Foundation in Pathology -End of Year 2 Semester II
(including Foundation in Clinical Pathology -Year 3 Semester I)
2011/12 Batch

Final document – 05th November, 2014

Duration: **Foundation in Pathology - 4 Weeks**
Foundation in Clinical Pathology – 3 Weeks

Topic & Concepts	Objectives	Time	Dept.	T/L activity
	At the end of the module, the student should be able,			
2011-3/PATH-SBM-1/01				
Introduction to Pathology	to understand the purpose of the module and the basis for the design of the module	1h	Pathology	Introductory session
2011-3/PATH-SBM-1/02				
Acute inflammation and suppuration	1. to define the process of acute inflammation.	9h	Pathology	Lectures (6h) + Museum Class (3h)
	2.to describe in detail* the various steps, controlling factors, sequale, complications and clinicopathological effects of acute inflammation. (includes suppuration)			
2011-/PATH-SBM-1/03				
Chronic inflammation	1.to define the process of chronic inflammation			
	2. to describe in detail* the non-specific and specific types of chronic inflammation, its sequele and complications			
2011-3/PATH-SBM-1/04				
Wound healing	1. to describe the process of healing in injured tissue and its complications	5h	Pathology	Lectures (4h) + Museum Class (1h)
	2. to describe in detail* the process of healing in different types of tissue and surgical wounds.			
	3. to describe in detail* the formation of the organ of repair- namely granulation tissue.			
2011-3/PATH-SBM-1/05				
Necrosis and apoptosis	1. to describe in detail* the morphological changes that occur in irreversibly injured cells and the clinico-pathological effects of such necrosis	4h	Pathology	Lectures (3h) + Museum class - (1h)
	2. to outline the non reversible types of cell injury.			
	3. to describe in detail* the pathogenesis and pathology of different types of necrosis			
	4. to outline the clinicopathological effects and recognition of necrosis			

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	5. to define the term reperfusion injury and describe the process			
	6. to define the term apoptosis and discuss the clinicopathological significance			
	7. to name the steps in apoptosis and the controling factors			
	8. to differentiate apoptosis from necrosis			
2011-3/PATH-SBM-1/06				
Tuberculosis	1. to describe the pathogenesis of tuberculosis	2h	Pathology	Lectures (2h)
	2. to understand the concepts of primary and postprimary tuberculosis			
	3. to describe the complications of the tuberculosis			
	4. to explain pathological basis of the clinical effects			
2011-3/PATH-SBM-1/07				
Disorders of Growth and differentiation	1. to outline the ways in which different cell types react to increased work demand and chronic irritation.	5h	Pathology	Lectures (3h) + Museum Class - (2h)
	2. to describe in detail* the process of hypertrophy, hyperplasia, atrophy and metaplasia, and the pathology of these processes.			
	3. to give examples and also to state the clinico pathological effects of the processes mentioned above.			
2011-3/PATH-SBM-1/08				
Thrombosis	1. to list the main factors which predispose to thrombosis.	3h	Pathology	Lectures (2h) + Museum class (1h)
	2. to describe in detail* the pathogenesis and sequelae of thrombosis in different types of blood vessels and the heart, and the fate of thrombi			
	3. to mention the clinicopathological features of thrombosis in the different types of blood vessels.			
2011-3/PATH-SBM-1/09				
Embolism	1. to define the process of embolism.	4h	Pathology	Lectures (2h) + Practical (2h)
	2. to describe in detail* formation of different types of emboli and describe the outcome of the different types of embolism including the clinicopathological effects.			
2011-3/PATH-SBM-1/10				
Congestion, oedema and infarction	1. to describe the effects in tissue, when the vascular blood supply alters, and the venous return is hampered.	5h	Pathology	Lectures (4h) + Museum class (1h)
	2. to define the processes hyperaemia(active and passive), oedema and infarction			
	3. to describe in detail* the pathogenesis of these processes.			
	4. to list the processes that injure lymphatics and the clinicopathological outcome due to injured lymphatics.			
2011-3/PATH-SBM-1/11				
Amyloidosis	1. to define the process of amyloidosis.	2h	Pathology	Lectures & Case

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	2. to describe in detail* the pathogenesis, types and clinical effects and methods of diagnosis of of amyloidosis.			discussions (2h)
2011-3/PATH-SBM-1/12				
Other accumulations	1. to describe the process of pathological calcification and to state clinical examples.	2h	Pathology	Lectures (2h)
	2. to enumerate the types of abnormal pigments in the living persons and their pathogenesis and clinical importance.			
2011-3/PATH-CLM-1/01				
Abnormal constituents in urine	to perform inward tests for urinary protein, sugar, bile and ketone bodies	4h	Biochemistry	Practical (4h)
2011-3/PATH-SBM-1/13				
Atherosclerosis	1. to describe the risk factors of atherosclerosis	2h	Pathology	Lectures (2h)
	2 to describe the pathogenesis and pathological processes involved in atherosclerosis			
	3. to describe the complications and clinicopathological effects of atherosclerosis.			
2011-3/PATH-SBM-1/14				
Neoplasia and Carcinogenesis				
a. Introduction to neoplasia and oncogenesis	1. to describe the fact that DNA alteration in a cell can lead to tumours and dysplasia.	4h	Pathology	Lectures (3h) + Museum class (1h)
	2. to describe in detail* the process of carcinogenesis and concepts of dysplastic and premalignant lesions.			
	3. to describe in detail* the different types of tumours and their pathogenesis and morphology and differences in behaviour.			
b. Spread of tumours	4. to describe in detail* the modes of spread of malignant tumours and the clinicopathological effects.	3h	Pathology	Lectures (2h) + Museum class (1h)
2011-3/PATH-SBM-1/15				
Applied general pathology	1. to define and explain the pathogenesis of erosions, ulcers, strictures and stenosis, blisters and bullae, fistula, sinus, polyps, adhesions, scars, fungating mass, organomegally, macule, papule, purpura, ecchymosis, naevi & warts and papillomata & application of these in systems	10h	Pathology	Lecture demonstration
2011-3/PATH-SBM-1/16		6h	Pathology	Lectures (6h)
Introduction to Haematology	1. recall the cellular components in blood and haemopoiesis			
	2. outline the common types of non malignant and malignant diseases of blood			
2011-3/PATH-SBM-1/17				
Introduction to Clinical Pathology	1. outline the applications of serological and haematological investigations in patient management	1h	Pathology	Lecture (1h)

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Foundation in Clinical Pathology (Year 3 Semester 1)
2011/12 Batch

Duration: 3 weeks

Topic & Concepts	Objectives	Time	Dept.	T/L activity
	At the end of the learning session the student should be able:			
2011-3/PATH-SBM-1/18				
Cont. Neoplasia and Carcinogenesis				
a. Introduction to Neoplasia and oncogenesis	1. to describe the fact that DNA alteration in a cell can lead to the occurance of tumours and dysplasia	3h	Pathology	Lectures & Museum class
	2. to describe in detail* the process of carcinogenesis			
	3.describe the concepts of dysplastic and premalignant lesions			
	4. descibe in detail* the different types of tumours and their pathogenesis and morphology and differences in behaviour			
b. Clinical features of tumours	5. to describe in detail* the mechanisms of clinicopathological features associated with benign and malignant tunours.(including local effects and paraneoplastic syndromes)	2h	Pathology	SGLA (2hr)
c. Early diagnosis and screening of tumours	6. to describe the methods of diagnosis and screening of tumours.	1h	Pathology	Lecture
d. Clinicopathological coorelation of tumours of important sites	7. to explain the clinical effects caused by physical presence of tumours in important sites. Eg: brain, lungs, GIT, liver, etc.	1h	Pathology	SGD
2011-3/PATH-SBM-1/19				
Haematology and clinical pathology				
a. Identification of specimen collection and laboratory errors	1.To identify the laboratory errors in the reports issued (problems in collection of the specimen (collection into the incorrect container, haemolized sample, delayed separation of plasma, exposure of the sample to sunlight, specimen collection from drip arm, etc.	1h	Pathology	Tutorial (1h)
b. Interpreting haematological investigations	2.List the tests included in a full blood count	2h	Pathology	Lectures
	3. List the commonly requested haematological investigations			
	4. State the physiological changes of haemoglobin value in neonate, infant, childhood, adult male & female& in pregnancy			
	5. State the changes in the red cell count (e.g. polycythaemia, anaemia)			

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	6. to know the definition of anaemia and classification of anaemia according to the morphology and red cell indices			
	7. Describe the physiological changes of WBC/DC in a neonate, infant, child below 6 yrs, adult & pregnancy			
	8. Describe the clinical significance and common causes of leucopenia, neutropenia, neutrophil leucocytosis, lymphocytosis (absolute and relative)			
	9. Describe the clinical significance of platelet count and causes of abnormally high and low platelet counts			
	10. Describe the clinical significance of erythrocyte sedimentation rate (ESR) and causes of high ESR			
	11. List the tests included in a coagulation profile i.e. bleeding time (BT), clotting time (CT), prothrombin time(PT), activated partial thromboplastin time (APTT) & platelet count			
	12. State the importance of reticulocyte count			
	13. List the basic laboratory tests necessary for investigation of haemolytic anaemia			
c. Clinical Enzymology	1. Explain the enzyme kinetics, isoenzymes and causes of increased enzyme levels	2h	Pathology	Lectures
	2. Describe the use of enzymes in the diagnosis of various diseases			
d. Interpreting urine laboratory reports	1. to know the commonly requested urine tests (urine sugar, urine albumin, urine deposit, urine full report, creatinine clearance, urine for specific gravity, 24 hour urinary protein excretion, creatinine clearance, urine for micro albuminuria)	1h	Pathology	Lectures
	2. State the advice given to the patients and importance of preparation of the patients for these investigations			
	3. Describe the basic procedure for performing urine ward tests			
	4. Describe the importance of abnormalities of urine deposit (different types of cells and casts)			
	5. Describe how to relate the urine biochemical tests with the urine deposit and the causes for likely incompatibilities			
	6. Describe the common special urine tests (urine for Bence Jones proteins, urine for haemosiderinuria, urinary protein electrophoresis)			
e. CSF Examination	1. Describe the normal function and composition of CSF	2h	Pathology	Lectures
	2. Describe the alteration in CSF in different clinical conditions			
	3. Describe how to send CSF specimens to the laboratory for CSF analysis			

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f. Specimen collection and transport in Histology, Cytology and Frozen section	1. Describe the proper collection and transport method specimen for histological, cytological and frozen section investigations	1h	Pathology	Lecture
g. Spleen	1. to describe the causes of splenomegaly	1h	Pathology	Lecture
h. Lymphnode	1. describe the causes of lymphadenopathy	2hrs	Pathology	Lecture

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Foundation in Pharmacology 1 & 2 (End of Year 2 Semester II & Year 3 Semester I)

Topic	Objectives	Time (hrs)	T/L activity
	At the end of the module, the student should be able to		
2011-3/PHARM-SBM-1/01			
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
2011-3/PHARM-SBM-1/02			
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	9 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		
2011-3/PHARM-SBM-1/03			
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		Lectures SGD
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	10 2	
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		
2011-3/PHARM-SBM-1/04			
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	6	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		

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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		
2011-3/PHARM-SBM-1/05			
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	1 1	Lecture SGD
2011-3/PHARM-SBM-1/06			
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		Lecture SGD
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	
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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2011-3/PHARM-SBM-1/07			
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
2011-3/PHARM-SBM-1/08			
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	Lecture
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
2011-3/PHARM-SBM-1/09			
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	6 4	Lecture SGD

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