

Course & Curriculum for UG

The course consists of teaching of Pharmacology, Pharmaco-therapeutics and applied toxicology. This is organized in form of didactic lectures, tutorials, demonstrations and practical-sessions.

1. General Pharmacology:

- (a) Introduction, history, dosage forms, methods of drug administration, mechanisms of drug action, factors modifying drug action and some other aspects of Pharmacodynamics, adverse drug reaction and drug interactions.
- (b) Absorption, distribution, metabolism and excretion of drugs, clinical pharmaco-kinetics, therapeutic drugs monitoring.
- (c) Principles of assays including bioassay, radioimmunoassay, Enzyme linked immunoassay, development of new drug, clinical trial of drug and basic principles of Clinical Pharmacology.

2. Drugs and Autonomic nervous system; autocooids:

- (a) Neurohumoral transmission.
- (b) Cholinergic agonists, anticholinesterase agents, organophosphorus poisoning and its treatment.
- (c) Anticholinergic drugs.
- (d) Sympathomimetics drugs.
- (e) Adrenergic receptor blocking agents & Adrenergic neuron blocking drugs.
- (f) Ganglionic stimulants and blocking agents.
- (g) Peripherally acting skeletal muscle relaxants.
- (h) Histamine, serotonin, bradykinin and rennin angiotensin system, prostaglandins, leucotrienes and drugs affecting autocooid/autocooid-actions.

3. Drug acting on Central Nervous System:

- (a) Neurohumoral transmission in CNS
- (b) General anaesthetic agents.
- (c) Sedative hypnotics, including alcohol, anti-anxiety drugs and centrally acting muscle relaxants.
- (d) Anti-epileptic and anticonvulsant drugs

- (e) Antiparkinsonian drugs.
- (f) Analgesics, antipyretics non steroidal anti-inflammatory Drugs (NSAIDs), treatment of Rheumatic fever, gout and migraine.
- (g) Narcotic analgesics and antagonists.
- (h) Psychopharmacological agents, anti psychotics, anti-depressants, anti-manic and hallucinogens), CNS stimulants.
- (i) Drug abuse and principles of de-addiction programmes.
- (k) Local anaesthetic agents.

4. Drugs acting on Cardiovascular System:

- (a) Digitalis glycoside and other drugs effective in cardiac failure.
- (b) Antiarrhythmic drugs.
- (c) Antihypertensive drugs.
- (d) Drugs for Ischaemic Heart Disease.
- (e) Drugs used in hyperlipoproteinemia.
- (f) Drug therapy of shock.

5. Drugs Affecting Blood and Blood Formation:

- (a) Haematinics,
- (b) Drugs affecting coagulation, bleeding and thrombosis
- (c) Plasma expanders

6. Drugs acting on gastro-intestinal system:

- (a) Drugs for acid peptic disease
- (b) Drugs for treatment of diarrhoea and constipation
- (c) Emetics and antiemetics, carminatives, digestive enzymes, demulcents, protectives, adsorbents, astringents, etc.

7. Drugs acting on Respiratory system:

- (a) Drugs for treatment of Bronchial asthma
- (b) Anti-tussive, expectorants, mucolytics, therapeutic gases.

8. Drugs and endocrine system:

- (a) Pituitary hormones and regulation of secretion
- (b) Thyroid hormones and anti-thyroid drugs
- (c) Parathyroid hormone, calcitonin, vitamin D and calcium metabolism
- (d) Insulin, oral hypoglycaemic drugs and treatment of diabetes mellitus, glucagon
- (e) Adrenocorticosteroids and synthetic analogues
- (f) Oestrogen, progestins and antagonists; Contraception
- (g) Androgen, anabolic steroids
- (h) Drugs acting on uterus

9. Drugs and Pregnancy:

10. Chemotherapy:

- (a) General consideration of chemotherapy; History, classifications, mode of actions, principles of selecting anti-infective agent, rationale of combination of anti-infective, phenomenon of resistance development etc.
- (b) Various anti-infective agents; Beta-Lactam anti-biotics, aminoglycosides, tetracyclines, chloramphenicol, macrolide anti-biotics, other anti biotics, sulphonamides and co-trimoxazole, Nalidixic acid, fluoroquinolones and other anti-infective drugs. antiseptics and disinfectants.
- (c) Chemotherapy of Tuberculosis, leprosy, urinary tract infections, sexually transmitted diseases, malaria, amoebiasis, trichomoniasis, helminthiasis, other protozoal and parasitic infections, fungal infections.
- (d) Chemotherapy of malignancy and immunosuppressive drugs.

11. Some other topic:

- (a) Toxicological considerations of common poisoning
- (b) Chelating agents
- (c) Immunisation
- (d) Parenteral nutrition and vitamins
- (e) Diagnostic agents: hepatic, renal functions tests, radio opaque materials.

Training in Practical Session:

This training in practical-sessions is organized with following aims:

1. To consolidate the concepts taught in lectures,
2. To provide opportunities to put these concepts in practice and understand actual uses of drugs for patient care.
3. To develop habit of rational considerations while selecting the drugs, their dosage forms, doses,
frequency of administration requires for planning the therapy.
4. To provide opportunities to develop analytical faculties related to therapeutic approach for patient care.
5. To provide opportunities to observe the experimental procedures while evaluating drug effects.

In the light of above aims the practical session teaching is divided as under:

1. **Clinical Pharmacology and Pharmacy:** In the training-sessions devoted to clinical pharmacy and therapeutics following therapeutic areas are covered:
 - (a) Prescription related patient oriented problems are given to the students. The students discuss the problem & work out the therapeutic solution. Discussion takes place in small batches under the guidance of teacher. Number of problems in various areas are covered.
 1. Some common problems of gastro-intestinal tract (Dyspepsia, nausea, vomiting, colic, dehydration & constipation);
 2. Some common problems of Respiratory system (Cough, bronchial asthma);
 3. Anaemia
 4. Diabetes mellitus & use of contraception;
 5. Management of some painful conditions;
 6. Some bacterial infections (Respiratory infections, urinary tract infections, infective diarrhoea etc.)
 7. Malaria and amoebiasis
 8. Some common skin problems (Fungal infections, scabies, acne etc.)
 9. Some common ophthalmic problems (Acute congestive glaucoma, iridocyclitis, trachoma, catarrhal conjunctivitis);

10. Use of some drugs in emergency (Myocardial infarction, hypertensive emergency, acute cardiac failure, anaphylaxis, cardiovascular collapse, pulmonary embolism etc.)
11. Some common drug-poisoning (Organophosphate insecticides, atropine, sedative-hypnotic drug, morphine etc.)

(b) Criticism and Comments:

Training for developing analytical faculties is given in these sessions, where group of students discuss the validity of a given prescription for a given problem. Problems related to in prescription-writing are highlighted in these sessions.

- (c) Dose calculation of commonly used drugs including drugs for I.V. Infusions.
- (d) Comment on common pharmaceutical preparations and formulations including FDCs.
- (e) Exercise on Adverse Drug Reactions.

2. Experimental Pharmacology:

Some exposure is given to the experimental work in development of the drugs. The same is used to understand and fortify certain concepts of pharmaco-kinetics and dynamics which will have some bearing ultimately in patient-care. Demonstrations to understand the principle of clinical trials are included in these sessions. Moreover, computer simulated model is used to demonstrate effects of drugs on various systems.

Following is the list of various experiments included as demonstration:

- Routes of administration
- Effect of adrenergic and anti-adrenergic drugs on blood pressure and heart rate
- Effect of cholinergic and anti-cholinergic drugs on blood pressure and heart rate
- Pharmacology of neuromuscular junction (NMJ), and effect of neuromuscular blockers on NMJ
- Effect of drugs on rabbit eye
- Effect of drugs on isolated heart
- Bioassay
- Anaesthesia (general and local),
- Study of drugs on some models related to central nervous system,
- Ocular pharmacology
- Relevance of chemical and physical properties of drugs in therapeutics and some demonstrations about principles of detection and estimations of drugs in biological fluids,
- Understanding of the principles of clinical trials. Demonstration of

experiments/studies participation of student volunteers.

- In addition to that there are about 15 graphic presentations of results of various experiments which are included in the group discussions.

3. Pharmacoeconomics