Department of Pharmacology & Therapeutics

Sahara Medical College, Narowal

THIRD YEAR COURSE

STUDY GUIDE

2018-19

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Sahara Medical College

Department of Pharmacology & Therapeutics

Dear Students,

Welcome to the 3rd year Pharmacology & Therapeutics Course. You will spend with us 36 weeks learning the different aspects of the subject. We hope that you will enjoy it. You will find the details of the syllabus in this study guide. Please go through it for fine details and more information.

The basic sciences courses you had in the last two years are pre-requisites for this course particularly Physiology. Please refresh your knowledge in this subject as well as Biochemistry as this will help you in this forthcoming course.

This Study Guide is NOT a list of facts and information about the subject. It has NOT been designed to replace recommended textbooks. It is designed to help you manage your learning and access to resources available to you.

For any assistance please do not hesitate to contact the Teaching faculty of the department of Pharmacology & Therapeutics.

We again warmly welcome you all in the department and we hope that your time in our department will be very fruitful and enjoyable.

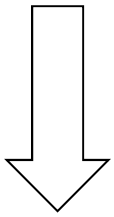
With compliments of the Head of department and all members of Department of Pharmacology & Therapeutics

CURRICULUM MAP

MBBS Course

University of Health Sciences

You are here



First year	Second Year	Third Year	Fourth Year	Final Year
Anatomy	Anatomy	Pharmacology	Special Pathology	Medicine
Physiology	Physiology	Pathology	Community Medicine	Surgery
Biochemistry	Biochemistry	Forensic Medicine	Eye	Gynecology & Obstetrics
		Behavioral Sciences	ENT	Pediatrics

You are entering in 1st year of clinical classes. Here you are going to study Pharmacology & Therapeutics along with other subjects. It will include lectures, practicals, tutorials, ward rotations and much much more.

STRUCTURE OF THIRD YEAR MODULE

Pharmacology & Therapeutics

Apart from other subjects (General Pathology, Forensic Medicine and Behavioral Sciences) the structure of 'Pharmacology & Therapeutics' portion of the module will be as follows:

- 8 lectures / week
- 1 Practical session/week in three batches
- 1 Tutorial session/week
- Other Remedial Classes later on (SDL, Saturday extra-classes)
- Class Tests (1st and 3rd Week of each month)
- Three term exams and Sendup

PHARMACOLOGY & THERAPEUTICS

GENERAL OBJECTIVES

It is expected that by the end of the course, the students should be able to:

1. Know the general principles of the two major branches of Pharmacology: Pharmacokinetics and Pharmacodynamics
2. Understand kinetics, mechanism of action, pharmacological actions, indications, contraindications, drug interactions and adverse drug reactions of the various drugs (especially prototype drugs or as a group) acting on different body systems
3. Classify drugs as per syllabus based on their chemistry, mechanism of action, therapeutic uses or other means specified in the specific objectives
4. Describe rationale of prescribing drugs for selected disorders
5. Describe signs, symptoms and management of over-dosage of selected drugs
6. Perform various practicals conducted throughout the course
7. Prescribe drugs safely and effectively, from knowledge of their pharmacological & therapeutic aspects.
8. Strive to become life-long learners.

ASSESSMENT

Formative Assessments

- MCQ and SEQ based
    - Class tests will be held 1st and 3rd week of every month
    - Three term exams will be held during the duration of the course
    - Sendup Examination as mock paper of professional exam
- Viva Voce and OSPE practice will also be conducted

Summative Assessment

- 1st paper of 3rd Professional examination under University of Health Sciences
- Theory
    - MCQs and SEQs
- Practical & Viva Voce
    - OSPEs
    - Viva

PHARMACOLOGY & THERAPEUTICS

RECOMMENDED BOOKS

The following Textbooks are recommended by University of Health Sciences for the course for undergraduate students of MBBS:

1. **Basic & Clinical Pharmacology**

   By Bertram Katzung, 14th Edition

2. **Pharmacology Examination & Board Review**

   By Katzung & Trevor, 11th Edition

3. **Lippincott's Illustrated Reviews, Pharmacology**

   By Karen Whalen, 7th Edition

FACULTY & CONTACT

S. No.	Name	Designation
1	Dr. Najiba Qamar	Professor & HOD
2	Dr. M. Nauman Shad	Associate Professor
3	Dr. Shahnaz Fatima	Assistant Professor
4	Dr. Mufakhara Fatimah	Assistant Professor

The following senior faculty member has been nominated from the Department of Pharmacology to answer to answer any queries regarding the subject.

NAME	DESIGNATION	PHONE NO	E-MAIL ADDRESS
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Pharmacology Study Guide

General Pharmacology

Introduction to Pharmacology

1. Define the term pharmacology
2. Define drug according to WHO
3. Describe the different branches of pharmacology
4. Describe different Pharmacopoeia
5. Describe drug nomenclature

Routes of Administration

1. Describe the factors that influence the route of administration of a drug
2. Enlist different routes of drug administration
3. Describe the merits & demerits of the different routes of drug administration

Transport of Drugs across Cell Membranes

1. Enlist the different processes by which drugs are transported across cell membranes
2. Describe each transport process
3. Differentiate between the different transport processes

Absorption I

1. Describe drug absorption
2. Describe drug based factors affecting rate and extent of drug absorption
3. Determine percentage of drug ionized or unionized when placed in a certain pH media
4. Explain ion trapping

Absorption II

1. Describe patient-based factors effecting absorption rate and extent of drug absorption
2. Describe the clinical significance of drug absorption

Bioavailability

1. Explain bioavailability
2. Describe factors affecting bioavailability
3. Explain first pass elimination and extraction ratio
4. Describe clinical significance of bioavailability
5. Explain bioequivalence and therapeutic equivalence

Distribution I

1. Explain drug distribution
2. Describe factors affecting distribution of a drug
3. Describe the distribution of a drug through various body compartments
4. Explain volume of distribution (Vd)
5. Calculate Vd using appropriate the formula
6. Describe clinical significance of Vd

Distribution II

1. Describe the characteristics of a drug that is bound to plasma proteins
2. Describe the clinical consequences of displacement of a drug from plasma protein binding
3. Explain redistribution
4. Describe drug reservoirs
5. Explain selective distribution

Biotransformation I

1. Explain biotransformation
2. Describe the aims and outcomes of biotransformation
3. Explain a ‘prodrug’
4. Enlist phase I and phase II biotransformation reactions
5. Describe characteristics of Phase 1 biotransformation reactions

Biotransformation II

1. Describe characteristics of Phase 2 biotransformation reactions
2. Describe microsomal and non-microsomal biotransformation reactions
3. Describe the microsomal oxidation system
4. Explain Hoffman's elimination

Biotransformation III

1. Describe factors effecting Biotransformation
2. Describe enzyme induction & enzyme inhibition with examples
3. Describe the clinical significance of enzyme induction and enzyme inhibition
4. Describe the clinical importance of biotransformation
5. Describe clinical importance of enterohepatic recycling

Plasma Half-Life

1. Explain plasma half life
2. Describe factors affecting half life
3. Explain clinical significance of plasma half life

Steady State Concentration & First & Zero Order Kinetics

1. Define steady state concentration and give its clinical significance
2. Explain First & Zero Order Kinetics with their clinical significance
3. Explain differences between First order kinetics and Zero Order Kinetics

Maintenance Dose & Loading Dose

1. Explain Maintenance Dose
2. Explain Loading dose
3. Calculate maintenance dose and loading dose using appropriate formula
4. Describe significance of maintenance dose and loading doses with examples

Drug Excretion

1. Describe drug excretion
2. Enlist routes of drug excretion
3. Describe processes of drug excretion through the kidneys
4. Describe factors effecting glomerular filtration & tubular reabsorption
5. Describe the clinical significance of glomerular filtration, active tubular secretion and passive tubular reabsorption of drugs

Drug Clearance

1. Explain drug clearance
2. Describe factors affecting drug clearance
3. Explain the clinical significance of different values of drug clearance

Introduction to Pharmacodynamics

1. Explain the term 'pharmacodynamics'
2. Describe the general mechanisms by which drugs act

Drug Receptor Interactions

1. Explain the terms affinity, efficacy, intrinsic activity & potency
2. Describe the different types of ligands
3. Explain difference between inverse agonist and pharmacological antagonist
4. Explain effect of a partial agonist in presence and absence of a full agonist
5. Describe spare receptors

Graded Dose Response Curve

1. Describe Graded Dose response curve
2. Describe the information that can be obtained from a Graded Dose Response Curve
3. Explain the significance of the log-dose response curve

Quantal Dose Response Curve

1. Explain Quantal Dose Response Curve

2. Describe the information that can be obtained from a Quantal Dose Response Curve
3. Tabulate differences between Graded and Quantal Dose Response Curve
4. Explain Therapeutic Index and Therapeutic Window

Drug Antagonism

1. Describe the different types of antagonism
2. Describe the role of epinephrine in anaphylactic shock
3. Describe competitive and irreversible pharmacological antagonism with help of dose response curves
4. Tabulate differences between Competitive and irreversible pharmacological antagonism

Receptor Transduction Mechanisms

1. Describe receptor-signaling mechanisms
2. Describe the role of 2^{nd} messengers in receptor signaling
3. Describe the significance of receptor-signaling
4. Explain temporal spareness of receptors

Tolerance, Tachyphylaxis, Down Regulation & Up-Regulation of Receptors

1. Explain Tolerance & Tachyphylaxis with clinical examples
2. Explain difference between Pharmacokinetic and Pharmacodynamic Tolerance
3. Explain cross tolerance
4. Tabulate differences between Tolerance and Tachyphylaxis
5. Explain Receptor Down regulation and Up-regulation with clinical examples

Factors Affecting Dose and Action of a Drug

1. Enumerate the factors affecting dose and action of a drug
2. State the formulae for calculating the dose of a drug according to age and weight
3. Explain Synergism, Summation and Potentiation
4. Explain drug interaction, contraindication, and drug accumulation

Pharmacogenetics

1. Define Pharmacogenetics
2. Explain the importance of the study of pharmacogenetics
3. Explain the term idiosyncrasy with examples
4. Explain examples of difference in response to drugs due to genetic variation

Adverse Drug Reactions

1. Define adverse drug reaction, adverse effect and side effect
2. Identify differences between adverse effect and side effect
3. Tabulate differences between Type A and Type B adverse reactions
4. Describe relationships between toxic & therapeutic effects of drugs
5. Describe different categories of drugs based on their teratogenic potential

New Drug Development & Regulation

1. Describe approaches in drug discovery
2. Describe screening of new drugs
3. Describe 4 phases of clinical trials of a new drug

<u>Autonomic Nervous System (ANS)</u>

Introduction to ANS

1. Explain the term 'Autonomic Pharmacology'
2. Describe brief anatomy of ANS
3. Describe basic physiology of ANS
4. Enumerate Autonomic neurotransmitters
5. Enlist cholinergic & adrenergic fibers
6. Enlist cholinergic & adrenergic receptors

Introduction to ANS II

1. Describe steps in synaptic transmission
2. Tabulate differences in sympathetic & parasympathetic nervous system

3. Describe presynaptic & post-synaptic regulation
4. Describe autoreceptors and heteroreceptors
5. Describe Enteric Nervous System & NANC Neurons

Parasympathomimetics I

1. Describe the synthesis, storage, release and breakdown of Acetylcholine
2. Name the drugs that block each step of Acetylcholine synthesis
3. Enumerate the different cholinoreceptors
4. Enlist location of cholinoreceptors

Parasympathomimetics II

1. Describe the signaling mechanism of cholinoreceptors
2. Describe mechanism of action of parasympathomimetics
3. Classify Parasympathomimetics
4. Describe actions of Parasympathomimetics-1

Parasympathomimetics III

1. Describe the actions of Parasympathomimetics-2
2. Describe uses of Parasympathomimetics
3. Tabulate differences between neostigmine and physostigmine

Parasympathomimetics IV

1. Differentiate between Myasthenic crisis & cholinergic crisis
2. Describe the clinical features of organophosphorus compound (OPC) poisoning
3. Describe the symptomatic and pharmacological treatment of OPC poisoning
4. Explain the mechanism of action of oximes
5. Describe ageing and its clinical significance
6. Describe feature of acute nicotine toxicity

Anti-Muscarinics I

1. Classify Anti-Muscarinics
2. Describe the mechanism of action of Anti-muscarinics
3. Describe the actions of anti-muscarinics

Anti-Muscarinics II

1. Describe therapeutic uses of anti-muscarinics
2. Classify Anti-muscarinics according to their therapeutic uses

Anti-Muscarinics III

1. Describe adverse effects of anti-muscarinics
2. Explain contraindications of Anti-muscarinics
3. Describe atropine poisoning & its treatment

Sympathomimetics I

1. Describe the synthesis, storage, release, breakdown & reuptake of catecholamines
2. Enlist the names of the drugs that block each step of catecholamine synthesis & reuptake
3. Enumerate the different adrenoreceptors

Sympathomimetics II

1. Describe the location and signaling mechanisms of adrenoreceptors
2. Classify Sympathomimetics
3. Describe actions of Sympathomimetics

Sympathomimetics III

1. Explain the vasomotor reversal phenomena of Dale
2. Tabulate the differences in CVS actions of major groups of sympathomimetics
3. Describe uses of Sympathomimetics
4. Classify sympathomimetics according to their therapeutic uses

Sympathomimetics IV

1. Enumerate adverse effects of sympathomimetics

2. Describe mechanism of action of indirectly Acting sympathomimetics
3. Describe uses and adverse effects of indirectly acting sympathomimetics

Sympatholytics-Alpha Blockers

1. Classify Alpha Blockers
2. Describe actions of alpha blockers
3. Explain why non-selective alpha blockers cause more tachycardia than selective alpha-1 blockers
4. Describe uses of alpha blockers
5. Enlist adverse effects of alpha blockers

Sympatholytics-Beta Blockers-1

1. Classify Beta Blockers based upon Receptor Selectivity
2. Explain ISA and MSA
3. Classify Beta Blockers based upon ISA & MSA activity

Sympatholytics-Beta Blockers-II

1. Describe the actions of Beta Blockers
2. Explain uses of Beta Blockers
3. Describe the pharmacological treatment of pheochromocytoma

Sympatholytics-Beta Blockers-III

1. Describe adverse effects of beta blockers
2. Enlist contraindications of beta blockers
3. Explain contraindication of beta blockers in IDDM
4. Explain the clinical significance of Beta Blockers with ISA & MSA Activity
5. Explain the clinical significance of cardioselective beta blockers

Neuromuscular Blockers I

1. Classify neuromuscular blockers
2. Describe the mechanism of action of Competitive & Depolarizing Neuromuscular Blockers

3. Describe tetanic fade and post-tetanic potentiation
4. Differentiate between Depolarizing & Non-depolarizing Neuromuscular Blockers

Neuromuscular Blockers II

1. Differentiate between Phase 1 and Phase 2 Block caused by Succinylcholine
2. Describe reversal of neuromuscular blockade caused by different neuromuscular blockers
3. Explain uses of Neuromuscular Blockers
4. Describe adverse effects of neuromuscular blockers
5. Describe contraindications of neuromuscular blockers

CVS

Anti-Hypertensive Drugs-1

3. Explain pharmacological strategies used in treating hypertension
4. Enlist 4 major groups of anti-hypertensive drugs
5. Classify Anti-Hypertensive Drugs
6. Enlist sites of action of anti-hypertensive drugs with examples

Anti-Hypertensive Drugs-2

1. Enlist groups of anti-hypertensive drugs affecting sympathetic nervous system
2. Explain the mode of action of various drugs affecting sympathetic nervous system in the treatment of hypertension
3. Describe mechanism of action of central sympathoplegics (clonidine and methyldopa)
4. Enlist adverse effects of methyldopa and clonidine
5. Enlist uses of clonidine

Anti-Hypertensive Drugs-3

1. Enumerate directly acting vasodilators
2. Describe four mechanisms of vasodilation produced by vasodilator drugs
3. Explain the common actions of directly acting vasodilators
4. Explain role of directly acting vasodilators in the treatment of hypertension

5. Explain the compensatory responses to directly acting vasodilators
6. Explain how the compensatory responses can be overcome by drugs
7. Describe the uses of directly acting vasodilators
8. Enlist adverse effects of directly acting vasodilators

Anti-Hypertensive Drugs-4

1. Classify Calcium Channel Blockers
2. Explain hemodynamic effects of Dihydropyridines
3. Explain the hemodynamic effects of Verapamil
4. Enlist uses of Calcium Channel Blockers
5. Explain the rationale for use of Calcium Channel Blockers in Hypertension
6. Enlist the adverse effects of Ca Channel Blockers
7. Differentiate between Dihydropyridines & Non-Dihydropyridines

Anti-Hypertensive Drugs-5

1. Classify Drugs Affecting the RAAS
2. Describe the mechanism of action of ACE Inhibitors
3. Describe the mechanism of action of ARBs
4. Enlist uses of ACE Inhibitors & ARBs
5. Explain role ACE Inhibitors & ARBs in the treatment of hypertension

Anti-Hypertensive Drugs-6

1. Explain use of ACE inhibitors and ARBs in diabetic nephropathy
2. Enlist adverse effects of ACE Inhibitors & ARBs
3. Describe why ACE inhibitors cause dry cough, wheezing and angioedema
4. Explain why ACE Inhibitors and ARBs are contraindicated in bilateral renal artery stenosis
5. Differentiate between ACE Inhibitors & ARBS

Anti-Hypertensive Drugs-7

1. Classify anti-hypertensive drugs into those that reduce cardiac output or TPR or reduce both cardiac output and TPR
2. Describe stepwise approach in treatment of hypertension
3. Describe treatment of hypertension with concomitant diseases
4. Enumerate Drugs used in Hypertensive Emergencies

Anti-Anginal Drugs-1

1. Know the pathophysiology of three types of angina
2. Describe strategies used in pharmacological treatment of angina
3. Classify anti-anginal drugs
4. Explain the mechanisms by which drugs decrease preload & afterload

Anti-Anginal Drugs-2

1. Describe the mechanism of action of nitrates
2. Explain the rationale for use of nitrates in the treatment of angina
3. Describe the adverse effects of nitrates and nitrites
4. Explain the dangerous interaction between nitrates and sildenafil
5. Explain the coronary steal phenomena

Anti-Anginal Drugs-3

1. Describe the role of Beta Blockers in the treatment of Angina
2. Describe the role of Calcium Channel Blockers in the treatment of Angina
3. Explain why the combination of a nitrate with a β-blocker or a calcium channel blocker may be more effective than either alone
4. Explain the role of Fatty Acid Oxidation inhibitors in the treatment of Angina
5. Explain role of Ranolazine in the treatment of angina

Drugs Used in treatment of CCF-1

1. Describe the strategies used in the treatment of CCF

2. Classify drugs used in treatment of CCF
3. Describe the mechanism of action of Digoxin/ Explain how digoxin increases cardiac contractility
4. Explain how digoxin decreases heart rate

Drugs Used in treatment of CCF-2

1. Describe electrical effects of digoxin
2. Describe effects of digoxin on the ECG
3. Enlist uses of Digoxin
4. Describe features of digoxin toxicity and its treatment
5. Explain why digoxin is no longer considered drug of choice for CCF
6. Describe important drug interactions of digoxin

Drugs Used in treatment of CCF-3

1. Describe the rationale for the use of following drugs in CCF:
    - Dopamine and Dobutamine
    - Phosphodiesterase Enzyme Inhibitors
    - ACE Inhibitors and ARBs
    - Some Beta Blockers
    - Directly acting vasodilators
2. Describe the treatment of acute and chronic heart failure

Anti-arrhythmic Drugs-1

1. Review electrophysiology of the heart
2. Describe causes of arrhythmias
3. Enlist types of arrhythmias

Anti-arrhythmic Drugs-2

1. Classify Anti-arrhythmic Drugs
2. Explain the strategies by which Arrhythmias are treated with drugs

3. Explain state-dependent or use-dependent block

Anti-Arrhythmic Drugs-3

1. Describe the mechanism of action of Class 1 Anti-arrhythmic drugs
2. Enlist uses of class 1 anti-arrhythmic drugs
3. Describe Torsades de pointes
4. Enlist other adverse effects of Class 1 Drugs

Anti-arrhythmic Drugs-4

1. Explain Role of Beta Blockers and Calcium Channel Blockers in Arrhythmias
2. Describe the mechanism of action of Class III Anti-arrhythmic drugs
3. Enumerate adverse effects of Class III anti-arrhythmic drugs

Anti-Arrhythmic Drugs-5

1. Describe mechanism of action of adenosine
2. Describe Role of Digoxin in treatment of supreventricular arrhythmias
3. Enlist drugs used for the treatment of ventricular & supraventricular arrhythmias

Renal Pharmacology

Diuretics-Classification & Carbonic Anhydrase Inhibitors

1. Classify Diuretics
2. Describe the mechanism of action of Carbonic Anhydrase Inhibitors
3. Explain why Carbonic Anhydrase Inhibitors are not effective diuretics and hence are not used in treatment of Hypertension

Carbonic Anhydrase Inhibitors-2

1. Enlist the uses of Carbonic Anhydrase Inhibitors
2. Explain the use of carbonic anhydrase inhibitors in acute mountain sickness
3. Explain the use of carbonic anhydrase inhibitors in glaucoma
4. Describe the Adverse Effects of Carbonic Anhydrase Inhibitors

Loop Diuretics

1. Describe the mechanism of action of loop diuretics
2. Explain the actions of loop diuretics
3. Enlist the uses of Loop Diuretics
4. Explain use of loop diuretics in hypertension and acute hypercalcemia
5. Enlist adverse effects of Loop Diuretics
6. Explain the term High-Ceiling Diuretics

Thiazide Diuretics

1. Enumerate Thiazide and Thiazide-like Diuretics
2. Describe the mechanism of action of Thiazide Diuretics
3. Explain actions of Thiazide diuretics
4. Enlist the uses of Thiazide Diuretics
5. Explain use of thiazide diuretics in treatment of nephrogenic diabetes inspidus
6. Explain use of thiazide diuretics in treatment of nephrolithiasis
7. Enlist the adverse effects of Thiazide Diuretics

Potassium Sparing Diuretics

1. Enumerate Potassium Sparing Diuretics
2. Describe the mechanism of action of different types of Potassium Sparing Diuretics
3. Enlist the uses of Potassium Sparing Diuretics
4. Explain the use of Potassium Sparing Diuretics in Hyperaldosteronism states
5. Enlist the adverse effects of Potassium Sparing Diuretics

Osmotic Diuretics

1. Describe the mechanism of action of Osmotic Diuretics
2. Enlist the uses of mannitol
3. Explain the use of mannitol in cerebral edema
4. Explain adverse effects of mannitol

5. Describe mechanism of action of ADH agonists and ADH antagonists
6. Enlist uses & adverse effects of ADH agonists and ADH antagonists

Clinical Pharmacology of Diuretics

1. Explain the use of some diuretics in treatment of hypertension
2. Explain the use of some diuretics in treatment of CCF
3. Explain the use of some diuretics in other edematous conditions

Respiratory Pharmacology

Anti-asthmatic Drugs-1

1. Classify drugs used in the treatment of Bronchial Asthma
2. Describe the mechanism of action of Beta 2 agonists used in asthma
3. Explain how an increase in cAMP causes bronchodilation
4. Enlist adverse effects of beta 2 agonists
5. Describe the mechanism of action of methylxanthines
6. Explain the actions & adverse effects of methylxanthines

Anti-asthmatic Drugs-2

1. Explain the role of Ipratropium in Asthma
2. Explain the role of Corticosteroids in the treatment of Bronchial Asthma
3. Describe the mechanism of action of leukotriene pathway inhibitors
4. Describe the treatment of status asthmaticus
5. Describe the treatment of chronic asthma

Anti-Tussives, Expectorants and Mucolytics

1. Classify Anti-Tussives & expectorants
2. Describe Anti-Tussives, mucolytics and expectorants
3. Describe Pharmacodynamics of these drugs

GIT Pharmacology

Drugs for Treatment of Peptic Ulcer-Antacids

1. Explain the strategies used in the treatment of peptic ulcer
2. Classify drugs used in the treatment of peptic ulcer
3. Describe the mechanism of action of antacids
4. Enlist the adverse effects of antacids
5. Describe the milk-alkali syndrome

H2 Receptor Blockers and Proton Pump Inhibitors

1. Describe the mechanism of action of H2 receptor Blockers
2. Describe the adverse effects of H2 Receptor Blockers
3. Tabulate differences between cimetidine & other H2 receptor blockers
4. Describe the mechanism of action of Proton Pump Inhibitors
5. Enlist uses of H2 receptor blockers and PPIs
6. Tabulate differences between PPIs and H2 receptor blockers
7. Enlist adverse effects of PPIs

Mucosal Protective Agents & Eradication of H. Pylori

1. Explain the general mechanisms of Mucosal protective agents
2. Describe mechanism of action of misoprostol, sucralfate and bismuth compounds
3. Describe adverse effects of Mucosal protective agents
4. Enlist the drugs used for eradication of H. Pylori
5. Describe triple regimen, quadruple regimen & sequential therapy for eradication of H. Pylori

Anti-Emetics

1. Enlist the location of different receptors mediating vomiting
2. Classify anti-emetics
3. Describe the mechanism of action of metoclopramide
4. Enlist uses of metoclopramide

5. Enlist adverse effects of metoclopramide
6. Tabulate differences between metoclopramide and domperidone

Ant-Emetics-2

1. Describe mechanism of action of 5 HT3 receptor antagonists
2. Enlist adverse effects of 5-HT 3 receptor antagonists
3. Describe mechanism of action of other anti-emetic drugs
4. Enlist adverse effects of other anti-emetics
5. Classify anti-emetics based on their therapeutic uses

Prokinetic Agents

1. Define prokinetic agent
2. Classify prokinetic agents
3. Describe basic mechanisms of prokinetic agents
4. Enlist uses of prokinetic agents

Laxatives

1. Define Laxative, Purgative & Cathartic
2. Classify laxatives
3. Describe the clinical benefits of the use of laxatives
4. Describe the mechanism of action of bulk laxatives
5. Enlist adverse effects of bulk laxatives
6. Describe the mechanism of action of osmotic laxatives

Laxatives-2

1. Enlist adverse effects of osmotic laxatives
2. Explain the role of lactulose in the treatment of Hepatic Encephalopathy
3. Describe the mechanism of action of fecal softeners
4. Describe the mechanism of action of stimulant purgatives

5. Enlist adverse effects of stool softeners & stimulant purgatives

Anti-Diarrheal Drugs

1. Classify Anti-diarrheal drugs
2. Explain the anti-diarrheal effect of Opioid agonists
3. Describe the mechanism of action of octreotide
4. Enlist uses & adverse effects of octreotide
5. Explain role of bismuth compounds & bile acid binding resins in treatment of diarrhea

Drugs for Inflammatory Bowel Disease (IBD)

1. Classify Drugs Used for treatment of IBD
2. Describe the mechanism of action of Aminosalicylates
3. Enlist uses & adverse effects of various aminosalicylates
4. Explain role of glucocorticoids & other Immunosuppressants in IBD

Drugs for Irritable bowel Syndrome (IBS)

1. Classify drugs used to treat Irritable Bowel syndrome (IBS)
2. Explain role of alosetron and lubiprostone in treatment of IBS
3. Enlist adverse effects of alosetron and lubiprostone
4. Explain role of anti-spasmodic agents in IBS

<u>Blood Pharmacology</u>

Anti-Anemic Drugs

1. Classify anti-anemic drugs
2. Enlist the different oral & parenteral iron preparations
3. Enlist uses of iron/Enlist causes of iron-deficiency anemia
4. Enlist adverse effects of iron preparations
5. Describe features of acute iron toxicity
6. Describe the treatment of acute iron toxicity

Anti-Anemic Drugs-2

1. Describe features of chronic iron toxicity
2. Describe treatment of chronic iron toxicity
3. Enlist the Vitamin B12 preparations
4. Enlist therapeutic uses of vitamin B12
5. Explain why folic acid alone is contraindicated in the treatment of pernicious anemia
6. Enlist uses of folic acid

Haematopoietic Growth Factors

1. Explain the term 'Haematopoietic Growth Factor'
2. Classify haematopoietic growth factors
3. Describe mechanism of action of the 3 major haemopoietic growth factors
4. Enlist uses of different haematopoietic growth factors
5. Enlist adverse effects of different haematopoietic growth factors

Anti-Coagulants-1

1. Classify Anti- coagulants
2. Describe the mechanism of Action of Unfractionated Heparins & Low molecular weight heparins (LMWH)
3. Tabulate differences between HMWH & LMWH
4. Enumerate advantages of LMWH over HMWH

Anti-Coagulants-2

1. Describe the uses of anti-coagulants
2. Enumerate adverse effects of heparin
3. Enlist contraindications of heparin
4. Describe parenteral Direct Thrombin Inhibitors
5. Describe the mechanism of action of Warfarin

Anti-Coagulants-3

1. Describe the adverse effects of Warfarin
2. Explain the contraindications of warfarin in pregnancy
3. Describe drug interactions of warfarin
4. Tabulate differences between heparin and warfarin
5. Enlist advantages and disadvantages of newer oral anti-coagulants

Anti-Platelet Drugs

1. Classify Anti-platelet Drugs
2. Describe the anti-platelet mechanism of Aspirin
3. Explain why aspirin is useful in low dose as an anti-platelet drug
4. Describe the mechanism of action of ADP receptor blockers
5. Enlist adverse effects of ADP receptor blockers
6. Describe differences between clopidogrel and ticlopidine

Anti-Platelet Drugs-2

1. Describe the mechanism of action of Platelet GpIIb/IIIa antagonists
2. Enlist adverse effects of Platelet GpIIb/IIIa antagonists
3. Describe the mechanism of action of phosphodiesterase enzyme inhibitors used as anti-platelet drugs
4. Describe the uses of Anti-platelet Drugs
5. Enlist the adverse effects of anti-platelet drugs

Fibrinolytics (Thrombolytics)

1. Enumerate Fibrinolytics
2. Describe the mechanism of action of fibrinolytics
3. Tabulate differences between Streptokinase & recombinant tissue plasminogen activators
4. Enlist uses of fibrinolytics
5. Enlist adverse effects of fibrinolytics

Drugs Used in Bleeding Disorders

1. Classify drugs used in treatment of bleeding disorders
2. Describe the mechanism of action of Vitamin K
3. Describe mechanism of action of Fibrinolytic Inhibitors
4. Describe mechanism of action of Serine Protease Inhibitors
5. Enlist adverse effects of major drugs used for treatment of bleeding disorders

Anti-Hyperlipidemics/Anti-Dyslipidemics

1. Know the brief biochemistry of Lipoproteins
2. Describe the different types of Hyperlipidemias
3. Classify Anti-Hyperlipidemics
4. Describe mechanism of action of Statins
5. Describe uses of statins
6. Enlist adverse effects of Statins

Anti-Hyperlipidemics-II

1. Describe mechanism of action of Fibrates
2. Enlist uses of fibrates
3. Enlist adverse effects of Fibrates
4. Describe mechanism of action of bile acid binding resins
5. Describe uses of bile acid binding resins
6. Enlist adverse effects of Bile Acid Binding resins
7. Describe interactions of Bile acid binding resins

Anti-Hyperlipidemics-III

1. Describe mechanism of action
2. Enlist uses of Niacin
3. Enlist adverse effects of Niacin
4. Describe mechanism of action of sterol absorption inhibitors

5. Enlist uses of sterol absorption inhibitors
6. Explain the rationale for combining HMG-CoA inhibitors with Ezetimibe
7. Enlist drugs used for the different types of hyperlipidemias
8. Enlist combination therapies for treatment of hyperlipidemias

Chemotherapy

General Principles of Chemotherapy-1

1. Classify anti-microbial drugs based on mechanism of action
2. Explain bacteriostatic & bactericidal activity of anti-microbial drugs
3. Classify antibiotics into bacteriostatic and bactericidal drugs
4. Explain the terms broad spectrum, narrow spectrum, expected spectrum & reverse spectrum antibiotics with examples
5. Explain empirical therapy with its clinical significance

General Principles of Chemotherapy-II

1. Describe the mechanisms by which resistance develops to antibiotics
2. Explain cross-resistance
3. Describe rationale use of antibiotics
4. Describe superinfection with examples
5. Explain concentration-dependent & time-dependent killing
6. Explain post-antibiotic effect with examples

General Principles of Chemotherapy-III

1. Explain Minimum alveolar concentration (MIC) and Minimim Bactericidal concentration (MBC)
2. Explain clinical significance of MIC/MBC
3. Describe advantages & disadvantages of combination antimicrobial therapy
4. Describe the factors affecting selection of an anti-microbial
5. Explain the principles of prophylactic empirical antibiotic therapy
6. Describe the causes of failure of anti-microbial therapy

Cell Wall Synthesis Inhibitors-Penicillins

1. Enlist drugs/groups of drugs that are Cell Wall Inhibitors
2. Enlist beta lactam antibiotics
3. Classify Penicillins
4. Describe mechanism of action of beta-lactam antibiotics
5. Describe mechanisms of resistance to beta lactam antibiotics

Penicillins-2

1. Describe anti-bacterial spectrum of each subclass of penicillins
2. Compare anti-bacterial spectrum of different penicillins
3. Explain beta lactamase inhibitors with their clinical significance
4. Describe uses of Penicillins
5. Enlist adverse effects of Penicillins

Cephalosporins

1. Classify Cephalosporins
2. Describe anti-bacterial spectrum of different generations of Cephalosporins
3. Describe uses of different generations of cephalosporins
4. Describe adverse effects of cephalosporins

Other Cell Wall Synthesis Inhibitors

1. Enlist uses of monobactams and carbapenems
2. Explain the rationale for combining cilastin with imipenem
3. Enlist adverse effects of monobactams and carbapenems
4. Describe the mechanism of action of vancomycin
5. Describe uses of vancomycin
6. Enlist adverse effects of vancomycin

Protein Synthesis Inhibitors

1. Enlist drugs/groups of drugs that are protein synthesis inhibitors
2. Describe mechanism of protein synthesis in eukaryotes
3. Enlist drugs that block each step in protein synthesis
4. Enlist drugs that bind to 30 S and drugs that bind to 50 S ribosomal subunit

Protein Synthesis Inhibitors- Aminoglycosides

1. Classify aminoglycosides
2. Describe pharmacokinetics of aminoglycosides
3. Describe mechanism of action of aminoglycosides
4. Describe mechanisms of resistance to aminoglycosides

Aminoglycosides-2

1. Describe the anti-bacterial spectrum of aminoglycosides
2. Describe uses of aminoglycosides
3. Explain role of neomycin in treatment of hepatic encephalopathy
4. Explain the use of aminoglycosides with penicillins
5. Enlist adverse effects of aminoglycosides

Tetracyclines

1. Classify tetracyclines
2. Describe pharmacokinetics of tetracyclines
3. Describe the mechanism of action of tetracyclines
4. Describe mechanisms of resistance to tetracyclines
5. Describe the anti-bacterial spectrum of tetracyclines
6. Describe uses of tetracyclines
7. Enlist adverse effects of tetracyclines
8. Describe Fanconi's syndrome
9. Enlist contraindications of tetracyclines

Macrolides & Clindamycin

1. Enlist Macrolides

2. Describe mechanism of action of Macrolides & Clindamycin

3. Describe mechanisms of resistance to macrolides

4. Describe spectrum of antibacterial activity of Macrolides

5. Tabulate differences between the macrolides
6. Describe uses of Macrolides
7. Enlist adverse effects of macrolides
8. Describe uses of Clindamycin
9. Enlist adverse effects of Clindamycin

Chloramphenicol, Streptogramins and Oxazolidinones

1. Describe the mechanism of action of Chloramphenicol
2. Enlist uses of chloramphenicol
3. Describe adverse effects of Chloramphenicol
4. Describe mechanism of action of Streptogramins & Oxazolidinones
5. Describe spectrum of Streptogramins & Oxazolidinones
6. Enlist uses of Streptogramins and Oxazolidinones
7. Enlist adverse effects of Streptogramins and Oxazolidinones

Sulfonamides & Antifolates

1. Enlist the sulfonamides
2. Describe the mechanism of action of sulfonamides
3. Describe mechanisms of resistance to sulfonamides
4. Describe uses of Sulfonamides
5. Describe adverse effects of sulfonamides
6. Describe the mechanism of action of trimethoprim

Cotrimoxazole

1. Explain rationale for combining sulfamethoxazole with trimethoprim
2. Describe the mechanism of action of Cotrimoxazole
3. Describe spectrum of Cotrimoxazole
4. Describe the uses of Cotrimoxazole
5. Describe adverse effects of Cotrimoxazole

Fluoroquinolones-1

1. Classify fluoroquinolones
2. Describe mechanism of action of Fluoroquinolones
3. Describe mechanisms of resistance to fluoroquinolones
4. Describe spectrum of Fluoroquinolones

Fluoroquinolones-2

1. Describe uses of fluoroquinolones
2. Describe the respiratory fluoroquinolones
3. Describe adverse effects of fluoroquinolones
4. Explain contraindications of Fluoroquinolones

Anti-Tuberculosis Drugs-1

1. Classify drugs used for treatment of tuberculosis
2. Describe mechanism of action of first line drugs used in tuberculosis
3. Describe spectrum of antibacterial action of Rifampicin
4. Describe drug interactions of Rifampicin

Anti-Tuberculosis Drugs-2

1. Describe adverse effects of 1^{st} line Anti-TB drugs
2. Describe drugs used for various anti-TB regimes
3. Describe chemo-prophylaxis of TB

4. Describe second line drugs used in TB

Anti-Malarial Drugs-1

1. Know the life cycle of the major forms of the malaria parasite
2. Classify anti-malarial drugs
3. Explain Schizonticide, Gametocide, Sporontocide, Radical cure, Suppressive Prophylaxis, Terminal Prophylaxis and Causal Prophylaxis

Anti-Malarial Drugs-2

1. Describe the mechanism of action of Chloroquine
2. Describe spectrum of chloroquine
3. Enlist uses of Chloroquine
4. Enlist adverse effects of chloroquine
5. Enlist contraindications of chloroquine
6. Describe mechanism of action of Artemisinins
7. Describe uses of Artemisinins
8. Enlist adverse effects of artemisinins

Anti-Malarial Drugs-3

1. Describe spectrum of primaquine
2. Enlist uses of primaquine
3. Enlist adverse effects of primaquine
4. Describe mechanism of action of the folate synthesis inhibitors used in malaria
5. Describe uses of folate synthesis inhibitors
6. Enlist adverse effects of anti-folates

Anti-Malarial Drugs-4

1. Describe spectrum of quinine and quinidine
2. Enlist uses of quinine and quinidine
3. Enlist adverse effects of quinine and quinidine

4. Describe cinchonism and blackwater fever
5. Enlist contraindications of quinine

Anti-Malarial Drugs-5

1. Describe briefly pharmacology of amodiaquine, mefloquine, atovaquone and Lumefantrine
2. Describe use of antibiotics in malaria
3. Enlist drugs used for treatment of uncomplicated, severe chloroquine sensitive and chloroquine resistant acute malaria

Anti-Amebic Drugs

1. Classify anti-amebic drugs
2. Describe the mechanism of action of Metronidazole
3. Enlist uses of metronidazole
4. Enlist adverse effects of metronidazole
5. Enlist adverse effects of Iodoquinol, Diloxanide Furoate and emetine

Other Anti-Protozoal Drugs

1. Classify drugs used for treatment of other protozoal infections (Leishmaniasis, toxoplasmosis, pneumocystitis jiroveci, trypanosomiasis and trichomoniasis)
2. Enlist uses of pentamidine
3. Enlist adverse effects of pentamidine
4. Enlist uses and adverse effects of suramin
5. Enlist uses and adverse effects of melarsoprol and eflornithine

Anti-Helminthics

1. Classify Anti-Helminthics
2. Describe mechanism of action of major anti-helminthic drugs
3. Enlist uses & adverse effects of major anti-helminthic drugs

Anti-Fungal Drugs

1. Classify antifungal drugs

2. Describe the mechanism of action of amphotericin B
3. Describe the spectrum of antifungal activity of amphotericin B
4. Enlist uses of amphotericin B
5. Enlist adverse effects of amphotericin B
6. Explain advantages of liposomal amphotericin B

Anti-Fungal Drugs-2

1. Describe the mechanism of action of Azoles
2. Enlist uses and adverse effects of Azoles
3. Describe drug interactions of Ketoconazole
4. Describe mechanism of action of Flucytosine
5. Enlist uses & adverse effects of Flucytosine

Anti-Fungal Drugs –3

1. Describe mechanism of action of Griseofulvin and Terbinafine
2. Enlist uses and adverse effects of Griseofulvin and Terbinafine
3. Enlist uses of topical anti-fungal drugs
4. Describe mechanism of action of Echinocandins
5. Enlist uses and adverse effects of Echinocandins

Anti-Viral Drugs-1

1. Classify anti-viral drugs based on the viral disease being treated
2. Classify anti-viral drugs based on mechanism of action
3. Describe mechanism of action of acyclovir
4. Enlist adverse effects of acyclovir

Anti-Viral Drugs-2

1. Classify drugs used to treat the HIV AIDs virus
2. Describe mechanism of action of major groups of Anti-Retroviral drugs

3. Enlist adverse effects of anti-retroviral drugs (NRTIs, NNRTIS and PIs)
4. Describe mechanism of action of Ribavirin
5. Enlist uses and adverse effects of ribavirin

Anti-Viral Drugs-3

1. Enlist drugs used for treatment of Hepatitis B
2. Describe drugs to treat Hepatitis C
3. Describe the mechanism of action of Interferons
4. Enlist uses and adverse effects of interferons
5. Describe advantages of pegylated interferons
6. Enlist uses and adverse effects of ganciclovir

Anti-Cancer Drugs

1. Classify anti-cancer drugs
2. Describe the different anti-cancer therapies
3. Explain the term cell-cycle specific and cell-cycle non-specific
4. Enlist cell-cycle specific and cell cycle non-specific anti-cancer drugs
5. Describe log-kill kinetics of anti-cancer drugs

Anti-cancer drugs-2

1. Describe mechanisms of resistance to anti-cancer drugs
2. Describe adverse effects common to anti-cancer drugs (shared toxicities)
3. Describe mechanism of action of alkylating agents especially cyclophosphamide
4. Enlist uses & adverse effects of alkylating agents
5. Describe role of MESNA in treatment/prevention of cyclophosphamide toxicity

Anti-cancer drugs-3

1. Describe mechanism of action of methotrexate
2. Describe leucovorin rescue

3. Describe mechanism of action of fluorouracil and other anti-metabolites
4. Enlist uses & adverse effects of Anti-metabolites
5. Describe mechanism of action of Vinca alkaloids
6. Enlist uses and adverse effects of Vinca alkaloids

Anti-cancer drugs-4

1. Describe mechanism of action of Anti-cancer antibiotics
2. Enlist uses and adverse effects of anticancer antibiotics
3. Describe role of dexrazoxane in treatment/prevention of anthracycline-induced cardiotoxicity
4. Describe use of hormonal agents in cancer chemotherapy
5. Describe different anti-cancer regimens (CHOP, MOPP, ABVD, CMF etc)

Immunosuppressants

1. Define Immunopharmacology and Immunosuppressants
2. Classify Immunosuppressants
3. Describe the mechanism of action of different Immunosuppressants
4. Enlist uses of Immunosuppressants
5. Enlist the adverse effects of different Immunosuppressants

Endocrine Pharmacology

Pituitary & Hypothalamic Hormones

1. Classify pituitary and hypothalamic hormones
2. Describe uses of growth hormone
3. Enlist adverse effects of growth hormone
4. Enlist uses & adverse effects of growth hormone antagonists

Pituitary & Hypothalamic Hormones-2

1. Describe uses of gonadotropin preparations

2. Enlist adverse effects of gonadotropin preparations
3. Describe uses of GnRH analogs/agonists
4. Enlist adverse effects of GnRH analogs/agonists
5. Describe uses of GnRH antagonists
6. Enlist adverse effects of GnRH antagonists

Prolactin Antagonists

1. Enlist Prolactin Antagonists (Dopamine agonists)
2. Describe Mechanism of Action of prolactin antagonists
3. Describe uses of prolactin antagonists
4. Enlist adverse effects of prolactin antagonists

Corticosteroids

1. Classify corticosteroids
2. Describe the mechanism of action of corticosteroids
3. Describe the actions of corticosteroids

Corticosteroids – 2

1. Describe the Uses of Corticosteroids
2. Describe the adverse effects of Corticosteroids
3. Justify the tapering off of corticosteroids
4. Describe the contraindications of corticosteroids

Corticosteroid Antagonists

1. Enumerate Corticosteroid Antagonists.
2. Briefly describe the mechanism of action of corticosteroid antagonists
3. Enlist uses of corticosteroid antagonists
4. Enlist adverse effects of corticosteroid antagonists

Thyroid Preparations & Anti-Thyroid Drugs

1. Describe different Thyroid Preparations
2. Describe uses of thyroid preparations
3. Describe the treatment of myxedema and myxedema coma
4. Describe steps of Thyroid Hormone synthesis, naming drugs that block each step
5. Classify Anti-thyroid drugs

Anti-Thyroid Drugs-2

1. Describe mechanism of action of anion inhibitors
2. Enlist adverse effects of anion inhibitors
3. Describe the mechanism of action of thioamides
4. Describe uses of thioamides
5. Enlist adverse effects of thioamides

Anti-Thyroid Drugs-3

1. Describe the mechanism of action of iodides
2. Enlist uses of iodides
3. Enlist adverse effects of iodides
4. Explain the Wolff-Chaikoff block/effect caused by iodides
5. Explain the escape phenomenon caused by iodides
6. Describe the Jod-Basedow phenomenon caused by iodides

Anti-Thyroid Drugs-4

1. Describe the mechanism of action of radioactive iodine
2. Enlist adverse effects of radioactive iodine
3. Describe mechanism of action of iodinated contrast media
4. Enlist adverse effects of iodinated contrast media
5. Explain the use of Beta Blockers in the treatment of Hyperthyroidism
6. Explain the rationale for use of different drugs in thyroid storm

Female Sex Hormones

1. Enumerate estrogen & progestogen preparations
2. Describe uses of estrogen & progestogen preparations
3. Enlist adverse effects of estrogen & progestogen preparations

Contraceptives

1. Classify Contraceptives
2. Describe the mechanism of action of contraceptives
3. Explain the advantages and disadvantages of the Progestin Only Pill (Minipill)
4. Enumerate post-coital contraceptives
5. Describe adverse effects of Oral contraceptives
6. Describe contraindications of Oral Contraceptives

SERMs

1. Enlist estrogen antagonists including SERMs
2. Describe mechanism of action of SERMs
3. Enlist uses & adverse effects of SERMs
4. Describe use of clomiphene in treatment of infertility
5. Tabulate differences between Clomiphene and Raloxifene
6. Classify drugs used for treatment of infertility

Progestogen Antagonists

1. Enlist progestogen antagonists
2. Describe mechanism of action of mifepristone and danazol
3. Enlist uses of mifepristone and danazol
4. Enlist adverse effects of mifepristone and danazol

Androgens & Anti-androgens

1. Enumerate androgen preparations

2. Describe uses & adverse effects of androgen preparations
3. Enumerate Anti-androgens
4. Describe mechanism of action, uses & adverse effects of Anti-Androgens

Anabolic Steroids

1. Enumerate anabolic steroids
2. Describe actions of Anabolic steroids
3. Describe uses & adverse effects of Anabolic steroids

Insulins

1. Classify Insulins
2. Compare animal & human insulins
3. Describe different insulin preparations
4. Describe kinetics of different insulins with their clinical significance
5. Describe different insulin delivery systems

Insulins-2

1. Describe actions of insulin on carbohydrate, protein and lipid metabolism
2. Describe uses of insulin preparations
3. Describe adverse effects of insulin preparations
4. Describe insulin resistance

Oral Anti-Diabetic Drugs-1

1. Classify Oral Hypoglycemics
2. Explain Euglycemia, hypoglycemia & hyperglycemia
3. Enlist hypoglycemic & Euglycemic drugs
4. Describe the mechanism of action of sulfonylureas
5. Tabulate differences between First and Second Generation sulfonylureas
6. Describe adverse effects of sulfonylureas

7. Tabulate differences sulfonylureas and meglitinides/D-Phenylalanine derivatives

Oral Anti-Diabetic Drugs-2

1. Describe mechanism of action of biguanides
2. Describe adverse effects of biguanides
3. Differentiate between Sulfonylureas and Biguanides
4. Describe the mechanism of action of Alpha-Glucosidase Inhibitors
5. Describe adverse effects of Alpha-Glucosidase Inhibitors

Oral Anti-Diabetic Drugs-3

1. Describe the mechanism of action of Thiazolidinediones
2. Enlist adverse effects of thiazolidinediones
3. Describe mechanism of action of incretin analogs
4. Describe mechanism of action of Sodium Glucose Co-transporter -2 inhibitors
5. Enlist adverse effects of incretin analogs and SGLT-2 inhibitors

Oral Anti-Diabetic Drugs-4

1. Enlist other anti-diabetic drugs
2. Enlist drugs used for prevention/delay of onset of type 2 diabetes mellitus
3. Describe uses of Oral Anti-diabetics
4. Rationalize use of drugs for control of postprandial & basal glucose levels

Calcium & Bone Metabolism

1. Enumerate vitamin D preparations & their uses
2. Describe drugs used for treatment of hypercalcemia
3. Enlist drugs used for treatment of hypercalcemia
4. Describe mechanism of action of Bisphosphonates
5. Enlist uses & adverse effects of Bisphosphonates

Uterine stimulants & Uterine Relaxants

1. Classify Uterine Stimulants
2. Describe actions of Oxytocin
3. Enlist the uses & adverse effects of Oxytocin
4. Classify Tocolytics
5. Describe the pharmacodynamics of tocolytic agents

Autacoids & Autacoid Antagonists

Anti-Histamines

1. Classify Anti-Histamines
2. Describe mechanism of action of Anti-Histamines
3. Describe uses of Anti-Histamines

Anti-Histamines-2

1. Enlist adverse effects of anti-histamines
2. Differentiate between first & 2nd Generation Anti-Histamines

Serotonin Agonists and Serotonin Antagonists

1. Enlist serotonin agonists and serotonin antagonists
2. Enlist uses of serotonin agonists
3. Enlist adverse effects of serotonin antogonists

Prostaglandins

1. Describe the actions of Prostaglandins
2. Describe the uses of Prostaglandin Analogs
3. Classify prostaglandin analogs according to their uses
4. Enlist adverse effects of prostaglandin analogs

NSAIDS-1

1. Classify NSAIDs

2. Describe the mechanism of action of NSAIDs
3. Describe the Shared Toxicities of NSAIDs

NSAIDS-2

1. Describe the actions of Aspirin
2. Describe the adverse effects of Aspirin
3. Differentiate between Non-Selective COX Inhibitors and Selective COX-2 Inhibitors
4. Differentiate between Aspirin and other non-selective NSAIDs
5. Enlist actions and uses of paracetamol
6. Describe major toxicity of Acetaminophen
7. Differentiate between Paracetamol and Aspirin

Drugs for Treatment of Gout

1. Classify Drugs used in the treatment of Gout
2. Describe the role of Corticosteroids in the treatment of Gout
3. Describe the role of NSAIDs in the treatment of Gout

Drugs for Treatment of Gout-2

1. Describe the mechanism of action of Colchicine, Allopurinol and Uricosuric Drugs
2. Enlist adverse effects of these drugs
3. Explain why allopurinol or probenecid should not be given in acute gout

Drugs for Treatment of Rheumatoid Arthritis-DMARDs

1. Enlist DMARDs
2. Describe the mechanism of action & rationale of use of important DMARDs

(Methotrexate, Azathioprine, Cyclophosphamide, Hydroxychloroquine, Sulfasalazine & TNF-blocking agents) in the treatment of RA

CNS

Drugs for Treatment of Parkinsonims-1

1. Classify Drugs used in the Treatment of Parkinson's Disease
2. Describe the mechanism of action of Levodopa
3. Describe the advantages and disadvantages of adding Carbidopa to Levodopa
4. Describe adverse effects of Levodopa & their treatment
5. Describe the On-Off Phenomena and its treatment

Drugs for Treatment of Parkinsonism-2

1. Describe mechanism of action & adverse effects of D2 Receptor Agonists, COMT Inhibitors, MAO B Inhibitors and Amantadine
2. Describe the role of these drugs in Parkinson's disease

Sedative Hypnotics

1. Define Sedative, Hypnotic & Anxiolytic
2. Classify Sedative/Hypnotics
3. Describe the mechanism of Action of Benzodiazepines & Barbiturates

Sedative Hypnotics-2

1. Describe actions of Benzodiazepines and Barbiturates
2. Describe uses of Benzodiazepines
3. Describe uses of Barbiturates
4. Enlist adverse effects of benzodiazepines
5. Tabulate differences between benzodiazepines and barbiturates

Sedative Hypnotics-3

1. Describe mechanism of action of Buspiron & Zolpidem
2. Describe differences between benzodiazepines and imidazopyridines
3. Describe differences between BZDs and Buspiron

Opioids-1

1. Classify Opioids
2. Describe the mechanism of action of Opioids

3. Describe the CNS actions of Opioids

Opioids-2

1. Describe peripheral actions of Morphine
2. Enlist stimulatory and inhibitory actions of opioids
3. Describe the uses of Opioids

Opioids-3

1. Describe contraindications of Opioids
2. Describe treatment of Opioid Poisoning
3. Describe symptoms of opioid withdrawal
4. Describe pharmacological management of opioid withdrawal

Opioids-4

1. Compare pethidine with morphine
2. Describe opioids that are agonist antagonists
3. Describe opioid antagonists

Anti-Depressants-1

1. Classify Anti-depressants
2. Describe the mechanism of Action of TCAs & SNRIs
3. Describe the Uses of Anti-depressants

Anti-Depressants-2

1. Describe Adverse effects of TCAs
2. Describe treatment of TCA toxicity
3. Describe mechanism of SSRIs
4. Enlist adverse effects of SSRIs

Anti-Depressants-3

1. Differentiate between SSRIs & TCAs

2. Describe mechanism of action & adverse effects of MAOIs
3. Describe drug interactions of anti-depressants
4. Differentiate between typical & atypical anti-depressants

Local Anesthetics

1. Classify local anesthetics
2. Describe the mechanism of action of local anesthetics
3. Tabulate differences between amide and ester local anesthetics
4. Describe factors effecting action of a local anesthetic

Local Anesthetics-2

1. Describe the advantages & disadvantages of adding a vasoconstrictor to a local anesthetic
2. Describe uses of local anesthetics
3. Classify local anesthetics therapeutically
4. Describe adverse effects of local anesthetics

Mood Stabilizers

1. Enumerate Mood Stabilizers
2. Describe the mechanism of action of Lithium
3. Describe the Uses of Lithium
4. Describe the adverse effects of Lithium

Anti-psychotics

1. Classify Anti-Psychotics
2. Describe the mechanism of action of anti-psychotics
3. Tabulate the differences between High potency & Low potency anti-psychotics

Anti-Psychotics -2

1. Describe the uses of Anti-Psychotics
2. Describe extrapyramidal adverse effects of anti-psychotics

3. Classify adverse effects of anti-psychotics based on receptor being blocked
4. Tabulate differences between typical and atypical anti-psychotics

Anti-Epileptics

1. Classify Anti-epileptics based on their mechanism of action
2. Outline the mechanism of action of major anti-epileptic drugs

Anti-Epileptic Drugs-2

1. Elist adverse effects of Na Valproate, Phenytoin, Carbamazepine and Ethosuxamide
2. Enlist adverse effects of Gabapentin & Lamotrigine

Anti-epileptic Drugs-3

1. Classify anti-epileptics based on their therapeutic uses
2. Describe fetal hydantoin syndrome
3. Enlist uses of anti-epileptic drugs besides epilepsy
4. Enlist major drug interactions of anti-epileptic drugs

Alcohol

1. Describe the metabolism of Alcohol
2. Describe Adverse Effects of Alcohol
3. Describe the fetal alcohol syndrome caused by alcohol
4. Describe pharmacological treatment of acute alcohol intoxication, alcohol withdrawal syndrome and alcoholism
5. Describe the Disulfiram reaction
6. Enumerate drugs that produce disulfiram-like effect when taken with alcohol
7. Enumerate uses of alcohol
8. Describe treatment of methanol poisoning with alcohol

<u>Eyes</u>

Miotics & Mydriatics

1. Enumerate drugs causing miosis & Mydriasis
2. Explain the mechanisms by which different drugs cause Miosis & Mydriasis
3. Enlist drugs used in measurement of refractive errors & fundoscopy
4. Differentiate Mydriasis caused by Anti-muscarinics & Sympathomimetics

Drugs for treatment of Glaucoma

1. Classify drugs used for treatment of Glaucoma
2. Describe the mechanisms by which different drugs decrease intraocular pressure
3. Enlist drugs used for Narrow & Closed Angle Glaucoma
4. Enlist adverse effects of the drugs used for treatment of glaucoma
5. Enlist drugs contraindicated in glaucoma

Effects of Drugs on Rabbit's Eyes

1. Observe the effects of drugs on rabbit's eyes
2. Identify the unknown drug instilled in the rabbit's eyes