

# DISPATCH



## Tuberculosis

### What Is It?

Tuberculosis (TB) is a serious infectious disease that usually affects the lungs, but can infect any part of the body. TB infection is caused by the bacterium *Mycobacterium tuberculosis (Mtb)*. Although TB was once well controlled in the US, since the mid-1980's it has become an increasingly important public health problem. An estimated 10 to 15 million Americans are infected with the TB bacteria and have the potential to develop active disease in the future.

Populations at high risk of contracting new TB infections include:

- Close contacts of a person with active (infectious) TB
- Immigrants from areas of the world with high TB rates
- Babies and children under 5 with a positive TB test
- Persons who live or work in group facilities (homeless shelters, correctional institutions, nursing homes, hospitals), and injection drug users
- Persons with medical conditions or receiving treatments that weaken the immune system: HIV/AIDS, substance abuse, silicosis, diabetes, end-stage kidney disease, organ transplants, head and neck cancer and patients receiving cancer chemotherapy or steroids.

Tuberculosis is a serious concern for all healthcare providers, including fire fighters and other first responders who perform emergency medical services. In the *IAFF 1998 Death and Injury Survey*, tuberculosis exposures accounted for 29.8% of all communicable disease exposures.

### How can you get it?

The major way that tuberculosis is transmitted is through **airborne spread**. When people with active (infectious) TB cough, sneeze or talk they produce droplets that disperse into the air. Other people can breathe contaminated air into their lungs and become infected. TB transmission usually requires prolonged (days or weeks) sharing of airspace with a person with active TB infection. Patients with unrecognized active TB are most likely to transmit it.

You could catch or transmit TB through:

- Exposure to contaminated air
  - Direct contact with infected person
  - Certain medical procedures that generate aerosols
    - Suctioning, endotracheal intubation
    - Administration of aerosolized medications (nebulizers)

# DISPATCH



One person with active tuberculosis has the potential to infect many others. TB contaminated droplets can remain airborne for an extended length of time and be carried from one area to another through heating/air conditioning currents. The TB bacteria are also killed by ultraviolet light. Healthcare workers, including first responders, also have significant potential to transmit this bacteria through multiple patient contacts.

## What are the symptoms?

TB infection can be **active** or **latent**. Patients with active TB have symptoms similar to pneumonia and are contagious. Symptoms may include:

- Cough that lasts 3 weeks or longer
- Chest pain
- Bloody sputum
- Weakness or fatigue
- Weight loss or decreased appetite
- Fever or chills
- Night sweats

Although most healthy people (90-95%) do not develop active TB disease, two groups are at highest risk of developing symptomatic illness: (1) people with *new* tuberculosis infections and (2) those with weakened immune systems.

Most people who become infected with tuberculosis develop **latent TB infection (LTBI)**. Persons with latent TB infection do not have any symptoms. They do not cough, have fever or other evidence of active infection and cannot transmit the bacteria to others. Their immune systems are able to contain the infection, but are not eliminate it. Risk of progressing from LTBI to active TB is highest in the years immediately after infection, but some ongoing risk continues unless treatment for LTBI occurs. About 5 to 10% of infected persons who do not receive treatment for latent TB infection will develop active TB disease at some time in their lives. For persons with weakened immune systems the risk is higher. Therefore, **it is essential that persons with latent TB infection get treatment to prevent development of active TB.**

## How do you prevent it?

Early identification and treatment of persons exposed to tuberculosis is critical to preventing transmission of TB. Annual tuberculosis screening is recommended for all firefighters in NFPA 1581, Fire Department Infection Control Programs. First responders can reduce their exposure to TB through consistent use of PPE and respiratory precautions.

# DISPATCH



In countries like the US, where TB is not extremely common, vaccine is rarely recommended. The vaccine used in other countries, BCG (Bacille Calmette-Guérin), is a live bacterial vaccine that works to prevent *spread* of TB within the body but does not prevent infection from occurring in the first place.

Indications for use in health care workers, although rare, can be found at: <http://www.cdc.gov/tb/publications/factsheets/prevention/BCG.htm>

You can help prevent the spread of tuberculosis by:

- Getting TB testing every year
- Using Universal Precautions
  - Assume patients with respiratory symptoms have TB and provide them with surgical masks
  - Strictly limit the number of crew members having direct patient contact
  - Use personal protective equipment (PPE) including NIOSH-certified respirators that are N95 or higher. CDC/NIOSH information on use of respirators by health care workers for protection against TB can be found at: <http://www.cdc.gov/tb/publications/factsheets/prevention/rphcs.htm> and a video at: <http://www.cdc.gov/niosh/docs/video/tb.html>
  - Operate ambulance or vehicle ventilation systems in nonrecirculating mode and bring in as much outdoor air as possible
  - Operate rear exhaust fan during transport, if available; air should flow from the front of vehicle, over the patient, and out the rear exhaust fan
  - Use recirculating ventilation units with HEPA filters when available
  - Use respiratory hygiene/Cough etiquette
- The Ryan White Comprehensive AIDS Resource Emergency Act of 1990 mandates notification of EMS personnel after they have been exposed to a patient with suspected or confirmed infectious TB disease (<http://hab.hrsa.gov/data2/adap/introduction.htm>).
- Maintain a written TB control plan in each workplace

## What should you do if you believe you have been exposed to Tuberculosis?

If you think you have been exposed to someone with active TB disease, immediately report the exposure to your infection control officer and/or medical director and see a healthcare provider for tuberculosis testing. There are two kinds of TB testing:

- Tuberculin Skin Test (TST)
- TB Blood Tests

# DISPATCH



If your initial test is negative, you should receive a second test 8-10 weeks after the last time you were exposed to the infectious source because your immune system can take several weeks to respond.

A "PPD converter" is someone who has had a negative skin test in the past and now has a positive skin test. On average, people infected with TB have a 10% chance of developing active TB disease at some point in their lives.

For employees who have had negative PPD skin tests in the past and no other sources of exposure, it is likely that a new PPD conversion is due to "on-the-job" exposure. They should be eligible for **workers' compensation** for any medical bills or lost work time incurred due to this exposure now or at any time in the future.

Positive TB testing does not tell whether the person has active or latent TB infection. Medical history for symptoms, physical examination, a chest X-ray and sputum sample to test for the TB bacteria are important for follow-up of positive test results.

## Treatment for LTBI

If there is no sign of active disease with this follow-up, treatment to prevent future active disease is frequently needed for new "PPD converters". Usually isoniazid (INH) treatment for 6-12 months is used. INH can be toxic to the liver so people should not drink alcoholic beverages during the months they are taking it. There is a minor risk of developing INH-induced hepatitis (inflammation of the liver), particularly among individuals older than 35, so blood tests are done to check the liver enzymes periodically. While the hepatitis occurs in only a small number of the individuals taking the drug, it must be weighed against the chance of developing TB, which can be a fatal infection. Even older individuals can be safely treated with INH with careful monitoring.

Persons receiving preventive treatment for TB are not infectious and can continue normal work activities.

## Treatment for Active (Infectious) TB

Patients who are found to have active TB must take multiple drugs for a prolonged period of time to completely eradicate the active infection. Work accommodations will be needed while they are infectious. Completion of all treatment is important to prevent drug resistant TB

# DISPATCH



## For More Information and Frequently Asked Questions (FAQs), Check Out:

- ✓ Occupational Safety & Health Administration (OSHA):  
<http://www.osha.gov/SLTC/tuberculosis/>
- ✓ National Institute for Occupational Safety and Health (NIOSH):  
<http://www.cdc.gov/niosh/topics/tb/>
- ✓ Centers for Disease Control and Prevention (CDC):  
<http://www.cdc.gov/tb/topic/basics/default.htm>
  - CDC, Guidelines for Prevention the Transmission of Mycobacterium tuberculosis in Health-Care Settings, 2005: <http://www.cdc.gov/mmwr/PDF/rr/rr5417.pdf>
- ✓ National Institute of Allergy and Infectious Diseases (NIAID):  
<http://www.niaid.nih.gov/TOPICS/TUBERCULOSIS/UNDERSTANDING/Pages/Default.aspx>
- ✓ Canadian Centre for Occupational Health and Safety (CCOHS):  
<http://www.ccohs.ca/oshanswers/diseases/tubercul.html>
- ✓ Public Health Agency of Canada (PHAC): <http://www.phac-aspc.gc.ca/tbpc-latb/index-eng.php>