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Fact Sheet	
 The logo for the California Department of Health Services (dhs) features a green outline of the state of California. Inside the outline, there is a caduceus symbol (a staff with two snakes and wings) in orange and yellow. Below the state outline, the letters 'dhs' are written in a large, bold, black font. Underneath 'dhs', the words 'DEPARTMENT OF HEALTH SERVICES' are written in a smaller, black, sans-serif font.	<p>Hazard Evaluation System and Information Service</p> <p>850 Marina Bay Parkway Building P, 3rd Floor Richmond, CA 94804</p> <p>(866) 282-5516</p>

Tuberculosis

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What Is Tuberculosis?

Tuberculosis (TB) is an infectious disease caused by *Mycobacterium tuberculosis* (*M. tuberculosis*). There are two stages of TB: TB infection and TB disease. Transmission occurs only with TB disease ñ TB infection alone is not contagious. You can be exposed to TB when you breathe particles containing the bacteria into your lungs. If they reach the lung tissue and grow, then TB infection begins. Usually the bacteria remain in the lung and do not cause any harm, because they are contained by your body's immune system. TB disease occurs when your immune system can no longer control the infection. The bacteria grow rapidly, most commonly in the lung, destroying tissue and causing illness.

Most persons who become infected with *M. tuberculosis* and who have a healthy immune system never develop TB disease. However, even a healthy immune system cannot kill all the bacteria; some always survive. Therefore, once you become infected, you always remain at risk of developing TB disease. This risk is highest in the first two years following the initial infection. A weakened immune system, such as from human immunodeficiency virus (HIV) infection, cancer, or chemotherapy with immunosuppressive medications increases the risk of developing TB disease. Preventive therapy for TB infection can almost always keep you from developing active disease.

Why Is TB Such A Problem Now?

About one out of three people in the world have TB infection. Until recently, TB had been decreasing in the United States, due to improvements in nutrition, hygiene, and medical care. Since 1985, however, TB has been increasing due to homelessness, drug and alcohol abuse, institutional transmission, immigration and HIV infection. Crowding in households or institutional environments increases the risk of TB transmission from a person with TB disease to others. Lack of medical care leads to delays or failures in diagnosing and properly treating infection and disease. In addition, TB disease is becoming more difficult to treat. The bacteria are becoming resistant to the drugs because some people with TB disease do not finish the complete course of drug treatment (see Drug-Resistant TB on page 5). About 10 million Americans have TB infection; most do not know that they are infected.

How Is TB Spread?

TB is spread from person to person by bacteria contained in tiny particles in the air. These particles may be released when a person with TB disease in an infectious state coughs, sneezes, sings or talks. Only persons with TB disease of the lungs or larynx are contagious; persons with inactive TB infection are not. By sharing the same airspace with a person with TB disease of the lungs or larynx, you may breathe the particles containing *M. tuberculosis* into your lungs, and become infected. Your risk of becoming infected depends upon the number of particles containing *M. tuberculosis* released into room air by infectious persons, the size of the shared airspace (room), the rate at which fresh air is supplied to and exhausted from the room, and the length of time you are exposed (share the airspace).

Can I Get TB From My Work?

If your work results in sharing airspace with people with active TB of the lungs or larynx, you may be exposed. Such exposure could occur in health care institutions, prisons, residential facilities for the elderly or those with AIDS, laboratories and clinical facilities that work with *M. tuberculosis*, shelters for the homeless, and residential and outpatient drug and alcohol treatment facilities. Health care workers who are present during certain cough-inducing procedures on patients who may have TB are particularly at risk. These procedures include induction of sputum, use of aerosolized drugs that cause coughing (such as pentamidine), bronchoscopy, tracheotomy, thoracotomy, aspiration and excision biopsy, intubation, suctioning, tracheostomy and endotracheal tube care.

How Do I Find Out If I Have TB Infection?

A tuberculin skin test (TST) is the only way to find out if you have TB infection. When administered by the Mantoux method, the TST involves injecting a small amount of liquid containing protein (Purified Protein Derivative ñ PPD) from the tubercle bacterium into your skin. TB cannot be transmitted to you through this test. The test is usually done on the forearm. If there is some reason to suspect that you have some problem with your immune system, the PPD skin test for TB may be accompanied by additional skin tests to determine whether you are able to respond. You must return 2-3 days later to have all these tests interpreted by a health care provider, who will carefully measure any hardness and swelling. It is critical that skin tests be administered, read, and recorded correctly. The tests can be performed by any licensed health care professional who has received training in TST administration and interpretation. Side effects of the test, such as itching of the skin, are rare.

What Do The Tuberculin Skin Test Results Mean?

When the skin reaction is greater than a certain size it is considered positive and usually means that you have TB infection. The size that is considered positive for you depends on whether you have any risk factors that may make development of TB disease more likely (for example, most people who have a swelling or hardness following a TST measured to be 10 mm or greater are considered to be positive currently in California, but if you are infected with HIV and have swelling or hardness following a TST measured to be 5 mm, this is considered positive).

Conversion of your TST means a change from one TST, conducted less than 2 years prior to another, from completely negative (without swelling or hardness), to a measured swelling or hardness of 10 mm or greater. Alternatively, if your previous TST result was between 5 mm and 10 mm, conversion then means an increase of 6 mm or more from one TST to the next, within a 2 year period. Conversion of your TST usually means you have TB infection. It is extremely important for you to know if you are infected, so that you can get medical evaluation to make sure you don't have TB disease. If you do have TB infection, you can be treated to prevent TB disease from developing. If you have a negative skin test now, this test can be used to compare with future tests. If you have a negative test now but a positive test later, this information can be used to determine the appropriate medical treatment to prevent TB disease.

Why are Occupational Tuberculosis Skin Test Programs Important?

In workplaces where there is increased risk of exposure to persons with TB disease, a systematic and comprehensive program of tuberculosis skin testing is essential to document that preventive measures are effective over time, and to insure early detection of TB infection. Your cooperation with the TST program is necessary to adequately protect you, your co-workers and others you may come into contact with at home and at work.

My Tuberculosis Skin Test Is Negative.

Could I Still be Infected?

Occasionally, your skin test can be negative even if you are infected. This result occurs when your immune system, which is necessary to produce a positive skin test, is suppressed by disease or medications. This lack of response may be indicated by a negative response to the mumps and/or yeast skin tests as well. This problem may occur when someone has AIDS or cancer. Drugs like steroids and anti-cancer drugs can also suppress immune function. Therefore, even if you have a negative skin test, if you also have HIV infection, cancer, or are receiving immunosuppressive drugs, the diagnosis of TB should be considered by your clinician. In that case, if you have symptoms which might be caused by TB, a chest X-ray or other tests should be done.

What Are Symptoms of Active TB?

If you have TB infection, it is very important for you to be on the lookout for the symptoms of TB disease and report them to a doctor promptly. The symptoms include: a cough, usually one that has lasted longer than 2 weeks; feeling tired all the time; fever; sweating, particularly at night; unexplained weight loss; loss of appetite; spitting or coughing up blood.

How can I find out if I have TB disease of the lung?

A chest X-ray, and laboratory tests of your sputum (phlegm) for the presence of bacteria that cause TB,

are tests for TB disease of the lung.

Should I Be Tested For TB?

If you are in any of the following groups, you are at higher risk for TB infection and should be tested at least once a year through a workplace tuberculin skin test screening program:

Working in job settings that put you in close contact with persons at risk for TB, including:

Health care or correctional facilities

Shelters for the homeless and drug and alcohol treatment facilities

Other situations involving increased risk of TB include:

Sharing the same airspace for a prolonged period of time with someone known to have TB disease of the lungs or larynx. Such close contact requires that TST be done as soon as 10 days after such exposure began, and repeated in 12 weeks if the first TST is negative. Do not wait for your annual TST if you have had such an exposure.

Having one of the following medical conditions that increases the risk of TB disease:

HIV infection

Certain kinds of cancer (for example, leukemia, lymphoma)

Prolonged therapy with steroid drugs or other drugs that suppress the immune system

Silicosis

Severe kidney disease (e.g., requiring dialysis)

Rapid weight loss or chronic undernutrition

Diabetes requiring treatment with insulin

Having other risk factors which increase the risk of TB:

Having lived in countries with high rates of TB

Being an alcoholic or intravenous drug user

If you have signs or symptoms of TB disease, you should have a skin test and a chest X-ray, since some medical conditions can cause your skin test to be negative even if you are infected. If you are not sure if you should be tested, ask your doctor, health care provider, county or local health department.

What If I Test Positive? Treatment to Prevent development of TB disease.

A person with a positive skin test, or TB infection, is at high risk for developing TB disease. The risk is highest during the first two years of infection so that if your skin test converted from negative to positive in the past two years, your risk is particularly high. If you have HIV infection, your risk of developing TB disease is extremely high.

Fortunately, treatment with the drug isoniazid (INH) can prevent TB infection from becoming TB disease. It is inexpensive and prescribed for six months to one year. INH can sometimes damage the liver as a side effect, but this potential problem can be monitored by monthly liver function blood tests. The liver function usually returns to normal if treatment is stopped. You should be treated if:

you are a close contact of someone with TB disease of the lung or larynx, regardless of your skin test result;

your skin test became positive in the 2 past years;

you have a positive skin test and an abnormal chest X-ray (but not active TB);

you have a positive skin test and any of the medical conditions listed above that put you at higher risk of developing active TB.

What If I Have TB disease?

Treatment to Cure TB Disease

Drug treatment can kill the bacteria that causes TB disease. If you have pulmonary TB disease, you can infect others; but after beginning treatment, you will probably become non-infectious within two weeks. Most people with TB disease can be cured by treatment with several drugs (usually including four drugs: INH, rifampin, ethambutal and pyrazinamide) for six months, then two drugs (INH and rifampin) for three additional months. TB disease is treatable even if you are infected with HIV. If you have TB disease and could infect others at work, you should not return to work until your doctor determines you are not contagious.

What Is Drug Resistant TB?

Drug resistance means that a drug has become less effective in fighting *M. tuberculosis* . Treatment of

drug-resistant TB infection and cure of drug-resistant TB disease is much harder to accomplish. Drug resistance is more likely to develop if you take medications irregularly or your physician prescribes inappropriate therapy. Once *M. tuberculosis* develops drug resistance, if they infect someone else, that person will also be infected with drug resistant *M. tuberculosis*. A recent problem in the U.S. has been the development of Multidrug Resistant TB. ñ strains of *M. tuberculosis* which are resistant to two of the mainstays of treatment for TB infection and disease, INH and Rifampin. Because the bacteria are resistant to more than one drug, treatment is very difficult, and the risk of dying from the disease is much higher. The best way to prevent drug resistant TB is to make sure that everyone who is diagnosed with TB disease takes all of their medicine for as long as necessary, and that doctors prescribe the drugs properly and closely monitor their patients for the duration of their illness.

Am I Entitled To Worker's Compensation Benefits If I Acquired TB Infection Or Disease At Work?

A Doctor's First Report of Work Injury or Illness must be filed by your physician or employee health service if it is probable that either tuberculosis infection or disease has occurred from exposure at work. This is the first step in providing coverage by your employer's worker's compensation insurance of any medical and other costs associated with treatment of TB infection or disease.

What Can Be Done To Prevent TB?

Each workplace in which TB transmission may occur should develop a comprehensive TB Control Program, the purpose of which is to prevent TB transmission to workers and institutionalized populations. Effective control of TB in institutions necessitates a comprehensive approach utilizing three main control strategies integrated into an effective program. These are detailed below in descending order from most to least reliable, based on current information:

Preventing the release of TB bacteria or containing their release at the source (the patient)
Administrative control measures are the key source control methods. These include policies and procedures ensuring a high index of suspicion for TB, which results in the rapid identification, prompt isolation, and early treatment of persons known or suspected to have infectious TB. Instructing patients to cover their coughs or use masks is another source control method. Engineering control measures are also essential in containing TB bacteria at the source and preventing their dispersion throughout the environment. These measures include booths, hoods, tents, and negative pressure in Acid-Fast Bacilli (AFB) isolation rooms and other selected areas, and the direct exhaust of air from these spaces to the outside atmosphere.

Interrupting the pathway and reducing the number of viable TB bacteria following their release into general room air by infectious TB patients. Examples of this control strategy include the use of dilution ventilation, ultraviolet germicidal irradiation, and high efficiency particulate air (HEPA) filters in AFB isolation rooms, and other institutional environments.

Providing a barrier between the worker and air potentially contaminated with *M. tuberculosis*. An

example of such a barrier is the correct use of appropriate respirators in conjunction with a comprehensive respiratory protection program. Depending on the type, respirators provide varying degrees of protection to workers. Therefore, selection of the type of respirator must be based on the potential for aerosolization of TB bacteria and on the best available scientific evidence on respirator efficacy. A High Efficiency Particulate (HEPA) Filter mask or powered air-purifying respirator is currently recommended for those exposed to individuals with suspected or confirmed pulmonary tuberculosis disease.

An industrial hygienist should be consulted before initiating a respirator program, to insure that the level of protection is adequate for the particular exposure situation. Certain types of respirators also require medical examination and "Fit Testing" to insure that the respirator fits properly and provides the necessary protection. Because transmission of TB occurs almost exclusively by inhalation of viable TB bacteria, other types of personal protective equipment, such as gloves, are not necessary to prevent transmission of TB to workers.

Although source control is a more reliable means of preventing TB transmission than reducing the number of TB bacteria after their release in room air or the use of respirators by workers, institutions must often use a combination of all three control approaches in an integrated way. However, because it is unlikely that even the most effective institutional TB control program can eliminate all risk of acquiring TB infection among workers, additional protective measures may be necessary for immunocompromised workers. These individuals are at significant risk of developing progressive, sometimes fatal, TB disease if infected with TB. For this reason, reasonable accommodation as defined by the American with Disabilities Act for these workers, including voluntary transfer and modified duty policies, may be necessary.

Should I get vaccinated against TB?

Vaccination with Bacillus Calmette-Guerin (BCG) is not usually recommended in the U.S. because of the low rate of infection here and because the BCG vaccine has varied in effectiveness. Many other countries still use BCG as part of their infection control programs, especially for babies. If you have been vaccinated with BCG, you still should be tested with tuberculin skin tests, because significant skin reactions still usually indicate infection with TB. Such persons should be evaluated for preventive therapy with INH.

[Resources](#)

This document was last updated in September 1996.