

Anti-tubercular Agents

Tuberculosis (TB)

What is Tuberculosis?

- Tuberculosis (TB) is a bacterial infection caused by *Mycobacterium tuberculosis*.
- While it primarily affects the lungs, it can also spread to other parts of the body, such as the kidneys, spine, and brain.

How is TB Spread?

- TB is an **airborne disease**, meaning it spreads when an infected person **coughs or sneezes**, releasing bacteria into the air.
- It can also be transmitted through **sharing needles** or other injection equipment contaminated with infected blood.

Symptoms of Tuberculosis

- Symptoms of TB can vary but commonly include:
 - Persistent cough (lasting more than three weeks)
 - Chest pain
 - Coughing up blood
 - Fatigue
 - Fever
 - Night sweats
 - Unexplained weight loss
- However, not everyone infected with TB develops symptoms.
- The bacteria can remain dormant in the body for years, a condition known as latent TB infection (LTBI).

TB Treatment

- Tuberculosis is treatable with antibiotics, but treatment is long and complex, typically lasting six to nine months or longer.
- It involves a combination of several medications to prevent the development of drug-resistant TB strains.

Importance of Completing Treatment

- Even if symptoms improve, it is essential to complete the full course of treatment to ensure complete eradication of the bacteria.
- Incomplete treatment can lead to **drug resistance**, making TB harder to treat and more dangerous.

Prevention of Tuberculosis

- Prevention strategies include:
 - **Avoiding close contact** with infected individuals
 - **Vaccination** (*BCG vaccine*) in high-risk populations
 - **Early diagnosis and treatment** to prevent the spread of TB

Screening and High-Risk Groups

- Screening for TB is recommended for individuals at higher risk, including:
 - People with weakened immune systems (e.g., HIV patients)
 - Those who have had close contact with an infected person

Anti-Tubercular Agents

- Anti-tubercular agents are medications used to treat **tuberculosis (TB)**, a potentially serious and contagious bacterial infection that primarily affects the lungs but can also involve other parts of the body.
- These medications work by killing or inhibiting the growth of *Mycobacterium tuberculosis*, the bacteria responsible for TB.

Factors Influencing Treatment Selection

- The choice of anti-tubercular agents and the duration of treatment depend on several factors, including:
 - The severity of the disease
 - The patient's age and overall health
 - The drug susceptibility of the TB bacteria

Treatment Duration and Importance

- Tuberculosis treatment typically involves a combination of multiple drugs taken for several months to ensure complete eradication of the bacteria and prevent the development of drug resistance.
- Adherence to the prescribed regimen is crucial to achieving successful treatment outcomes.

Classification of Anti-Tubercular Agents

- Anti-tubercular agents are used to treat infections caused by ***Mycobacterium tuberculosis*** and can be classified based on their mechanism of action and chemical structure.
- They are often categorized into first-line and second-line drugs, and further grouped into two main types:

1. Synthetic Anti-Tubercular Agents

- These are chemically synthesized drugs that target various biochemical pathways in *M. tuberculosis*.
- Examples:
 1. Isoniazid
 2. Ethionamide
 3. Ethambutol
 4. Pyrazinamide
 5. Para-aminosalicylic acid

2. Anti-Tubercular Antibiotics

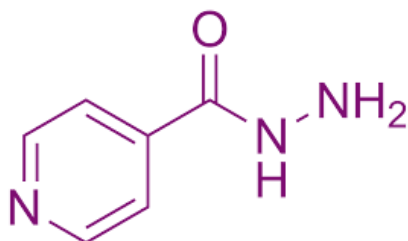
- These agents are naturally derived or semi-synthetic and work by inhibiting mycobacterial growth through mechanisms such as interfering with bacterial RNA synthesis, protein synthesis, or cell wall formation.
- Examples:
 1. Rifampicin
 2. Rifabutin
 3. Cycloserine
 4. Streptomycin
 5. Capreomycin sulphate

Various Synthetic Anti-Tubercular Agents Drugs

1. Isoniazid (INH)*

Chemical Structure / Formula

- **Formula:** $C_6H_7N_3O$
- **Structure:** Pyridine ring with a hydrazide ($-CONHNH_2$) group.



Mechanism of Action

- **Prodrug** that is activated by **KatG enzyme** (catalase-peroxidase) in *Mycobacterium tuberculosis*.



FREE PREVIEW

[Click here to visit our website](#)

PHARMACY PREMIUM NOTES

Complete subject
and semesters are
available on
FirstHope app only.



[Scan or click here](#)

Click here to get the app



Available on Google Play

JOIN THE FIRSTHOPE COMMUNITY

Join our Telegram channel

Click here to join Telegram



[Scan or click here](#)

@FirstHopeNotes

Instagram

@firsthope.official

[Click here to follow >](#)

YouTube channel

FirstHope-Pharmacy / Live streams

[Click here to watch >](#)

WhatsApp channel

Follow FirstHope on WhatsApp

[Click here to join >](#)

FirstHope website

firsthopenotes.com

[Click here to visit >](#)

B.Pharm / D.Pharm / M.Pharm / Pharm.D

Preview notes. Complete subjects and semesters in the FirstHope app.