Republic of Iraq
Ministry of Higher Education & Scientific Research
AUIQ
College of Medicine

جمهورية العراق
وزارة التعليم العالي والبحث العلمي
جـامعــة العـين العراقية
كليــة الطــب

Course Description Template for the subject | Pharmacology

University/College Name	AUIQ/ College of Medicine
Subject Name	Pharmacology
Academic Stage	Third Stage
Available Attendance Modes	Lecture and Discussion
Subject System	Yearly
Academic Year for Preparing this Description"	2023-2022

Pharmacology

FORWARD:-

The department of pharmacology was established in 2006/2007 to provide a course in pharmacology with aim of achieving adequate knowledge and competence in pharmacology , which form the basis for rational drug therapy in medical practice .The student by the end of the course should be able to :

1. understand the mechanism of action at molecular as well as cellular level both desirable and adverse.
2. understand the principle of pharmacokinetic i.e. drug absorption ,distribution, metabolism and excretion and be able to apply these principle in therapeutic practice.
3. recognize that drug have action at all systems and should be able to group drug with common pharmacological action and appreciate that this classification is not absolute .
4. be able to know or to prototype drug of each pharmacological group especially of clinical importance .
5. acquire a comprehensive description of the major group of drugs as applied to medical practice and be sufficiently.

VISION

The department of pharmacology has always placed great emphasis on the quality of academic teaching and assisting students in studying pharmacology and its relation to clinical fields .

MISSION

The department of pharmacology is responsible for teaching the science of drugs to the medical students (3rd year) as it is a basic material in studying medicine .The department starts with an introduction of pharmacokinetics and pharmacodynamic ; Then provides the basic knowledge on the functions of the different drugs clinically .Through their study courses at the department of pharmacology ,the students continue learning the essentials of the human pathophysiology in relation to therapeutics .

Teaching and learning methods

The curriculum has been designed as –Ministry of higher education and scientific research recommendations .The material of course will be presented through lectures and seminars .The program of seminars shall focus on the program covered in the lectures and subjects prepared by the students .The theory classes in each course would comprise of 45 hours of didactic teaching The practical classes would comprise of 30 hours in each course .

Objectives

The goal of this course of pharmacology is to prepare the student for the upcoming years during which they must be able to understand not only which drug may be useful for a particular clinical situation but be able to design rational and effective pharmacotherapy for treatment of particular patient.

Rational and effective choice in the clinic involve an understanding of the physiology , drug mechanism and therapeutic end point as well as potential side effect and drug – drug interaction

This involve understanding of:-

1. Influence of drug on different biochemical process of the body and the ability to suggest the use of drug to modify changes produce by disease state or disorders.
2. Drug mechanism of action .
3. therapeutic response.
4. potential drug adverse effect .
5. Drug –drug interaction, drug food interaction.
6. In course of pharmacology learning .student must understand not just that medicine worse for particular ailment but why & how it will work and when comparing different mode of treatment , Which one will be the most officious.

Didactic hours	1st semester	2nd semester	Total
Theoretical	45hrs	454hrs	90hrs.
Practical	30hrs	30hrs	60hrs.
Discussions		30hrs	30hrs.
Units No.			8 units

7. Keep the student well informed with development of newer drug that provide better remedy of the disease with least adverse effect.
8. The knowledge gained in pharmacology should bind together the integration of clinical skill , the understanding of disease and the effective use of pharmacotheraputic agent.

(Unit= 15 hours theory or 30 hours practical .)

Students assessment

Examination	1st semester	Mid-year	2nd semester	Seminars	Final theory	Final practical	Total
Degree	5 degrees	25 degrees	5 degrees	5 degrees	50 degrees	10 degrees	100 degrees

*** Site of theoretical lectures , at the hall number 2 in the first floor .**

Pharmacology curriculum

NO	Lecture Title	Lecture Time /hrs	Day and date	Objective
	1- General pharmacology			
1.	Introduction to pharmacology	1 hr.	Sunday 1/Oct./2017	Definition of drug ,pharmacodynamic, pharmacokinetic, Toxicology, clinical pharmacology, therapeutic, pharmacogentics.
2.	Pharmacokinetics	2 hrs.	MON. 2/10	Definition ;drug passage across cell membrane Order of p/k. process, half life, SSC, bioavailability, first-pass effect,Vd., protein binding, result of metabolism, phases of metabolism, enzyme-induction and inhibition, excretion; renal, pulmonary, fecal, milk
3.	Pharmacodynamic	4 hrs.	Wedn. 4/10	The biochemical and physical mechanism of drug action on body ;Receptor interactions , Competitive andnon competitive inhibition ;Agonist- antagonist –receptor complex ,Dose – response(potency),Therapeutic index(TI) .
4.	Cholinergic nervous system	4 hrs.	Sun. 8/10	Anatomy of autonomic nervous system ;sites of Ach. action; cholinomimetic drugs, cholinesterase inhibitors ,antimuscarinic drugs; Atropine as aprototype ,Atropine like drugs ,organophosphorus compoundspoisoning .
5.	Adrenergic nervous system	4 hrs.	Wedn. 18/10	Catecholamines, biosynthesis and metabolism Adrenergic agonists (alpha and beta);Therapeutic uses of sympathomimetic drugs . Adrenergic blockers; selectivity of adrenergic blocking ,classification of alpha and beta adrenoceptors blockers .

6.	**Autocoids**	**2 hrs.**	**Mo n. 30/ 10**	**Definition of autacoids, Histamine andanti histamine H1 and H2 blockers. Serotonin (5HT) and its antagonist ;prostaglandins ,drugs act viaprostaglandins inhibition.**
	2- Central nervous system			
7	**Ant anxiety andhypnotic drugs**	**1 hours**	**Wed n. 1/11**	**Definition. Benzodiazepines as Diazepam, Benzodiazepines antagonist as Flumazenil. Other drugs like beta- blockers and antihistamines in anxiety .**

8	Antipsychoticdrugs	1 hour	Sun. 12/11	Definition of psychosis and dopaminehypothesis of schizophrenia ,classification of antipsychotic drugs ,pharmacological action of antipsychotic ,therapeutic indications and side effects .
9	General anesthetics	2 hours	Mon. 13/11	Definition ,classification, inhalationaland intravenous anesthetics, advantages , disadvantages, clinical uses and sideeffects .
10	Antiepilepticdrugs	2 hours	Wedn. 15/11	Definition and general classification of epilepsy, main antiepileptic drugs like Phenytoin, Carbamazepine, Sodium valproate , the newer drugs as Vigabatrin ,lamotrigine, gabapentin and Topiramete .
11	Local anesthetics	1 hour	Sun. 19/11	Types of local anesthesia ,Mechanism ofaction ,Lidocaine as a prototype ,methods of prolongation of duration ofaction of LA.
12	Antidepressantdrugs	2 hour	Mon. 20/11	Definition and classification of depression ;classification of antidepressant drugs like Tricyclic grouplike Imipramine, Amitriptyline, Clomipramine, mechanism of action ,clinical uses, side effects ,SSRIs grouplike Fluoxetine , MAO inhibitors ,Lithium, clinical use andside effects .
13	Anti Parkinsonian drugs	1 hours	Wedn. 22/11	Definition of Parkinson disease and pathophysiology ,cholinergic and dopaminergic mechanism in Parkinson disease ,drugs useful in disease ;L-dopa,decarboxylase inhibitors ,dopamine agonists as Bromocriptine .
14	Ethanol pharmacology	1 hours	Sun. 26/11	Metabolism and pharmacological action of ethanol ,acute and chronic action ofEthanol, interaction with other drugs .

15	**NSAIDs**	**2 hours**		**Classification ,COX1- inhibitors such assalicylates, Ibuprofen, Indomethacin, COX2- inhibitors like Celecoxib. Differences between COX1 and COX2 . other uses of NSAIDs with mechanism ofaction such as Aspirin and Paracetamol.**
16	**Opioids analgesics**	**2 hour**		**Narcotic: endogenous enkephalins andendorphins ,Opiates receptors ,mechanism of action of narcotic**

				analgesics, Morphine as a prototypedrug .other like Pethidine ,Codeine ,Methadone, Tramadol and Propoxyphene. Opiate antagonists :Naloxone and Nalorphine .
17	Anti rheumatic drugs	1 hour		Aims of treatment of rheumatoid arthritis ,disease modifying drugs ,role of corticosteroids in rheumatoidarthritis .
18	Drugs used forgout	1 hour		Drugs useful in acute attack of gout :NSAIDs and Colchicines, drugs useful inchronic gout :- Probencid and Allopurinol.
19	Ganglionic and neuromuscul arblockers	1 hour		Neuromuscular transmission .classification of muscle relaxants into depolarizing and non depolarizing agents .peripherally and centrally actingmuscle relaxants :Dantroline ,Baclofen, and Benzodiazepines .
20	3- Drugs acting onrespiratory tract	3 hours		Bronchodilators :beta 2 stimulants ,xanthine derivatives ,mast cell stabilizers :Sodium cromoglycate and ketotifen .Mucolytics and expectorants .Mechanism of cough and coughsuppressants .
21	4- Drugs acting onGIT	3 hours		Antacids, anti ulcer drugs include :H2-blockers ,proton pump inhibitors ,Sucralfate ,bismuth chelate ,prostaglandins analogues as misoprostol, laxatives and purgatives ,antidiarrhoeal drugs ;antiemetic drugs like Metoclopramide and domperidone.Drugs useful in ulcerative colitis and drugs for dissolution of gall stones .
22	5- Drugs acting onurinary system	3 hours		Renal handling of water and electrolytes .Diuretics ; mode and site of action ;classification and clinical uses .
6- Drugs acting on cardiovascular system				

23	**Anti hypertensive drugs**	**2 hours**		**Definition of hypertension ,factors regulating blood pressure; classificationof anti hypertensive drugs :-Diuretics ,centrally acting drugs , calcium channels blockers and angiotensinconverting enzyme inhibitors ,angiotensin-2-receptors blockers ,betablockers , non-pharmacological treatment of hypertension .**
24	**Drugs used to treat ischemic heart diseases**	**2 hours**		**Definition of angina pectoris ;Nitrates,pharmacological features of GTN; mechanism of action; rout of drug administration side effects and**

				tolerance . other drugs useful in treatment of angina as calcium channel blockers and beta blockers ,role of anti-plate let in angina .
25	Drugs used to treat heart failure	2 hours		Pathophysiology of heart failure ;cardiacglycosides ;pharmacology of Digoxin as aprototype drug ;other drugs like vasodilators ,and ACE inhibitors in heart failure ;New inotropic drugs asAmrinone and Milrinone.
26	Antiarrhyth micdrugs	3 hours		Pathophysiology of cardiac arrhythmias;types of arrhythmias ;classification of anti arrhythmic drugs .pharmacology of lignocaine ;Procainamide ;Quinidine ;Disopyramide ,beta-blockers andcalcium channel blockers .
27	Anticoagula ntdrugs	2 hours		Blood coagulation process . Heparin; unfractionated (UFH)and low molecular weight heparin(LMWH):mechanism of action , p/k. ; clinical uses and side effects ;Advantages of the use of LMWHon UFH. plate let aggregation inhibitors ; Clopidogrel; thrombolytic agents and dugs acting on the plate lets ;Vitamin K preparation and Aminocaproaic acid .
28	Fibrinolytic, antifibrolytic and ant platelets drugs	2 hours		Physiology of plate let adhesion and aggregation (thrombus formation), antiplate let aggregation as Aspirin, Abciximab, Tirofiban ,plasminogen activators as Streptokinase,Alteplase,Anistrepl aes.
29	Anti anemic andvitamins	2 hours		Iron preparations, indications andadverse effects , folic acid ,and V itaminb12 ,Haemopoietic growthfactors.
30	Hypolipidemic drugs	2 hour		Statins, Cholestyramine, Nicotinic acid ,Gemfibrozil .
7- Chemotherapeutic drugs				

31	**Antibacter ialdrugs**	**5 hours**		**Definition and introduction to antimicrobial agents ,mechanism of action and resistant to antimicrobial drugs (Penicillin, cephalosporins first to fourth generations), Vancomycin, Sulphonamides and urinary tract antiseptic , Aminoglycosides , Macrolides as Erythromycin, Clindamycin, Tetracyclines , Fusidic acid, Chloramphenicol and Quinolones .**
32	**Anti tuberculosis**	**1 hour**		**Definition ; classification ,first and second line drugs ,Rifampicin, Isoniazid ,**

				Ethambutol, Cycloserine, Para - aminosalicylic acid ,and Streptomycin .
33	Anthelmint hicdrugs	2hou rs		Classification of worms ,classification ofanthelmintic drugs, mechanism of action and side effects ,broad spectrumanthelmintic ,Albendazole ,Mebendazole ,Pyrantel pamoate Piperazine ,Thialbendazole ,Ivermectin .
34	Antifungal drugs	1 hour		Local and systemic anti fungal drugs , Amphotericin , Griseoflvin, Nystatin andFlucytosine .
35	Ant protozoa drugs	2 hours		Metronidazole ,Diloxanide furoate,Chloroquine ,Iodoquinol; Emetine .
36	Antimalarial drugs	1 hour		Definition ;life cycle of malarial parasite;classification of anti malarial drugs ;Chloroquine, Quinine ,Primaquine, Mefloquine ,Artemisinin, possible mechanism of action and side effects ;Antimalarial drugs and G6PDD .
37	Antiviral drugs	1 hour		Why it is difficult to treat viral infection ;classification of anti viral drugs according to mechanism and site of action ;Acyclovir, anti retroviral agents as Zidovudine, Lamivudine and stavudine ; protease inhibitors as Indinavir, Ritinovir ;Antiinfluenza agents as Amantadine ,Rimatadine, andOsdeltamivir .
38	Cancer chemothera py	3 hours		Classification of cytotoxic drugs .mechanism of action ,clinical uses and adverse effects .
8- Hormones				
39	Corticosteroids	2 hours		Pharmacological action of steroids ,different preparations ,clinical uses ,adverse effects , differences between glucocorticoids and mineralocorticoides .

40	**Insulin and oral hypoglycemic drugs**	**2 hours**		**Definition and clinical features, Insulin; action and different preparations ,side effects ; oral hypoglycemic drugs ;Sulphonylureas ,Biguanides , meglitinides , thiazolidindiones and alpha-glucosidase inhibitors .**

41	Thyroid hormonesand ant thyroid drugs	1 hour		Thyroid hormones, biosynthesis Andpharmacological actions ,Carbimazole and Propylthiouracil ,the use of radio-active iodine .
42	Drugs acting onuterus	1 hour		Oxytocin and Ergometrine ,pharmacology and mode of action ,clinical uses ,prostaglandins asabortant drugs .
43	Sex hormones and contraceptives	2 hours		Oral contraceptive pills types ,pharmacological actions and clinicaluses ,adverse effects and contraindications .
44	Androgens andanti androgens	1 hour		Pharmacological action, clinical usesand side effects of androgens ,anti androgens .
9- Selective topics				
45	General toxicology	3 hours		Heavy metal poisoning ,Thalliumpoisoning ,the use of chelating agents ,activated charcoal .
46	Skin pharmacology	1 hour		Principle of treating skin diseases,dermatological preparations , percutaneous absorption .
47	Immune-pharmacology	1 hour		Indication of immunosuppressant ;ciclosporin, tacrolimus, corticosteroids , cytotoxic drugs as Azathioprine ,cyclophosphamide , monoclonal antibodies as basiliximaband anti lymphocytic immunoglobulin.
48	Drug interaction	1 hour		Definition ; types of interactions ,harmful and useful ,antagonism, synergism , interaction of drugs withfood.

Practical pharmacology lab.

One weekly (2 hours) practical pharmacology lab is given with different experiments and calculations of various pharmacologically active drugs or groups;(taken in pharmacological lab in the 3rd section of 3rd floor of college building) .

First semester

No.	Lab title
1.	**Rout of drug administration.**

2.	Drug formulations and pharmaceutical dosage forms.
3.	Weights, measures and posology.
4.	Prescription order writing.
5.	Absorption and excretion of drugs.
6.	Dose response curve (LD_{50} and ED_{50} of Thiopental).
7.	Anti-inflammatory activity of NSAIDs.
8.	Antipyretic activity of some NSAIDs on feverish rats.
9.	Evaluation of analgesic drugs.
11.	General anesthesia.
12.	Local anesthesia.

Second semester

No.	Lab title
1.	Action of drugs on the eye.
2.	Muscle relaxation effect of diazepam in mice.
3.	Diuretic effect of some drugs on conscious rat.
4.	Effects of some drugs on uterine contraction of rat uterus.
5.	Effect of drugs on blood pressure of anesthetized rat.
6.	Drugs effect on rabbit heart.
7.	Investigation for active principles of plants.
8.	Analytical and drug measurement techniques
9.	Muscle relaxation effect of diazepam in mice.
10.	Study of aspirin and paracetamol toxicities.

Students seminars

The design of student seminars focus on the student as the central part of the learning rather than focus on lecturer, who giving the outlines and advice the student to get more informations from the given resources (student self –study); insmall group teaching (about 40 students in each group) ,distributed as 3 group per week .

Assessment of student done according to the understanding of the subject , language, personality and littreture survey (writing and arrangement of seminar) .