

Dow University of Health Sciences



NEUROSCIENCES AND PSYCHIATRY MODULE

STUDY GUIDE 2023

Fourth Year MBBS

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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 who can be contacted in case of need.
- Defines the outcomes and objectives which are expected to be achieved at the end of the module.
- Elaborates the teaching and learning strategies which will be implemented during the module.
- Inform learners about the learning resources in order to maximize their learning.
- Provides information about 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. 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-1 and Cardiovascular 2 module is in the Clinical Sciences Spiral-2 and the relevant practical and clinical teaching/learning will be accomplished in Final year Spiral-3.

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 Demonstrations, tutorials and case- based learning (CBL) sessions facilitate 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 equipped Skills Lab and Simulation Lab in which students observe and learn skills relevant to the respective modules under guidance of Clinical Faculty.
5. **Self-Directed Learning (Self- Study):** 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 CURRICULAR ORGANIZATION

Spiral	year	Modules					
First Spiral	I	FND1- Foundation Cell, Genetics & Cell Death (Basics of Anatomy, Physiology, Biochemistry, Gen. Pathology, Gen. Pharmacology, Community Medicine & Behavioral Sciences, 9 Weeks		HEM1- Blood Module Immunity, Inflammation, Tissue repair, Antimicrobials & Neoplasia 9 Week			
		LCM1- Locomotion Bones, Joints, Nerves & Muscles, 9weeks		RSP1- Respiratory System 6 weeks	CVS1- Cardiovascular System 4 weeks		
	II	NEU1- Nervous System 8 weeks		HNN1- Head & Neck & Special 6 weeks	END1- Endocrinology 5weeks		
		GIL 1-GIT and Liver 8 weeks		EXC1- Renal and Excretory System	REP1- Reproductive System 5 weeks		
Second Spiral	III	Foundation 2 2 wks	IDD 1- Infectious diseases 6 weeks	HEM2- Hematology 5 weeks	RSP2- Respiratory System 5 weeks	CVS2- Cardiovascular System 4 weeks	
		GIL 2-GIT and Liver (including Nutritional Disorders) 8weeks			EXC2- Renal & Excretory System 4 weeks	END2- Endocrinology 5 weeks	
	IV	ORT2- Orthopedics, Rheumatology, Trauma 7 weeks		PMR-Physical Medicine & Rehabilitation DPS-Dermatology Plastic Surgery / Burns GEN-Genetics 6 weeks		REP2- Reproductive System 8 Weeks	
		NEU2- Neurosciences and Psychiatry 8 weeks			ENT* 4 weeks	OPHTHALMOLOGY/EYE 4 weeks	
Third Spiral	V	Clinical Rotation 9:45 to 3:00 (with Ambulatory, Emergency, Intensive care) In Medicine, Pediatrics, Cardiology and Neurology units <ul style="list-style-type: none"> ▪ Lecture on problem based approach, twice a week ▪ Ward tutorial twice a week ▪ Student research presentation once a week 			Clinical Rotation 9:45 to 3:00 (Inpatient, Ambulatory, Emergency, Intensive care and Operation Theatres) In Surgery, Gynecology & Obstetrics, Orthopedics and Neurosurgery. <ul style="list-style-type: none"> ▪ Lecture on problem based approach, twice a week ▪ Ward tutorial twice a week ▪ Student research presentation once a week 		

OVERVIEW

Program	MBBS	
Year	Four	
Module Title	Neurosciences and Psychiatry	
Module Code	NEU-2	
Duration	8 weeks	
	Anatomy	9
	Pathology	9
	Neurology	25.5
	Radiology	4
	Pharmacology	25
	Community Medicine	12.5
	Biostatistics	7
	Anesthesia	7
	Pediatrics	4
	Psychiatry	6
	Neurosurgery	8
	Physical medicine and rehabilitation	4
Total Hours		121

INTEGRATED MODULE COMMITTEE

RESPONSIBILITIES	NAMES	DESIGNATION	EMAILS
Chairperson Curriculum Committee, DUHS Chief Module coordinator	Prof. Naheed Khan	Prof. and Chairperson Anatomy	naheed.khan@duhs.edu.pk
Coordinator DMC	Dr. Kanwal Naz	Lecturer Physiology	kanwal.naz@duhs.edu.pk
Co- Coordinator DMC	Dr. Arisha Sohail	Assistant Professor Biochemistry	arisha.sohail@duhs.edu.pk
Co-Coordinator DIMC	Dr. Faryal Nawab	Assistant Professor Community Medicine	faryal.nawab@duhs.edu.pk

MODULE DESCRIPTION:

This module has been designed for students to introduce to the basic concepts of Anatomy Pathology Neurology Radiology Pharmacology Community Medicine Biostatistics Anesthesia Pediatrics Psychiatry Neurosurgery and Physical medicine and rehabilitation. Lectures, tutorials, small group sessions including SBL and practical are important components of this module. History taking, as part of clinical skills, is included in 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 Neurosciences and Psychiatry module and it is hoped that students will be able to achieve the desired module learning outcomes.

RATIONALE:

Nervous system is the most complex system of the body. A large number of diseases involve the nervous system in their primary pathology or the nervous system may be secondarily involved in systemic illnesses. Infections like meningitis and encephalitis, movement disorders, demyelinating diseases, epilepsy and cerebrovascular accidents along with congenital and traumatic disorders are some of the common diseases of the nervous system. Timely diagnosis and management prevents high morbidity and mortality. The Neurosciences 1 module in the basic cycle has already provided a sound basis of the anatomy, physiology, neuropharmacology and pathologic basis of CNS diseases. In this second, clinical spiral, the student will learn the clinical presentation, diagnosis and management of these diseases.

LEARNING OUTCOMES

- Develop a solid understanding of common neurological disorders.
- Take a detailed medical history and conduct thorough examinations.
- Formulate a comprehensive differential diagnosis.
- Correlate the underlying pathophysiological mechanisms at play in various neurological disorders with clinical features.
- Interpret laboratory data effectively.
- Develop comprehensive management plans.
- Recognize neurological emergencies and respond promptly.
- Appropriately refer non-neurological cases to relevant specialties. motor and sensory examination, and gait assessment.
- Acquire hands-on experience with neuroimaging modalities, such as MRI and CT scans, and interpret

basic neuroimaging findings.

DISCIPLINE-WISE LEARNING OBJECTIVES AND CONTENTS

PATHOLOGY

Learning Objectives:

- Characterize the features of neuronal injury, effects of hypoxia, edema and toxins
- Enlist and describe the features of degenerative and prion related diseases of the CNS, along with myelin associated diseases.
- Describe the causes, clinical features, pathogenesis and lab diagnosis of different types of meningitides
- Describe the features of major neoplastic disorders of the CNS.

Topics/ Contents:

Lectures: (1 hour each)

1. Reaction of Neurons and Glial Cells to Injury, Cerebral Hypoxia & Cerebral Edema
2. Degenerative Diseases of Cerebral Cortex like Alzheimer's Diseases
3. Degenerative Diseases of Basal ganglia (Parkinsonism)& Brainstem
4. Meningitis -1
5. Meningitis -2
6. Brain Tumors I
7. Brain Tumors II
8. Prion Diseases and Demyelinating Disease
9. Toxic and Metabolic Acquired Diseases

PHARMACOLOGY

Learning Objectives:

- Explain different neurotransmitters and their role in different diseases related to CNS
- Understand the mechanism of action of different drugs used to treat depression, anxiety and Schizophrenia
- Identify the mechanism of action and major toxicities of anti-seizure drugs
- Name the major inhalational anesthetic agents and explain their pharmacodynamics and pharmacokinetic properties
- Know the commonly used intravenous anesthetics and their main pharmacokinetic & pharmacodynamics features

- Describe the mechanism of action of local anesthetics and their classification
- Describe the therapeutic and toxic effects of major antiparkinsonism agents
- Know the clinical uses of opioid analgesics and different drugs used to treat migrainetherapy
- Name two SERMs & describe their unique properties.

Topics/Contents:

Lectures: (1 hour each)

1. Introduction to neurotransmitters
2. Sedative-hypnotic drugs-I (Benzodiazepines)
3. Sedative-hypnotic drugs-II (Barbiturates)
4. Drugs used to treat parkinsons disease
5. Antidepressants
6. Antipsychotics
7. Anti-epileptics
8. Local anesthetics
9. General anesthetics-I (Inhaled)
10. General anesthetics-II (I/V)
11. CNS-stimulants
12. Opioid analgesics
13. Treatment of Migraine

Tutorials: (1.5 hour each)

1. Anxiolytic drugs
2. Antidepressants/antipsychotics
3. Treatment of parkinsons disease
4. Anti-epileptics/CNS-stimulants
5. Local anesthetics
6. General anesthesia

Practicals (Each practical 1.5 contact hr)

- 1- Effects of strychnine and picrotoxin on CNS of frog
- 2- Effects of local anesthetic agent lignocaine and procaine on legs of frog

COMMUNITY MEDICINE.

Learning Objectives:

- Describe epidemiology of Neurological diseases
- Analyze burden and identify strategies of prevention and control of neurological diseases

- Analyze global burden of neurological disorders
- Define a public health approach for neurological disorders
- Analyze the importance of Mental health and Mental health policy in Pakistan
- Analyze descriptive study designs
- Analyze Case Control studies, uses and disadvantages.
- Make a 2x2 table
- Calculate Odds Ratio
- Analyze Cohort studies, uses and disadvantages in detail.
- Compute and interpret Relative Risk and Attributable risk
- Define various types of clinical trials and their phases, advantages and disadvantages
- Perform Data entry and Analysis in SPSS independently
- Apply T-Test, ANOVA and Chi Square test appropriately in analysis
- Perform Regression analysis independently
- Present research paper in journal club
- Present group research project

Topics/Contents:

Lectures: (1 Hour each)

1. Global burden of neurological disorders
2. Neurological Disorders: A public health approach
3. Mental health
4. Snake bite and its prevention
5. Descriptive Study Designs
6. Case Control Studies and Odds Ratio
7. Cohort studies and Relative Risk
8. Clinical trials

Tutorials: (1.5 hour each)

1. Data Entry in SPSS
2. Data Analysis in SPSS
3. Mock Research presentation of students

BIostatistics

Learning Objectives:

- Enhance the data entry and management skills on SPSS software.
- Present descriptive statistics including tables and graphs.
- Apply the inferential statistics including t-test, Chi square test, ANOVA.
- Interpret the data and write the result.

Topics/Contents:

Lectures: (1 Hour each)

1. Review concepts of Biostatistics
2. Review Data analysis measure
3. Intro to SPSS, Variable Creation and data entry
4. T-Test application
5. CHI Square Test
6. ANOVA test
7. Regression analysis

ANATOMY

Learning Objectives:

- Describe the general organization of nervous system, different types of nerve tissue cells & functional neuroanatomy of brain.
- Relate the different syndromes & clinical manifestation of ischemia in anterior and posterior circulation of brain with the normal pattern of arterial supply of brain.
- Discuss the neuro - anatomic basis of ataxia and incoordination by applying the knowledge of cerebellar cortex, nuclei and peduncles.
- Localize the cranial nerves lesions by recognizing motor and sensory nuclei of the cranial nerves, including their locations and central connections.
- Discuss the development of brain including various congenital malformations of brain and by knowing the embryological basis of neurulation and transformation of neural tube into CNS and the anomalies in the process.
- Interpret the various clinical presentations of spinal cord disorders correlating with its organization, structure and function.

Topics/Contents:

Lectures: (1 Hour each)

1. Neurons and Neuroglia
2. (REVISIT) Functional Neuro anatomy of Brain

3. (REVISIT) Anatomy of circulation of brain: Anterior and posterior cerebral circulation
4. (REVISIT) Revisit Cerebellum
5. (REVISIT) Cranial nerves I- VI
6. (REVISIT) Cranial nerves VII-XII
7. (REVISIT) Functional Neuro anatomy of Spinal Cord
8. (REVISIT) Development of brain
9. (REVISIT) Neurons and Neuroglia

NEUROSURGERY

Learning Objectives:

1. Know the classification, pathophysiology presenting symptoms and different management options of Neural tube defects
2. Know the pathophysiology of CSF production, pathway and absorption, types of hydrocephalus, management and complications of VP shunt
3. Classify types of brain herniation, Describe types of cerebral edema and Know the different options for management of raised ICP
4. Know about ATLS protocol pathophysiology and management options for different types of traumatic brain injury
5. Know the pathophysiology of Spontaneous IC bleed, different causes and medical and surgical management options
6. Know the classification, presenting symptoms and different medical and surgical management options of CNS tumors
7. Differentiate between myelopathy and radiculopathy, Know the pathophysiology, presenting symptoms, causes and the management options for myelopathy
8. Know the pathophysiology ,different classifications and the management options for different types of spine injury

Topics/Contents:

Lectures: (1 Hour each)

9. Congenital disorders of CNS: Neural tube defects
10. Synthesis and flow of CSF along with its composition. Hydrocephalus & its Management
11. Raised intracranial and its effects: management of cerebral edema, raised ICP, and brain herniations
12. Traumatic Brain injury I
13. Intracranial Hemorrhage
14. Approach & Management of CNS tumors
15. Compressive Myelopathies
16. Traumatic Myelopathies

PSYCHIATRY

Learning Objectives:

- Make diagnosis of common Psychiatric disorders on the basis of standardized diagnostic criteria.
- Justify treatment plan for prevalent Psychiatric disorders i.e, mood and anxiety disorders.
- Generate ideas to work on public awareness related to common Psychiatric disorders.

Topics/Contents:

Lectures: (1 Hour each)

1. Depressive Disorders
2. Anxiety and OCD
3. Mania and psychiatric disorders
4. Suicide And Self Harm
5. Medically Unexplained Symptoms
6. Beh Behavioral Disorders

PHYSICAL MEDICINE AND REHABILITATION

Learning Objectives:

- To give idea regarding scope of Neuro-Rehabilitation Medicine.
- To learn evaluation of functional limitations or disability caused by neurological disorders.
- To learn the role of Multidisciplinary Rehabilitation team in management of neurological disorders.
- To learn the role of exercises, physical agents, assistive and adaptive equipment and environment modifications to improve quality of life of person with neurological disorders.

Topics/Contents:

Lectures: (1 Hour each)

1. Introduction to Neuro- Rehabilitation
2. Rehabilitation of Stroke Patient
3. Parkinson rehabilitation
4. Spinal cord injury Rehabilitation

NEUROLOGY

Learning Objectives:

- Formulate a management plan for primary headaches and distinguish them from secondary and red-flag

headaches.

- Categorize disorders of consciousness and outline an approach to managing coma.
- Classify epilepsy and develop management plans for different types of seizure disorders.
- Correlate the clinical presentation of stroke syndromes with territorial blockage, artery rupture, or dural venous sinus issues, and plan management accordingly.
- Distinguish between hyperactive and hypoactive movement disorders, with a particular focus on Parkinson's Disease, and design appropriate management strategies.
- Identify various acute and chronic infectious processes affecting the central and peripheral nervous systems and establish approaches to their prevention and treatment.
- Distinguish various domains of higher mental functions and recognize their decline in dementia, with specific reference to Alzheimer's Disease.
- Differentiate between various clinical entities along the spectrum of central demyelinating disorders and outline a treatment plan.
- Associate cerebellar dysfunction with causative agents and create management plans for ataxia syndromes.
- Diagnose and develop an approach to both compressive and non-compressive myelopathies.
- Distinguish between various disorders of anterior horn cells, ranging from poliomyelitis (acute flaccid paralysis) to amyotrophic lateral sclerosis, and explain prognosis.
- Identify clinical and peripheral neuropathies, subdivide peripheral neuropathies, and formulate an approach to management, with specific reference to Guillain-Barre Syndrome.
- Specify diagnostic and management approaches for neuromuscular junction disorders, particularly with reference to Myasthenia Gravis.
- Classify inherited and acquired myopathic disorders, develop an approach to diagnosis and management, with a particular focus on Duchenne Muscular Dystrophy.

Topics/Contents:

Lectures: (1 Hour each)

1. Investigations for Neurological Disorders
2. Primary Headache Syndromes
3. Secondary Headache Syndromes & Trigeminal Associated Cranial and Facial Neuralgias
4. Approach to Coma
5. Approach to Epilepsy.
6. Clinical feature and Diagnosis of Cerebrovascular Accidents
7. Approach to and Management of CVA
8. CNS infections: Acute.
9. CNS infections: Chronic.
10. Approach to Movement Disorders, Parkinsons Disease.
11. Approach to and Management of Dementia; Alzheimer's Disease.
12. Demyelinating Disorders of CNS; Multiple Sclerosis.
13. Clinical Approach to Ataxias.
14. Non Compressive Myelopathies Clinical Features and Management.
15. Lesion of Cranial nerves.
16. Disorder of Anterior Horn Cells; Amytrophic Lateral Sclerosis;
17. Clinical Approach to Neuropathy; GBS

18. Neuromuscular junction Disorder; Myasthenia Gravis.
19. Classification & Clinical approach to myopathies: Duchenne muscular dystrophy
20. Parkinson's diseases
21. Headache

SBL (1.5 hr)

1. Headache
2. Parkinson's disease
3. Brain tumors

RADIOLOGY

Learning Objectives:

- Know when to perform X-ray /CT / MRI of spine and spinal cord
- Recognize the basic radiological anatomy of spinal cord , nerves and vessels
- Relate gross brain anatomy with cross sectional in different planes
- Identify the radiological features of basic pathologies involving spinal cord like Tumors/ischemia /infections
- Identify common neurological abnormalities on imaging.
- Able to differentiate between primary and secondary brain tumour
- Identify radiological features of head trauma and differentiate between subdural, epidural and subarachnoid bleed.
- Identify imaging appearance of communicating and non communicating hydrocephalus
- Recognize the basic radiological features of cerebral ischemia on CT/ MRI.
- know the importance of characteristic sequence like diffusion In ischemia.
- know normal and abnormal appearance of intracranial vasculature on angiograms including CTA/MRA /DSA.
- Differentiate between hemorrhage and ischemia on imaging.
- Locate territorial distribution of typical ischemia

Topics/Contents:

Lectures: (1 Hour each)

1. Brain MRI
2. Neuroradiology of stroke & cerebral angiography & interventional radiology
3. Brain tumors, head injury and hydrocephalus
4. Radiological features of normal and diseased spinal cord

PEDIATRICS

Learning Objectives:

- Achieve the basic knowledge and clinical competencies related to common neurological disorders.
- Understand, assessment, causes, clinical signs and symptoms and complications of common neurological problems including, childhood epileptic syndrome, stroke, acute flaccid paralysis, cerebral palsy and mental retardation.
- Understand routine, investigations and laboratory tests to diagnose epilepsy, pediatric stroke, cerebral palsy and mental retardation.
- Understand approach to a child with acute flaccid paralysis, and its relevant investigations and management.
- The student should be able to take a good detailed history of a patient with neurological complaints in all settings like inpatient and in outpatient department.
- Perform a general physical and systemic examination of a child with epilepsy, stroke, acute flaccid paralysis and cerebral palsy.
- Make differential diagnoses and most probable diagnosis.
- Understand, essential management plan and counselling of mothers/attendant of a child with, cerebral palsy, epilepsy, stroke, mental retardation and acute flaccid paralysis.
- Participate in the research, related to neurological diseases in children.
- Do self-learning, and participate in continuous medical education activities related to neurological problems in children.

Topics/Contents:

Lectures: (1 Hour each)

1. Childhood epileptic Syndrome
2. Approach to Paediatrics Stroke
3. Cerebral palsy / mental retardation
4. Approach to AFP in Children

ANAESTHESIA

Learning Objectives:

- Describe anaesthesia, and its Types and Components
- Know History taking and examination specific for Anaesthesia
- Define Regional Anaesthesia (RA)
- Know Indications, Contraindications, Medication and Equipment for RA
- Recognition of Critically ill patient, Etiquettes of ICU and the team dynamics of patient care in ICU
- Know Methods and Drugs used for pain management

Topics/Contents:

Lectures: (1 Hour each)

1. Introduction to anaesthesia.
2. Pre-operative assessment.
3. Regional anaesthesia.
4. Safe transfer of critically ill patients.
5. Acute pain management.
6. Chronic pain management.
7. Recognition critically ill patients & o2 therapy.

SKILL LAB

Topics/Contents (1.5 hr)

Lumbar Puncture

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

LEARNING RESOURCES

PATHOLOGY

- Robbins Basic Pathology Kumar & Abbas 10th Edition
- Robbins & Cotran Pathologic Basis Of Disease Kumar & Abbas & Aster 10th 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 & Robertson 13th Or Latest Edition
- Hutchison's Clinical Methods William M Drake & Michael Glynn 23rd Or Latest Edition

PAEDIATRICS

- Nelsons's Essentials Of Pediatrics Marc dante & 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), OSCE (Objective Structured Clinical Exam) and structured vivas will be the main assessment tool.