

# Dow University of Health Sciences



## ORTHOPEDICS, RHEUMATOLOGY AND TRAUMA MODULE STUDY GUIDE

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. **Practical:** 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

**Dow University of Health Sciences                      FOURTH YEAR MBBS**  
**ORTHOPEDICS, RHEUMATOLOGY AND TRAUMA MODULE**

**5 YEAR CURRICULAR ORGANIZATION**

Spiral	year	Modules				
First Spiral	I	<b>FND1- Foundation</b> Cell, Genetics & Cell Death (Basics of Anatomy, Physiology, Biochemistry, Gen. Pathology, Gen. Pharmacology, Community Medicine & Behavioral Sciences, <b>9 Weeks</b>		<b>HEM1- Blood Module</b> Immunity, Inflammation, Tissue repair, Antimicrobials & Neoplasia <b>9 Week</b>		
		<b>LCM1- Locomotion</b> Bones, Joints, Nerves & Muscles, 9weeks		<b>RSP1- Respiratory System</b> 6 weeks	<b>CVS1- Cardiovascular System</b> 4 weeks	
	II	<b>NEU1- Nervous System</b> 8 weeks		<b>HNN1- Head &amp; Neck &amp; Special</b> 6 weeks	<b>END1- Endocrinology</b> 5weeks	
		<b>GIL 1-GIT and Liver</b> 8 weeks		<b>EXC1- Renal and Excretory System</b> 5 weeks	<b>REP1- Reproductive System</b> 5 weeks	
Second Spiral	III	<b>IDD 1- Infectious diseases</b> 5 weeks	<b>HEM2- Hematology</b> 5 weeks	<b>RSP2- Respiratory System</b> 5 weeks	<b>CVS2- Cardiovascular System</b> 5 weeks	
		<b>GIL 2-GIT and Liver (including Nutritional Disorders)</b> 8weeks		<b>EXC2- Renal &amp; Excretory System</b> 5 weeks	<b>END2- Endocrinology</b> 5 weeks	
	IV	<b>ORT2- Orthopedics, Rheumatology, Trauma</b> 7 weeks	<b>PMR-Physical Medicine &amp; Rehabilitation</b> <b>DPS-Dermatology Plastic Surgery / Burns</b> <b>GEN-Genetics</b> 6 weeks	<b>REP2- Reproductive System</b> 8 Weeks		
		<b>NEU2- Neurosciences and Psychiatry</b> 8 weeks		<b>ENT*</b> 4 weeks	<b>OPHTHALMOLOGY/ EYE</b> 4 weeks	
Third Spiral	V	Clinical Rotation 9:30 to 3:00 (with Ambulatory, Emergency, Intensive care) In Medicine, Pediatrics, Cardiology and Neurology units <ul style="list-style-type: none"> <li>▪ Lecture on problem based approach, twice a week</li> <li>▪ Ward tutorial twice a week</li> <li>▪ Student research presentation once a week</li> </ul>		Clinical Rotation 9:30 to 3:00 (Inpatient, Ambulatory, Emergency, Intensive care and Operation Theatres) In Surgery, Gynecology & Obstetrics, Orthopedics and Neurosurgery. <ul style="list-style-type: none"> <li>▪ Lecture on problem based approach, twice a week</li> <li>▪ Ward tutorial twice a week</li> <li>▪ Student research presentation once a week</li> </ul>		

**OVERVIEW**

<b>Program</b>	<b>MBBS</b>	
Year	Four	
Module Title	Orthopedic, Rheumatology and Trauma	
Module Code	ORT-2	
Credit Hours		
Duration	7 weeks	
	Radiology	5
	Pharmacology	14
	Orthopedic	19.5
	Community medicine	13
	Pathology	16
	Medicine	7
Total Hours	Orthopedics, Rheumatology and Trauma Module	74.5

**INTEGRATED MODULE COMMITTEE**

<b>RESPONSIBILITIES</b>	<b>NAMES</b>	<b>DESIGNATION</b>	<b>EMAILS</b>
Chairperson Curriculum Committee, DUHS Chief Module coordinator	Prof. Naheed Khan	Prof. and Chairperson Anatomy	<a href="mailto:naheed.khan@duhs.edu.pk">naheed.khan@duhs.edu.pk</a>
Coordinator DIMC	Dr. Arisha Sohail	Assistant Professor Biochemistry	<a href="mailto:arisha.sohail@duhs.edu.pk">arisha.sohail@duhs.edu.pk</a>
Co-coordinator DMC	Dr. Kanwal Naz	Lecturer Physiology	kanwal.naz@duhs.edu.pk
Medical Education			

### **MODULE DESCRIPTION:**

This module has been designed for students to introduce them to the basic concepts of orthopedics, rheumatology and trauma. This module includes Pathology, Orthopedics, Pharmacology, Medicine, Community medicine, and Radiology.

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 orthopedics, rheumatology and trauma module and it is hoped that students will be able to achieve the desired module learning outcomes.

### **RATIONALE:**

The Orthopedics module provides the student with the knowledge regarding common bone and joint problems. The diseases involving this system include congenital disorders, infections, acute and chronic osteomyelitis, bone tumors, metabolic diseases of bone and degenerative disorders. A major component of this module as trauma related disorders. A medical graduate after qualification, will be expected to manage orthopedics related trauma and skill required for management of the injuries in the acute phase are essential for a doctor. The Locomotor module in the basic sciences cycle prepares the student by providing the necessary knowledge of anatomy and physiology of the structures of the limb. This clinical cycle module dwells on this knowledge and prepares the student by providing the principles of radiological diagnosis and management of orthopedic diseases and trauma.

### **LEARNING OUTCOMES**

1. Understand the normal and abnormal structures and functions of skeletal system and joints.
2. Interpret the biochemical changes in the body related to the bones with reference of some common mineral metabolic disorders.
3. Take history and perform a satisfactory physical examination of the musculoskeletal system.
4. Describe normal changes that occur in skeletal system functioning from infancy to old age.



5. Formulate an appropriate plan for evaluating patients with bone related conditions, signs and symptoms to achieve a reasonable differential diagnosis and to develop an investigative and management plan.
6. Select the imaging techniques involved in the diagnosis of bone related disorders and tumors
7. Diagnose, manage and prevent common skeletal system and joints diseases.

## **DISCIPLINE-WISE LEARNING OBJECTIVES AND CONTENTS**

### **PATHOLOGY**

#### **Learning Objectives:**

- Classify the disorders of the bone.
- Enlist the major developmental abnormalities of the bone cells and bone matrix, and characterize these disorders.
- Describe the features of different types of osteomyelitis
- Discuss the pathogenesis and complications of osteomyelitis.
- Enlist the lab investigations related to osteoporosis, osteomalacia and rickets.
- Describe the features of Paget's disease and renal osteodystrophy
- Explain in detail the morphology, histological changes, pathogenesis and clinical features of Osteoarthritis,
- Rheumatoid Arthritis, Juvenile Idiopathic Arthritis, Infectious Arthritis, Crystal-Induced Arthritis
- Explain in detail the features morphology, histological changes, pathogenesis and clinical features of Seronegative Spondyloarthropathies
- Describe the Synovial Fluid Composition, explain its clinical/pathological importance and pathophysiological phenomena involving it.
- Explain the morphology, histological changes, pathogenesis and clinical features of skeletal muscle disorders.
- Characterize the diseases involving the Neuromuscular Junction.
- Classify the tumors and tumor like conditions of the bone.
- Describe the clinical features of bone tumors and tumor like conditions.
- Describe their pathogenesis histopathological, clinical and lab findings of the tumors of the bone.

**Topics/ Contents:**

**Lectures: (1 hour each)**

- Bone and Cartilage: Structure and Classification of Disorders
- Developmental Abnormalities in Bone Cells, Bone Matrix and Structures Part-I
- Developmental Abnormalities in Bone Cells, Bone Matrix and Structures Part-II
- Type, Classification, Pathogenesis of Osteomyelitis
- Paget's Disease and Renal Osteodystrophy
- WHO classification of Bone tumors: Tumors and Tumor like Conditions-1
- WHO classification of Bone tumors: Tumors and Tumor like Conditions-2
- Arthritis -1: Osteoarthritis and Rheumatoid Arthritis
- Arthritis -2: Gout and Infectious Arthritis
- Skeletal Muscles Disorders & Myasthenia Gravis

**Practicals/Tutorials: (1.5 Hour each)**

- Lab Investigations of Osteoporosis, Rickets & Osteomalacia
- Lab Investigations of Osteomyelitis
- Investigations of Synovial Fluid in Various forms of Arthritis
- Histopathology of Bone Tumors

**MEDICINE**

**Learning Objectives:**

- Recognize major risk factors for developing gout
- Assess the signs & symptoms of gout
- Outline the investigations with interpretation in a pt with gout.
- Advise dietary restrictions for gout.
- Outline the management plan of acute gout and identify pts in whom prophylaxis should be given.
- Discuss the mechanism of action and side effects of drugs used for treating gout.
- Define hyper & hypoparathyroidism
- Differentiate between primary, secondary & tertiary hyperparathyroidism

- Recognize the clinical features of hyper & hypoparathyroidism
- Outline the investigations with interpretation to be done in pts with hypoparathyroidism.
- Outline the investigations with interpretation to be done in pts with hyperparathyroidism
- Outline the management plan in pts with hypoparathyroidism
- Outline the management plan in pts with hyperparathyroidism.
- Define SLE
- Discuss the pathophysiology of SLE.
- Discuss the signs and symptoms of SLE
- List the investigations with interpretation to diagnose the disease
- Recognize the disease associations
- Discuss the various systemic involvement in SLE with its follow up.
- Discuss treatment options and follow up in patients with SLE
  
- Discuss metabolic bone diseases and disorders of mineral homeostasis
- Differentiate between osteoporosis and osteomalacia.
- Discuss the pathophysiology of metabolic bone disease.
- Identify the clinical presentation of osteoporosis and osteomalacia.
- Outline the investigations to diagnose both disease.
- Discuss key points in diagnosis including DXA bone densitometry.
- Summarize the management of both diseases.
- Discuss the different medications used in osteoporosis.
- Offer advice about management, treatment follow up of individual cases
  
- Understand the etiology & risk factors of osteomalacia
- Discuss the laboratory investigations relevant to diagnose osteomalacia.
- Elaborate the prevention & treatment plan
- Counsel patient about disease and its prognosis
- Enlist the different seronegative arthritis
- Discuss the clinical features and diagnostic criteria for different seronegative arthritis.
- Discuss the different investigations needed to diagnose seronegative arthritis.
- Outline the treatment and follow up of patient with seronegative arthritis, various complications of RA and its treatment

**Topics/ Contents:**

**Lectures (1 hour each)**

- Diagnose & manage pt with gout
- **Clinical features, diagnosis & management of hyperparathyroidism & hypoparathyroidism**

- **SLE**
- **Diagnosis and management of osteoporosis and osteomalacia PART 1 & PART 2**
- **Clinical features, diagnosis and management of patient with sero- negative spondyloarthropathies**

### **PHARMACOLOGY**

#### **Learning Objectives:**

#### **Topics/Contents:**

#### **Lectures: (1 hour each)**

- 1- Drug treatment of osteoporosis
- 2- Drug treatment of osteomalacia & rickets
- 3- NSAIDs-I
- 4- NSAIDs-II
- 1- Pharmacology of acetaminophen( non-narcotic analgesics)
- 2- Drugs used in rheumatoid arthritis(DMARDs)-I
- 3- Drugs used in rheumatoid arthritis(DMARDs)-II
- 4- Drugs used to treat Gout

#### **Practicals: (1.5 hour each)**

- 1- Treatment of osteoporosis
- 2- Treatment of rheumatoid arthritis
- 3- Treatment of gout
- 4- Internal evaluation

### **COMMUNITY MEDICINE.**

#### **Learning Objectives:**

- Analyze occupational health and Occupation diseases (Pneumoconiosis)
- Define the Hierarchy of control of occupational hazards
- Identify type, nature and source of air pollution and water pollution
- Apply the control measures for the hazards of Air and water pollution
- Recognize the significance and Advise appropriate measures of Noise pollution

- Identify the diseases due to water pollution & water quality standards
- Advise appropriate methods of water purification for safe community water supply
- Recognize the importance of proper Housing, proper waste disposal and radiation hazards
- Evaluate the importance of Water, Sanitation and Hygiene (WASH)
- Define the hierarchy of waste management
- Frame appropriate plan for Waste Disposal (safety measures for solid and liquid; domestic industrial and Hospital waste)
- Investigate Occupational Hazards & Ergonomics
- Analyze Tobacco control strategies like MPOWER, FCTC, Tobacco Control Program of Pakistan
- Advocate for global environmental concerns & Climate change

**Topics/Contents:**

**Lectures: (1 Hour each)**

1. Introduction to occupational health
2. Occupation diseases (Pneumoconiosis)
3. Air pollution
4. Water pollution
5. Water purification
6. Noise pollution
7. Housing and radiation hazards

**Tutorials: (1.5 hour each)**

1. Water, Sanitation and Hygiene (WASH)
2. Waste Disposal (safety measures for solid and liquid; domestic industrial and Hospital waste).

**Videos/ online**

1. Global environmental concerns & Climate change
2. Occupational Hazards & Ergonomics
3. Tobacco control (M POWER, FCTC, Pakistan)

**RADIOLOGY**

**Learning Objectives:**

1. Know the basic process of growth maturation, skeletal development and bony modeling

2. Identify the radiological features of anomalies arising during fetal development such as congenital absence or fusion of part of limb, supernumerary digits in hands/feet.
3. Differentiate between normal and abnormal bone on imaging.
4. Identify and differentiate bony dysplasia on imaging
5. Differentiate between normal and abnormal bone on imaging
6. -Identify normal appearance of different joints on imaging X-ray
7. -Differentiate between inflammatory arthritis from degenerative arthritis
8. - Differentiate inflammatory bony conditions like Rheumatoid arthritis from infective process like Tuberculosis
9. Differentiate between normal and abnormal bone on imaging
10. -Diagnose osteoporosis on X-ray and elaborate its diagnostic factors
11. -Differentiate osteoporosis from other metabolic process like Rickets , osteomalacia
12. Differentiate between normal and abnormal bone on imaging.
13. -Know the gold standard radiological imaging for further characterization of any particular bone tumour.
14. -Enlist its differential diagnosis
15. -Characterizes bony lesions considering pathognomic points of identification like cartilaginous, bony, soft tissue tumour.
16. Know when to perform X-ray /CT / MRI of spine and spinal cord
17. -Recognize the basic radiological anatomy of spinal cord , nerves and vessels

**Topics/Contents:**

**Lectures: (1 Hour each)**

1. Congenital abnormalities of bones and skeletal system
2. Inflammatory and infectious diseases of bones and joints
3. Metabolic skeletal lesions (rickets/osteoporosis)
4. Imaging techniques involved in diagnosis of bone tumor
5. Radiological features of normal and diseased spinal cord

**ORTHOPEDICS**

**Learning Objectives:**

- Able to read fracture radiographs
- Understand the treatment methods
- Identify implants in upper & lower limb
- Define delayed & Nonunion
- Identify Factors of nonunion
- Define & Differentiate Osteoporosis, OM, Back Pain, OA MBD, Ricketts & Osteomalacia
- Explain pathogenesis of bone disorders
- Interpret and investigate the bone related disorders
- Diagnostic investigation interpretation like DEXA Scan , XRAY findings
- identification of common pediatric deformities deformities, TEV, Congenital knee dislocation, Developmental dysplasia hip
  
- Define and Diagnose Bursitis around hip , knee & Ankle ,Avulsion fractures, Snapping hip, Tendinopathies, Rupture of Quadriceps & Tendoachilles and Muscle Injuries
- Define and Diagnose sero - negative spondyloarthropathies with Radiological interpretation and Management
- Differences b/w Unipolar & Bipolar Diathermy, conventional / Laminar & Horizontal flow OTand Measures to prevent infection
- Difference in benign & Malignant Bone tumor and Investigate and Treatment
- Define ATLS Protocol for spine injuries, Clinical Assessment, Xray & MRI interpretation of spine fractures

**Topics/Contents:**

**Lectures: (1 Hour each)**

1. Management of Fractures of lower limb
2. Management of Fractures of Upper limb
3. Healing problems – delayed union and nonunion
4. Acute osteomyelitis & Chronic Osteomyelitis
5. Diagnosis and management of osteoarthritis
6. Metabolic Bone Problems
7. Back Pain
8. Diagnosis and management of Rheumatoid arthritis
9. Common Pediatric Orthopaedic Problems
10. Soft Tissue Disorders Lower Limb
11. Soft tissue disorders upper limb

12. Clinical features, diagnosis and management of patient with sero - negative spondyloarthropathies
13. Best Operation Room Discipline
14. Management of Benign and malignant bone tumors
15. Spinal Injuries

**SBLs (1.5 hour each)**

- 1- Osteomyelitis
- 2- Osteoporosis
- 3- Osteomalacia

**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.