

## GLOSSARY OF TB TERMS

**ACID-FAST BACILLI- (AFB)** Bacteria which retain certain dyes even when washed with an acid solution. Only rarely are acid-fast bacteria which are seen on smear not mycobacteria. A presumptive diagnosis of tuberculosis is often made on the basis of a positive “AFB smear;” however, the diagnosis is not confirmed until a culture is grown and identified as *M. tuberculosis*.

**ACQUIRED DRUG RESISTANCE-** Resistance to one or more antituberculous drugs which develops while a patient is on therapy, usually the result of erratic compliance on the part of the patient.

**ADVERSE REACTIONS-** Any undesirable effect of a medication. All drugs may cause such reactions, so that periodic monitoring of tuberculous patients under treatment is necessary to detect any that do occur, even though their occurrence may be common.

**ALVEOLI-** The small air sacs in the lungs which lie at the end of the bronchial tree. The site of gas exchange in the lungs, and the site where tuberculous infection usually begins.

**ANEMIA-** A condition in which there is a decreased volume of red cells in the blood. There are many causes for anemia, including chronic infections such as untreated tuberculosis.

**ANOREXIA-** Loss of appetite. Symptom frequently seen in many illnesses, including tuberculosis.

**ATTENUATED-** Refers to the **weakened ability of an infectious agent to cause disease**. For example, BCG is an attenuated strain of *Mycobacterium bovis*.

**BACTERICIDAL-** Capable of killing bacteria. Isoniazid and rifampin are the two most potent bactericidal antituberculous drugs.

**BACTERIOLOGICAL SPECIMEN-** Refers to any body fluid, secretion, or tissue sent to the laboratory where smears and cultures for tubercle bacilli will be performed. The specimen may consist of sputum, urine, spinal fluid, material **obtained at biopsy**, etc.

**BACTERIOSTATIC-** Capable of preventing bacterial growth (but not necessarily capable of killing bacteria). Drugs such as **ethambutol** and para-amino salicylic acid are **primarily bacteriostatic**.

**BIOCHEMICAL TESTS-** In tuberculosis work, refers to special tests performed on mycobacterial cultures to determine which particular species of mycobacteria is growing. Also refers to blood tests performed on patients to test liver function.

**BOOSTER PHENOMENON-** Seen when an individual has a diminished ability to react to tuberculin even though truly infected with mycobacteria. An initial tuberculin test may stimulate (boost) the immune system so that the next test will be positive.

**BOVINE TUBERCULOSIS-** An **illness of cattle caused by *M. bovis***, an organism which can also cause disease in man identical to that caused by *M. tuberculosis*. It may be transmitted by means of contaminated unpasteurized milk. It is rarely seen in this country because the reservoir of infected cattle has been practically eliminated.

**CAPREOMYCIN-** An **injectable second-line antituberculous drug related to streptomycin. Used primarily for non-tuberculous mycobacteria and drug-resistant TB.**

**CAVITY-** A **hole in the lung resulting from destruction of pulmonary tissue**. May be caused by tuberculosis, but also by other pulmonary infections and conditions. Tuberculosis patients with cavities in their lungs are said to have “**cavitary disease**” and are **often more infectious** than patients without cavities.

**CHEMOTHERAPY-** Treatment of infection or disease by means of oral or injectable drugs.

**CHEST RADIOGRAPH: APICAL LORDOTIC VIEW-** A special radiograph taken in order to better visualize the apices (upper portions) of the lungs which are often affected by tuberculosis but which may be obscured by the clavicles (collar bones) in a standard view.

**CHEST RADIOGRAPH: POSTERIOR ANTERIOR (PA) FILM-** The most common radiograph view taken with the patient standing facing the film and with the X-ray source coming from the back.

**COLONY-** Laboratory term used to quantify numbers of tubercle bacilli in a cultured specimen. **Each microscopic bacterium, when grown in the laboratory, gives rise to one visible colony.**

**CONTACT-** An individual who has shared the **same air space as a case of tuberculosis for a sufficient amount of time so that there is a probability that transmission of tuberculosis has occurred.**

**CONTAMINATION-** In tuberculosis, objects contaminated with tubercle bacilli ( see “Fomites”) are very rarely associated with transmission. Air contaminated with infectious **droplet nuclei is almost always the vehicle implicated in the spread of infection.** May also refer to sputum specimens from which no mycobacteria can be cultured because of overgrowth (contamination) by other more rapidly growing bacteria.

**CONVERTER-** A person, who, within a 2-year period, has an IGRA that converts from negative to positive or (1) had an initial tuberculin test without a positive reaction, (2) has had a second test with a positive reaction, and (3) has had a difference of 10 or more millimeters (of induration) between the two test results. Such “conversion” may represent new infection which is associated with a high risk of developing disease, or in an older, low-risk population.

**CULTURE-** The process of growing bacteria in the laboratory so that organisms can be identified.

**CYCLOSERINE-** A second line **oral** antituberculous drug, used primarily for treating drug- resistant tuberculosis and disease **caused by non-tuberculous mycobacteria.**

**DROPLET NUCLEI-** The microscopic airborne particles of aerosolized sputum which can carry tubercle bacilli to the alveoli of susceptible individuals.

**DRUG SUSCEPTIBILITY TESTS-** Laboratory tests which determine if the tubercle bacilli cultured from patient can or cannot be killed or inhibited by various anti- tuberculous drugs.

**ERYTHEMA-** In skin testing, refers to the area of redness around the injection site. It **is not measured** when the tuberculin test is read.

**ETHIONAMIDE-** A second line oral antituberculous drug.

**EXTRAPULMONARY TUBERCULOSIS-** Refers to tuberculosis outside the lungs. In the United States, **about 15 percent** of reported cases involve extrapulmonary sites, such as the kidney, pleura, lymph nodes, etc.

**FOMITES-** Linens, book, dishes, or other objects used or touched by a patient. They are **not** involved in the transmission of tuberculosis.

**HEMOPTYSIS-** Coughing of blood. Sometimes seen in tuberculosis as well as in other pulmonary conditions.

**HEPA Filter** High Efficiency Particulate Arrestance - To qualify as HEPA by US government standards, an air filter must remove (from the air that passes through) 99.97% of particles that have a size of 0.3  $\mu\text{m}$ .<sup>1</sup>

**HUMAN IMMUNODEFICIENCY VIRUS** or HIV INFECTION- Infection with the retrovirus that causes the acquired immunodeficiency syndrome (AIDS). One of the clinical conditions which increases the risk of progressing from tuberculous **infection to disease**.

**IMMUNOCOMPEN T** – having a functioning immune system

**IMMUNOCOMPROMISED**- having an immune system that has been impaired by disease or treatment

**IMMUNOSUPPRESSED**- the active medical suppression of the immune response.

**INDUCED SPUTUM**- Sputum obtained from a patient unable to cough up a spontaneous specimen. The patient inhales a mist of saline, which stimulates a cough from deep within the lungs.

**INDURATION**- The **area of raised palpable** swelling between the site of injection of tuberculin. The diameter of the indurated area is measured 48-72 hours after the injection and is recorded as the result of the tuberculin test.

**INFECTION**- Condition in which virulent organisms, such as *M. tuberculosis*, are able to multiply within the body and cause a response from the host's immune defense.

**IGRA**- Interferon-Gamma Release Assays (IGRAs) are blood tests that can aid in diagnosing *M. tuberculosis* infection. They do not help differentiate tuberculosis infection (TBI) from tuberculosis disease. Two IGRAs that have been approved by the U.S Food and Drug Administration (FDA) are commercially available in the US: QuantiFERON®-TB Gold In-Tube test ( QFT-GIT); and T-SPOT®. TB test (T-Spot)

**INTERMITTENT THERAPY**- Therapy given on a twice-weekly or three times weekly basis, usually directly supervised by a health worker. Useful for treating patients who are unable or unwilling to take their own medications regularly. Must be preceded by an **initial period of daily therapy**.

**INTRADERMAL**- Within the layers of the skin.

**ISONIAZID**- An **oral bactericidal drug** used both for treatment of tuberculous infection and in combination with one or more other drugs in the **treatment of tuberculosis disease**.

**KANAMYCIN**- Injectable second- line antituberculous drug related to streptomycin. **It is used primarily** for treatment of streptomycin-resistant **tuberculosis**.

**KOCH**- German scientist who discovered the tubercle bacillus in **1882 and who later** discovered tuberculin.

**MALAISE**- A vague, non-localized feeling of **uneasiness, debility, and/or discomfort associated with illness**.

**MANTOUX TEST**- Tuberculin test given by injecting a measured amount of liquid solution of tuberculin into the superficial layers of the skin with a needle and syringe. The most reliable and best standardized technique for tuberculin testing.

**MILIARY**- Those cases of tuberculosis where large numbers of tubercle bacilli have been disseminated through the **bloodstream to many parts of the body. Refers also to the appearance of the chest film in disseminated tuberculosis** (looks like scattered millet seeds).

**MILLIMETER**- Metric unit of length used to measure induration in tuberculin testing.

**MORBIDITY**- **The condition of being diseased or sick.**

**MYCOBACTERIUM TB**- The bacterium which causes tuberculosis (often abbreviated as *M. tuberculosis*).

**N-95 MASK** - The 'N95' designation **means** that when subjected to careful testing, the respirator blocks at least 95% of very small (0.3 micron) test particles.

**NIACIN TEST**- An important biochemical test performed by the laboratory on a culture of mycobacteria. A **“positive” niacin test almost always identifies *M. tuberculosis***.

**NONTUBERCULOUS MYCOBACTERIA**- Bacteria related to *Mycobacterium tuberculosis* but of a different species. Sometimes called **“atypical” mycobacteria**, or **“mycobacteria other than tuberculosis”**

**PATHOGENESIS**- The natural evolution of a disease process in the body without **intervention** ( i.e., without treatment).

**PHOTOCROMOGENS**- Nontuberculous mycobacteria which form pigmented colonies in the laboratory when exposed to light (e.g., *M. kansasii*).

**POSITIVE REACTION**- Reaction to the tuberculin test which suggests the individual tested is infected with tubercle bacilli. A tuberculin reaction of **5mm or more induration is considered positive for those persons who are immunosuppressed, are close contacts to an infectious tuberculosis case, and for those with an abnormal chest radiograph indicative of tuberculosis. A reaction of 10 mm or more of induration is considered positive for all others with risk factors for tuberculosis (such as diabetes or other medical risk factors for tuberculosis)**. The term “significant” is also used to describe such reaction.

**MYCOBACTERIUM AVIUM- COMPLEX**- MAC or MAI is an atypical mycobacterial infection, i.e. one with nontuberculous mycobacteria or NTM, caused by *Mycobacterium avium* complex (“MAC”), which is made of three mycobacteria species, *M. avium*, *M. intracellulare*, and *M. chimaera*. This infection causes respiratory illness in birds, pigs, and humans, especially in immunocompromised people, In the later stages of AIDS it can be very severe. It usually first presents as a persistent cough. It is typically treated with a series of three antibiotics for a period of at least six months.

**MYCOBACTERIUM TUBERCULOSIS COMPLEX**- The *Mycobacterium tuberculosis* complex (MTC OR MTBC) is a genetically related group of *Mycobacterium* species that can cause tuberculosis in humans or other living things

It includes, but are not limited to:

- *Mycobacterium tuberculosis*
- *Mycobacterium africanum*
- *Mycobacterium bovis* and the *Bacillus Calmette- Guérin strain*
- *Mycobacterium microti*
- *Mycobacterium canetti*
- *Mycobacterium caprae*
- *Mycobacterium pinnipedii*
- *Mycobacterium suricattae*
- *Mycobacterium mungi*

**PRIMARY DRUG RESISTANCE**- Resistance of bacteria to drugs which exists prior to the beginning of treatment.

**PRIMARY DRUGS**- Term sometimes used to refer to the most commonly used antituberculous drugs; isoniazid, rifampin, pyrazinamide, ethambutol, and streptomycin.

**PULMONARY**- Referring to the lungs. Most tuberculosis cases in the United States (85 percent) are pulmonary.

**PURIFIED PROTEIN DERIVATIVE (PPD)**- Type of purified tuberculin preparation derived from old tuberculin (OT) and developed in the 1930's. The standard Mantoux test uses 5 TU (tuberculin units) of PPD.

**PYRAZINAMIDE**- An oral antituberculous drug. It is becoming more important as a primary drug in short-course treatment regimens.

**RADIOGRAPH**- An x-ray film.

**RADIOMETRIC METHODS**- A rapid method for culturing tuberculosis allowing identification of *M. tuberculosis* in 5-10 days.

**REGIMEN**- Any particular treatment plan for tuberculosis specifying which drugs are used, in what doses, according to what schedule, and for how long.

**RESISTANCE**- Refers to the ability of some strains of bacteria (including *M. tuberculosis*) to grow and multiply even in the presence of certain drugs which normally kill them. (Such strains are referred to as "drug resistant strains.")

**RIFAMPIN**- An oral bactericidal antituberculosis drug which when used along with isoniazid provides the basis for short-course therapy.

**ROENTGEN**- German scientist who discovered X-rays in 1895. Also a measure of radiation.

**SARCOIDOSIS**- A chronic disease whose cause is not known and which may affect the lungs as well as other parts of the body. The appearance of radiographs in sarcoidosis may occasionally mimic that seen in tuberculosis.

**SCOTOCHROMOGENS**- Nontuberculous mycobacteria which form pigmented colonies even when grown in the dark (e.g., *M. scrofulaceum*).

**SECONDARY DRUGS**- Refers to the antituberculous drugs used in difficult cases ( such as for retreatment or when there is resistance to primary drugs). Examples are Cycloserine, Ethionamide, Capreomycin.

**SHORT-COURSE CHEMOTHERAPY**- Therapy based on the combination of the two most potent antituberculosis drugs, isoniazid and rifampin, which allows therapy for many (but not all) patients to be completed in 6 to 9 months.

**SMEAR (AFB SMEAR)**- A laboratory technique for visualizing mycobacteria under the microscope. Smear results are usually available within a few days, and they correlate strongly with infectiousness, especially in untreated patients. However, a "positive" result is not definitive for tuberculosis.

**SOURCE CASE**- An infectious individual who has transmitted tubercle bacilli to another person or persons.

**SPUTUM**- Material coughed up from deep within the lungs. If a patient has a pulmonary infection, an examination of the sputum (by smear and by culture) can indicate what organism is responsible for the infection. Should not be confused with saliva or with nasal secretions.

**STREPTOMYCIN**- The most commonly used injectable antituberculous drug.

**SURGICAL MASK**- Surgical masks provide barrier protection against droplets including large respiratory particles. Most surgical masks do not effectively filter small particles from the air and do not prevent leakage around the edge of the mask when the user inhales

**SUSCEPTIBLE**- Refers to bacteria which can be killed or inhibited by the drugs used against them. Also refers to uninfected persons who are susceptible to infection, or to infected persons who are susceptible to developing disease.

**TUBERCULOSIS INFECTION**- Condition in which living tubercle bacilli are present in an individual, or positive IGRA. The infected individual, although having a positive tuberculin reaction, has no symptoms related to the infection, has a normal chest radiograph, does not have a “positive” bacteriological examination (smear and culture), is not infectious, and is not considered a “case” of tuberculosis. **However, the infected individual remains at lifelong risk of developing disease.**

**TUBERCLE BACILLUS**- Term often used to refer to *Mycobacterium tuberculosis* (and to *Mycobacterium bovis*).

**TUBERCULOSIS**- The disease caused by *M. tuberculosis* (or rarely *M. bovis*). Condition in which tuberculous infection has progressed so that the individual typically has signs and symptoms of illness, an abnormal radiograph, a “positive” bacteriological examination (smear and/or culture), as well as positive tuberculin reaction. Individuals with disease may be infectious.

**ULTRAVIOLET (UV) LIGHT**- A form of radiation intermediate between visible light and X-rays. UV radiation is effective in killing many bacteria including tubercle bacilli. May be artificial (from a special light fixture) or natural (from sunlight).

**VENTILATION**- Refers to the flow of air into and out of the area surrounding an infectious tuberculosis patient. If the flow is sufficient, tubercle bacilli become dispersed, and there is a diminished risk of transmission of infection.

**VET** – Video Enhanced Therapy – directly observed therapy remotely performed via HIPAA compliant live computer feed such as Facetime from an Apple to Apple product.

**VIRULENCE**- Refers to the ability of a microorganism, such as *M. tuberculosis*, to **produce serious disease**. *M. tuberculosis* is a virulent organism. Some nontuberculous mycobacteria are virulent (e.g., *M. kansasii*), while others (e.g. *M. goodii*) are not. (PATHOGENICITY is a related—though not identical—concept.

**WAKSMAN**- American scientist who in 1944, discovered **streptomycin**, the first **drug found to be effective** against tuberculosis.

**ZIEHL- NEELSEN**- A technique for staining mycobacteria in preparation for examining a sputum smear. The stain results in a red appearance of mycobacteria under the microscope.