

PACIFIC MEDICAL UNIVERSITY, UDAIPUR

Ph.D. Entrance Syllabus – Medical Pharmacology

1. General & Basic Pharmacology

- History and scope of pharmacology
- Routes of drug administration and absorption
- Pharmacokinetics: ADME
- Drug–receptor interactions and dose–response
- Potency, efficacy, therapeutic index, bioavailability, half-life
- Pharmacogenetics and personalized medicine

2. Autonomic Pharmacology

- Neurotransmission in autonomic nervous system
- Cholinergic pharmacology (agonists/antagonists)
- Adrenergic pharmacology (agonists/antagonists)
- Ganglionic blockers
- Clinical uses and adverse effects

3. Cardiovascular Pharmacology

- Antihypertensive drugs
- Anti-anginal drugs
- Anti-arrhythmic agents
- Heart failure pharmacotherapy
- Anticoagulants, antiplatelets, fibrinolytics
- Lipid-lowering drugs

4. Central Nervous System (CNS) Pharmacology

- Sedatives, hypnotics, anxiolytics
- Antidepressants, antipsychotics
- Antiepileptics
- Opioids and analgesics
- Drugs for Parkinson's & Alzheimer's
- Local anesthetics

5. Respiratory & GI Pharmacology

- Bronchodilators & anti-asthmatic drugs
- Antihistamines & corticosteroids
- Antitussives, expectorants
- Anti-ulcer drugs
- Laxatives and antidiarrheals
- Antiemetics

6. Endocrine Pharmacology

- Insulin and oral hypoglycemics
- Thyroid and antithyroid drugs
- Corticosteroids and adrenal drugs
- Hormonal contraceptives
- Drugs in osteoporosis

7. Chemotherapy & Antimicrobials

- Principles of antimicrobial chemotherapy
- β -lactams, aminoglycosides, macrolides, fluoroquinolones, tetracyclines
- Antifungals, antitubercular drugs
- Antivirals (HIV, hepatitis, influenza)
- Antimalarials & antiparasitic agents
- Mechanisms of resistance and stewardship

8. Toxicology

- Principles of toxicology
- Heavy metal poisoning
- Pesticide and organophosphate poisoning
- Drug overdose and antidotes
- Environmental and industrial toxicants

9. Autocoids & Inflammation

- Prostaglandins, leukotrienes, thromboxanes
- NSAIDs and COX-2 inhibitors
- Histamine and antihistamines
- Cytokines and mediators of inflammation

10. Clinical Pharmacology & Therapeutics

- Rational drug use and essential medicines
- Prescription writing and drug interactions
- Adverse drug reactions and pharmacovigilance
- Therapeutic guidelines for common diseases
- Evidence-based pharmacotherapy

11. Pharmacokinetics & Pharmacodynamics (Advanced)

- Compartment models
- Clearance concepts
- Steady-state concentration
- Dose adjustment in renal/hepatic dysfunction
- Therapeutic drug monitoring

12. Research Methodology & Biostatistics

- Types of research & study designs
- Literature search and review
- Hypothesis formulation
- Research ethics (ICMR/DBT guidelines)
- Protocol writing
- Basic statistical tests (t-test, chi-square, correlation, regression)

13. Drug Development & Regulatory Science

- Preclinical studies and toxicity testing
- Clinical trial phases (I–IV)
- GLP, GCP
- Drug regulatory approvals (DCGI, CDSCO)

14. Laboratory Techniques & Instrumentation

- Spectrophotometry
- HPLC/LC-MS (basic principles)
- ELISA and immunoassays
- In vitro pharmacological assays
- Bioassay methods