

Dow University of Health Sciences



LOCOMOTOR MODULE

STUDY GUIDE 2023

First 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 (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 equipped 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

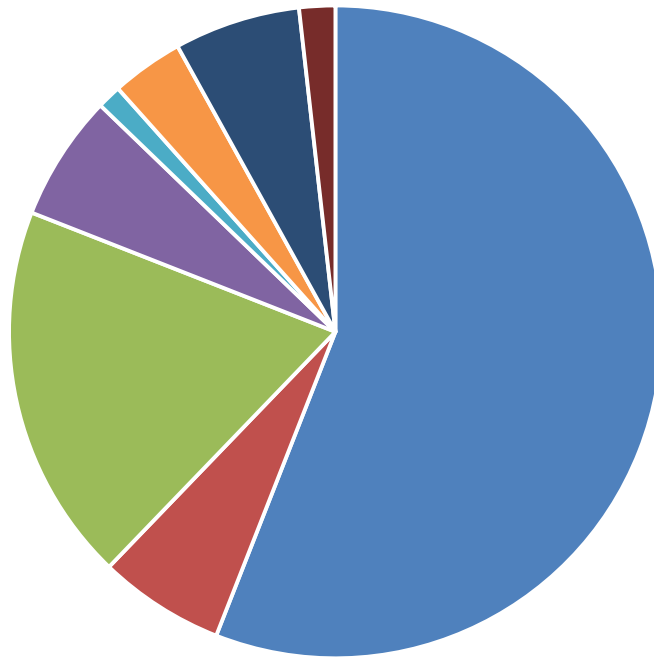
FIVE YEAR CURRICULAR ORGANIZATION

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 5 weeks	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	OPHTHALMOLOG Y/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	First	
Module Title	Locomotor	
Module Code	LCM 1	
Duration	9weeks	
	Anatomy	94
	Pathology	10.5
	Physiology	31.5
	Biochemistry	10.5
	Radiology	2
	Community Medicine	6
	CBL	10.5
	Skills Lab	3
Total Hours	168	

Chart Title



■ Anatomy ■ Pathology ■ Physiology ■ Biochemistry ■ Radiology ■ Community Medicine ■ CBL ■ Skills Lab

INTEGRATED MODULE COMMITTEE

RESPONSIBILITIES	NAMES	DESIGNATION	EMAILS
Chairperson Curriculum Review Committee Chief Module coordinator	Prof Naheed Khan	Chairperson & Professor, Anatomy Dept. DMC	naheed.khan@duhs.edu.pk
Module coordinator DMC	Dr Sabahat Babar	Lecturer Anatomy DMC	sabahat.babar@duhs.edu.pk
Module coordinator DIMC	Dr Afshan Mehboob	Assoc Prof Physiology DIMC	afshan.khan@duhs.edu.pk
Department	RESOURCE PERSON	DESIGNATION	EMAILS
Medical education	Dr. Syeda Rubaba Azim	Assistant Professor	rubaba.azim@duhs.edu.pk
	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 locomotion and musculoskeletal. This module includes Gross anatomy, Histology, Embryology, Physiology, pharmacology biochemistry, Neurology, Radiology, Microbiology Pathology, Orthopedic, Behavioral sciences and Community medicine.

Lectures, tutorials, and small group sessions including CBL and practical are important components of this module. Clinical skills such as accurate measurement of vital signs including measurement of blood pressure are part 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 Locomotion module and it is hoped that students will be able to achieve the desired module learning outcomes.

LEARNING OUTCOMES

- Describe the anatomy of the upper and lower limbs.
- Explain the biochemistry of extracellular matrix related to cartilage and bones.
- Describe the histology & embryology of bones, cartilage, and muscles.
- Describe the role of calcium, Vit D, and other minerals in bone metabolism.
- Enlist and interpret various investigations used to diagnose diseases of the locomotor system.

DISCIPLINE-WISE LEARNING OBJECTIVES AND CONTENTS**ANATOMY****Learning Objectives:****Gross Anatomy:**

1. Discuss the division and functions of skeletal system along with axial and appendicular skeleton.
2. List the bones of the upper limb along with their side determination, bony features, muscles attachment, relevant fractures & applied anatomy.
3. List the muscle of the pectoral girdle along with origin ,insertion, neurovascular supply & action of muscles in stabilizing the pectoral girdle
4. List the muscles of shoulder region along with Origin, Insertion, Nerve supply, action & clinical correlates of shoulder muscles.
5. Describe Axilla its boundaries, contents along with course and relations of axillary vessels, arrangement and groups of axillary lymph nodes with their clinical importance.
6. Describe the formation of brachial plexus, with its root value and divisions (roots, trunk, division, and cords) with the branches arising from the cords & relevant injuries to the plexus resulting in different deformities of upper limb.
7. Discuss the anatomy of breast, its blood supply, lymphatic drainage, important clinical correlation with axilla in Carcinoma of Breast.
8. Identify the muscles of different compartments of the arm, forearm & hand with their origin, insertion, nerve supply, action & relevant applied anatomy.
9. Discuss the palmar spaces and their clinical importance.
10. Describe the neurovasculature of upper limb with origin, termination, branches & clinical correlation.
11. Explain the joints of upper limb in context to its type, structure, related muscles acting, range of mobility,

movements, neurovascular supply & applied clinical anatomy.

12. List the bones of the lower limb along with their side determination, bony features, muscles attachment, relevant fractures & applied anatomy.
13. Identify the muscles of gluteal region, different compartments of the thigh, leg & foot with their origin, insertion, nerve supply, action & relevant applied anatomy.
14. Explain femoral triangle, its boundaries and contents, femoral sheath and its contents. Clinical conditions associated with it.
15. Discuss the formation & branches of lumbosacral plexus with their root values along with applied anatomy.
16. Describe the neurovasculature of lower limb with commencement, termination, branches & clinical correlation.
17. Explain the joints of lower limb in context to its type, structure, related muscles acting, range of mobility, movements, neurovascular supply & applied clinical anatomy.
18. Describe the arches of foot, factors responsible for their maintenance, their function & clinical correlation.
19. Describe the neurovasculature of lower limb with origin, termination, branches & clinical correlation
20. Outline the applied aspects of the upper & lower limb.
21. Demonstrate the surface marking of upper & lower limbs

Histology:

1. Describe the general properties of Hyaline, Elastic and Fibrocartilage.
2. Identify types of cartilages at the light and electron microscope levels, including distinctive features of each.
3. Discuss histogenesis, Intramembranous & Endochondral Ossification of Bone.
4. Identify three types of bone at the light and electron microscope levels, including distinctive features of each.
5. Identify three types of muscle at the light and electron microscope levels, including distinctive features of each muscle fiber.

Embryology:

1. Explain the mechanism of development of muscular & skeletal systems and limbs.
2. Discuss the relevant congenital anomalies.

Topics/Content:

Lectures:

Upper Limb

- Topographic Anatomy of upper limb Nomenclature
- Muscles of pectoral girdle

- Structure of typical spinal nerve
- Shoulder joint & its movements
- Axilla Boundaries and contents: Axillary Artery & Vein, axillary lymph nodes
- Formation and relations of Brachial plexus Cutaneous Supply/dermatome of upper limb
- Muscles and nerves of arm
- Gross Anatomy of Breast
- Brachial vessels + scapular anastomosis
- Boundaries and contents of cubital fossa
- Elbow joint & arterial anastomosis around elbow
- Wrist joints, superior and inferior radioulnar joints & small joints of hands
- Superficial veins, lymphatics & lymph nodes of upper limb
- Spaces of palm
- Nerve injuries of upper limb

Lower Limb

- Topographic anatomy of lower limb nomenclature
- Deep fascia of thigh, iliotibial tract, saphenous opening
- Formation of lumbosacral plexus, cutaneous supply, dermatomes of lower limb
- Muscles of anterior compartment of thigh
- Nerves & vessels of anterior compartment of thigh
- Hip Joint and movements
- Femoral Sheath, Femoral ring and femoral canal + femoral triangle & its contents, Adductor canal
- Gluteal region
- Medial compartment of thigh
- Superficial Veins of lower limb; Formation of great & small saphenous veins, Lymphatic Drainage
- Posterior compartment of thigh
- Knee Joint
- Anterior Compartment of Leg
- Lateral Compartment of Leg & Dorsum of foot
- Posterior compartment of leg, muscles, posterior tibial vessels and tibial nerves
- Popliteal fossa
- Foot fascia and muscles
- Neurovascular supply of foot
- Arches of foot
- Nerve injuries of lower limb
- Classification & histology of cartilages
- Classification & histology of bones
- Development of Bone, cartilage & joints
- Development of mesoderm, Paraxial Mesoderm, Sclero-Myotome and formation of cartilages
- Development of Limbs, Congenital Anomalies of limbs

- Development of Muscle.
- Development & histology of mammary gland.

Histology

- Classification & histology of cartilages
- Histology of cartilage
- Classification & histology of bones
- Histology of Bones
- Histology of Muscle

Embryology

- Development of Bone, cartilage & joints
- Development of mesoderm, Paraxial Mesoderm, Sclero-Myotome and formation of cartilages.
- Development of Limbs, Congenital Anomalies of limbs
- Development of Muscle.
- Development & histology of mammary gland.

Demonstration/Tutorial

- Bone study (clavicle, scapula, humerus) (Museum study)
- Muscles of shoulder region with nerve supply, action + Rotator cuff (demonstration)
- Models study Clavicle, Scapula and Humerus
- Applied anatomy of Breast & Axillary lymph nodes
- Osteology of Ulna
- Osteology of radius and hand
- Models Study Muscles of the Pectoral and Shoulder regions
- Muscles of front of forearm & flexor retinaculum & space of parona
- Nerves and blood vessels of forearm
- Model Study Shoulder Region, Pectoral Region and Axilla
- Elbow joint & arterial anastomosis around elbow
- Muscles of hand, movement of thumb, palmar aponeurosis, anatomical snuff box
- Nerves & vessels of hand.
- Nerve injuries of upper limb
- Dissection of upper limb (simulation lab)
- Surface anatomy of upper limb (demonstration)
- Osteology of Hip Bone I
- Osteology of Hip Bone II

- Femur I: Gross Features
- Femur II: Muscle and ligaments attachments
- Model Study Hip Bone, Femur, Lumbosacral
- Tibia
- Fibula
- Bones of foot with applied
- Model Study Thigh, Leg and Foot (Bones, Muscles, Vessels and Nerves)
- Ankle and superior and inferior tibiofibular joints and transverse Tarsal joints
- Surface Anatomy of lower limb
- Dissection of lower limb

Pathology

Learning Objectives

- Describe the basic structure and function of bone matrix, cells, its development, homeostasis and remodeling.
- Identify the congenital anomalies of bone and cartilages and discuss its structure and chemistry.
- Enlist the developmental disorder of bone and cartilage describing the major features.
- Describe the molecular mechanisms related to the developmental disorders of bones and cartilage.
- Explain the role and significance of vitamin D in the skeletal system.
- Describe the disorders associated with vitamin D deficiency with relevant investigations
- Explain osteoporosis with its causes, pathogenesis, clinical manifestations and complications of osteoporosis.
- Explain the role of different investigations in the diagnosis of osteoporosis.
- Describe different types and complications of fractures and mechanisms of bone healing.
- Describe Etiology and Pathogenesis of Pathologic fractures.
- Elaborate different factors that interfere with healing of bone.
- Classify osteomyelitis and explain its pathogenesis along with complications.
- Enumerate clinical features of syphilis, related to musculoskeletal system.

Topics/content

- Overview of Basic structure and Function of Bone with Developmental Disorders of Bone and Cartilage-1
- Overview of Basic structure and Function of Bone with Developmental Disorders of Bone and Cartilage-2
- Deficiency states of Vitamin D
- Types and important clinical manifestations of Osteoporosis
- Fractures and bone repair
- Osteomyelitis and Skeletal syphilis

Practical

- Vitamin D Deficiency States
- Osteoporosis
- Fractures and bone repair

Physiology

Learning Objectives

- Understand potential difference, its origin in cell membranes, measurement, units, and terms like equilibrium, valency, anion, and cation.
- Explore the origins, sustenance, and forces affecting K⁺ ion movement in the resting membrane potential of unstimulated nerve and muscle cells.
- Understand graded potentials' role in how neuron stimulation causes local electrical changes, particularly regarding Na⁺ influx, and their relationship with ion channels and membrane voltage.
- Define action potentials, local potentials, depolarization, repolarization, nerve impulse, and refractory period, then explain action potential creation and recovery.
- Explain nerve signal creation, axon transmission, one-way action potential travel, saltatory vs. continuous conduction, and myelination's speed effect.
- Examine nerve fiber characteristics, classification methods based on diameter and conduction velocity, and sensory nerve classification
- Detail the origins and levels of nerve injury, elucidate three forms of neuronal degeneration, and explain the process of nerve fiber regeneration.
- Explain neuron communication, post-synaptic cell inhibition, neurotransmitters, five steps from action potential arrival to new one in the postsynaptic neuron, and three ways synaptic transmission ends
- Outline muscular tissue functions, properties, structural differences, functions, and vulnerability to hypertrophy and hyperplasia.
- Explain the neuromuscular junction's structure and action potential production, distinguish acetylcholine, its receptor, and acetylcholinesterase, and describe the sarcolemma's motor end plate.
- Summarize the causes, signs, symptoms, diagnosis, and treatment for NMJ disorders including Myasthenia Gravis, Lambert-Eaton Myasthenic syndrome, Botulism, Organophosphate poisoning, and NMJ blocking drugs.
- Explain thick and thin filaments, striations, protein filament overlap, myofilament arrangement for A bands, I bands, H bands, and Z discs, key muscle proteins, and their activities in skeletal muscle fiber microscopic anatomy.
- Explain nerve fiber stimulation of a muscle, acetylcholine (ACh) receptor effects, electrical changes, and troponin and tropomyosin in myosin-actin interaction
- Explain the sliding filament mechanism and the functions of contractile, regulatory, and structural proteins

and calcium ions in muscle action. Explain how sarcomere length impacts contraction maximum tension.

- Identify rigor mortis and its timing, note its duration, recognize myopathy presentations, and outline the diagnostic process.
- Learn about motor units' structure, function, size-muscle control, muscle tone, twitch contraction phases, stimulation frequency's effect on tension, muscle tone production, and isotonic contraction sensations.
- Examine "fast" and "slow" skeletal muscle fibers, ATP production methods, marathon ATP sources, anaerobic glycolysis from aerobic respiration, muscle fatigue, and "recovery oxygen uptake" over "oxygen debt."
- How does exercise influence different skeletal muscle fibers? Cellular causes of muscle hypertrophy. Discuss muscle strength. Resistance and endurance exercises affect muscles. Exercise energy system definition

Topics/Content

Lectures

- Membrane potential
- Resting membrane potential
- Graded potential
- Action potential
- Action potential properties & propagation
- Nerve fibers: Properties & classification
- Nerve injury: Nerve degeneration & regeneration, Neuropathies
- Synapse
- Difference between skeletal, cardiac & smooth muscle
- Neuromuscular junction (NMJ) & its blockers
- NMJ disorders
- Gross, microscopic & ultrastructure of skeletal muscle
- Excitation contraction coupling
- Molecular basis of muscle contraction
- Rigor mortis and contractures, Myopathies
- Skeletal muscle mechanics
- Skeletal muscle energetics & muscle fiber types
- Muscle adaptation to exercise

Practical / Tutorial

- Introduction to Power Lab
- Difference between Skeletal, Cardiac and Smooth Muscles
- Action potential
- NMJ Disorders

- To Record repeated stimuli & fatigue in Skeletal Muscles
- Muscle Contraction
- Electromyography (EMG)
- To Record Nerve Conduction Velocity
- Skeletal Muscles Energetics and Muscle Fiber Type

Biochemistry

Learning objectives

- Discuss the biochemical importance of calcium & phosphate.
- Explain the biochemical importance of Vit D.
- Explain the role of PTH, calcitonin & Vit D in Calcium and phosphate homeostasis.
- Discuss clinical manifestations of calcium & phosphate deficiency.
- Describe biochemical composition of Cartilage and bone
- Explain Collagen synthesis and associated disorders.
- Describe hormonal regulation of bone modelling and remodeling.
- Discuss the clinical importance of bone markers.
- Assess the importance of serum estimation of Alkaline phosphatase, Calcium & Phosphate in diagnosing various bone diseases.

Topics/content

Lectures

- Sources & biochemical importance of calcium & phosphate
- Vit. D Metabolism
- Extracellular matrix (proteoglycans)
- Collagen biosynthesis
- Biochemical composition of Cartilage and bone
- Hormonal regulation of bone modeling and remodeling

Tutorial/Practical

- Regulation of Calcium and Phosphate (tutorial).
- Interpretation of bone markers in bone diseases (tutorial).
- Biochemical analysis of ALP, Ca and Phosphate (practical).

Radiology

Learning objectives

- Recognize the basic radiological anatomy of upper and lower limb on X-ray in different views
- Identify normal appearance of bones on x-ray
- Recognize the basic cross-sectional anatomy of upper and lower limb
- Identify normal appearance of muscles, bones, blood vessels and nerves on cross sectional images CT /MRI
- Relate gross anatomy with cross sectional anatomy in different planes

Topic/content

- Radiological anatomy of Upper and lower limb on X rays
- Cross-sectional (CT and MRI) anatomy of Upper and Lower limb

Community Medicine

Learning objectives

- Analyze the concept of health transition and double burden of disease in context of developing countries
- Appreciate the importance of demography in public health
- Evaluate demographic transition
- Analyze determinants of fertility and mortality
- Make conclusions for healthcare using demography
- Evaluate national and global trends in morbidity and mortality of diseases of social significance, the impact of migration and environmental factors on health and the role of national and international health organizations on health status.
- Relate effects of demographic factors and their impact on the community health.
- Relate effects of lifestyles, genetic, demographic, environmental, social, cultural, economic and psychological determinants of health and their impact on the community.
- Calculate disability adjusted life years (DALYs), quality adjusted life years (QALY).
- Evaluate the impact of DALYs, HALYs and QALYs on economy and health of individuals, communities, and countries.

Topics/content

- Health Transition

- Introduction to Demography
- Determinants of fertility and mortality 1
- DALYS/QALYS/HEALYS

CBL Topics and Objectives

CBL 1: Osteomalacia

- Define osteomalacia
- Describe the pathophysiology of osteomalacia
- Interpret role of Vit D and Calcium in bone formation
- Elaborate the effect of Vit D and calcium deficiency

CBL 2: Breast Lump

- Describe the Anatomy of the axilla.
- Describe the Anatomy of the breast and relationship to the axilla
- Define Clinical importance of axilla in relation to breast diseases

CBL3: Supracondylar Fracture

- Identify the normal structures related to elbow joint
- Relate the changes that may occur due to fracture in this area
- Identify radiological anatomy of upper limb
- Recognize that injury to one structure is not isolated but also involves other adjacent structures

CBL 4 Ulnar Nerve Palsy

- Enumerate the normal structures of the elbow region
- Describe the neurovascular relations of the elbow joint
- Describe the common injury patterns of this region
- Differentiate the various neurovascular injuries at the elbow

CBL 5 Gunshot

- Describe anatomy of major vessels in the thigh.

- Correlate Blood loss which can be associated with gunshot injury.
- Explain clinical assessment of nerves of lower limb.
- Describe that an injury at thigh can damage various tissues locally and can be associated with systemic complications

CBL 6 Dermatome

- Describe the motor and sensory distribution of lumbar and sacral nerve roots.
- Recognize the features that occur due to disease of a certain nerve root.
- Correlate the motor and sensory impairment to identify the level of nerve root involved.

CBL 7 Myasthenia Gravis

- Recognize the causes of weakness in the limb.
- Identify modalities of investigation of muscular disorders.
- Recognize the genetic basis of muscle diseases.

Skills lab

Vital signs:

Introduction

This is one of the first skills that a healthcare professional needs when dealing with patients generally, and specially in suspected cases of shock due to injuries. Accurate measurement of vital signs is of prime importance in the decision making process for diagnosis and management. Students will watch demonstration videos and then practice the measurement of five vital signs. The module is divided into two sub modules and will be taught in two sessions.

Module 2A- Temperature, Pulse, Respiration and Pain

Module 2B- Measuring Blood Pressure

Learning objectives:

- Demonstrate the correct methods of assessing Vital Signs.
- Demonstrate effective communication skills during and after assessment.

Subtopic learning objectives

Temperature

- Identify different types of thermometers

- List the four sites for assessing temperature and recognize expected differences between the measurements obtained at different sites.
- Demonstrate how to take oral temperature and read the thermometer accurately.

Pulse

- Identify seven sites where pulse may be counted (Superficial Temporal radial, carotid, femoral, popliteal, posterior tibial, dorsalis pedis)
- Demonstrate correct palpation of radial pulse, count the pulse rate and note its rhythm accurately.
- Describe method of assessing pulse in infants (heart rate in neonates and brachial pulse in infants)

Respiratory rate

- Demonstrate how to count and record respiratory rate accurately

Pain

- Demonstrate the ability to use a pain measurement scale (faces pain scale, visual analog scale) to evaluate the intensity of patient's pain.
- Demonstrate the ability to empathize with the patient in pain

Blood pressure:

- Identify the different parts of the instruments (stethoscope and sphygmomanometer) and their types.
- Demonstrate proper placement of BP cuff on the arm and thigh.
- Demonstrate how to measure and record blood pressure accurately
- Describe and demonstrate the methods used to assess blood pressure in different pediatric age groups.
- Demonstrate appropriate communication skills before, during and after the procedure.

Learning Resources

S. No	Subject	Readings
1	ANATOMY	<ul style="list-style-type: none"> Moore KL, Dalley AF. Clinically oriented anatomy. South Asia ed. India. Wolters Kluwer; 2018 Jul 12. Drake R, Vogl AW, Mitchell AW, Tibbitts R, Richardson P. Gray's Atlas of Anatomy E-Book. Elsevier Health Sciences; 2020 Feb 27. CLINICAL ANATOMY BY REGIONS (REFERENCE BOOK) Richard S. SNELL 9th EDITION LAST'S ANATOMY: REGIONAL & APPLIED (REFERENCE BOOK) Chummy S. Sinnatamby 12th or Latest EDITION ATLAS OF HUMAN ANATOMY FRANK H NETTER 6th EDITION
2	EMBRYOLOGY	<ul style="list-style-type: none"> LANGMAN'S MEDICAL EMBRYOLOGY T.W. SADLER 13th EDITION THE DEVELOPING HUMAN CLINICALLY ORIENTED EMBRYOLOGY (REFERENCE BOOK) MOORE & PERSAUD & TORCHIA 10th EDITION
3	HISTOLOGY	<ul style="list-style-type: none"> MEDICAL HISTOLOGY LAIQ HUSSAIN SIDDIQUI 5TH or Latest EDITION WHEATERS FUNCTIONAL HISTOLOGY BARBARA YOUNG 5th EDITION BASIC HISTOLOGY(TEXT AND ATLAS) (REFERENCE BOOK) LUIZ JUNQUEIRA, JOSE CARNEIRO Latest EDITION
4	PHYSIOLOGY	<ul style="list-style-type: none"> GUYTON AND HALL TEXTBOOK OF MEDICAL PHYSIOLOGY GUYTON AND HALL 13th EDITION
5	BIOCHEMISTRY	<ul style="list-style-type: none"> LIPPINCOTT'S ILLUSTRATED REVIEWS SERIES DENISE R. FERRIER 6th EDITION HARPERS ILLUSTRATED BIOCHEMISTRY (REFERENCE BOOK) VICTOR RODWELL, DAVID BENDER, KATHLEEN M. BOTHAM, PETER J. KENNELLY, P. ANTHONY WEIL 28th EDITION
6	COMMUNITY MEDICINE	<ul style="list-style-type: none"> PUBLIC HEALTH AND COMMUNITY MEDICINE SHAH, ILYAS, ANSARI 7th EDITION

7	PATHOLOGY	<ul style="list-style-type: none">• ROBBINS BASIC PATHOLOGY KUMAR &ABBAS 9TH EDITION• ROBBINS & COTRAN PATHOLOGIC BASIS OF DISEASE (REFERENCE BOOK) KUMAR & ABBAS & ASTER 9th EDITION
8	MICROBIOLOGY	<ul style="list-style-type: none">• REVIEW OF MEDICAL MICROBIOLOGY AND IMMUNOLOGY WARREN LEWINSON 14th EDITION
9	PHARMACOLOGY	<ul style="list-style-type: none">• LIPPINCOTT'S ILLUSTRATED REVIEW PHARMACOLOGY KAREN WHALEN 6th or Latest Edition• BASIC AND CLINICAL PHARMACOLOGY (REFERENCE BOOK) BERTRAM G. KATZUNG 11th EDITION
10	BEHAVIORAL SCIENCES	<ul style="list-style-type: none">• HANDBOOK OF BEHAVIORAL SCIENCES 3RD EDITION (MOWADAT H RANA, ROOP Z RANA, MANSOOR MUSTAFA)• BEHAVIORAL SCIENCES (DR MOWADAT RANA) 2ND EDITION (available on PDF)

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.