Tuberculosis (TB) is a disease present throughout the United States. Lehigh Valley Health Network is concerned about your health and needs your help to prevent the spread of TB in the workplace.

Although the risk is low, your chances of getting infected with TB can be reduced by understanding the ideas presented in this training module.
Upon completion of this training, you should be able to:

• Discuss the characteristics of Pulmonary Tuberculosis, including how the disease is spread and the risk factors and symptoms associated with TB.
• Describe the treatment for patients with TB.
• Apply the early identification methods used to protect yourself and others from TB.
• Identify the five basic control methods used to prevent the spread of TB to others.
Although your chances of contacting TB are low, you may be surprised at how prevalent cases of TB are. Click the Next button to find out how prevalent TB is.
The Correct Answer is an estimated 10 million people are infected with TB.

The Correct Answer is over 20 thousand NEW cases of Tb are reported each year.
Pulmonary Tuberculosis (TB) is a disease that is spread from person to person through the air.

When an individual is infected with active TB disease, tiny particles called droplet nuclei can be spread through coughing or sneezing. You may become infected by breathing in the air surrounding the person with active TB.

After the TB bacteria move through the air, they travel into the lungs. A Tuberculosis infection begins when enough bacteria reach the lungs and multiply.
It is important to understand that there is a difference between Inactive TB Infection and Active TB Disease.

Everyday, we breathe in disease-producing bacteria. But, our immune systems work to prevent most diseases from ever developing. Click the buttons to read the definitions of Inactive TB Infection and Active TB Disease.
**Inactive TB Infection** - A person is considered to have an Inactive TB Infection when they have a positive skin or blood test, but are not contagious. These individuals have no screening symptoms, but remain at risk for developing Active TB Disease.
**Active TB Disease** - Active TB Disease only develops when a person who has been exposed to TB is unable to fight off the disease. People with Active Pulmonary or Laryngeal TB disease are contagious to others until they have received enough anti-tuberculosis medication.
A variety of risk factors can increase your chances of becoming infected with TB. Click the Characteristics button and the Health Issues button to learn more about these risk factors.
Characteristics: Certain groups of people have a higher rate of TB infection. These include:
• Homeless persons
• Recent test converters
• Residents or employees of long-term care facilities
• Immigrants from areas with a high incidence of TB (for example, Africa, Asia, Eastern Europe, Latin America, and Russia). This is particularly true for individuals who have lived in the United States for less than five years.
• Frequent travelers to countries with a high incidence of TB.
• Healthcare workers and other people with close contact with people with TB.
Health Issues: If your body's defenses are down, you are more likely to get TB. The following are examples of diseases or problems which may weaken your body's defenses:

- HIV infection
- Chronic kidney failure
- Certain cancers
- Treatment with high dose steroids
- Treatment with immunosuppressive agents
- Very young and very old age
- Malnutrition
- Chronic lung disease
- Diabetes
- Alcoholism
- IV drug use
If you are infected with Active TB Disease, you may have some or all of the following symptoms:
- Fatigue
- Fever, night sweats
- Weight loss
- Cough
- Chest pain
- Blood-tinged sputum
- Chest X-ray changes
Patients with Active TB Disease are treated with an appropriate combination of anti-tuberculosis drugs. Initial therapy includes daily doses of the medications listed here.

Drug sensitivity tests are performed on all tuberculosis patients. After several weeks, the results are available and the drug regime should be adjusted accordingly.

Patients must be directly observed while taking anti-tuberculosis drugs. This is referred to as Directly Observed Therapy, or DOT. It is important to observe patients while taking these medications because inappropriate or incomplete drug therapy increases the likelihood of the patient developing a drug resistant strain of TB.
LVHN is committed to protecting the health and safety of all employees, patients and visitors. The following section will provide you with more detail on how you can protect yourself and others from TB infection.
Lehigh Valley Health Network has developed a TB Exposure Control Plan for your protection. You can view a complete copy of this plan in the Infection Control and Prevention Manual.

The TB Exposure Control Plan includes information, such as:
- TB screening procedures,
- Identification of individuals with TB,
- Procedures for the care of patients with TB, and
- Respiratory Protection Program

To view the most up to date version of this document, visit the Infection Control and Prevention Intranet site. Once on the Infection Control and Prevention home page, click the Manual link.
There are two key principles to protect yourself and others from TB infections; early identification and basic control methods.

The next section will provide more detail on each of the key principles.
Early identification is key! The sooner a case of TB is diagnosed, the sooner you can act to protect yourself and others.

People with Active TB Disease will not always be aware that they have been infected by the disease. It is important to follow the screening procedures to identify infected persons as soon as possible.
Employee Health Services offers Tuberculosis screenings free of charge for employees. The screenings protect the health of our employees and our patients. This testing helps to ensure early identification of changes in TB status and provides those infected with quick medical treatment. Because of the health impacts associated with TB, these screenings are a condition of employment at LVHN.

Screening is performed by one of two methods; Mantoux Tuberculin Skin Tests or Quantiferon TB Gold Test. Employees are first screened for TB before starting work at LVHN. Employees are then screened every year (except for exempt personnel). Those working in high risk areas, receive tests every 6 months.
The TB skin test must be read 48-72 hours after injection. The results must be read by an employee health nurse or other designee.

This is an example of a negative test result. Notice that there is no visible swelling or discoloration after 72 hours.

This is an example of a positive skin test. Staff with a positive skin test may be monitored or put on medication.
Once someone has been identified as being infected with active TB disease, how can you prevent the spread of the disease to others?

Following some basic control methods will help prevent the spread of TB. To help you remember, think of the 5 P’s:

- Patient TB screening tool
- Patient hygiene
- Place airborne sign on door
- Proper room assignment
- Properly fitting respirators
Screening tools have been developed for use throughout LVHN to help identify patients that may have TB. This screening tool is another form of early identification. The other control methods will not be effective if infected patients are not identified early. Be sure to use this handy screening tool during patient registration.

Once Active TB Disease is diagnosed in a patient, appropriate therapy should begin immediately. Active TB is identified in patients through history, physical exam, chest x-ray, Tuberculin skin test or Quantiferon Gold Test.
Remember that TB is a disease that is spread through the air. To prevent the spread of TB, it is important to explain “Respiratory Hygiene and Cough Etiquette” to any patients whose illnesses are associated with airborne transmission.

Cough Etiquette simply means instructing your patient to cover their mouth with a tissue when they cough or sneeze. Special Cough Etiquette stations are located in common waiting areas. These organizers hold tissues, masks, hand sanitizers, and signs for cough etiquette. For more information, click the Attachments tab above to view the “Cover Your Cough” poster.

Another important hygiene rule to follow is to wash your hands frequently. Instruct your patients to properly wash with soap and water or an alcohol based hand sanitizer.
Patients infected with diseases transmitted through the air, like TB, should be encouraged to wear surgical masks. Surgical masks limit the number of contaminated bacteria released into the air by the patient.

Patients with suspected or confirmed active TB Disease should always wear a surgical mask (not a respirator/N-95 mask) while outside of designated isolation rooms. This includes waiting rooms, treatment rooms, and during transport or ambulation. Visitors will be instructed on the use of the N-95 respirator mask worn by the healthcare workers.

Please note that not all patients will be able to tolerate wearing a surgical mask. Speak with a physician if you are not sure if the patient can safely wear a surgical mask.
Place an Airborne Isolation Sign on the door for patients who have suspected or confirmed TB. Place this sign on the door immediately to alert staff to use special precautions.
Proper placement of patients with suspected or confirmed TB will help to prevent exposure to others. These patients should be placed in a room with negative air flow. LVHN has numerous airborne isolation rooms that are designated to safely house patients on airborne precautions.

It is important to remember the following points for patients who are on airborne precautions or in an isolation room:

- The door to the precaution or isolation room must be kept closed.
- An airborne precaution sign must be placed on the door.
- Airborne precautions should be discontinued only when the patient is on effective therapy, is clinically improving, and has had a negative sputum exam for tubercle bacilli for three days in a row. Precautions are discontinued on a case by case basis at the physician’s discretion.
Patients infected with illnesses such as TB, Chickenpox and SARS can spread bacteria through the air. Respiratory protection is required to help protect you from diseases spread through airborne contaminants.

“N-95 respirators” are the primary type of respiratory protection used at LVHN.

There are three requirements for using respiratory protection. Click each button to learn more.
Medical Clearance

Employees must receive medical clearance to use a respirator from LVHN Employee Health Services.

Some people have medical conditions that may prevent them from safely using respiratory protection. Examples of conditions that may cause problems when using a respirator are asthma, heart disease, and claustrophobia.

If your job requires that you wear a respirator, you must first complete a "Respirator User's Medical Surveillance Form". LVHN Employee Health Services will decide whether or not you are permitted to use a respirator.

If you experience any difficulty when wearing a respirator, promptly report the condition to Employee Health Services.

Periodic medical evaluation is also required. A "medical questionnaire for continued respirator use" is completed during annual fit testing.
Training Requirement

Federal law requires that employees who must use respiratory protection receive training. Employees are required to take training prior to wearing a respirator. After that, employees must receive training each year.

This training module meets the annual training requirement. N-95 users also receive hands-on respiratory protection training each year at their mandatory annual fit test.
Proper Fit

Respirators only provide protection when they are properly fitted to the individual. For this reason, the government requires that all personnel permitted to use N-95 respirators receive an initial fit test. Employees must be properly fitted before they are assigned tasks using N-95’s. In addition, annual fit tests are required to maximize safety.

During fit tests and hands-on training, you will learn how to properly wear a respirator. You will also learn how to perform a user check. Perform a user check each time you wear a respirator to ensure you have a good fit.
Always wear the same model, brand, and size respirator that you wore during fit testing. Failure to do so could reduce the level of protection provided by the respirator.

Never share your respirator. N-95’s are only intended to be used by one person. Store your labeled respirator in a secure location so that no one else will accidently use it.

You may use your N-95 respirator for an entire work shift unless told otherwise by your supervisor. At the end of your shift, throw away your N-95 into a regular waste basket. N-95’s do not go into the red bag waste.
Important Warning

WARNING!

N-95 Respirators do not provide protection against chemical vapors.

If protection from chemicals is required, contact LVHN Safety:
610-969-4488

N-95 Respirators do not provide protection against chemical vapors. Never assume an N-95 will provide any protection against chemical odors, gases, or vapors.

If protection from chemicals is required, contact LVHN Safety at 610-969-4488 for specific information.
If you have any questions about respiratory protection, please contact the Respiratory Protection Program or the Safety department.