may be very subtle and slowly progressive infection. Fortunately most children with active tuberculosis are not contagious.

The diagnosis of either latent or active tuberculosis infection in children is difficult. A tuberculosis skin test is used to diagnose. A small amount of a material called PPD is injected superficially into the skin on the arm, and 48 to 72 hours later the test site is examined for swelling called induration. Redness without swelling is ignored, as is the swelling that occurs in the few minutes to hours immediately after the test is placed. There are numerous difficulties with this test, including placing it correctly in a wriggling, unhappy child and the necessity to return in 2-3 days for the reading. A positive test indicates infection with tuberculosis but does not indicate whether the infection is active or latent. Even worse, about 10% of children with active tuberculosis have a negative skin test, and some children with have a falsely positive test. All children with a positive test need a physical examination to look for signs of active tuberculosis infection, and a chest x-ray to look for evidence of active tuberculosis in the lungs. Lung infections caused by tuberculosis cannot be diagnosed without a chest x-ray.

Many families who adopt internationally are told that BCG will cause a false positive skin test. As a result, they are reluctant for their child to be tested. The medical literature documents that positive skin tests following BCG can occur, but the reactions are small and most become negative after a few months to a year. In our experience, nearly 70% of children with a past history of BCG vaccine have a negative skin test. The Centers for Disease Control and the American Academy of Pediatrics strongly recommends that history of prior BCG vaccination should usually be ignored in the decision to place a skin test and should not affect interpretation of the skin test.

Sara (not her real name, but a real case) illustrates the confusion that commonly occurs. Sara was newly adopted from China and a beautiful 14-month old girl. She had already gained 2 pounds in the few weeks since adoption. She was examined by her doctor and appeared very healthy except for a slight amount of drainage from one ear. Sara's parents were told that she had received BCG vaccine, that she would always have a positive skin test, and that she did not need a tuberculosis skin test. Despite the history of BCG, Sara's pediatrician placed a skin test, which was positive. A chest x-ray was done and showed evidence of tuberculosis in the upper segment of one lung. A computed tomogram (CT) scan of the area around the draining ear also suggested Tb infection. Cultures obtained from the ear and lung proved active infection with Tb. Fortunately, Sara has done very well with therapy and remains a healthy active child.

Many families and physicians who hear Sara's story are surprised, but they shouldn't be. Sara's case is typical and illustrates many important lessons. Tuberculosis infection can be very subtle, and hard to detect by routine examination. Children with active tuberculosis may appear very healthy.

Infection may be acquired even in a very good orphanage, without other cases being known. BCG offers little protection against tuberculosis, and we should not hesitate to test and evaluate a child who has received BCG. The skin test is not foolproof, but it is the best test we currently have for detecting tuberculosis.

Finally, all children adopted internationally from countries where Tb is common need an evaluation for tuberculosis, and treatment if latent or active infection is found. State and County Public Health Departments are charged with control of tuberculosis and other communicable diseases in the United States. Physicians working in the Public Health Department usually have considerable experience in the diagnosis and treatment of tuberculosis infection and can assist families and the physicians providing care to internationally adopted children.