Foundation in Pharmacology - Year 2 Semester II
2016/17 Batch

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Topic	Objectives	Time (hrs)	T/L activity
	At the end of the module, the student should be able to		
2016-SBM/MED2214/01			
Introduction to Pharmacology **a. Definitions of basic concepts in Pharmacology** **b. Sources of drug information**	1. define the following terms- Drug, Medicine, Pharmacology, Therapeutics, Clinical Pharmacology, Pharmacokinetics, Pharmacodynamics, Generic name, Brand name 2. list the different sources of drug information	1	Lecture
2016-SBM/MED2214/02			
Drug action – Pharmacodynamics **a. Modes of action of drugs at different levels: molecular, cellular, tissue/organ & overall individuals**	1. list the mechanisms by which drugs exert chemical influences at cellular level to produce a pharmacological response 2. define • receptor • drug binding sites • ligand • agonist • antagonist • partial agonist • inverse agonist • receptor affinity • receptor occupancy • spare receptors • efficacy • potency	6 2	Lecture SGD
b. Receptor as target for drug action	1. classify receptors based on their structure and function 2. briefly explain the signaling mechanisms by which receptor activation is coupled to cellular effector systems		
c. Drug-target interaction	Explain 1. competitive antagonism 2. non competitive antagonism 3. physiological antagonism 4. tolerance, tachyphylaxis 5. placebo and placebo effect		

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d. Dose-response relationship	Draw the concentration-effect curves for the relationship of the effect against, • full agonist concentration • logarithm of full agonist concentration • log partial agonist concentration • log full agonist concentration in the presence of a fixed/increasing amounts of competitive antagonist • log full agonist concentration in the presence of a non-competitive antagonist • log full agonist concentration in the presence of a partial agonist • log inverse agonist		
2016-SBM/MED2214/03			
Pharmacokinetics **a. Transport across cell membrane:**	Describe the mechanisms of transport of drug molecules across the cell membrane and the factors that influence such mechanisms		
b. Absorption	1. explain how drugs are absorbed into blood after administration 2. list the factors that influence the absorption of drugs		
c. Routes of administration	1. list different routes of administration of drugs 2. list the different types of dosage forms/special drug delivery systems 3. explain the advantages and disadvantages of different routes of administration		
d. Distribution in tissues, body compartments and across barriers	1. list the different compartments of the body into which drugs are distributed 2. describe the factors which influence the distribution of drugs into different compartments 3. explain the concept of redistribution of drugs 4. explain the concept of barriers across tissues for transport of drugs	6 2	Lectures SGD
e. Metabolism (Biotransformation)	1. explain the basic mechanisms by which drugs undergo biotransformation in the body 2. list the common drugs which induce/inhibit the cytochrome P 450 enzyme system		
f. Elimination	1. define elimination of drugs 2. list the physiological processes of different organ-systems that are involved in drug elimination 3. describe the mechanisms by which drugs are eliminated from the body		

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g. Pharmacokinetic parameters	1. define the following • bioavailability • bioequivalence • first pass effect • area under the Concentrate-time curve (AUC) • (apparent) volume of distribution • clearance • half life • steady state concentration • loading dose • maintenance dose • dosage regimen 2. explain the principles of calculating the bioavailability, volume of distribution, clearance, loading dose & maintenance dose		
h. Drug concentration vs time curve in different dosing regimes	draw the concentration-time curves for • single intravenous bolus injection • intermittent intravenous bolus injection • continuous intravenous infusion • single intramuscular injection • single subcutaneous injection • single-dose oral administration • intermittent oral administration • modified-release formulations		
i. First-order & Zero-order kinetics	explain first order kinetics and zero order kinetics		
j. Clinical application of pharmacokinetic parameters	explain the clinical significance of pharmacokinetic principles		
2016-SBM/MED2214/04			
Adverse and Toxic effects **a. Basis of adverse/toxic effects**	1. define adverse effects and toxic effects of drugs 2. describe the mechanisms of adverse effects of drugs 3. classify adverse effects based on their mechanisms briefly explain teratogenicity, mutagenecity and carcinogenicity 5. explain how these reactions could be minimized/prevented. 6. define therapeutic index 7. explain the clinical significance of therapeutic index	4	Lecture
b. Drug interactions	1. classify drug interactions (eg. Drug-drug, drug-food and drug-herb) 2. describe mechanisms of drug interactions 3. explain the clinical significance of drug interactions	2	SGD

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c. Pharmacogenetics	describe the influence of genetic variation on response to drug therapy		
d. Drug therapy in special populations	describe the principles underlying the precautions that should be taken during drug therapy in special situations such as pregnancy, breast feeding, renal and hepatic dysfunction, extremes of age		
e. Measurement & monitoring of drug effect	1. describe the methods by which the effects of drug therapy could be measured 2. describe how the measurement of plasma drug concentrations helps in monitoring drug therapy		
2016-SBM/MED2214/05			
Autonomic Nervous System	1. recall the anatomical and functional organization of autonomic nervous system 2. recall the anatomy and the physiology of the cholinergic and the noradrenergic 'junctions 3. recall the types of autonomic receptors with examples of typical sites 4. describe the mechanisms of action and clinical uses of drugs acting on autonomic nervous system	2 1	Lecture SGD
2016-SBM/MED2214/06			
Pain Control **a. Physiology of pain**	1. recall the definition of pain and briefly explain theories of pain 2. list the types of pain 3. recall physiology of pain perception (stimuli, receptors, pathways and central connection) 4. list methods of pain relief 5. classify pharmacological agents used in pain relief (with main indications) 6. explain the basis of neuropathic pain		
b. Opioid Analgesics	1. classify the agents acting on opioid receptors 2. describe the mechanisms of action of opioid analgesics. 3. describe the pharmacokinetics of the drugs acting on opioid receptors. 4. describe the adverse effects of opioid analgesics. 5. list the clinical uses of opioid receptor antagonists	2 2	Lecture SGD
c. Non-steroidal anti-inflammatory drugs (NSAIDs)	1. describe the physiological/pathological roles of cyclo-oxygenase-I (COX-1) and COX-2 enzymes. 2. describe the pharmacokinetics, clinical uses, important adverse effects and drug interactions of NSAIDs (including COX-2 inhibitors). 3. list the commonly used NSAIDs		

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2016-SBM/MED2214/07			
Drug therapy in neoplastic disease	1. state how neoplastic cells/tissues differ from normal cells/tissues with respect to potential targets for drug therapy in neoplastic disease 2. explain the basis of • combination chemotherapy • resistance to chemotherapy • adverse effects of chemotherapy 3. classify antineoplastic drugs based on the mechanism of action	1	Lecture
2016-SBM/MED2214/08			
Drug Information **a. Sources, Reliability and Interpretation**	1. identify different sources of drug information 2. differentiate unbiased information from promotional material. 3. critically analyse the information in a given source of drug information. 4. carry out a literature search on drug information	2	SGD
b. Drug Discovery and Development	1. state the history of drug discovery 2. list the sources from which new drugs are developed 3. describe the different stages of the development of a new drug	1	Lecture
2016-SBM/MED2214/09			
Antimicrobial agents	1. define an "antimicrobial agent" 2. classify antimicrobial agents based on their chemical structure/mechanism of action with examples 3. describe the mechanism of action, pharmacokinetics, clinical uses, adverse effects, interactions and limitations for the use of commonly used antimicrobial drugs 4. explain the basis of chemoprophylaxis in infections 5. explain the principles underlying the selection of appropriate antimicrobial agents in infectious diseases	9 4	Lecture SGD

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