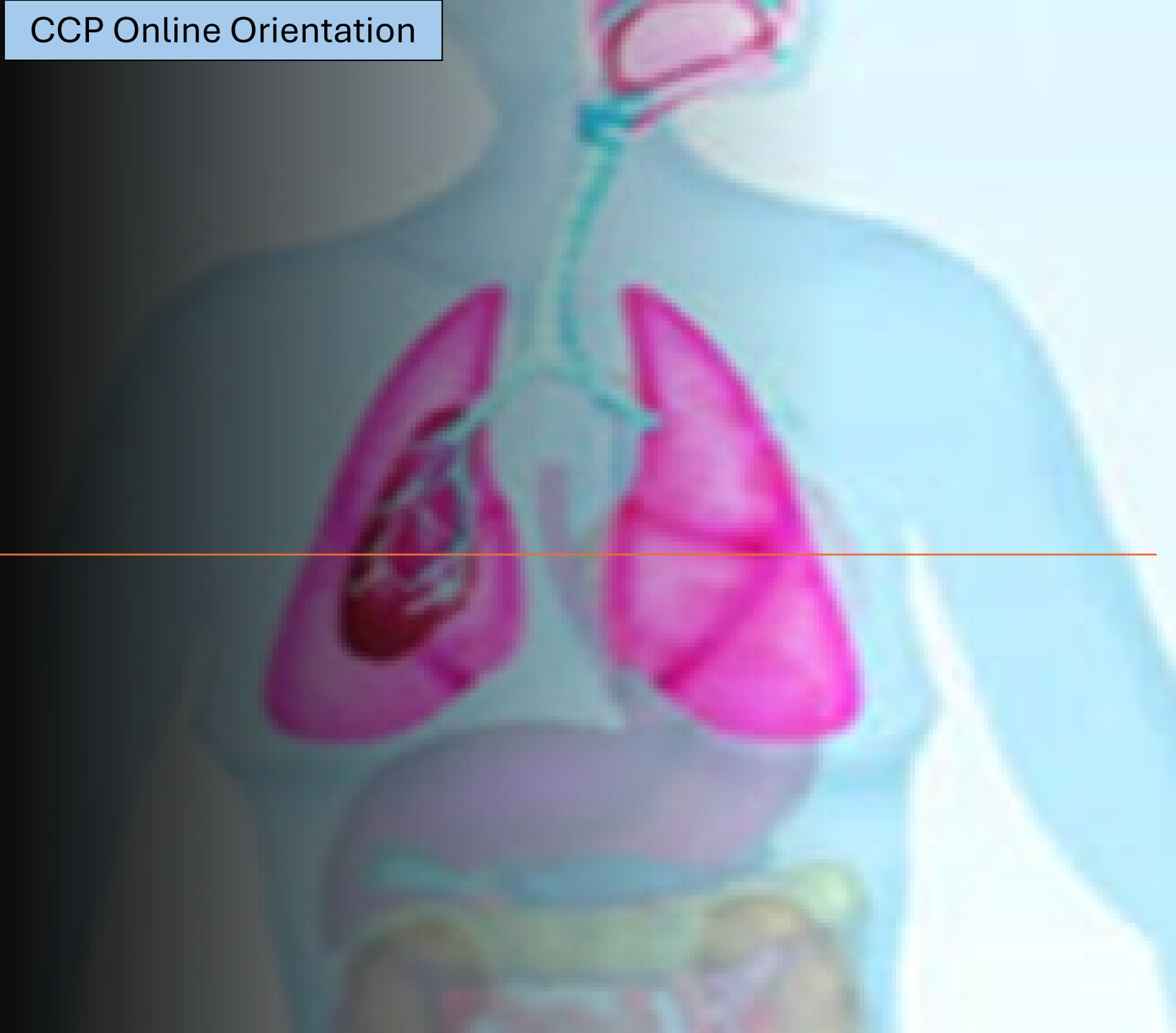
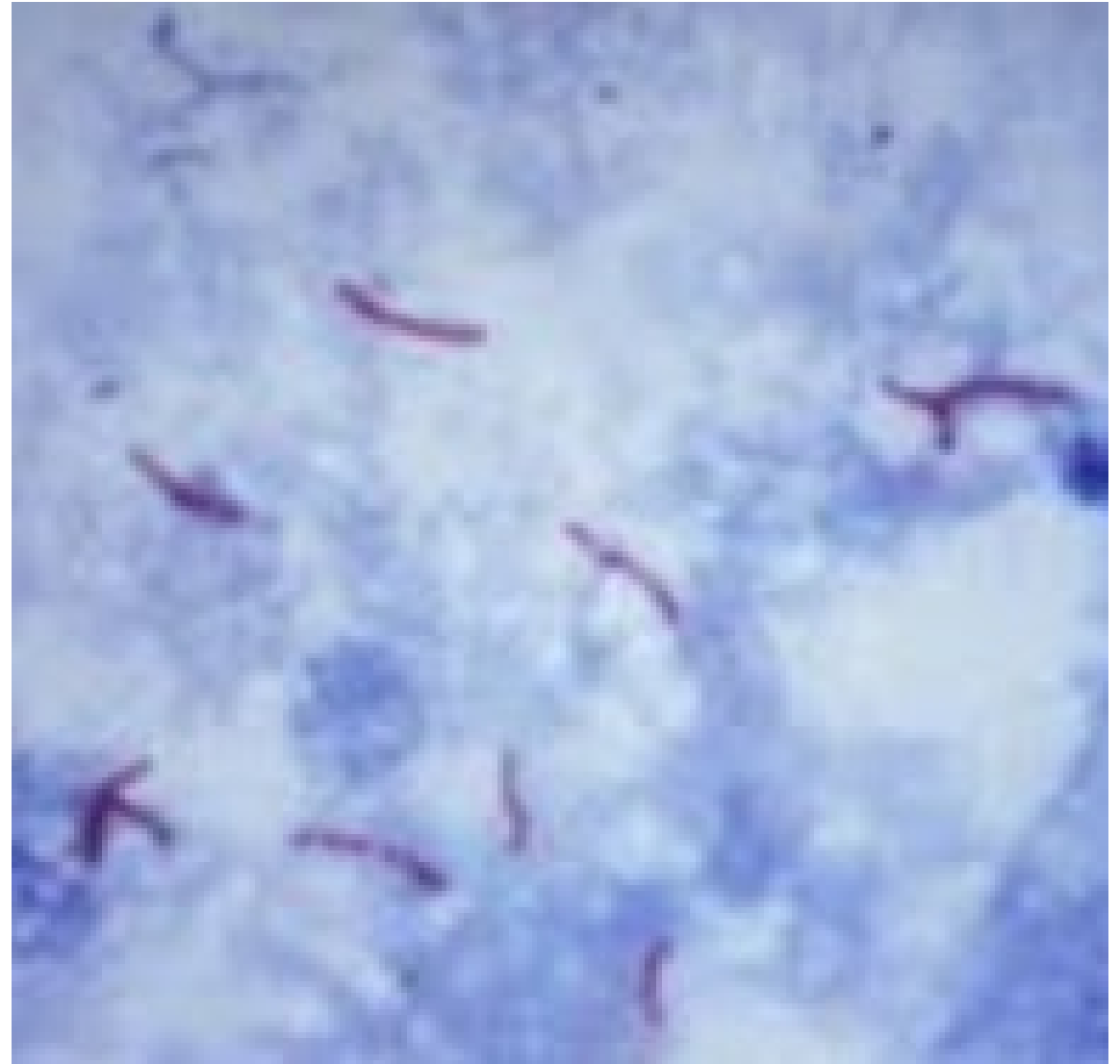


Tuberculosis



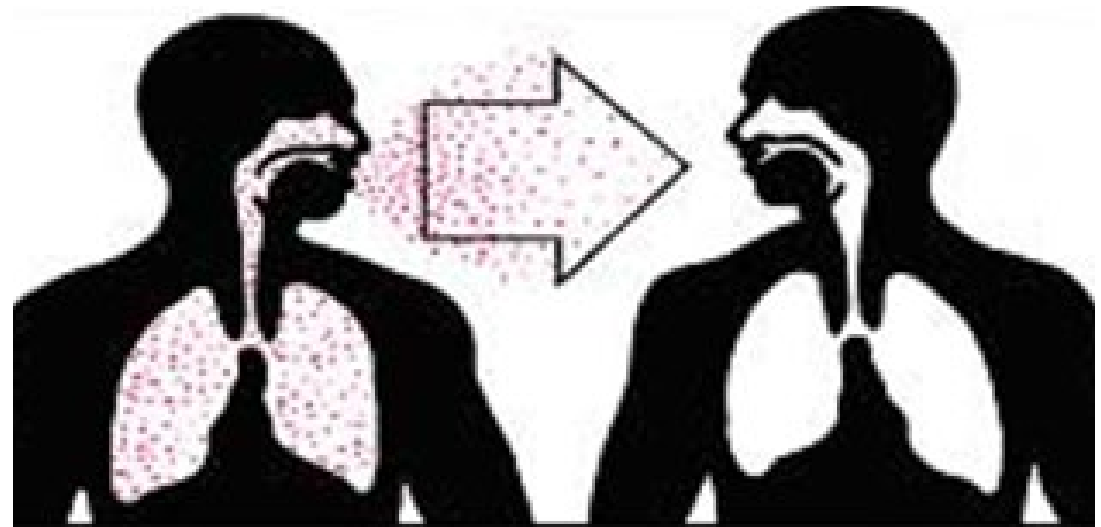
Overview

- Tuberculosis (TB) is an ancient infectious disease caused by the bacterium *Mycobacterium tuberculosis* (Mtb), which most commonly affects the lungs but can also affect the central nervous system, lymphatic system, circulatory system, genitourinary system, bones and joints.
- Suspected and confirmed TB cases must be report within 24 hours to the state's designated department or health official.
- If not treated properly, TB disease can be fatal.



Transmission

- TB is spread through the air via airborne droplet nuclei from one person to another.
- People with the active disease expel bacilli into the air by:
 - coughing,
 - sneezing,
 - shouting,
 - talking,
 - laughing,
 - or any other way that will expel bacilli into the air.



Pathogenesis

TB Infection

Susceptible person inhales droplet nuclei containing Mtb bacilli that become established in the body. This causes the **Mtb infection**.

Within 2-10 weeks the immune response limits further spread of tubercle bacilli; however, some of the bacilli remain viable but are dormant as long as the immune system remains active and functions normally. This is known as latent TB infection.

People who have latent TB infection do not get sick and do not spread the bacteria to others. But some people with latent TB infection eventually do get TB disease

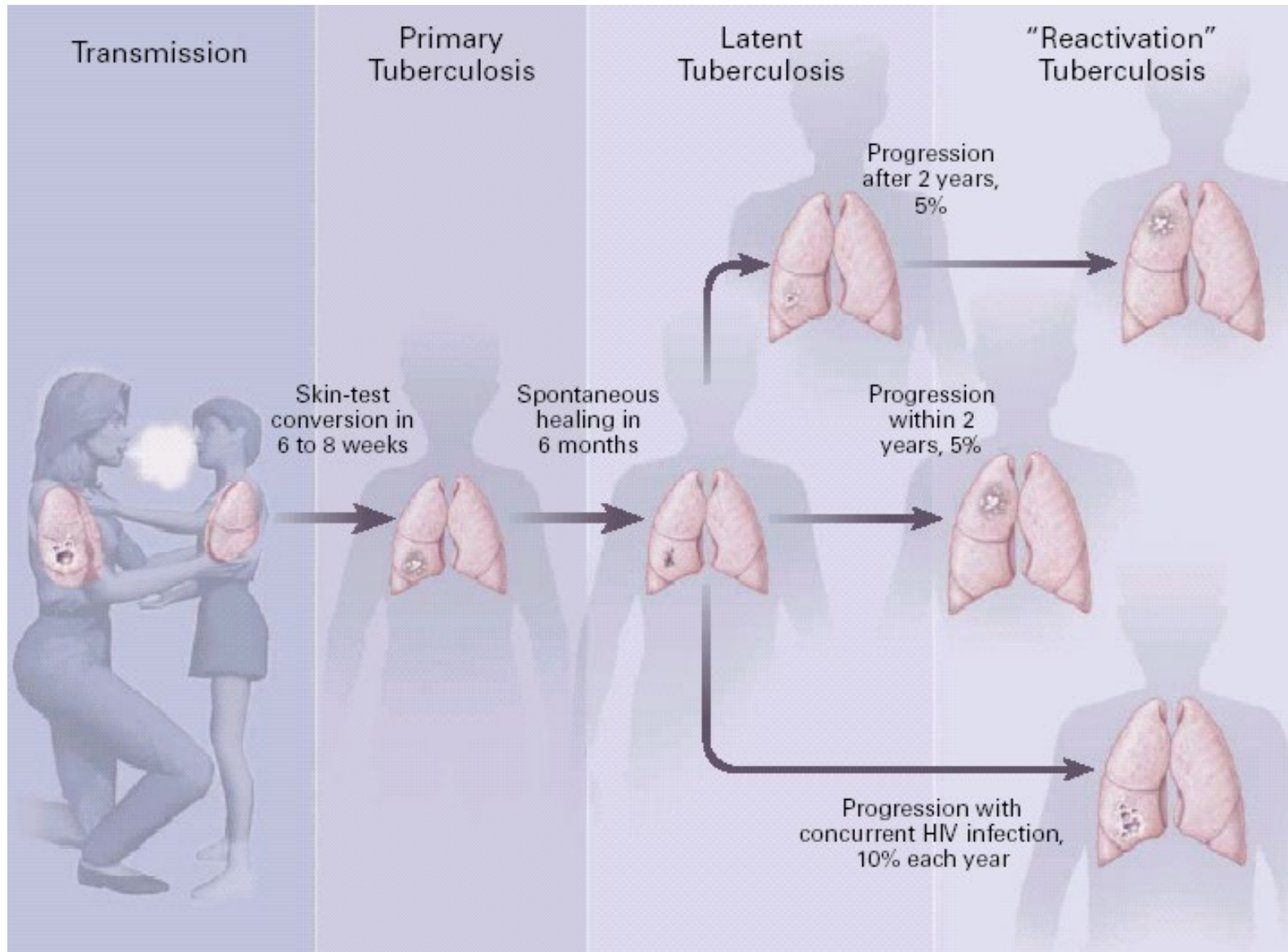
Progression to active disease is more likely in people with medical conditions that result in immune deficiencies; the elderly; and those less than 4 years of age.

TB Disease

For someone to develop active TB disease, the following two events must take place:

1. The entrance of TB bacteria into the body to cause the Mtb infection.
2. The inability of the immune system to stop the TB bacteria from growing and spreading after the initial infection.

In most cases the bacteria affects the lungs but can be found in all parts of the body.





Sign and Symptoms

- Productive cough 3 weeks or longer
- Shortness of breath
- Chest pain
- Hemoptysis
- Night sweats/fever/chills
- Loss of appetite/unexplained weight loss
- Weakness/fatigue/lethargy

Diagnosis

TB Infection:

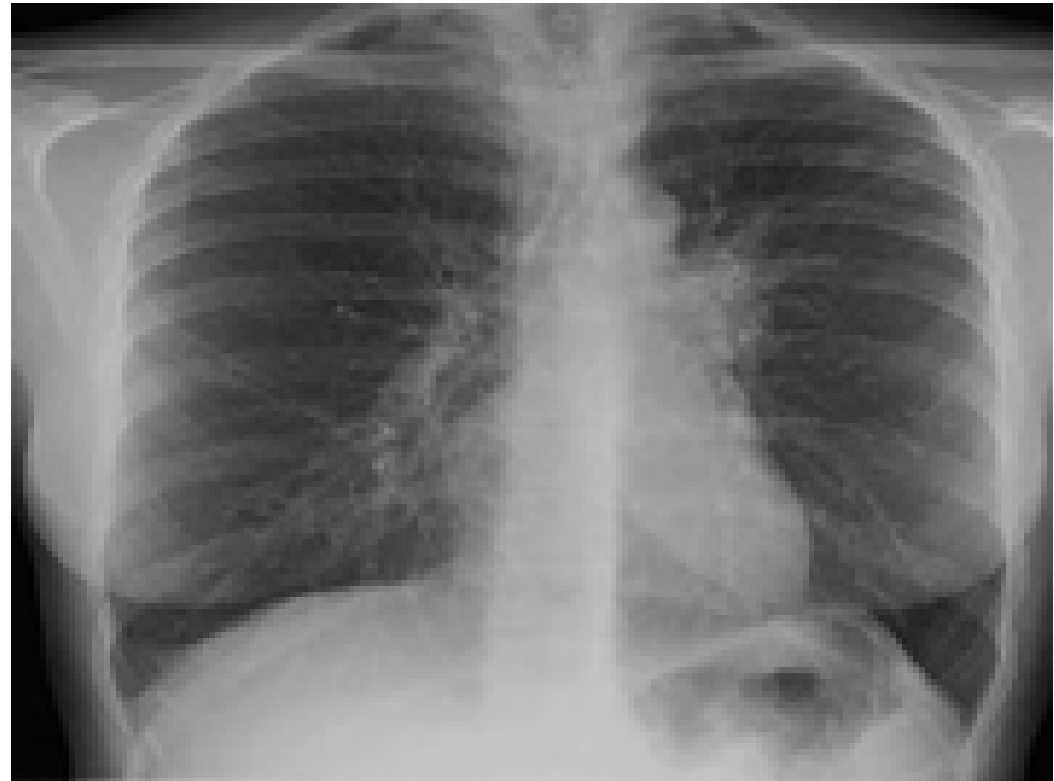
- Mantoux Tuberculin Skin test (TST): uses TB antigens (purified protein derivative) to detect TB infection. It cannot tell if the infection is active or inactive (latent).
 - Redness alone at the skin test site is a negative reaction.
 - A firm red bump is a positive reaction. The size of the bump determines whether the test results are significant, based on risk factors for TB.
 - A false-positive test most likely occurs if a person has been infected with a different type of mycobacterium other than the one that causes TB, or if vaccinated with the bacillus Calmette-Guerin (BCG) vaccine, a vaccine used in other countries with high TB infection rates.
- Blood tests (interferon-gamma release assays [IGRAs]): measure how the immune system reacts to the bacteria that cause TB.



Diagnosis

TB Disease:

- Medical history and physical examination
- Chest radiograph (X-ray)
- Bacteriologic or histologic examinations: tests to see if TB bacteria are in the sputum



Treatment

▶ TB Infection

- Isoniazid (INH) for 9 to 12 months is the preferred regimen to kill the TB bacteria that are in the body and to prevent the person from developing TB disease.

▶ TB Disease

- TB disease can be treated by taking several drugs for 6 to 12 months.





Treatment

- The length of therapy and combination of antibiotics is decided based upon the organism's sensitivity to the antibiotics, signs of improvement, and patient's compliance with medication regimen.
- It is especially important that the prescribed drug therapy regimen be completed in order to kill all bacilli.
- Drug resistance may develop when medications are taken incorrectly by either skipping doses or not taking the medication for the prescribed amount of time.

Who is at Risk of Tuberculosis Disease?

- People infected with HIV.
- People with close contact to an individual with active infectious tuberculosis.
- People with conditions that increase the risk of active tuberculosis after infection (diabetes mellitus, chronic renal failure, malignancies, etc.).
- People born in countries or geographic regions with a high prevalence of tuberculosis.
- Substance abusers, such as alcoholics, IV drug users, and cocaine or crack users.
- Residents of long-term care facilities, nursing homes, prisons, mental institutions, homeless shelters, and other congregate housing settings.
- Medically underserved low-income populations.
- Healthcare workers and others who provide service to any high-risk group.

Infection Control and Prevention

- Early detection and prompt treatment of patients/residents who have TB.
- Placement of any patient/resident with active symptoms and a suspected diagnosis of active TB, a positive chest x-ray, positive sputum smears, or positive sputum cultures in an airborne infection isolation room (AIIR)/negative pressure room.
- Enforcement of the requirement for health care providers to wear specially designed and fitted **NIOSH-Approved Particulate Respirator Masks**, at least an N-95.

Minimizing Exposure

- Provide as many services in the isolation room as possible (e.g., portable x-ray);
- Place a surgical mask on the patient/resident for transport or relocation;
- Take the individual directly to the location;
- Immediately perform the procedure upon arrival;
- Return the patient/resident to the isolation room as soon as practical;
- If possible, choose a time when the procedure area is not being used by others;
- Delay elective procedures and surgeries until the patient/resident is determined to be non-infectious.



References

- Center for Disease Control and Prevention. (2023). Tuberculosis. Retrieved from www.cdc.gov/tb/
- Mayo Clinic. (2023), Tuberculosis. Retrieved from www.mayoclinic.com/health/tuberculosis/DS00372