Dow University of Health Sciences

HEMATOLOGY II MODULE 2023

STUDY GUIDE

Third Year MBBS

INTRODUCTION

WHAT IS A STUDY GUIDE?

A study guide provides a focus for different educational activities in which the students are engaged. It equips students with information on the topic of study and assists in management of student learning. Furthermore, it imparts relevant information about the organization of the module and thus helps students organize their educational activities accordingly. Another important purpose of a study guide is the dissemination of information about rules and policies and teaching and assessment methods.

HOW DOES A STUDY GUIDE HELP LEARNERS?

- Includes information on organization and management of the module.
- Advises the learners about representatives (from various departments) who can be contacted in case of need.
- Defines the objectives which are expected to be achieved at the end of the module.
- Elaborates the learning strategies which will be implemented during the module.
- Informs learners about the learning resources in order to maximize their learning.
- Provides information on the assessment methods that will be held to determine every student's achievement of objectives.

CURRICULUM MODEL:

Integrated modular curriculum is followed at Dow University of Health Sciences for MBBS program. This implies that instead of studying basic and clinical sciences separate and apart, students will experience a balanced and integrated combination of basic and clinical sciences in the form of a system –based modules.
The modular curriculum followed by Dow University of Health Sciences is integrated both in the vertical and the horizontal directions. However in order to prepare the students for clinical teaching with a sound background knowledge of the basic sciences, the curriculum has been divided in three spirals.
The three spirals are:

1. Spiral -1 Basic Sciences
2. Spiral -2 Clinical Sciences

3. Spiral -3 Integrated Supervised Practical Training

The Basic Sciences Spiral is spread over the first two years and clinical sciences spiral is distributed over the next two years. In the final year students are given practical hands on training in the role similar to that of a shadow house officer. They are encouraged to refer to the theoretical teaching of the first four years for their practical training. The whole curriculum is divided into modules, each module being related to a particular system for example. Cardiovascular 1 module is in the Basic Sciences Spiral and Cardiovascular 2 module is in the Clinical Sciences Spiral.

TEACHING & LEARNING METHODOLOGIES:

The following teaching/ learning methods may be used to facilitate the learning process:

1. **Interactive Lectures**: Lectures are considered as an efficient means of transferring knowledge to large audiences.

2. **Small Group Discussion**: Small group discussion such as case- based learning (CBL) is a form of and interactive learning which helps students develop discussion skills and critical thinking.

3. **Practicals**: Practical related to Basic Sciences are held to facilitate student learning.

4. **Skills**: Skills sessions are scheduled parallel with various modules at fully eqipped skills lab in which students observe and learn skills relevant to the respective modules.

5. **Self-Directed Learning**: Students have a measure of control over their own learning. They diagnose their needs, set objectives in accordance to their specific needs, identify resources and adjust their pace of learning

5 YEAR CURRICULARORGANIZATION

<table>
<tr><th>Spiral</th><th>year</th><th colspan="5">Modules</th></tr>
<tr><td rowspan="4">First Spiral</td><td rowspan="2">I</td><td colspan="3">FND1- Foundation
Cell, Genetics & Cell Death
(Basics of Anatomy, Physiology, Biochemistry, Gen. Pathology, Gen. Pharmacology, Community Medicine & Behavioral Sciences,

9 Weeks</td><td colspan="2">HEM1- Blood Module
Immunity, Inflammation, Tissue repair, Antimicrobials & Neoplasia
9 Week</td></tr>
<tr><td colspan="3">LCM1- Locomotion
Bones, Joints, Nerves & Muscles, 9weeks</td><td>RSP1- Respiratory System 6 weeks</td><td>CVS1- Cardiovascular System 4 weeks</td></tr>
<tr><td rowspan="2">II</td><td colspan="3">NEU1- Nervous System
8 weeks</td><td>HNN1- Head & Neck & Special 6 weeks</td><td>END1- Endocrinology 5weeks</td></tr>
<tr><td colspan="3">GIL 1-GIT and Liver
8 weeks</td><td>EXC1- Renal and Excretory System</td><td>REP1- Reproductive System 5 weeks</td></tr>
<tr><td rowspan="4">Second Spiral</td><td rowspan="2">III</td><td>Foundation 2
2 weeks</td><td>IDD 1- Infectious diseases 6 weeks</td><td>HEM2- Hematology
5 weeks</td><td>RSP2- Respiratory System 5 weeks</td><td>CVS2- Cardiovascular System4 weeks</td></tr>
<tr><td colspan="3">GIL 2-GIT and Liver (including Nutritional Disorders)
8weeks</td><td>EXC2- Renal & Excretory System 4 weeks</td><td>END2- Endocrinology 5 weeks</td></tr>
<tr><td rowspan="2">IV</td><td colspan="2">ORT2- Orthopedics, Rheumatology, Trauma
7 weeks</td><td colspan="2">PMR-Physical Medicine & Rehabilitation
DPS-Dermatology Plastic Surgery / Burns
GEN-Genetics6 weeks</td><td>REP2- Reproductive System
8 Weeks</td></tr>
<tr><td colspan="3">NEU2- Neurosciences and Psychiatry
8 weeks</td><td>ENT*
4 weeks</td><td>OPHTHALMOLOGY/EYE
4 weeks</td></tr>
<tr><td>Third Spiral</td><td>V</td><td colspan="3">Clinical Rotation 9:45 to 3:00 (with Ambulatory, Emergency, Intensive care)
In Medicine, Pediatrics, Cardiology and Neurology units
▪ Lecture on problem based approach, twice a week
▪ Ward tutorial twice a week
▪ Student research presentation once a week</td><td colspan="2">Clinical Rotation 9:45 to 3:00
(Inpatient, Ambulatory, Emergency, Intensive care and Operation Theatres)
In Surgery, Gynecology & Obstetrics, Orthopedics and Neurosurgery.
▪ Lecture on problem based approach, twice a week
▪ Ward tutorial twice a week
▪ Student research presentation once a week</td></tr>
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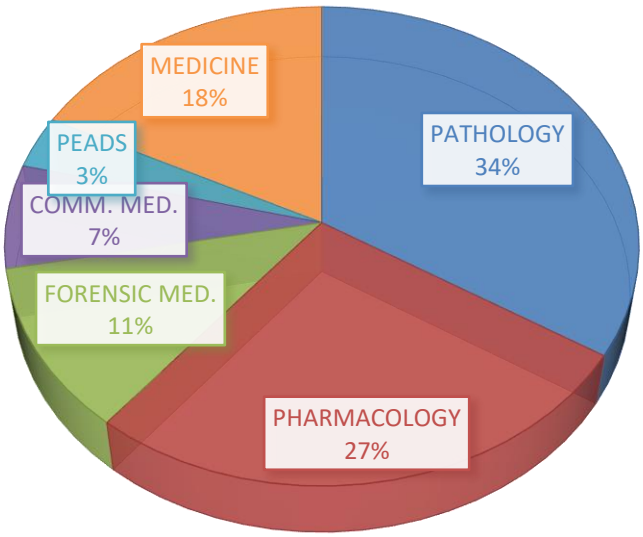
OVERVIEW

Program	**MBBS**	
Year	Three	
Module Title	Hematology II	
Module Code	HEM-2	
Duration	4 weeks	
	Pathology	29
	Pharmacology	23
	Forensic Medicine	9.5
	Community medicine	6
	Pediatrics	3
	Medicine	15
Total Hours	Hematology Module	89.5

HEMATOLOGY MODULE



INTEGRATED MODULE COMMITTEE

RESPONSIBILITIES	NAMES	DESIGNATION	EMAILS
Chief Module coordinator	Prof Naheed Khan	Chairperson Anatomy	naheed.khan@duhs.edu.pk
Coordinator	Dr. Mehreen Fatima	Assistant Professor	mehreen.fatima@duhs.edu.pk
Co-coordinators	Dr. Sadia Iqbal	Assistant Professor	saadia.iqbal@duhs.edu.pk
Department	**RESOURCE PERSON**	**DESIGNATION**	**EMAILS**
	Dr Munizha Nisar	Medical Simulation Facilitator	munizha.nisar@duhs.edu.pk

MODULE DESCRIPTION:

This module has been designed for students to introduce them to the basic concepts of blood diseases. This module includes Pathology, Pharmacology, Forensic Medicine, Community medicine, Medicine and Pediatrics Lectures, tutorials, small group sessions including SBL and practicals are important components of this module. Your co-operative and teamwork abilities will be improved by working in different teams. You will be able to develop problem solving skills to apply your medical knowledge to practical situations by means of group and individual tasks. This study guide has been developed to assist you and keep you focused to achieve your goals.

Welcome to the Hematology II module and it is hoped that students will be able to achieve the desired module learning outcomes.

RATIONALE:

Knowledge of blood, immunity and inflammation is essential, as blood is responsible for the supply of micronutrients, O2 delivery to the tissues, maintenance of homeostasis, body responses and defense mechanisms against injurious agents. The module is designed to provide basic knowledge of hematological diseases to the students in order to deal with various Hematological, Immunological and Immuno- Hematological disorders of adults and children. In this regard students will learn to take history, examine patients and to know about sampling techniques, relevant Laboratory tests, their interpretations, differential diagnosis, treatment regimens and prognostic values of various disorders.

LEARNING OUTCOMES

- Describe pathogenesis of common hematological disorders
- Recognize the clinical presentations of common hematological, immunological and inflammatory disorders
- Describe pathogenesis & clinical presentations of common coagulation & platelet disorders
- Take history & formulate appropriate plan of investigations for attaining differential diagnosis
- Analyze findings of history, examinations & investigations for diagnosis.
- Practice basic principles of management of hematological, immunological & inflammatory disorders.
- Recognize preventive measures & prognosis for counseling the patient

PATHOLOGY

Learning Objectives:

- Define anemia and classify it into different types.
- Describe the etiology and pathogenesis of different types of anaemia.
- Describe the laboratory diagnosis of different types of anaemia with the help of red cell indices.
- Correlate microbial disease symptoms with microbial pathogenesis.
- Describe the etiology, pathogenesis, signs & symptoms of thalassemia.
- Explain the lab findings in different types of thalassemia.
- Describe the non- neoplastic disorders of WBCs.
- Classify the WBC neoplasms.
- Explain the main features of acute leukemias, Hodgkin's and Non-Hodgkin's Lymphomas
- Describe the characteristics of Myelodysplastic and Myeloproliferative disorders.

Topics:

Lectures: (1 hour each)

- Classification of Anemia: Overview
- Anemia of Diminished Erytrhopoiesis-1
- Anemia of Diminished Erytrhopoiesis-2
- Hemolytic Anemia-1
- Hemolytic Anemia-2
- Thalassemia Syndromes
- Coagulation Disorders (Hemophilia, vW Disease)
- Bleeding Diathesis, Platelet and Vascular Disorders
- DIC, Thrombotic, Thrombocytopenic purpura, Hemolytic Uremic Syndrome
- Non-Neoplastic Disorders of wbcs
- Neoplastic Proliferation of White Blood Cell Disorders: Overview
- Acute Leukemia
- Hodgkin's Lymphoma
- Non-Hodgkin's Lymphoma-1
- Non-Hodgkin's Lymphoma-2
- Myeloproliferative disorders
- Myelodysplastic syndromes

Practicals: (1.5 Hour each)

- Analysis of Hemoglobin Indices
- Thalassemia: Lab Diagnosis
- Screening Tests for Bleeding and Coagulation Disorders
- Morphology of Peripheral smear

MEDICINE

Learning Objectives:

- .Define anaemia
- List clinical features (symptoms and signs) in a patient with anaemia.
- Classify different types of anemia
- Discuss the pathophysiology of different types of anemia.
- Outline & interpret investigations to determine the cause of anaemia.
- Discuss the management of different types of anaemia
- Describe thrombosis and it's types
- Enlist different thrombophilia disorders, Hereditary or Acquired
- Recognize signs and symptoms of Thrombotic Disorders
- Identify basic defects in Coagulation cascade
- Enlist basic investigations to diagnose the disorder
- Describe different anticoagulation drugs with mechanism of action and their treatment duration
- Define hemostasis, its pathophysiology and components.
- Evaluate the patients by history and physical examination.
- Explain the types of bleeding defect and define the disorders of hemostasis and its differential diagnosis
- Outline investigations for assessment of primary and secondary hemostasis
- Discuss the causes of thrombocytopenia, ITP and coagulopathy.
- Discuss the management of ITP and coagulopathy
- Discuss the different lymph anodes group and its drainage
- Enlist the etiology of lymphadenopathy
- Discuss the approach to patient with lymph adenopathy by history and physical examination
- Enlist the laboratory investigations and interpretation in patients with lymphadenopathy.
- List the risk factors for malignancy
- Discuss the etiology of splenomegaly
- Discuss the diagnostic approach by history and physical examination of patient with splenomegaly.
- Outline the investigation with interpretation in patients with splenomegaly to reach to a diagnosis

Topics:

Lectures (1 hour each)

- Approach to a patient with anemia
- Approach to patient with bleeding disorders
- Approach to a patient with thrombotic disorders
- Approach to patient with lymphadenopathy with or without splenomegaly

PHARMACOLOGY

Learning Objectives:

- Explain the approved indications for treatment of anemia by erythropoietin, iron, folic acid
- Explain the treatment for iron toxicity or overdose.
- Name 3–5 major hematopoietic growth factors that are used clinically and describe the clinical uses and toxicity of each.
- Compare the pharmacokinetics, clinical uses, and toxicities of the major antiplatelet drugs.
- List the 3 major classes of anticlotting drugs and compare their usefulness in venous and arterial thromboses.
- Compare the oral anticoagulants, standard heparin, and LMW heparins with respect to pharmacokinetics, mechanisms

Topics:

Lectures: (1 hour each)

- Pharmacology of B12, Folic acid, Iron and Hematopoietic growth factors
- Anti-platelets and anti-coagulants
- Thrombolytic/ Firinolytics
- Immunosuppressant/stimulants

Practicals: (1.5 hour each)

- Pharmacotherapy of anemia
- Anti-coagulants/thrombolytics

COMMUNITY MEDICINE.

Learning Objectives:

- Appreciate the role of educational, socioeconomic and cultural factors as risk factors of anemia
- Suggest strategies for prevention and control of iron deficiency anemia in Pakistan.
- Recognize Haemoglobinopathy/ Thalassemia in the context of Pakistan.
- Appreciate the importance of screening in blood donation and transfusion
- Address endemic parasitic diseases in Pakistan.
- Appreciate the importance of Immunology and Immunization
- Analyze the role of immunization for prevention and control of diseases
- Deliberate Expanded Program on Immunization (EPI) Pakistan
- Advise important Vaccines not included in the EPI

Topics:

Lectures: (1 Hour each)

- Anemia risk factors and prevention
- Endemic Parasitic diseases in Pakistan
- Immunization, Vaccination, EPI
- Vaccines other than EPI

FORENSIC MEDICINE

Learning Objectives:

- Define, classify, diagnose and explain death and its medico legal significance
- Explain concept of Brain and Brainstem death and its medico legal aspects.
- Explain Medico legal aspects of sudden and unexpected death.
- Certify cause of death according to World Health Organization (WHO) guidelines.
- Explain physio-chemical changes in body after death and factors modifying these changes and relation of these changes with the time scale after death.
- Explain Cause, Mechanism, Mode and Manner of death.
- Estimate POST MORTEM INTERVAL (PMI) by various methods
- Differentiate between postmortem staining and bruising, hypostasis and congestion, rigor mortis and cadaveric spasm, rigor mortis and other simulating conditions.
- Interpret Death Certificate
- Define Personal Identity
- Describe parameters of personal identity.
- Explain various methods of identification.
- Describe and Establish Identity of decomposed, mutilated bodies, fragmentary and skeletal remains.
- Describe and Establish role of Teeth in identification and their medico legal importance.
- Describe and Establish role of Radiology in identification and its medico legal importance.
- Describe and Establish role of Osteology in identification and its medico legal importance.

- Describe and Establish role of the special identification techniques and recent developments in DNA Testing, Forensic Photography, Osteometry, Finger Prints, Retinal Imaging, Lip Prints and other esoteric techniques.

Topics:

Lectures: (1 hour each)

- Personal identity I
- Personal Identity II
- Personal Identity III
- Personal Identity IV
- Personal Identity V
- Personal Identity VI
- Thanatology I
- Thanatology II
- Thanatology III
- Thanatology IV

Practicals: (1.5 hour each)

- Age estimation by radiology.
- Determination of sex from bones, skull, mandible and pelvis.
- Age and sex determination by teeth. Bite marks and their analysis
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PAEDIATRICS.

Topics:

Lectures (1hour each)

- Approach to a child with Anemia, Nutritional Anemia in children (iron Deficiency, B12 & Folic Acid deficiency)
- Coagulation disorder: Hemophilia A,B,C Von Willibrand Disease, ITP, platelets function defect
- Disseminated Intravascular Coagulation: Hemolytic Uremic Syndrome, Thrombotic Thrombocytopenic Purpura
- Diagnosis of Hemolytic Disease of Newborn – Rh incompatibility
- Lymphoma and leukemia in Children

SBL

Hemolytic Anemia

Learning objectives:

- Define hemolytic anemia.
- Discuss the risk factors.
- Enumerate the examination finding.
- Discuss differentials diagnosis on the basis of history and examination.
- Enlist investigation.

The contents are subjected to be altered according to requirement of academic calen

Learning Resources

PATHOLOGY

- Robbins Basic Pathology Kumar & Abbas 9th Edition
- Robbins &Cotran Pathologic Basis Of Disease Kumar & Abbas & Aster 9th Edition

COMMUNITY MEDICINE

- Public Health And Community Medicine Shah, Ilyas, Ansari 7th Edition

PHARMACOLOGY

- Lippincott's Illustrated Review Pharmacology Karen Whalen 6th Or Latest Edition
- Basic And Clinical Pharmacology Bertram G. Katzung 11th Edition

FORENSIC MEDICINE

- Principles And Practice Of Forensic Medicine Nasib R.Awan 1 St Edition

MEDICINE

- Principles & Practice Of Medicine Davidson's 22nd Or Latest Edition
- Essentials Of Kumar And Clark's Clinical Medicine Kumar & Clark 9th Or Latest Edition
- Macleod's Clinical Examination Douglas & Nicol & Robertson13th Or Latest Edition
- Hutchison's Clinical Methods William M Drake & Michael Glynn 23rd Or Latest Edition

PAEDIATRICS

- Nelsons's Essentials Of Pediatrics Marcdante&Kliegman 7th Or Latest Edition

ASSESSMENT

Assessment will be done in two parts:

At the end of module

- Module Exam (Theory) -20%
- Module Exam Practical Internal Evaluation- 20%

At the end of Year

- Annual Exam (Theory) -80%
- Annual Exam (ospe, Viva)-80%

MCQs (Multiple choice questions), OSPE (Objective Structured Practical Exam) and structured vivas will be the main assessment tool.