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Air borne bacterial disease

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Introduction:-

- **Airborne disease are illnesses spread by tiny pathogens in the air.**
- **An airborne disorder is any disease that is caused by microorganism that is transmitted through the air.**
- **Many clinically important airborne diseases are caused by a variety of pathogen including bacteria, viruses, and fungi.**
- **Diseases that can be transmitted by droplet or airborne routes**

Droplets transmitted:

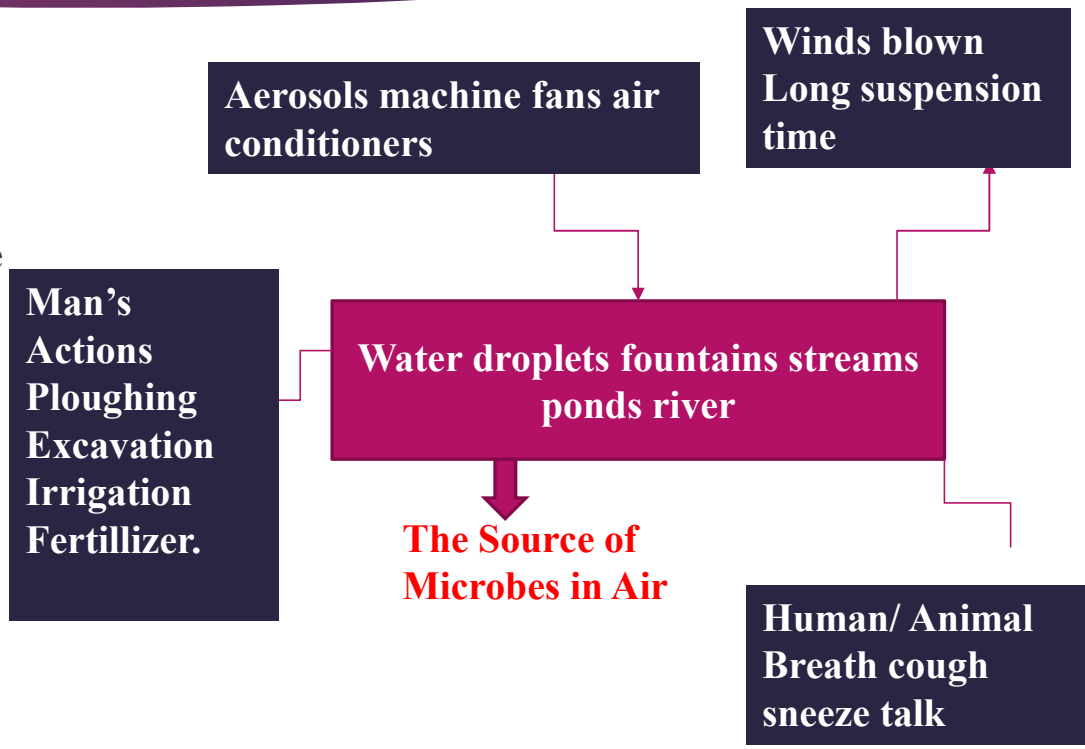
- By talking, coughing, sneezing

- During aerosol- generation procedures

- **Also possible to become infected by contact routes.**

History And Aero Microbiology

- During 1930s the term aero-microbiology was used to denote the air borne spores (e.g. fungi and other micro-organism)
- Further in 1951, the term was elaborated to include dispersion of insect population, fungal spores, bacteria, and viruses.
- In 1964, the term included the research work of air borne materials of biological significance.



What is aero- microbiology:-

"Study of living microbes suspended air".

Types of air borne disease :-

- **Airborne Bacterial Diseases:-**

1. **Tuberculosis** → *Mycobacterium tuberculosis*
2. **Diphtheria** → *Corynebacterium diphtheriae*
3. **Pertussis (whooping cough)** → *Bordetella pertusis*

Airborne disease by virus

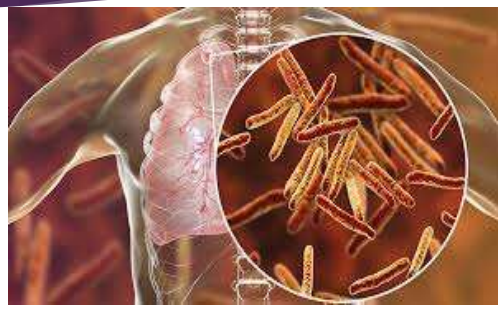
- **Influenza / Flu** ⟹ **Orthomyxoviruses**
- **Parainfluenza** ⟹ **Paramyxovirus**
- **Common cold** ⟹ **Rhinovirus**
- **Chickenpox** ⟹ **Varicella Zooster Virus**

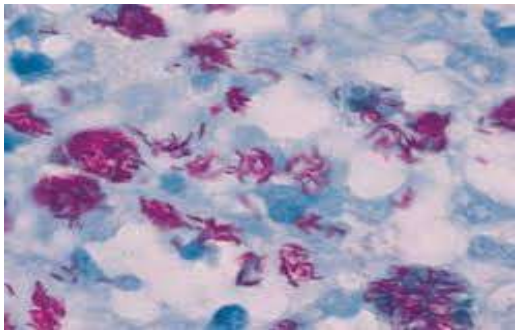
Air borne fungal diseases

- **Blastomycosis** → ***Blastomyces dermatitidis***
- **Coccidioidomycosis** → ***Coccidioides immitis***
- **Cryptococcosis** → ***Crptococcus neoformans***
- **Histoplasmosis** → ***Histoplasma capsulatum***

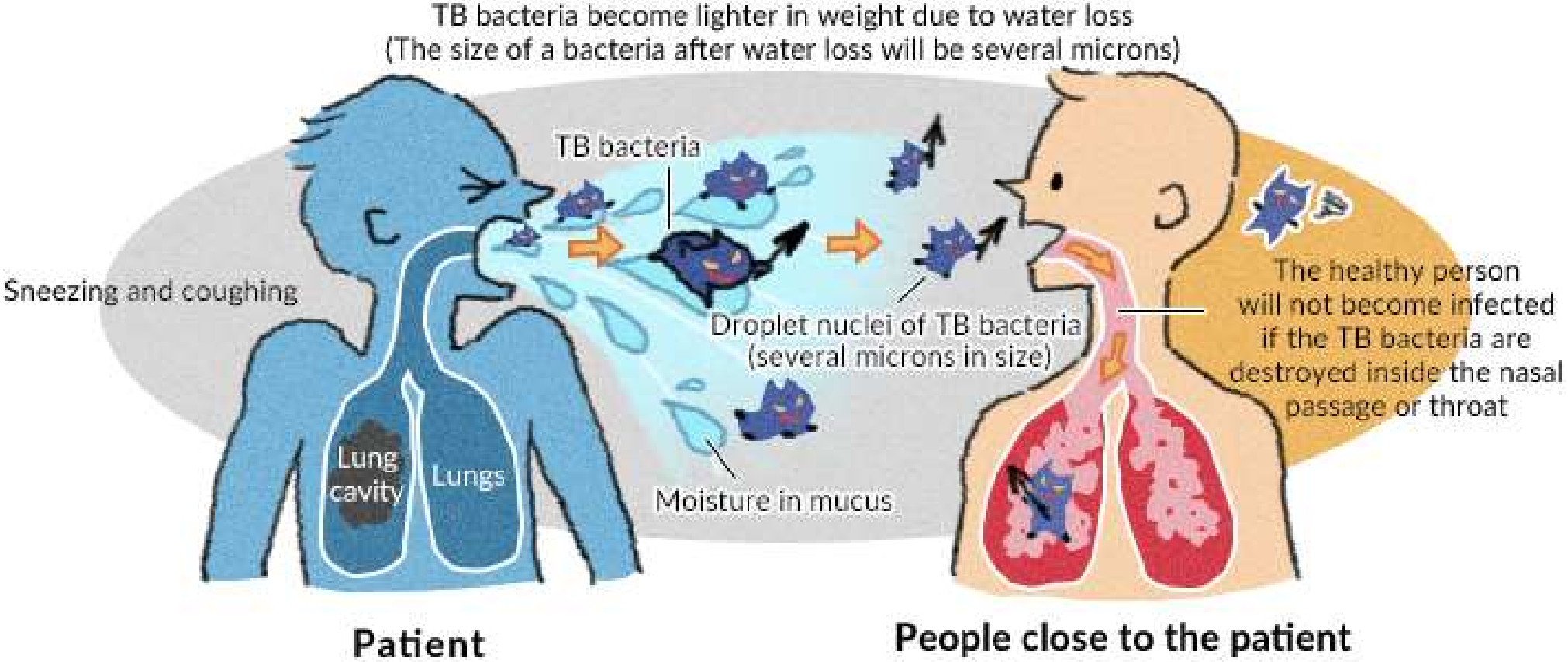
Tuberculosis

- **Tuberculosis (TB) is primarily an airborne disease caused by the bacteria *Mycobacterium tuberculosis*.**
- **which are spread person-to-person through the air.**
- **This bacteria mainly affects the lungs, but may adversely affect other organs.**
- **First discovered in 1882 by Robert Koch**
- **Acid-fast staining method for Mycobacterium tuberculosis is the Ziehl-Neelsen stain. smear is fixed, stained with carbol-fuchsin (a pink dye), and decolorized with acid-alcohol. The smear is counterstained with methylene-blue or certain other dyes. Acid-fast bacilli appear pink in a contrasting background**



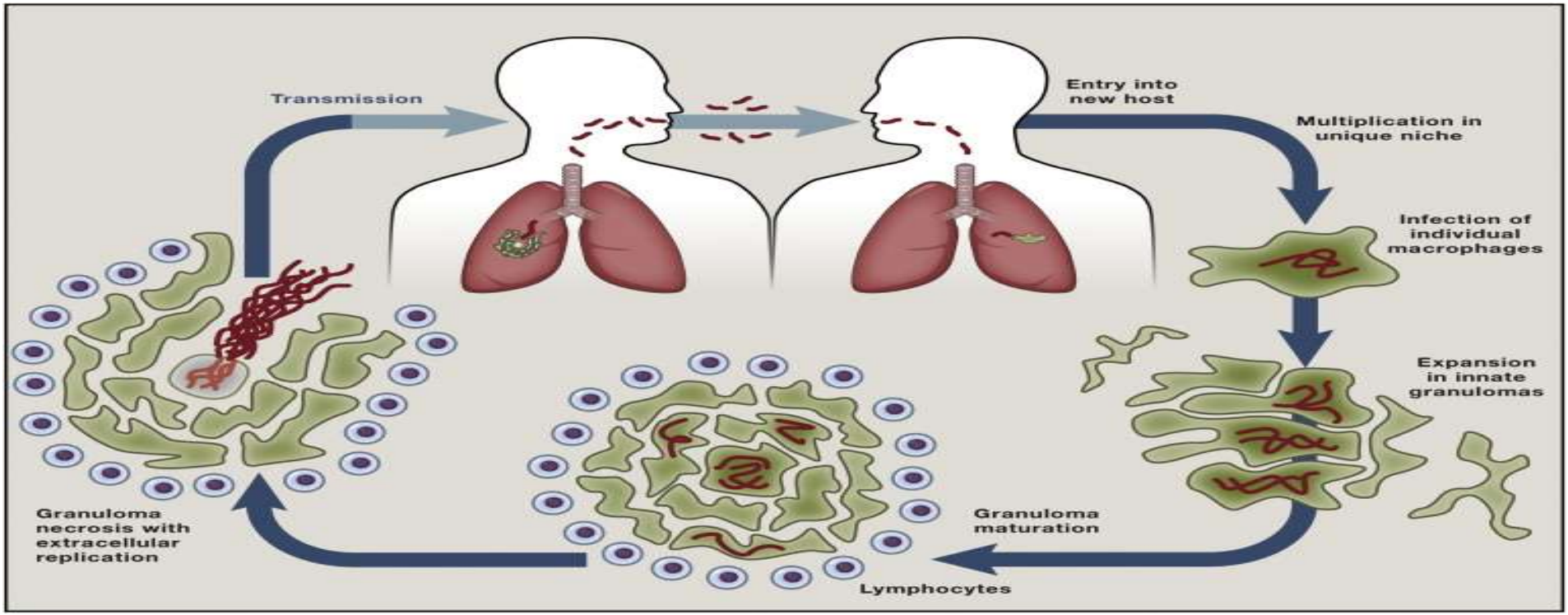


Transmission



Japan Anti-Tuberculosis Association:Common sense of Tuberculosis 2007,2,2007

Life cycle of M. tuberculosis



Symptoms :-

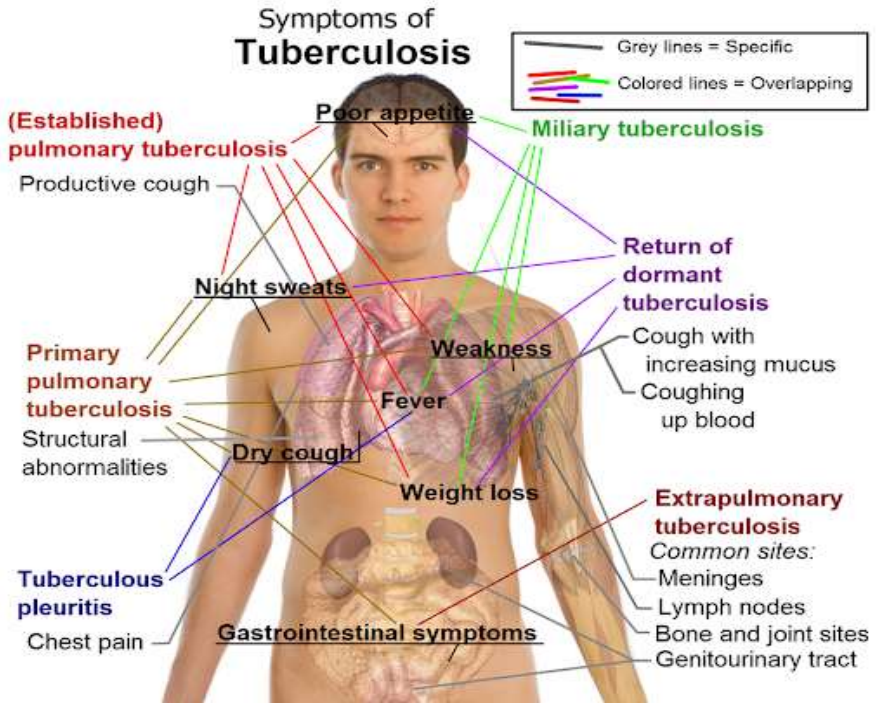
Symptoms ➡ **Chronic or debilitating cough (that lasts 3 weeks or longer)**

➡ **Pain in the chest**

➡ **Coughing up bloody sputum (saliva)**

➡ **Weight loss**

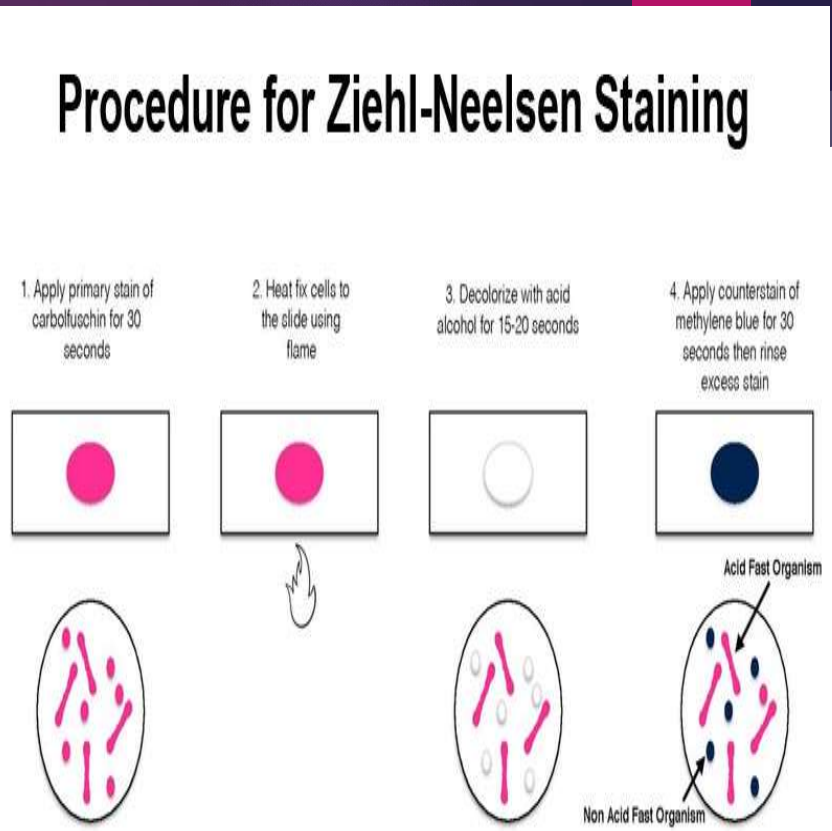
➡ **Fever, Night sweats,**



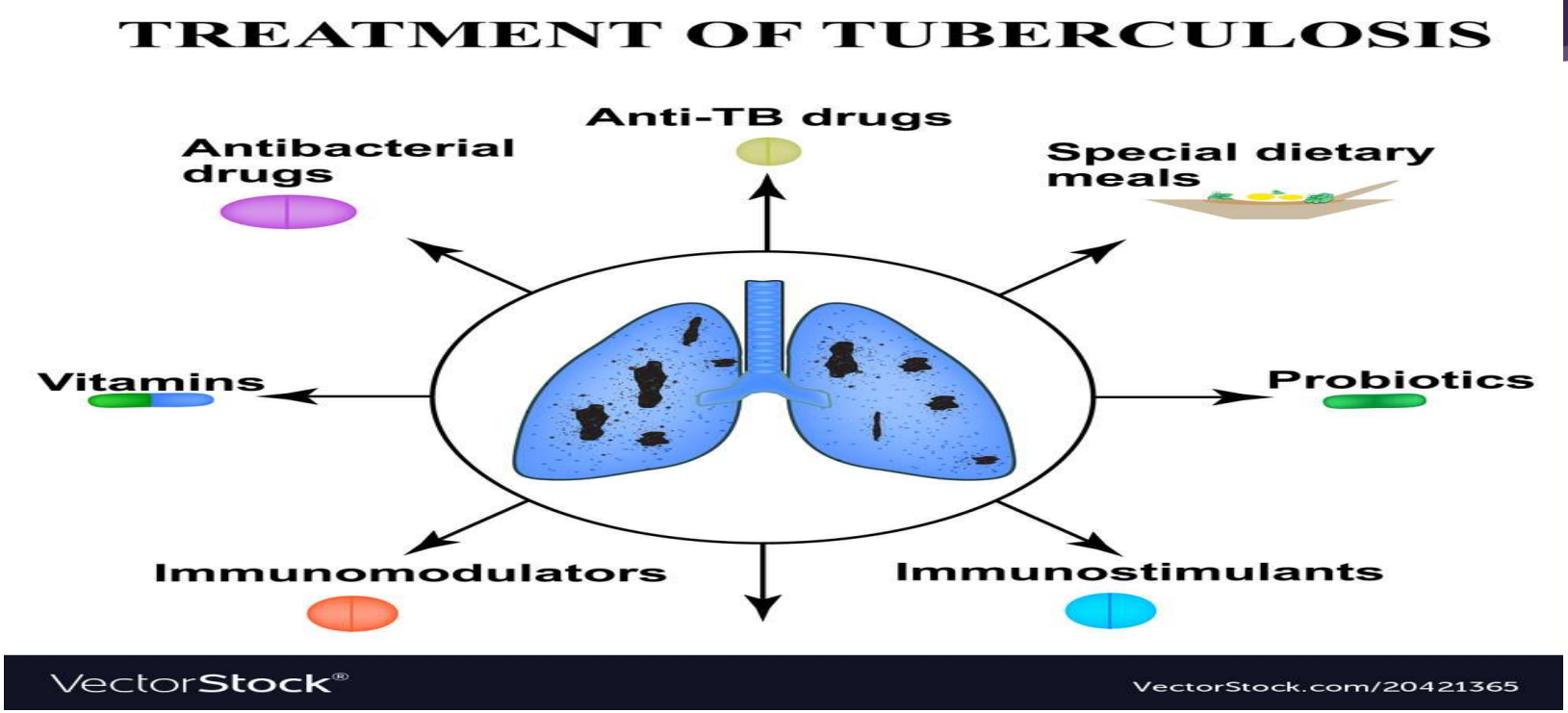
https://www.otsuka.co.jp/en/health-and-illness/tuberculosis/infection

DIAGNOSIS

- **Sample collection** – **Pulmonary sample** -sputum
- **Non pulmonary sample** – skin,urin, lymph node ,tissue biopsy
- Sputum smear stained by Acid fast staining.
- Chest radiography(X-Ray)



Treatment



www.google.com/search?q=treatment+of+bt&source=lnms&tbm=isch&sa=X&ved

Treatment for Active TB :

- **These are the three treatment options:**

- **Isoniazid (INH) : This is the most common therapy for latent TB. You typically take an isoniazid antibiotic pill daily for 9 months.**
- **Rifampin (Rifadin, Rimactane): You take this antibiotic each day for 4 months. It's an option if you have side effects or contraindication to INH.**
- **Isoniazid and rifapentine: You take both of these antibiotics once a week for 3 months under your doctor's supervision.**

Diptheria

- Diptheria is an acute infectious disease that typically strikes the upper respiratory tract including the troat.
- it is caused by ***Cornebacterium diphtheria***
- This disease transfer by person to person by sneezing, talking and close contact.
- First discovered in **1883 by Edvin klebs**
- ***Corynebacterium diphtheriae*** is a Gram-positive nonmotile, club-shaped bacillus. Strains growing in tissue, or older cultures in vitro, contain thin spots in their cell walls that allow decolorization during the Gram stain and result in a Gram-variable reaction.

Symptoms and treatment

- A sore throat and harseness
- Fever
- Runny nose , chills, Blood tinged discharge

- Treatment :- including antibiotics (penicillium , erythromycin) and an antitoxin that neutralizes the diphtheria. Also vaccine is available
- ***DPT (Diptheria pertussis tetanus)***

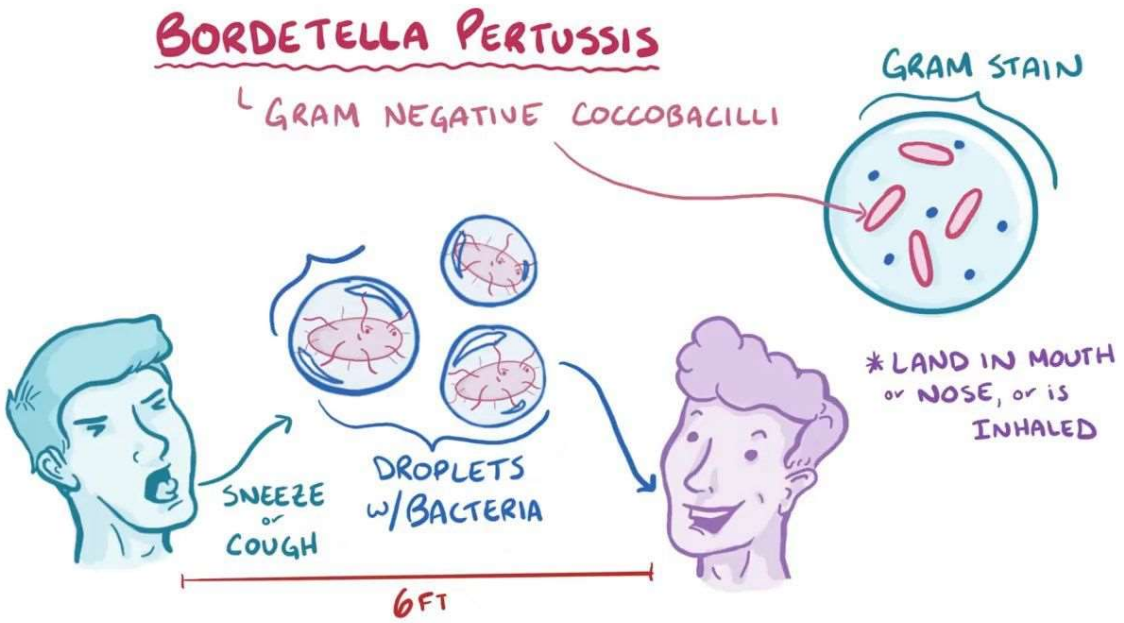
Diptheria is easily prevented with the use of a safe and effective vaccine and this is know as a DPT vaccine.

Pertussis (whooping cough)

- Pertussis, also known as whooping cough is a highly contagious bacterial disease mainly caused by ***Bordetella pertussis.***
- It's characterized by severe coughing spells, which can sometimes end in a "whooping" sound when the person breath in.
- Whooping cough is also known as 100 days cough.
- ***Bordetella Pertussis*** is gram -ve rod shaped, non motile bacteria
- In 16th century **Guillaume de Baillous** describe the pertussis and in 1906 **Jules Bordet** and **Octave Gengou** is isolate this organism.

Mode of Transmission

- Tiny droplets that comes from mouth & nose of infected patient.
- respiratory droplets
- Close contact



Symptoms and Treatment

- **Runny nose, fever, vomiting, whoop sound, watery eyes**
- **Treatment and prevention :- we use some antibiotics (Erythromycin, Azitromycin, Clarithromycin) this medicine use for treatment also we use vaccine for prevention.**
- **for Active immunization is best preventive measure for pertussis**
- **DPT Vaccine = 0.5 ml IM, 5 dose**

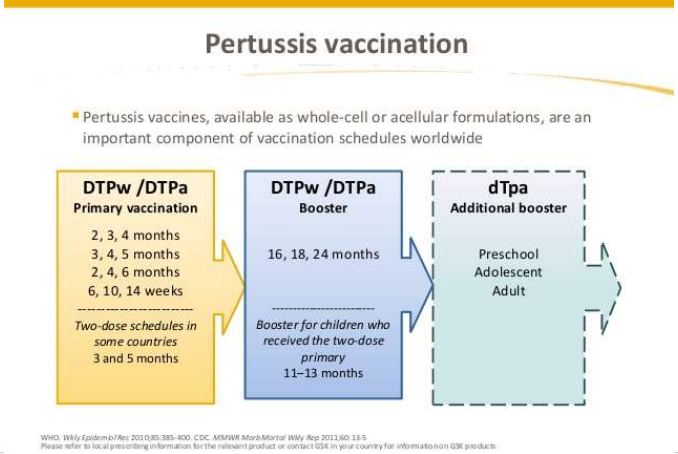
✓ **DPT 1ST dose → 6 Weeks**

✓ **DPT 2ND dose → 10 weeks**

✓ **DPT 3RD dose → 14 weeks**

✓ **DPT 4TH dose → 16-18 months**

✓ **DPT 5TH dose → 5 years**



What we do

https://www.google.com/search?q=use+senitizer&tbm=isch&ved=2ahUKEwjbgO7tpbHuAhWwiEsFHUHlBjUQ2-cCegQIABAA&oq=use

Reference

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