



PHARMACOLOGY

STUDY GUIDE

MBBS YEAR III

2020-2021



BAQAI MEDICAL COLLEGE

BAQAI MEDICAL UNIVERSITY

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VISION & MISSION

Baqai Medical University Vision Statement:

Baqai Medical University is a community based and community oriented center of excellence striving to mold students to become competent and caring health professionals, groomed to be social leaders capable of improving health, education and socioeconomic well-being locally, nationally and globally.

Baqai Medical University Mission Statement:

The mission of Baqai Medical College is to be recognized as a center of excellence in education, research, patient care and community services by producing highly capable and knowledgeable professionals

Baqai Medical College Vision Statement:

Our vision is to enhance the access and excellence in medical education and research, with the aim of capacity building of students and faculty through innovations, and science and technology competencies, to achieve rapid and sustainable health. The medical graduate thus produced will be informed and trained enough to serve the community better, and to be advisor to the national and international health organizations.

Baqai Medical College Mission Statement:

The mission of the Baqai medical college is to produce medical graduates, who are accomplished individuals and have skills for problem solving, clinical judgment, research & leadership for medical practice at the international level and are also aware of the health problems of the less privileged rural and urban population of Pakistan.

OUTCOMES OF THE MBBS PROGRAM

The Baqai University graduate of the MBBS program will be able to:

1. Utilize knowledge of basic and clinical sciences for patient care.
2. Take Focused history, perform physical examination, formulate a diagnosis and management plan for common health problems.
3. Require professional behaviours that embodies lifelong learning, altruism, empathy and cultural sensitivity in provision health care service.
4. Identify problems, critically review literature, conduct research and disseminate knowledge
5. Lead other team members as per situational needs for quality health service.
6. Apply evidence-based practices for protecting, maintaining and promoting the health of individuals, families and community.

POLICIES AND PROCEDURES

Code of Conduct and Maintenance of Discipline of Students Regulations

Under section 25(e) BMU Act.1996

All University students shall be under the full disciplinary control of the University. No students shall be allowed to participate in politics. The action against the act of indiscipline shall include fines, debarring from attending class and cancellation of admission, depending on the gravity of indiscipline.

The following shall constitute acts of indiscipline for which action may be taken against the student or students:

- (a) Breach of any rule public morals, such as:
 - Use of indecent or filthy language;
 - Use of immodest dress;
 - Use of undesirable remarks or gestures; and
 - Disorderly behavior, such as shouting, abusing, quarrelling, fighting and insolence.
- (b) Defiance of authority
- (c) Action, defamatory of and derogatory to Islam
- (d) Immorality
- (e) Being found under the effect of an intoxicant or misuse of drugs including marijuana, LSD dope and other opioids.
- (f) False personation or giving false information or willful suppression of information, cheating or deceiving.
- (g) Inciting or staging a walk-out, a strike or an unauthorized procession.
- (h) Shouting of slogans derogatory to the prestige of the Univeristy or the reputation of its officers or teachers.

- (i) Visiting without a pass places which are not to be visited without a pass.
- (j) Visiting places declared out of bounds for students

Every student must carry his / her Identity Card which will be open to examination and will be demanded at the time of entrance to the various University Faculties and functions.

No. student will be admitted to the facilities of the library, transport or the canteen unless he /she is in possession of the Identity Card

INTRODUCTION TO PHARMACOLOGY

Pharmacology is the branch of pharmaceutical sciences as well as medical sciences which is concerned with the study of drug or medication action, where a drug can be broadly or narrowly defined as any man-made, natural, or endogenous (from within the body) molecule which exerts a biochemical or physiological effect on the cell, tissue, organ, or organism.

More specifically, it is the study of the interactions that occur between a living organism and chemicals that affect normal or abnormal biochemical function

This field encompasses drug composition and properties, synthesis and drug design, molecular and cellular mechanisms, organ/systems mechanisms, signal transduction/cellular communication, molecular diagnostics, interactions, chemical biology therapy, and medical applications and anti-pathogenic capabilities.

Pharmacology is presented and taught in such a way as to prepare the students to be able to deal and navigate their way through drugs, medicines and poisons alike, in the field of medicine, dentistry and physiotherapy, both in a non-clinical as well as a clinical setting. Pharmacology's focus is not only on beneficial effects and clinical uses of medicines but also on the adverse effects of such drugs and poisons alike, as this field is also linked to toxicology. The main aim of this field is to prepare future clinicians to be familiar with clinical uses, indications to use as well as contra indications of drugs in multitude of clinical scenarios they will encounter in their practice.

WHY THIS STUDY GUIDE

- To inform students how student-learning program has been organized semester wise, and how it would be implemented.
- To help students organize and manage their studies throughout the year.

The Guide provides:

- Information on organization and management of the annual system. This will help you to contact the right individual in case you have any difficulty.
- A description of the module objectives which you will be expected to achieve at the end of each module.
- Information on learning methods that you will experience during the module. The methods include, tutorials (SG), lectures, skills/ practical. These learning methods should help you achieve the module objectives.
- A description of the learning resources available for each module. These include books, Computer Assisted Learning Programs videos and others.
- Information on the methods of assessment that will be held to determine your achievement of objectives.

- Information on examination policy, rules and regulations.

TEACHING METHODS:

The following teaching methods/strategies are used to promote better understanding.

- Lectures
- Tutorials
- Practical
- Assignments
- Small Group Sessions (SGS)

WHOM TO CONTACT?

Any queries or difficulties with the schedule, learning strategy should be directed in the first instance to the individual, teacher or module coordinator and then to Semester In-charge.

CONTACTS:

Dr. Lubna Jahanzeb

Assistant professor & Module Coordinator.

Email: (jlubna85@gmail.com)

Dr. Asif Ahmed

Head of Department, Pharmacology

Prof. Sheikh Nadeem Ahmed

Chairman, Pharmacology

Prof. Dr. Iftikhar Ahmed

Principal, Baqai Medical University

Dr. Shams Nadeem Alam.

Head of Department of Educational Development.

Mr. Israr Ahmed

(Registrar)

Resource Persons:

Prof. Dr. Sheikh Nadeem Ahmed

Prof. Dr. Asif Ahmed

Dr. Aitmauddollah Khan

Dr. Lubna Jahanzeb

Dr. Hina Masood

Dr. Ghazala Javed

Dr. Zohaib-ur-Rehman

Dr. Humaira Arif

Dr. Shehrish Mehmood.

Dr. Samreen Khurram

Dr. Sumreen Mujahid.

LECTURE BASED LEARNING OBJECTIVES 1st MODULE 2020-2021

At the end of 1 hour lecture, 3rd year MBBS student should be able to

INTRODUCTION TO PHARMACOLOGY
<ul style="list-style-type: none">• Define Pharmacology.• Classify Pharmacology.

- Define Pharmacokinetics and Pharmacodynamics.
- Define 4 steps of Pharmacokinetics.
- Define major receptor families.
- Understand the process of drug development.

ROUTES OF DRUG ADMINISTRATION

- Classify the routes of drug administration.
- Understand the specific advantages and disadvantages of oral route of drug administration.
- Understand the specific advantages and disadvantages of parental route of drug administration.

ABSORPTION OF DRUGS

- Define drug absorption.
- Explain various mechanisms of drug absorption.
- Explain various factors influencing drug absorption.
- Define bioavailability, Bioequivalence and therapeutics equivalence.
- Enlist various factors affecting bioavailability of a drug with examples.
- Understand area under the curve.
- Explain first pass effect with example.

DRUG DISTRIBUTION

- Define drug distribution.
- Explain drug distribution in various compartments of body.
- Enlist various factors influencing drug distribution with examples.
- Understand the effects of the physiological barriers for drug distribution.
- Define and correlate half-life and volume of distribution.
- Enlist factors influencing drug half-life with examples.
- Define loading dose, maintenance dose and therapeutic window.

METABOLISM OF DRUGS

- Define metabolism of a drug.
- Define biotransformation.
- Enlist the consequences of biotransformation.
- Define and Enlist phase I and phase II reactions with examples of drugs.
- Understand enzyme inducers and inhibitors with examples.

EXCRETION OF DRUGS

- Define excretion of a drug.
- Explain different modes of drug excretion.
- Enlist factors affecting excretion of a drug.
- Correlate steady state concentration of a drug with therapeutic dosage of a drug.
- Understand first and zero order kinetics of drug elimination.
- Understand total drug clearance.

PHARMACODYNAMICS I (MECHANISM OF ACTION)

- Define Pharmacodynamics.
- Explain major types of drug receptors with examples.
- Understand signal transduction pathway.
- Correlate signal transduction pathway with drug efficacy.

PHARMACODYNAMICS II (RECEPTOR AGONIST & ANTAGONIST)

- Define Receptor, graded dose response and quantal dose response curve.
- Define therapeutic index and therapeutic window.
- Define drug agonists and antagonists.
- Explain partial, full and inverse agonists.
- Define competitive and non competitive antagonists.
- Explain pharmacological, physiological and chemical antagonists.
- Define competitive and non competitive antagonists.
- Enlist the types of antagonist used in therapeutics.

INTRODUCTION TO ANS

- Classify the two divisions of ANS.
- Enlist different autonomic neurotransmitters with examples.
- Classify cholinergic & adrenergic receptors, according to their site of action.
- Explain molecular signaling mechanism according to their site of action.

ADVERSE EFFECTS

- Define and classify adverse drug reactions.
- Compare predictable and unpredictable drug reactions with examples.
- Outline the management of adverse drug reactions.
- Enlist factors affecting susceptibility to ADRs.

DRUG-DRUG INTERACTIONS

- Define drug-drug interactions
- Correlate clinical importance of drug-drug interaction
- Classify different categories of drug interactions on the basis of pharmacodynamics and pharmacokinetics
- Define the terms synergism, addition, summation and antagonistic drug interaction
- Enlist commonly encountered drug interactions.

NEUROMUSCULAR BLOCKERS

- Classify types of neuromuscular blockers.
- Explain the mechanism of action of neuromuscular blockers.
- Understand the pharmacokinetics of pancuronium and succinylcholine.
- Enlist common adverse effects and contraindications of pancuronium and succinylcholine.

CHOLINERGIC AGONISTS

- Define the synthesis of neurotransmitter at cholinergic neurons.
- Enlist and classify direct and indirect acting cholinergic drugs.
- Explain the different types of cholinergic receptors.
- Explain the mechanism of action of Bethanechol, pilocarpine, nicotine, & Neostigmine.
- Understand the pharmacokinetics of Bethanechol, pilocarpine, nicotine, & Neostigmine.
- Enlist the clinical uses of Bethanechol, pilocarpine, nicotine, & Neostigmine.
- Enlist the adverse effects of Bethanechol, pilocarpine, nicotine, & Neostigmine.
- Enlist the various antidotes used in case of drug toxicity.

CHOLINERGIC ANTAGONISTS

- Classify types of cholinergic antagonists.
- Explain the mechanism of action of atropine and pralidoxime.
- Understand the pharmacokinetics of atropine and pralidoxime.
- Enlist common adverse effects and contraindications of atropine and pralidoxime.

ADRENERGIC AGONIST
<ul style="list-style-type: none"> • Classify adrenergic agonists. • Explain mechanism of action of dobutamine, amphetamine and ephedrine. • Understand the pharmacokinetics of dobutamine, amphetamine and ephedrine. • Enlist common adverse effects and contraindications of dobutamine, amphetamine and ephedrine.
ADRENERGIC ANTAGONIST
<ul style="list-style-type: none"> • Classify adrenergic antagonists. • Classify alpha receptor antagonists. • Explain mechanism of action of prazosin and labetalol. • Enlist clinical uses of prazosin and labetalol. • Understand pharmacokinetics of prazosin and labetalol. • Enlist common adverse effects and contraindications of prazosin and labetalol.
ANTI EMETICS
<ul style="list-style-type: none"> • Outline the pathophysiology of Emesis. • Classify anti-emetics. • Explain the mechanism of action of Metoclopramide, Promethazine & Ondansetron • Understand the pharmacokinetics. • Correlate the indication /contra-indication of common anti- emetics. • Enlist the common adverse effects.
DRUGS FOR PEPTIC ACID DISEASE
<ul style="list-style-type: none"> • Outline the pathophysiology of Acid-peptic disease. • Classify the drugs to treat acid-peptic disease. • Explain the MOA of Antacids/Cimetidine/Omeprazole. • Understand the pharmacokinetics of common drugs. • Enlist the indication/contra-indication. • Enumerate common adverse effects.
INFLAMMATORY BOWEL DISEASES & IRRITABLE BOWEL SYNDROME
<ul style="list-style-type: none"> • Outline pathophysiology of IBD & IBS.

- Classify the drugs used to treat IBD & IBS .
- Explain the MOA of Mesalamine, Sulphasalazine & Alosetron.
- Understand the pharmacokinetics.
- Enumerate the common adverse effects.

ANTI DIARRHEAL DRUGS

- Classify anti-diarrheal drugs with examples.
- Compare the mechanism of action of diphenoxylate, aluminum hydroxide and bismuth subsalicylate.
- Understand pharmacokinetics of diphenoxylate, aluminum hydroxide and bismuth subsalicylate.
- Enlist common adverse effects and contraindications of diphenoxylate, aluminum hydroxide and bismuth subsalicylate.

ASTHMA

- Classify the drugs used in asthma with examples.
- Explain the mechanism of action of Albuterol, Salmeterol, Methylxanthines.
- Understand the pharmacokinetics of Albuterol, Salmeterol, Methylxanthines
- Enlist the clinical uses of Albuterol, Salmeterol, Methylxanthines
- Enlist the adverse effects and contraindications of Albuterol, Salmeterol, Methylxanthines

DRUGS FOR DIARRHEA

- Classify anti-diarrheal drugs.
- Explain mechanism of action of loperamide.
- Enlist the clinical uses of loperamide.
- Understand pharmacokinetics of loperamide.
- Enlist common adverse effects and contraindications of loperamide.

LAXATIVES AND PURGATIVES

- Classify Laxatives.
- Explain Mechanism of Action of senna, lactulose and bisacodyl.
- Understand pharmacokinetics of senna, lactulose and bisacodyl.
- Enlist common adverse effects and contraindications of senna, lactulose and bisacodyl.

DRUGS FOR COR PULMONALE AND RESPIRATORY FAILURE

- Explain the pharmacological management of Cor pulmonale and pulmonary hypertension.
- Outline the pathophysiology of respiratory failure.
- Enlist the drugs used in respiratory failure.

COUGH

- Classify cough.
- Classify drugs used for cough.
- Explain mechanism of action of dextromethorphan and guaifenesin.
- Understand pharmacokinetics of dextromethorphan and guaifenesin.
- Enlist common adverse effects and contraindications of dextromethorphan and guaifenesin.

DRUGS FOR COPD

- Outline the pathophysiology of COPD.
- Classify drugs used for COPD with examples.
- Explain the mechanism of action of beclomethasone and tiotropium.
- Understand pharmacokinetics of beclomethasone and tiotropium.
- Enlist common adverse effects and contraindications of beclomethasone and tiotropium.
- Explain the stepwise management of COPD.

ASTHMA

- Classify the drugs used in asthma with examples.
- Explain the mechanism of action of Albuterol and Salmeterol.
- Understand the pharmacokinetics of Albuterol and Salmeterol.
- Enlist the clinical uses of Albuterol and Salmeterol.
- Enlist the adverse effects and contraindications of Albuterol and Salmeterol.

Lectures Distribution of 1st Module

As per the time table		
S. No.	Topics	Teachers
1	INTRODUCTION TO PHARMACOLOGY	Dr.Nadeem / Dr. Lubna
2	ROUTES OF DRUG ADMINISTRATION	Dr.Asif & Dr. Aitmaud
3	ABSORPTION OF DRUGS	Dr.Nadeem / Dr. Lubna
4	DRUG DISTRIBUTION	Dr.Asif & Dr. Aitmaud
5	METABOLISM OF DRUGS	Dr.Nadeem / Dr. Lubna
6	EXCRETION OF DRUGS	Dr.Asif & Dr. Aitmaud
7	PHARMACODYNAMICS I (MECHANISM OF ACTION)	Dr.Nadeem / Dr. Lubna
8	PHARMACODYNAMICS II (RECEPTOR AGONIST & ANTAGONIST)	Dr.Asif & Dr. Aitmaud
9	INTRODUCTION TO ANS	Dr.Nadeem / Dr. Lubna
10	ADVERSE EFFECTS	Dr.Asif & Dr. Aitmaud
11	DRUG-DRUG INTERACTIONS	Dr.Nadeem / Dr. Lubna
12	NEUROMUSCULAR BLOCKERS	Dr.Asif & Dr. Aitmaud
13	CHOLINERGIC AGONISTS	Dr.Nadeem / Dr. Lubna
14	CHOLINERGIC ANTAGONISTS	Dr.Asif & Dr. Aitmaud
15	ADRENERGIC AGONIST	Dr.Nadeem / Dr. Lubna
16	ADRENERGIC ANTAGONIST	Dr.Asif & Dr. Aitmaud
17	ANTI EMETICS	Dr.Nadeem / Dr. Lubna
18	DRUGS FOR PEPTIC ACID DISEASE	Dr.Asif & Dr. Aitmaud
19	INFLAMMATORY BOWEL DISEASES & IRRITABLE BOWEL SYNDROME	Dr.Nadeem / Dr. Lubna
20	ANTI DIARRHEAL DRUGS	Dr.Asif & Dr. Aitmaud
21	ASTHMA	Dr.Nadeem / Dr. Lubna
22	DRUGS FOR DIARRHEA	Dr.Asif & Dr. Aitmaud
23	LAXATIVES AND PURGATIVES	Dr.Nadeem / Dr. Lubna
24	DRUGS FOR COR PULMONALE AND RESPIRATORY FAILURE	Dr.Asif & Dr. Aitmaud

25	COUGH	Dr.Nadeem / Dr. Lubna
26	DRUGS FOR COPD	Dr.Asif & Dr. Aitmaud
27	ASTHMA	Dr.Nadeem / Dr. Lubna
28	INTRODUCTION TO PHARMACOLOGY	Dr.Asif & Dr. Aitmaud
29	ROUTES OF DRUG ADMINISTRATION	Dr.Nadeem / Dr. Lubna
30	ABSORPTION OF DRUGS	Dr.Asif & Dr. Aitmaud
31	DRUG DISTRIBUTION	Dr.Nadeem / Dr. Lubna
32	METABOLISM OF DRUGS	Dr.Asif & Dr. Aitmaud
33	EXCRETION OF DRUGS	Dr.Nadeem / Dr. Lubna
34	PHARMACODYNAMICS I (MECHANISM OF ACTION)	Dr.Asif & Dr. Aitmaud
35	PHARMACODYNAMICS II (RECEPTOR AGONIST & ANTAGONIST)	Dr.Nadeem / Dr. Lubna
36	INTRODUCTION TO ANS	Dr.Asif & Dr. Aitmaud
37	ADVERSE EFFECTS	Dr.Nadeem / Dr. Lubna
38	DRUG-DRUG INTERACTIONS	Dr.Asif & Dr. Aitmaud
39	NEUROMUSCULAR BLOCKERS	Dr.Nadeem / Dr. Lubna
40	CHOLINERGIC AGONISTS	Dr.Asif & Dr. Aitmaud
41	CHOLINERGIC ANTAGONISTS	Dr.Nadeem / Dr. Lubna
42	ADRENERGIC AGONIST	Dr.Asif & Dr. Aitmaud
43	ADRENERGIC ANTAGONIST	Dr.Nadeem / Dr. Lubna
44	ANTI EMETICS	Dr.Asif & Dr. Aitmaud
45	DRUGS FOR PEPTIC ACID DISEASE	Dr.Nadeem / Dr. Lubna
46	INFLAMMATORY BOWEL DISEASES & IRRITABLE BOWEL SYNDROME	Dr.Asif & Dr. Aitmaud
47	ANTI DIARRHEAL DRUGS	Dr.Nadeem / Dr. Lubna
48	DRUGS FOR DIARRHEA	Dr.Asif & Dr. Aitmaud
49	LAXATIVES AND PURGATIVES	Dr.Nadeem / Dr. Lubna
50	DRUGS FOR COR PULMONALE AND RESPIRATORY FAILURE	Dr.Asif & Dr. Aitmaud
51	COUGH	Dr.Nadeem / Dr. Lubna
52	DRUGS FOR COPD	Dr.Asif & Dr. Aitmaud

LECTURE BASED LEARNING OBJECTIVES OF 2nd MODULE 2020-2021

At the end of 1 hour lecture, 3rd year MBBS student should be able to

DRUGS USED IN HYPERTENSION I

- Define and classify hypertension.
- Explain pathophysiology of hypertension.
- Classify anti hypertensive drugs according to different grades of

hypertension.

- Classify anti hypertensives on basis of their mechanism of action.

DRUGS USED IN HYPERTENSION II

- Understand pharmacokinetics of beta blockers and calcium channel blockers.
- Explain pharmacodynamics of beta blockers and calcium channel blockers.
- Correlate clinical uses of beta blockers and calcium channel blockers.
- Enlist indications and contraindications of beta blockers and calcium channel blockers.

DRUGS USED IN TREATMENT OF ANGINA PECTORIS

- Define and classify angina.
- Explain pathophysiology of angina.
- Classify anti anginal drugs.
- Explain the mechanism of action of Nitrates.
- Describe pharmacokinetics of Nitrates.
- Enlist their common adverse effects.

DRUGS USED IN HEART FAILURE I

- Define and classify heart failure.
- Explain pathophysiology of heart failure.
- Classify drugs used in treatment of heart failure on basis of their mechanism of action.
- Explain the mechanism of action of cardiac glycosides.
- Understand the pharmacokinetics of cardiac glycosides.
- Enlist the common adverse effects of cardiac glycosides.

DRUGS USED IN HEART FAILURE II

- Classify drugs used in treatment of heart failure on basis of their mechanism of action.
- Explain the mechanism of action of ACE Inhibitors/ARBs.
- Understand the pharmacokinetics of ACE Inhibitors/ARBs.
- Enlist the common adverse effects and contraindications of ACE Inhibitors/ARBs.

ANTI ARRHYTHMICS

- Understand and classify arrhythmias.

- Classify anti arrhythmic drugs on basis of mechanism of action.
- Understand pharmacokinetics of sodium and potassium channel blockers.
- Correlate clinical uses of sodium and potassium channel blockers.'
- Enlist common adverse effects of sodium and potassium channel blockers.

DIURETICS I

- Recall structure of nephron.
- Classify diuretics.
- Explain mechanism of action of loop diuretics.
- Understand pharmacokinetics of loop diuretics.
- Enlist clinical uses of loop diuretics.
- Enlist common adverse effects and contraindications of loop diuretics.

DIURETICS II

- Classify diuretics.
- Explain mechanism of action of carbonic anhydrase inhibitor, osmotic, thiazide and potassium sparing diuretics.
- Understand pharmacokinetics of carbonic anhydrase inhibitor , osmotic, thiazide and potassium sparing diuretics.
- Enlist clinical uses of carbonic anhydrase inhibitor, osmotic, thiazide and potassium sparing diuretics.
- Enlist common adverse effects and contraindications of carbonic anhydrase inhibitor, osmotic, thiazide and potassium sparing diuretics.

ANTI HYPERLIPIDEMICS

- Recall types of hyperlipidemia.
- Classify anti hyperlipidemics.
- Explain mechanism of action of statins, niacin and fibrates.
- Understand pharmacokinetics of simvastatin.
- Enlist common drug-drug interactions associated with use of simvastatin.
- Enlist common adverse effects and contraindications of simvastatin, fibrates and niacin.

ANTI COAGULANTS

- Outline of coagulation cascade.
- Classify anticoagulants.

- Explain mechanism of action of heparin and warfarin.
- Understand pharmacokinetics of heparin and warfarin.
- Enlist clinical uses of heparin and warfarin.
- Enlist common drug-drug interactions associated with use of heparin and warfarin.
- Enlist common adverse effects and contraindications of heparin and warfarin.

THROMBOLYTICS AND ANTIPLATELETS

- Define anti platelets and thrombolytics.
- Classify anti platelets and thrombolytics.
- Explain mechanism of actions of aspirin, clopidogrel and streptokinase.
- Understand pharmacokinetics of aspirin, clopidogrel and streptokinase.
- Enlist clinical uses of aspirin, clopidogrel and streptokinase.
- Enlist common adverse effects and contraindications of aspirin, clopidogrel and streptokinase.

DRUGS USED OF BLEEDING DISORDERS

- Outline and Enlist types of bleeding disorders.
- Classify drugs used for bleeding disorders.
- Explain mechanism of action of vitamin K and tranexamic acid.
- Understand pharmacokinetics of vitamin K and tranexamic acid.
- Enlist common adverse effects and contraindications of vitamin K and tranexamic acid.

DRUGS FOR ANEMIA

- Outline and enlist types of anemia.
- Classify drugs used for anemia.
- Explain mechanism of action of ferrous sulphate used in anemia.
- Understand pharmacokinetics of ferrous sulphate used in anemia.
- Enlist common adverse effects and contraindications of ferrous sulphate used in anemia.

HYPOTHALAMIC AND PITUITARY HORMONES

- Outline of pituitary and hypothalamic disorders.
- Classify the drugs used in management of hypothalamic and pituitary disorders.

- Explain mechanism of action of somatropin, octreotide, vasopressin and oxytocin.
- Understand pharmacokinetics of somatropin, octreotide, vasopressin and oxytocin.
- Enlist common adverse effects and contraindications of somatropin, octreotide, vasopressin and oxytocin.

ANTI THYROID DRUGS

- Outline thyroid disorders.
- Classify drugs used in management of thyroid disorders.
- Explain the mechanism of action of drugs used in hypothyroidism (thyroxine).
- Understand pharmacokinetics of thyroxine.
- Enlist drug-drug interactions of thyroxine.
- Enlist common adverse effects and contraindications of thyroxine.
- Explain the mechanism of action of drugs used in hyperthyroidism.
- Understand pharmacokinetics of methimazole, iodide and propylthiouracil.
- Enlist drug-drug interactions of methimazole, iodide and propylthiouracil
- Enlist common adverse effects and contraindications of methimazole, iodide and propylthiouracil.

CORTICOSTEROIDS I

- Outline disorders of adrenal gland.
- Classify glucocorticoids.
- Explain mechanism of action of glucocorticoids.
- Understand pharmacokinetics of glucocorticoids.
- Enlist clinical uses of glucocorticoids.
- Enlist common adverse effects and contraindications of glucocorticoids.

CORTICOSTEROIDS II

- Outline disorders of adrenal gland.
- Classify mineralocorticoids.
- Explain mechanism of action of mineralocorticoids.
- Understand pharmacokinetics of mineralocorticoids.
- Enlist clinical uses of mineralocorticoids.

- Enlist common adverse effects and contraindications of mineralocorticoids.

ORAL HYPOGLYCEMICS I

- Outline pathophysiology of and classify diabetes mellitus.
- Classify the drugs used in diabetes mellitus.
- Explain mechanism of action of sulfonylureas and biguanides.
- Understand pharmacokinetics of sulfonylureas and biguanides.
- Enlist common adverse effects and contraindications of sulfonylureas and biguanides.

ORAL HYPOGLYCEMICS II

- Classify the drugs used in diabetes mellitus.
- Explain mechanism of action of acarbose, rosiglitazone and Dipeptidyl peptidase 4 inhibitors.
- Understand pharmacokinetics of acarbose, rosiglitazone and Dipeptidyl peptidase 4 inhibitors.
- Enlist common adverse effects and contraindications of acarbose, rosiglitazone and Dipeptidyl peptidase 4 inhibitors.

INSULIN THERAPY

- Classify insulin preparations according to their duration of action
- Explain the mechanism of action of insulin.
- Understand pharmacokinetics of insulin.
- Enlist the indications of insulin in a diabetic patient.
- Enlist the common adverse effects and contraindications of insulin.

PHARMACOLOGICAL MANAGEMENT OF DIABETIC EMERGENCIES

- Classify diabetic emergencies.
- Explain the pathophysiology of diabetic keto-acidosis.
- Enlist the drugs used in diabetic ketoacidosis.
- Explain mechanism of actions of these drugs.

ESTROGENS, PROGESTERONE AND ORAL CONTRACEPTIVES

- Outline physiological functions of estrogen and progesterone.
- Classify estrogen and progesterone analogues.
- Explain the mechanism of action of estrogen and progesterone analogues.
- Understand pharmacokinetics of estrogen and progesterone analogues.

- Enlist indications for the use of estrogen and progesterone analogues.
- Enlist common adverse effects and contraindications of estrogen and progesterone analogues

ANDROGENS

- Outline physiological functions of androgens.
- Explain the mechanism of action of androgen and anti androgen.
- Understand pharmacokinetics of androgen and anti androgen.
- Enlist indications for the use of androgen and anti androgen.
- Enlist common adverse effects and contraindications of androgen and anti androgen.

DRUGS FOR BONE DISORDERS

- Outline bone disorders.
- Classify the drugs used in bone disorders.
- Explain the mechanism of action of bisphosphonates, PTH, vitamin D, calcium and calcitonin.
- Understand pharmacokinetics of bisphosphonates, PTH, vitamin D, calcium and calcitonin.
- Enlist indications for the use of bisphosphonates, PTH, vitamin D, calcium and calcitonin.
- Enlist common adverse effects and contraindications of bisphosphonates, PTH, vitamin D, calcium and calcitonin.

INTRODUCTION TO AUTACOIDS

- Define autacoids.
- Explain their physiological and pathological effects through multiple receptor subtypes.
- Classify autacoids according to site of action.
- Define obesity and classify drugs used in obesity.
- Explain mechanism of action of anti obesity drugs.
- Enlist common adverse effects and contraindications of anti obesity drugs.

ERGOT ALKALOIDS

- Define ergot alkaloids.
- Memorize sources of ergot alkaloids.

- Classify ergot alkaloids on basis of their effects on major tissues.
- Explain the effects of ergot alkaloids on serotonin and alpha dopamine receptors.
- Enlist the clinical uses of ergot alkaloids.
- Enlist the common adverse effects and contraindications of ergot alkaloids.

SEROTONIN AGONISTS/ANTAGONISTS

- Identify serotonin as a neurotransmitter and its prominent peripheral actions.
- Memorize various serotonin receptors with their effects.
- Classify serotonin receptors agonists and antagonists.
- Enlist the clinical uses of serotonin agonists.
- Enlist the clinical uses of serotonin antagonists.
- Explain characteristics of serotonin syndrome and other hyperthermic syndromes.
- Enlist the common adverse effects and contraindications of serotonin antagonists.

HISTAMINES AND ANTIHISTAMINES

- Define histamine and its role as a chemical mediator.
- Enlist types of histamine receptors with their distribution.
- Classify histamine receptors with examples.
- Explain the mechanism of action of chlorpheniramine ,cyclizine and citrizine.
- Understand pharmacokinetics of chlorpheniramine ,cyclizine and citrizine.
- Enlist the common adverse effects and contraindications of chlorpheniramine ,cyclizine and citrizine.

NSAIDS

- Outline the pathophysiology of pain.
- Classify NSAIDS.
- Explain the mechanism of action of aspirin and celecoxib.
- Understand pharmacokinetics of aspirin and celecoxib.
- Enlist common adverse effects and contraindications of aspirin and celecoxib.

MANAGEMENT OF SALICYLATE POISONING

- Define salicylate
- Understand salicylate overdose

- Explain general guidelines to manage salicylate poisoning
- Enumerate the steps of management of acute salicylate poisoning.
- Enumerate the steps of management of chronic salicylate poisoning.

DRUGS FOR RHEUMATOID ARTHRITIS (DMARDs)

- Outline pathophysiology of rheumatoid arthritis.
- Classify drugs used for management of rheumatoid arthritis.
- Explain mechanism of action of methotrexate and leflunomide.
- Understand pharmacokinetics of methotrexate and leflunomide.
- Enlist common adverse effects and contraindications of methotrexate and leflunomide.

DRUGS FOR GOUT

- Outline pathophysiology of GOUT
- Classify drugs used for management of GOUT.
- Explain mechanism of action of allopurinol and colchicine.
- Understand pharmacokinetics of allopurinol and colchicine.
- Enlist common adverse effects and contraindications of allopurinol and colchicine.

PHARMACOLOGY OF CHEMICAL MEDIATORS

- Outline physiology of chemical mediators.
- Classify chemical mediators.
- Explain mechanism of action of misoprostol and latanoprost .
- Understand pharmacokinetics of misoprostol and latanoprost.
- Enlist common adverse effects and contraindications of misoprostol and latanoprost.

IMMUNOPHARMACOLOGY

- Outline physiology of immunomodulators.
- Classify immunomodulators.
- Explain mechanism of action of interferons and azathioprine.
- Understand pharmacokinetics of interferons and azathioprine.
- Enlist common adverse effects and contraindications of interferons and azathioprine.

Lectures Distribution of 2nd Module

As per the time table

S. No.	Date (Tuesday)	Timings	Topics	Teachers
1	05-May-20	9:00-10:00	ANTI HYPERTENSIVES I	Dr.Nadeem / Dr. Lubna
2	05-May-20	10:00-11:00	ANTI HYPERTENSIVES II	Dr.Asif & Dr. Aitmaud
3	05-May-20	11:00-12:00	DRUGS FOR ANGINA PECTORIS	Dr.Nadeem / Dr. Lubna
4	05-May-20	12:00-1:00	DRUGS FOR HEART FAILURE I	Dr.Asif & Dr. Aitmaud
5	12-May-20	9:00-10:00	DRUGS FOR HEART FAILURE II	Dr.Nadeem / Dr. Lubna
6	12-May-20	10:00-11:00	ANTI ARRHYTHMICS	Dr.Asif & Dr. Aitmaud
7	12-May-20	11:00-12:00	DIURETICS I	Dr.Nadeem / Dr. Lubna
8	12-May-20	12:00-1:00	DIURETICS II	Dr.Asif & Dr. Aitmaud

9	19-May-20	9:00-10:00	ANTI HYPERLIPIDEMICS	Dr.Nadeem / Dr. Lubna
10	19-May-20	10:00-11:00	ANTI COAGULANTS	Dr.Asif & Dr. Aitmaud
11	19-May-20	11:00-12:00	THROMBOLYTICS AND ANTIPLATELETS	Dr.Nadeem / Dr. Lubna
12	19-May-20	12:00-1:00	DRUGS FOR ANEMIA	Dr.Asif & Dr. Aitmaud
13	02-Jun-20	9:00-10:00	DRUGS FOR BLEEDING DISORDER	Dr.Nadeem / Dr. Lubna
14	02-Jun-20	10:00-11:00	HYPOTHALAMIC AND PITUTARY HORMONES	Dr.Asif & Dr. Aitmaud
15	02-Jun-20	11:00-12:00	ANTI THYROID DRUGS	Dr.Nadeem / Dr. Lubna
16	02-Jun-20	12:00-1:00	CORTICOSTEROIDS I	Dr.Asif & Dr. Aitmaud
17	09-Jun-20	9:00-10:00	CORTICOSTEROIDS II	Dr.Nadeem / Dr. Lubna
18	09-Jun-20	10:00-11:00	ORAL HYPOGLYCEMICS I	Dr.Asif & Dr. Aitmaud
19	09-Jun-20	11:00-12:00	ORAL HYPOGLYCEMICS II	Dr.Nadeem / Dr. Lubna
20	09-Jun-20	12:00-1:00	INSULIN THERAPY	Dr.Asif & Dr. Aitmaud
21	16-Jun-20	9:00-10:00	PHARMACOLOGICAL MANAGEMENT OF DIABETIC KETOACIDOSIS	Dr.Nadeem / Dr. Lubna
22	16-Jun-20	10:00-11:00	ESTROGENS, PROGESTERONES AND CONTRACEPTIVES	Dr.Asif & Dr. Aitmaud
23	16-Jun-20	11:00-12:00	ANDROGENS	Dr.Nadeem / Dr. Lubna

24	16-Jun-20	12:00-1:00	DRUGS FOR BONE DISORDERS	Dr.Asif & Dr. Aitmaud
25	23-Jun-20	9:00-10:00	INTRO TO AUTACOIDS	Dr.Nadeem / Dr. Lubna
26	23-Jun-20	10:00-11:00	ERGOT ALKALOIDS	Dr.Asif & Dr. Aitmaud
27	23-Jun-20	11:00-12:00	SEROTONIN AGONIST & ANTAGONISTS	Dr.Nadeem / Dr. Lubna
28	23-Jun-20	12:00-1:00	HISTAMINES & ANTI HISTAMINES.	Dr.Asif & Dr. Aitmaud
29	30-Jun-20	9:00-10:00	NSAIDS	Dr.Nadeem / Dr. Lubna
30	30-Jun-20	10:00-11:00	MANAGEMENT OF SALICYLATE POISONING	Dr.Asif & Dr. Aitmaud
31	30-Jun-20	11:00-12:00	DRUGS FOR RHEUMATOID ARTHRITIS & DMARDS	Dr.Nadeem / Dr. Lubna
32	30-Jun-20	12:00-1:00	DRUGS FOR GOUT	Dr.Asif & Dr. Aitmaud
33	07-Jul-20	9:00-10:00	PHARMACOLOGY OF CHEMICAL MEDIATORS	Dr.Nadeem / Dr. Lubna
34	07-Jul-20	10:00-11:00	IMMUNOPHARMACOLOGY	Dr.Asif & Dr. Aitmaud

LECTURE BASED LEARNING OBJECTIVS OF 3rd MODULE 2020-2021

At the end of 1 hour lecture, 3rd year MBBS student should be able to

GENERAL ANESTHETICS II (INTRAVENOUS)
<ul style="list-style-type: none">• Define intravenous anesthetics.• Understand MAC.• Classify intravenous anesthetic drugs.• Explain mechanism of action of propofol and ketamine.• Understand pharmacokinetics of propofol and ketamine.• Enlist pharmacological effects of propofol and ketamine.• Enlist common adverse effects and contraindications of propofol and ketamine.
GENERAL ANESTHETICS I (INHALED)
<ul style="list-style-type: none">• Define general anesthesia.• Classify General anesthetics• Discuss stages of Anesthesia (1 to 4).• Discuss patient protocol for Anesthesia selection.• Explain mechanism of action of inhaled anesthetics. (Halothane, NO₂, isoflurane)• Understand pharmacokinetics of Halothane, NO₂, isoflurane.• Enlist pharmacological effects of Halothane, NO₂, isoflurane on various organ systems.• Enlist common adverse effects and contraindications of Halothane, NO₂, isoflurane.
LOCAL ANESTHETICS
<ul style="list-style-type: none">• Define Local anesthetics.• Classify local anesthetics.

- Explain mechanism of action of Lignocaine.
- Understand pharmacokinetics of Lignocaine .
- Enlist the common side effects and contraindications of Lignocaine.

ANTI PARKINSON DRUGS

- Classify Anti Parkinson's drugs.
- Explain mechanism of action of levodopa and carbidopa.
- Enlist the clinical uses of levodopa and carbidopa.
- Understand pharmacokinetics of levodopa and carbidopa.
- Enlist common adverse effects and contraindications of levodopa and carbidopa.
- Enlist drugs used in extrapyramidal diseases.

SEDATIVE-HYPNOTICS

- Classify Benzodiazepines and Barbiturates according to duration of action.
- Explain the mechanism of action of Benzodiazepine(Diazepam) and Barbiturates (Phenobarbital)
- Understand the pharmacokinetics of Diazepam and Phenobarbital.
- Enlist the therapeutic applications of Diazepam and Phenobarbital.
- Enlist adverse effects and contraindications of Diazepam and Phenobarbital

ANITDEPRESSANTS

- Outline pathophysiology of depression.
- Classify antidepressants on basis of their mechanism of action.
- Understand pharmacokinetics of Fluoxetine, venlafaxine, imipramine, phenelzine,
- Enlist indications, adverse effects and contraindications of Fluoxetine, venlafaxine, imipramine, phenelzine,
- Enlist common drug-drug interactions associated with the use of SSRIs and MAOIs

SKELETAL MUSCLE RELAXANTS

- Outline the process of neuromuscular transmission at the skeletal neuromuscular endplate
- Classify Skeletal muscle relaxants
- Explain the mechanism of action of Tubocurarine and succinylcholine

- Describe pharmacokinetics and pharmacodynamics of Tubocurarine and succinylcholine.
- Enlist the clinical uses, common adverse effects and contraindications of Tubocurarine and succinylcholine.

ANTI PSYCHOTIC DISORDERS

- Outline pathophysiology of psychotic disorder.
- Classify anti psychotic drugs.
- Explain mechanism of action of chlorpromazine, haloperidol and fluphenazine.
- Understand pharmacokinetics of chlorpromazine, haloperidol and fluphenazine.
- Enlist common adverse effects and contraindications of chlorpromazine, haloperidol and fluphenazine.

DRUGS FOR BIPOLAR DISORDER

- Outline pathophysiology of Bipolar disorder.
- Enlist drugs for Bipolar disorder.
- Explain mechanism of action of lithium.
- Understand the pharmacokinetics of lithium.
- Enlist common adverse effects and contraindications of lithium.

DRUGS USED IN EPILEPSY

- Define and classify seizures.
- Classify anti-epileptic drugs.
- Correlate the clinical uses of anti-epileptics used in each type of seizures.
- Explain mechanism of action of phenytoin, carbamazepine and valproic acid.
- Understand pharmacokinetics of phenytoin, carbamazepine and valproic acid.
- Enlist the common adverse effects and contraindications of phenytoin, carbamazepine and valproic acid.

OPIOID ANALGESICS

- Enlist opioid agonists and antagonists with respect to target receptors.
- Explain mechanism of action of morphine and codeine.
- Correlate clinical use of morphine and codeine.
- Understand pharmacokinetics of morphine and codeine.

- Enlist common adverse effects and contraindications of opioids.
- Describe mechanism of action and understand pharmacokinetics of naloxone.
- Enlist symptoms of opioid withdrawal.
- Enlist clinical uses of methadone.

DRUGS USED IN NEURODEGENERATIVE DISORDERS

- Classify the drugs used in alzheimer's disease on basis of their mechanism of action.
- Understand pharmacokinetics of rivastigmine and memantine.
- Enlist common adverse effects and contraindications of rivastigmine and memantine.
- Correlate the clinical use of natalizumab and interferons in multiple sclerosis.
- Understand pharmacokinetics of natalizumab and interferons.
- Enlist common adverse effects and contraindications of natalizumab and interferons.
- Explain the mechanism of action of riluzole.
- Understand pharmacokinetics of riluzole.
- Enlist common adverse effects and contraindications of riluzole.

DRUGS OF ABUSE

- Define Drug Abuse
- Classify Drugs Of Abuse
- Enumerate various steps of the management of drug abuse.

PATIENT CONTROLLED ANALGESIA

- Define Patient Controlled Analgesia
- Correlate clinical relevance of PCA
- Classify drugs used in PCA
- Explain the mechanism of action of morphine and pethidine.
- Understand the pharmacokinetics of morphine and pethidine.
- Enlist the common adverse effects and contraindications of morphine and pethidine.

PRINCIPLES OF ANTIMICROBIALS

- Define Optimal antimicrobial prescription
- Enumerate reasons of appropriate antimicrobial use

- Identify selection criteria of antimicrobial drugs
- Determine anti microbial susceptibility of infective organisms
- Enlist recommended common combinations of antimicrobial drugs.

BETA LACTAM ANTIBIOTICS

- Define beta lactam antibiotics
- Classify beta lactams antibiotics
- Explain penicillin's mechanism of action according to its spectrum of activity.
- Understand pharmacokinetics of Amoxicillin.
- Enlist clinical uses of Amoxicillin.
- Enlist common adverse effects and contraindications of Amoxicillin.
- Understand pharmacokinetics of imipenem/cilastatin, aztreonam, vancomycin and daptomycin.
- Enlist clinical uses of imipenem/cilastatin, aztreonam, vancomycin and daptomycin
- Enlist common adverse effects and contraindications of imipenem/cilastatin, aztreonam, vancomycin and daptomycin.

AMINOGLYCOSIDES

- Enlist aminoglycosides according to site of action
- Explain mechanism of action of amikacin, gentamycin and streptomycin.
- Describe pharmacokinetics and clinical uses of amikacin, gentamycin and streptomycin.
- Enlist common adverse effects and contraindications of amikacin, gentamycin and streptomycin.

Lectures Distribution of 3rd Module

As per the time table		
S. No.	Topics	Teachers
1	GENERAL ANESTHETICS II (INTRAVENOUS)	Dr.Nadeem / Dr. Lubna
2	GENERAL ANESTHETICS I (INHALED)	Dr.Asif / Dr. Aitmaud
3	LOCAL ANESTHETICS	Dr.Nadeem / Dr. Lubna
4	ANTI PARKINSON DRUGS	Dr.Asif / Dr. Aitmaud
5	SEDATIVE-HYPNOTICS	Dr.Nadeem / Dr. Lubna
6	ANITDEPRESSANTS	Dr.Asif / Dr. Aitmaud
7	SKELETAL MUSCLE RELAXANTS	Dr.Nadeem / Dr. Lubna
8	ANTI PSYCHOTIC DISORDERS	Dr.Asif / Dr. Aitmaud
9	DRUGS FOR BIPOLAR DISORDER	Dr.Nadeem / Dr. Lubna
10	DRUGS USED IN EPILEPSY	Dr.Asif / Dr. Aitmaud
11	OPIOID ANALGESICS	Dr.Nadeem / Dr. Lubna
12	DRUGS USED IN NEURODEGENERATIVE DISORDERS	Dr.Asif / Dr. Aitmaud
13	DRUGS OF ABUSE	Dr.Nadeem / Dr. Lubna
14	PATIENT CONTROLLED ANALGESIA	Dr.Asif / Dr. Aitmaud
15	PRINCIPLES OF ANTIMICROBIALS	Dr.Nadeem / Dr. Lubna
16	BETA LACTAM ANTIBIOTICS	Dr.Asif / Dr. Aitmaud
17	AMINOGLYCOSIDES	Dr.Nadeem / Dr. Lubna

LECTURE BASED LEARNING OBJECTIVS OF 4th MODULE 2020-2021

At the end of 1 hour lecture, 3rd year MBBS student should be able to

MACROLIDES
<ul style="list-style-type: none">• Classify Macrolides.• Explain mechanism of action of Macrolides.• Understand pharmacokinetics of erythromycin, Azithromycin and clarithromycin.• Enlist clinical uses of erythromycin, Azithromycin and clarithromycin.• Enlist common adverse effects and contraindications of Macrolides.
DRUGS FOR TREATMENT OF TUBERCULOSIS
<ul style="list-style-type: none">• Classify drugs used for treatment of tuberculosis.• Explain Mechanism of action of isoniazid, Rifampin ,ethambutol and streptomycin.• Understand pharmacokinetics of isoniazid, Rifampin, ethambutol and streptomycin.• Enlist common adverse effects and contraindications of isoniazid, Rifampin, ethambutol and streptomycin.
DRUGS USED IN MALARIA
<ul style="list-style-type: none">• Outline the lifecycle of Malarial parasites

- Classify antimalarial drugs
- Explain the mechanism of action of chloroquine and arthemeter.
- Enlist clinical uses of chloroquine.
- Understand pharmacokinetics of chloroquine.
- Enlist common adverse effects and contraindications of chloroquine
- Understand the drugs used for the prophylaxis of malaria
- Understand the drugs used to treat multidrug resistant malaria.

AMOEBCIDAL DRUGS

- Classify amoebicidal drugs according to site of action.
- Explain the mechanism of action of metronidazole.
- Enlist clinical uses of metronidazole.
- Understand pharmacokinetics of metronidazole.
- Enlist common adverse effects and contraindications of metronidazole.

FOLIC ACID ANTAGONISTS

- Classify Antifolate drugs.
- Explain the mechanism of sulphamethoxazole and trimethoprim
- Understand the pharmacokinetics of sulphamethoxazole and trimethoprim
- Enlist the common adverse effects and contraindications of sulphamethoxazole and trimethoprim.

FLUOROQUINOLONES

- Classify Fluoroquinolones.
- Explain the mechanism of action of Ofloxacin, Ciprofloxacin and levofloxacin.
- Understand the pharmacokinetics of Ofloxacin, Ciprofloxacin and levofloxacin.
- Enlist the common adverse effects and contraindications of Ofloxacin, Ciprofloxacin and levofloxacin.

DRUGS USED IN HYPERTENSIVE EMERGENCY

- Define Hypertensive Emergency.
- Outline the pathophysiology of hypertensive emergency.
- Classify drugs used in Hypertensive Emergency.
- Explain the mechanism of action of Sodium Nitroprusside.
- Understand the pharmacokinetics of Sodium Nitroprusside.
- Enlist the common adverse effects and contraindications of Sodium

Nitroprusside.
ANTI FUNGALS
<ul style="list-style-type: none"> • Outline types of mycotic infections. • Classify antifungal agents. • Explain the mechanism of action of Fluconazole, amphotericin B, Flucytosine and griseofulvin. • Understand pharmacokinetics of Fluconazole, amphotericin B, Flucytosine and griseofulvin. • Enlist indications, common adverse effects and contraindications of Fluconazole, amphotericin B, Flucytosine and griseofulvin.
ANTI HELMINTHIC DRUGS
<ul style="list-style-type: none"> • Classify pathological nematodes, trematodes and cystodes. • Classify anti helminthic drugs. • Explain mechanism of action of albendazole, mebendazole and ivermectin. • Understand pharmacokinetics of albendazole, mebendazole and ivermectin. • Enlist common adverse effects and contraindications of albendazole, mebendazole and ivermectin.
IMMUNIZATION & VACCINATION
<ul style="list-style-type: none"> • Define immunization. • Differentiate between active and passive immunization. • Enlist methods of immunization. • Understand the types of vaccines. • Memorize EPI program. • Enlist common adverse effects and contraindications of different vaccines.
CEPHALOSPORINS
<ul style="list-style-type: none"> • Classify cephalosporins with respect to generation of drug. • Explain mechanism of action of cephalosporins. • Understand pharmacokinetics of cephalosporins. • Enlist the common adverse effects and contraindications of cephalosporins. • Enlist the clinical uses of cephalosporins.
TETRACYCLINES
<ul style="list-style-type: none"> • Classify tetracyclines.

- Explain mechanism of action of tetracyclines.
- Understand pharmacokinetics of tetracyclines.
- Enlist the common adverse effects and contraindications of tetracyclines.
- Enlist the clinical uses of tetracyclines.

DRUGS USED IN PREGNANCY

- Outline the physiological changes in pregnancy.
- Categorize FDA approved drugs during pregnancy.
- Enlist teratogenic drugs.
- Enlist commonly used drugs safe in pregnancy.

CHLORAMPHENICOL AND CLINDAMYCIN

- Explain mechanism of action of chloramphenicol and clindamycin.
- Understand pharmacokinetics of chloramphenicol and clindamycin.
- Enlist the common adverse effects and contraindications of chloramphenicol and clindamycin.
- Enlist the clinical uses of chloramphenicol and clindamycin.

POISONING MANAGEMENT

- Define poison.
- Differentiate common poisons. (chemical, drug overdose, animal bite)
- Understand the general guidelines of poisoning management.
- Classify the antidotes.

DRUGS USED IN STROKE

- Understand pathology of stroke.
- Classify drugs used in stroke.
- Understand the general guidelines of stroke management.
- Enlist clinical indication of Mannitol.
- Explain mechanism of action of Mannitol.
- Understand pharmacokinetics of Mannitol.
- Enlist common adverse effects and contraindications of Mannitol.

DERMATOLOGICAL DISORDERS

- Enlist common Dermatological Disorders
- Classify drugs used in Dermatological Disorders
- Enlist the topical drugs used to treat psoriasis.

- Explain the mechanism of action of Betamethasone and calcipotriene.
- Enlist adverse effects and contraindications of Betamethasone and calcipotriene
- Enlist drugs used to treat acne vulgaris.
- Explain the mechanism of action of macrolide used in acne vulgaris.
- Understand pharmacokinetics of macrolide.
- Enlist adverse effects and contraindications macrolide.

Lectures Distribution of 4th Module

As per the time table		
S. No.	Topics	Teachers
1	MACROLIDES	Dr.Nadeem / Dr. Lubna
2	DRUGS FOR TREATMENT OF TUBERCULOSIS	Dr.Asif & Dr. Aitmaud
3	DRUGS USED IN MALARIA	Dr.Nadeem / Dr. Lubna
4	AMOEBEICIDAL DRUGS	Dr.Asif & Dr. Aitmaud
5	FOLIC ACID ANTAGONISTS	Dr.Nadeem / Dr. Lubna
6	FLUOROQUINOLONES	Dr.Asif & Dr. Aitmaud
7	DRUGS USED IN HYPERTENSIVE EMERGENCY	Dr.Nadeem / Dr. Lubna
8	ANTI FUNGALS	Dr.Asif & Dr. Aitmaud
9	ANTI HELMINTHIC DRUGS	Dr.Nadeem / Dr. Lubna
10	IMMUNIZATION & VACCINATION	Dr.Asif & Dr. Aitmaud
11	CEPHALOSPORINS	Dr.Nadeem / Dr. Lubna
12	TETRACYCLINES	Dr.Asif & Dr. Aitmaud
13	DRUGS USED IN PREGNANCY	Dr.Nadeem / Dr. Lubna
16	CHLORAMPHENICOL AND OTHERS	Dr.Asif & Dr. Aitmaud
17	POISONING MANAGEMENT	Dr.Nadeem / Dr. Lubna
18	DRUGS USED IN STROKE	Dr.Asif & Dr. Aitmaud
19	DERMATOLOGICAL DISORDERS	Dr.Nadeem / Dr. Lubna

RECOMMENDED BOOKS FOR PHARMACOLOGY

Essential

- Bertram G. Katzung. Basic and Clinical Pharmacology, 14th Edition. 2017.
- Katzung and Trevor's pharmacology Examination and Board Review 11th Edition 2015.
- Rang, Dale, Ritter and Moore. Pharmacology, 8th Edition. 2015.

Recommended

- Bennett and Brown. Clinical Pharmacology, 11th Edition. 2012.
- Lippincott's illustrated review of Pharmacology. 6th Edition. 2015.
- Kaplan Medical USMLE STEP 1. Lecture Notes. Pharmacology 2017

- Goodman and Gillman. The Pharmacological Basis of Therapeutics, 13th Edition. 2017.