D.PHARM • SECOND YEAR

Pharmacotherapeutics

CHAPTER 2.7

Infectious Diseases

ENGLISH CHAPTER NOTES



DIPLOMA IN PHARMACY

TUBERCULOSIS (TB)

DEFINITION

A chronic infectious disease caused mainly by *Mycobacterium tuberculosis*, an acid-fast bacillus. Pulmonary TB affects the lungs; extrapulmonary TB affects other organs.

TRANSMISSION

- Usually by inhaling infectious airborne particles from a person with pulmonary or laryngeal TB.
- Hematogenous spread means spread through blood within the patient—not a usual person-to-person route.
- *M. bovis* infection can follow ingestion of unpasteurized contaminated milk.

PATHOGENESIS

Bacilli reach alveoli → uptake by alveolar macrophages → immune response and granuloma formation.

Ghon focus: the primary lung lesion.

- Latent TB infection: no symptoms and not infectious.
- Active TB: primary progressive disease or later reactivation, especially when immunity falls.

RISK FACTORS

- HIV/AIDS and immunosuppression.
- Malnutrition and diabetes.
- Smoking.
- Close contact with infectious TB.
- Corticosteroids or TNF-α blockers.

Not everyone exposed develops active disease.

TUBERCULOSIS (TB)

PULMONARY FEATURES

- Persistent cough; assess cough lasting **2 weeks** or more.
- Earlier assessment for high-risk people or concerning symptoms.
- Hemoptysis: blood in sputum.
- Fever, night sweats, weight loss and fatigue.
- Chest pain; breathlessness in advanced disease.

EXTRAPULMONARY SITES

- Lymph nodes: scrofula.
- Spine: Pott's disease; other bones/joints may be involved.
- CNS: tuberculous meningitis.
- Genitourinary system.
- Miliary TB: widespread dissemination.

PREVENTION AND SUPPORT

- Airborne precautions/isolation while infectious, as advised.
- Good ventilation, cough hygiene and safe sputum disposal.
- Adequate nutrition, including protein; rest during acute illness.
- Stop smoking; support treatment adherence.
- Public-health notification and contact tracing.
- Screen contacts; eligible people may need TB preventive treatment after active disease is excluded.
- BCG vaccination especially protects children against severe TB, including meningitis and miliary TB.

Do not wait for a fixed cough duration if hemoptysis, severe illness or high-risk exposure is present.

TUBERCULOSIS (TB)

DRUG-SUSCEPTIBLE TB

WHO standard regimen (6 months):

2HRZE/4HR

- Intensive phase: H + R + Z + E for 2 months.
- Continuation: H + R for 4 months.

H = isoniazid; R = rifampicin.
Z = pyrazinamide; E = ethambutol.

India NTEP commonly uses:

2HRZE/4HRE

Ethambutol continues with H and R.

Daily, weight-based combinations and duration follow the current national protocol and disease site.

Complete treatment; do not stop when symptoms improve.

DRUG-RESISTANT TB

MDR-TB includes resistance to H and R.

MDR/XDR-TB needs specialist care; drug-susceptibility results guide therapy.

Shorter all-oral regimens, e.g., six-month BPaLM, are available for eligible patients.

BPaLM: bedaquiline + pretomanid + linezolid + moxifloxacin.

A long injectable regimen is not the default for everyone.

MONITORING

- H, R, Z: hepatotoxicity.
- E: optic neuritis; report visual changes.
- H: peripheral neuropathy; pyridoxine reduces risk.
- Review adherence, response, interactions and adverse effects.

PNEUMONIA

DEFINITION

Infection-induced inflammation of lung parenchyma, causing consolidation and impaired gas exchange.

MECHANISM

Pathogens enter by inhalation/aspiration → alveolar inflammation → exudate and consolidation → reduced oxygen exchange.

TYPES AND PATHOGENS

- **CAP:** community-acquired pneumonia. Streptococcus pneumoniae, Haemophilus influenzae, Mycoplasma pneumoniae and viruses.
- **HAP:** hospital-acquired pneumonia.
- **VAP:** ventilator-associated pneumonia. HAP/VAP may involve Pseudomonas aeruginosa, MRSA and other Gram-negative bacilli.
- **Aspiration pneumonia:** aspiration of contaminated secretions; not always an anaerobic infection.

MRSA = methicillin-resistant Staphylococcus aureus.

RISK FACTORS

Older age, smoking, COPD/asthma, prolonged hospitalization and immunosuppression from HIV, cancer or corticosteroids.

CLINICAL FEATURES

- Fever, chills and productive cough, often with purulent sputum.
- Dyspnea and pleuritic chest pain.
- Tachypnea and tachycardia.
- Dull percussion note, bronchial breath sounds and crepitations.

SEVERE DISEASE

Hypoxia, confusion, sepsis or respiratory failure require urgent assessment.

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