

**Syllabus for M.B.B.S. students in Pharmacology
(Revised on 04.8.2014)**

Unit A - General Pharmacology

1. Introduction
2. Pharmacokinetics : Drug absorption, Distribution, Metabolism & Elimination.
3. Pharmacodynamics : Mechanism of Drug Action & relationship between drug concentration & effect.
4. Principles of therapeutics : Clinical trials, Individualization of Drug Therapy, Factors affecting therapeutic outcome & ADR.
5. Principles of toxicology & treatment of Poisoning in general.
6. Gene - Based therapy.

Unit B - Chemotherapy of Microbial Disease

1. Introduction
2. Principles of use of Antibacterial Agents
 - a. General consideration
 - b. Sulfonamides
 - c. Trimethoprim - sulfamethoxazole
 - d. Quinolones
 - e. Penicillins
 - f. Cephalosporins
 - g. Other β - lactam Antibiotics like Carbapenems
 - h. Aminoglycosides
 - i. Tetracyclines
 - j. Chloramphenicol
 - k. Erythromycin / Clarithromycin / Azithromycin / Clindamycin
 - l. Miscellaneous including Spectinomycin, Polymyxin-B & Colistin, Vancomycin, Bacitracin
3. Drug Treatment of Urinary Tract Infection
4. Drugs used in the Chemotherapy of Tuberculosis & Leprosy
5. Antifungal agents
6. Antiviral agents - Retroviral & Non retroviral

Unit C - Chemotherapy of Parasitic Infections

1. Chemotherapy of Protozoal Infection
 - a. Anti malarial Drugs
 - b. Anti amebiasis
 - c. Anti giardiasis
 - d. Anti Trichomoniasis, Tripanosomiasis & other Protozoal infections
 - e. Anti Leishmaniasis

2. Chemotherapy of Helminthic Infection
Ascariasis, Ancylostomiasis, Oxyuriasis, Strongyloidiasis, Filariasis, Taeniasis.

Unit D - Chemotherapy of Neoplastic Diseases

1. Introduction
Antineoplastic agents
2. Drugs used for Immunomodulation
 - i. Immunosuppressants
 - ii. Immunostimulants

Unit E - Toxicology

1. Heavy Metals & Heavy Metal Antagonists
2. Non-Metallic Environmental Toxicants
Airpollutants, Solvents, Vapours & Pesticides

Unit F - Hormones and Hormone Antagonists

1. Hypothalamic Releasing Factors and Adenohypophyseal Hormones
2. Thyroid & Anti-thyroid Drugs
3. Estrogens & Progestins
4. Hormonal Contraceptives
5. Androgens & Antiandrogens
6. ACTH
Adrenocortical steroids & their synthetic Analogues
ACTH Inhibitors / Antiglucocorticoids
7. Physiological regulation of blood sugars
Insulin, Oral hypoglycemic agents, Glucagon
Management of Diabetes Mellitus

Unit G - Family Welfare

1. Agents affecting Spermatogenesis and Ovulation
2. Hormonal and Non-Hormonal Contraceptives

Unit H - Agents affecting Calcification & Bone Turnover

1. Ca, Phosphate, Parathyroid hormone, Vit. D, Calcitonin, Bisphosphonates, Fluoride, etc
2. Prevention & Treatment of Osteoporosis

Unit I - Vitamins

1. Water & Fat soluble Vitamins
2. Deficiency states and their management

Unit J - Drugs acting on the Blood & The Blood forming Organs

1. Hematopoietic Agents
Erythropoitin, & Other growth factors, Iron, Folic acid, Cyanocobalamine, Copper and Zinc
2. Anti Coagulants, Thrombolytic & Antiplatelet drugs.

Unit K - Dermatological Pharmacology

1. Glucocorticoids - Topical & Systemic
2. Local Antibiotics, Antifungal
3. Retinoids, Tretinoin, Isotretinoin, Etretnate
4. Cytotoxic & Immunosuppressive Drugs
5. Photochemotherapeutic Agents : Sunscreens, Soothing Agents
6. Melanizing & demelanizing Agents, etc.

Unit L - Ocular Pharmacology

1. Antimicrobial, Steroids & autonomic drugs
2. Toxicology of ocular therapeutic agents
3. Therapeutic & Diagnostic application of drugs in Ophthalmology

Unit M- Autonomic Nervous System

1. (i) Anatomy and Physiology of autonomic & somatic motor nervous system
(ii) Division of the peripheral autonomic system
 - a. Sympathetic
 - b. Parasympathetic
- (iii) Responses of effector organs to autonomic Nerve impulses
- (iv) Steps involved in Neurotransmission
 - Cholinergic transmission, Cholinergic receptors
 - Adrenergic transmission, Adrenergic receptors
2. Muscarine receptors - Clinically useful Agonists and Antagonists with their pharmacological properties
3. Anticholinesterase Agents and their clinical uses
Poisoning & its treatment
4. Agents acting at the Neuromuscular junction & Autonomic Ganglia
 - Nicotinic cholinergic receptors
 - N-M Blocking Agents & their pharmacological properties and uses
 - Ganglion blocking drugs; Clinical use of Trimethaphan, Pempidine
5. Sympathomimetic drugs
6. Adrenergic receptors antagonists

Unit N - Autacoids :

1. Histamine, Bradykinin & their antagonists
2. Lipid derived Autocoids - Eicosanoids, PAF
3. 5 H.T. receptors agonist & Antagonists
4. Pharmacotherapy of Migraine

Unit O - Drugs acting on Central Nervous System

1. Drug used in General anaesthesia
 - i. Principles, Method of Administration and mechanism of action of General Anesthetics
 - ii. Preanaesthetic Medication
 - iii. Modes of General Anaesthetic with examples
2. Local Anaesthetic Agents
3. Therapeutic gases - O_2 , CO_2 , NO_2 , He, Water vapour
4. Hypnotics, Sedatives & Anxiolytics
 - a. Ethanol
 - b. Benzodiazepines, Barbiturates, Other sedative hypnotic drugs
 - c. Management of Insomnia
5. Drugs and treatment of Psychiatric disorders
 - a. Drug treatment of Psychosis
 - b. Drugs used in depression & mania
6. Anti-Epileptic drugs
 - (i) Terminology & Epileptic seizure classification
 - (ii) Antiseizure drugs - Hydantion, Barbiturates, Iminostilbenes, Succinimides, Valproic acid, Oxazolidinedione, Benzodiazepine, Gabapentin, Lamotrigines, R-vinyl GABA
 - (iii) Choice of drugs for the therapy of the epilepsies
7. Treatment of CNS degenerative disorders
 - (i) Drugs for Parkinson's disease
 - (ii) Drugs for Alzheimer's disease
 - (iii) Drugs for Huntington's disease
 - (iv) Drugs for Amyotrophic Lateral Sclerosis
8. Opioid Analgesics and Antagonists
 - (i) Opioid receptors Agonists & Antagonists
 - (ii) Centrally Active Antitussive Agents
9. Physical & Psychological Drug Dependence - Withdrawal / Abstinence syndrome
 - (i) CNS depressants and CNS stimulants
 - (ii) Treatment of Drug Abuse and Addiction

Unit P- Drug Therapy of Inflammation

1. Pathophysiology of Inflammation
2. NSAIDs
3. Treatment of Rheumatic Fever, Rheumatoid Arthritis, Gout, Osteoarthritis

Unit Q - Drugs used in Cardiovascular Diseases

1. Drugs used for treatment of Myocardial Ischemia
 - (i) Organic nitrates
 - (ii) Ca^{++} channel Blockers
 - (iii) β Adrenergic Receptors Antagonists
 - (iv) Management of Angina pectoris and MI
2. Anti hypertensive agents
Sympatholytics, Ca^{++} channel blockers, Agents affecting Renin-Angiotensin System
Direct Vasodilators
Pharmacotherapy of Hypertension

3. Drugs used in Heart failure
 - (i) Digoxin
 - (ii) Diuretics
 - (iii) Vasodilators
 - (iv) ACE - Inhibitors & Angiotensin receptors antagonists
4. AntiArrhythmic drugs
 - (i) Cardiac Electrophysiology and mechanism of causation of Arrhythmias
 - (ii) Mechanism of antiarrhythmic drugs, Drugs used in cardiac arrhythmias
5. Drugs used in the treatment of Hypercholesterolemia & dyslipidemia
 - (i) Physiology of lipoprotein transport
 - (ii) Causes of hyperlipoproteinemia, Hyperlipidemia & Atherosclerosis
 - (iii) Practical approach for management of hyperlipoproteinemia
 - (iv) Drugs used to lower plasma lipoprotein level : HMG Co - A Reductase Inhibitors, Bile acid - binding Resins, Nicotinic Acids, Fibric Acid derivative etc.

Unit R - Drugs affecting Renal function

1. Diuretics
 - (i) Renal anatomy and Physiology
 - (ii) Principle of Diuretic Action
Inhibition of Carbonic Anhydrase, Osmotic Diuretics, Loop Diuretics, Thiazide, Thiazide like drugs, K⁺ sparing Diuretics
2. Vasopressin & other agents affecting the renal conservation of water.
3. Drugs used in Diabetes Insipidus
4. Renin - Angiotensin system

Unit S - Drug Therapy of Respiratory disorders

1. Pathophysiology of Bronchial asthma
2. Drugs used in the treatment of COPD, Cough

Unit T - Drugs affecting GIT function

1. Agents for control of gastric acidity and treatment of peptic ulcer & Gastroesophageal reflux disease
 - (i) Cellular pharmacology of gastric secretion
 - (ii) Therapeutic strategies for treatment of peptic ulcer & gastro esophageal reflux disease
 - (iii) H₂ Histamine receptor antagonist, Inhibitors of H⁺ K⁺ ATPase, Antacids, Sucralfate, Prostaglandin Analogues and other drugs (e.g. Muscarinic Antagonists)
2.
 - (i) Agents affecting Gastrointestinal Water Flux & Motility
 - a. Laxatives
 - b. Antidiarrheal agents, IBD
 - c. Emesis, Antiemetics & Prokinetic agents
 - (ii) Bile acids, Pancreatic and other digestive enzymes

Unit U - Drugs affecting Uterine Motility

1. Agents that cause contraction or relaxation of the uterus
 - (i) Oxytocics : Clinical cause & Pharmacological properties of Oxytocin, PGs and Ergot alkaloids
 - (ii) Tocolytics : β -Adrenergic Receptor Agonists, Magnesium Sulphate & Others.

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List of Practicals for M.B.B.S. (Batch 2013) :

Pharmacy lab.

1. Introduction, Metrology, Posology, Calculations of dilution factors.
2. Prescription writing, Instruments used in Pharmacy and Latin Abbreviations.
3. Preparation and uses of different types of Oral rehydration powders.
4. Preparation and uses of Mixtures (Carminative).
5. Preparation and uses of Lotion (Condy's & Calamine).
6. Preparation and uses of Emulsion (Benzyl Benzoate) and Ointment (Whitefield).
7. Preparation and uses of Paint (Mandl's) and Liniment (Terpentine).
8. Physical quality control test of Tablets. (Exercise).
9. Test

CAL lab.

1. To study the effect of stimulants and depressants on cardiac muscle.
2. To determine the nature and site of action of an unknown drug on cardiac muscle.
3. To study the effect of stimulants and depressants on smooth muscle of gut.
4. To determine the nature and site of action of drugs on rabbit eye.
5. To study the effect of drugs on blood pressure.
6. To study the effect of drugs on skeletal muscle.
7. To study Pharmacokinetics Parameters.
8. Research Methodologies
9. Test

Experimental lab.

1. Demonstration of Equipments/Instruments.
2. Demonstration of Equipments/Instruments.
3. To study the effect of drug (Coffee) on human Psychomotor performance by Time Sense & Multichoice apparatus.
4. To study the effects of Mydriatics, Miotics & Local anesthetics on eye.
5. Clinical Problems
6. Clinical Problems
7. Review of drug promotional literature
8. Revision
9. Test

Clinical Pharmacology

1. Dosage forms of the drugs (Oral, Inhalation, Parental and Topical).
2. Concept of Essential medicine, WHO list of Essential medicine. Over the counter drugs, Drug formularies and Pharmacopoeia.
3. Rational use of drugs and concept of "P" drug.
4. Adverse Drug Reaction Monitoring
5. Clinical Trial and Ethics in research.
6. Emergency treatment of poisoning.
7. Therapeutic drug monitoring with special reference to Antiepileptic drugs, Anticancer drugs, Aminoglycosides, Digoxin and Lithium.
8. Rational use of Antibiotics, Rational combination of drugs and critical appraisal of Fixed dose drug combination.
9. Test

Therapeutic Exercises

1. Prescription writing for common infectious diseases.
2. Prescription writing for common systemic diseases (non-infectious).
3. Prescription writing for common diseases in pediatric and geriatric patients.
4. Prescription writing for common disease conditions in Pregnancy and Lactation.
5. Drug interaction and Clinical problems.

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Paper : General and Dental Pharmacology and Therapeutics

Part A

1. **General Pharmacology** : General principles of Pharmacology, sources and nature of drugs, dosage forms, prescription writing, pharmacokinetics (absorption, distribution, metabolism and excretion of drugs), mode of action of drugs, combined effects of drugs, receptor mechanism of drug action, factors modifying drug response, adverse drug reactions, drug interactions, Implications of General Principles in clinical dentistry.
2. **Chemotherapy** : Antimicrobial agents (against bacteria, anaerobic infections, fungi, virus and broad spectrum). Infection management in dentistry. Pharmacotherapy of Tuberculosis, leprosy and chemotherapy of malignancy in general. Implications of Chemotherapy in clinical dentistry.
3. **Endocrines** : Emphasis on treatment of diabetes and glucocorticoids, thyroid and antithyroid agents, drugs affecting calcium balance and anabolic steroids, Implications of these drugs in clinical dentistry.
4. **Vitamins** : Water soluble vitamins, Vit. D, Vit. K, and Vit. E, Implications of Vitamins in clinical dentistry.
5. **Autacoids** : Histamine, antihistamines, prostaglandins, leukotriens and bronchodilators, Implications of Autacoids in clinical dentistry.

Part B

1. **CNS Drugs** : General anaesthetics, hypnotics, analgesics, psychotropic drugs, antiepileptics, muscle relaxants, local anaesthetics, Implications of these drugs in clinical dentistry.
2. **Autonomic Drugs** : Sympathomimetics, antiadrenergic drugs parasympathomimetics and parasympatholytics, Implications of Autonomic drugs in clinical dentistry.
3. **Cardiovascular drugs** : Cardiac stimulants, antihypertensive drugs, vasopressor agents, treatment of shock, Antianginal agents and diuretics, Implications of these drugs in clinical dentistry.
4. **Drugs acting on blood** : Coagulants, anticoagulants & hematinics, their Implications in clinical dentistry.
5. **G.I.T. drugs** : Purgatives, anti-diarrhoeal, antacids, anti-emetics, Implications of these drugs in clinical dentistry.
6. **Dental Emergencies** : Pharmacotherapy of emergencies in dental office and emergency drugs tray Implications of Pharmacotherapy in clinical dentistry.
7. **Chelating agents** : BAL, EDTA and desferrioxamine.
8. **Special Dental Pharmacology** : Anti-septics, astringents, obtundents, mummifying agents, bleaching agents, styptics, disclosing agents, dentifrices, mouth washes, caries and fluorides.
9. **Dental Therapeutics** : Pharmacotherapy of common oral conditions in dentistry.