

Dow University of Health Sciences



ORTHOPAEDICS MODULE

7 weeks

Fourth Year MBBS

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) 6 Weeks		Foundation Sub Module Genetics, Microbiology, Bioethics 2 Weeks	HEM1- Blood Module Immunity, Inflammation, Tissue repair, Antimicrobials & Neoplasia 8 Week
		LCM1- Locomotion Bones, Joints, Nerves & Muscles, 8 weeks		RSP1- Respiratory System 4 weeks	CVS1- Cardiovascular System 4 weeks
	II	NEU1- Nervous System 8 weeks		HNN1- Head & Neck & Special 4 weeks	END1- Endocrinology 4 weeks
		GIL 1-GIT and Liver 8 weeks		EXC1- Renal and Excretory System 4 weeks	REP1- Reproductive System 4 weeks
Second Spiral	III	IDD 1- Infectious diseases 4 weeks	HEM2- Hematology 4 weeks	RSP2- Respiratory System 4 weeks	CVS2- Cardiovascular System 4 weeks
		GIL 2-GIT and Liver (including Nutritional Disorders) 8weeks		EXC2- Renal & Excretory System 4 weeks	END2- Endocrinology 4 weeks
		ORT2- Orthopedics, Rheumatology, Trauma 7 weeks	REP2- Reproductive System 8 Weeks	PMR-Physical Medicine & Rehabilitation DPS-Dermatology Plastic Surgery / Burns GEN-Genetics 6 weeks	
		NEU2- Neurosciences and Psychiatry 8 weeks		OPH / ENT* 4 weeks	ENT/OPH * 4 weeks
		Clinical Rotation 9:30 to 1:00 (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 9:30 to 1:00 (Inpatient, Ambulatory, Emergency, Intensive care and Operation Theatres) In Surgery, Gynae & 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 	
		PARALLEL THEMES: The following themes are not part of any individual module but shall run concurrently:Communication Skills, Clinical Skills, Writing and Presentation Skills, Article Writing, Ethics			

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.

TERMINAL OBJECTIVES

Medical graduate after completion of 5 years training program should be able to:

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.

MODULE OBJECTIVES

1. Review normal anatomy and physiology of bones and joints.
2. Discuss and identify the common congenital anomalies of bones and joints.
3. Describe the diseases associated with Defects in Metabolic pathways like Osteoporosis.
4. Describe the pathogenesis of OSTEOPOROSIS.
5. Differentiate the different diseases associated with abnormal mineral hemostasis including clinical features, differential diagnosis and management of Rickets & Osteomalacia a. Rickets & Osteomalacia b. Hyperparathyroidism c. Renal osteodystrophy
6. Classify different Fractures Types, Classifications & Managements of fractures and know the healing process.
7. Classify Osteomyelitis.
8. Classify tumors of bone.
9. Classify types of arthritis.
10. Discuss the pharmacokinetics, drug interactions, contraindications.
11. Approach to a patient with arthritis.
12. Discuss autoimmune disorders.
13. Describe different types of soft tissue disorders involving the limbs and Avascular Necrosis.
14. Discuss soft tissue tumors.

MODULE CONTENTS

ANATOMY

Gross Anatomy:

1. **ORT 2 Ang 1** Revisit: morphology of bones types of cartilage epiphysis + blood supply applied
2. **ORT 2 Ang 2** Revisit Gross features of joints (synovial membrane, fluid) emphasis on cartilage, synovial lining, capsule

Anatomy Embryology:

1. **ORT 2 Ane 1** Development of skeletal system Three germ layers spine +hip joint, concept of ossification
2. **ORT 2 Ane 2** Congenital anomalies related to skeletal system (Absence of bones supernumerary, syndactyly)

PATHOLOGY

1. **ORT 2 Pth 1** Classification of Bone Disorders
2. **ORT 2 Pth 2** Developmental Abnormalities on bone cells bone matrix and structures PART-1
3. **ORT 2 Pth 3** Developmental Abnormalities on bone cells bone matrix and structures PART-2
4. **ORT 2 Pth 4** lab. Investigations of osteoporosis, rickets and osteomalacia (tutorial)
5. **ORT 2 Pth 5** Type, classification, Pathogenesis of Osteomyelitis
6. **ORT 2 Pth 6** lab investigations of osteomyelitis (tutorial)
7. **ORT 2 Pth 7** WHO classification of bone tumors
8. **ORT 2 Pth 8** histopathology of bone tumors
9. **ORT 2 Pth 9** Arthritis (Pathophysiology of different types of OA/RA)
10. **ORT 2 Pth 10** Clinical Implication of fluid in various forms of Arthritis (tutorial)

PHARMACOLOGY

1. **ORT 2 Pha 1** Drugs pharmacology of Osteoporosis
2. **ORT 2 Pha 2** Drugs used in Management of Osteomyelitis
3. **ORT 2 Pha 3** Pharmacology of Acetaminophen
4. **ORT 2 Pha 4** NSAIDS 1(Classification, mechanism and pharmacology)
5. **ORT 2 Pha 5** NSAIDS 2 (Classification, mechanism and pharmacology)
6. **ORT 2 Pha 6** Drugs pharmacology of DMARDs
7. **ORT 2 Pha 7** Pain management (Narcotic analgesics)
8. **ORT 2 Pha 8** Drugs pharmacology of Gout

PHYSIOLOGY

1. **ORT 2 Phy 1** Modeling & Remodeling of bones

BIOCHEMISTRY

1. **ORT 2 Bio 1** Revisit of Ca, Phosphate Vit D
2. **ORT 2 Bio 2** Effect of Parathyroid Hormone on Bone Mineral Metabolism
3. **ORT 2 Bio 3** Synovial Fluid Composition (PRACTICAL)
4. **ORT 2 Bio 4** Revisit uric acid and Pyrophosphate metabolism and relationship to kidney function

RADIOLOGY

1. **ORT 2 Rad 1** Congenital abnormalities of bone & skeletal system
2. **ORT 2 Rad 2** Osteoporosis, Rickets
3. **ORT 2 Rad 3** Metabolic Skeletal Lesions
4. **ORT 2 Rad 4** Imaging techniques involved in diagnosis of bone tumors

COMMUNITY MEDICINE

1. **ORT 2 Com 1** Introduction to Occupational Health
2. **ORT 2 Com 2** Air Pollution
3. **ORT 2 Com 3** Water pollution
4. **ORT 2 Com 4** Water sources and Purification
5. **ORT 2 Com 5** Housing and radiation
6. **ORT 2 Com 6** Nuclear Medicine
7. **ORT 2 Com 7** Sports Medicine

8. **ORT 2 Com 8** **Pneumoconiosis**
9. **ORT 2 Com 9** **Snake Bite**
10. **ORT 2 Com 10** **Introduction to research**
11. **ORT 2 Com 11** **Literature Search**

BEHAVIORAL SCIENCES

1. **ORT 2** **Beh2** **Psychosocial aspects of aging**

ORTHOPAEDIC

1. **ORT 2** **Ort 1** **Pre-management of Poly trauma / ATLS**
2. **ORT 2** **Ort 2** **Types classification and management of fractures Basic Principles of Fractures**
3. **ORT 2** **Ort 3** **Treatment of Fractures of Upper Limb**
4. **ORT 2** **Ort 4** **Treatment of Fractures of lower limb**
5. **ORT 2** **Ort 5** **Management of Dislocation of Upper & Lower Limb**
6. **ORT 2** **Ort 6** **Spinal Injuries**
7. **ORT 2** **Ort 7** **Healing problems – delayed union and non-union**
8. **ORT 2** **Ort 8** **Management of Acute & Chronic Osteomyelitis**
9. **ORT 2** **Ort 9** **Back Pain**
10. **ORT 2** **Ort 10** **Diagnosis and management of osteoarthritis**
11. **ORT 2** **Ort 11** **Management of Benign and malignant bone tumors / Basic Principles of Bone Tumor**
12. **ORT 2** **Ort 12** **Management of malignant bone tumors**

MEDICINE

1. **ORT 2** **Med 1** **Diagnosis and management of osteoporosis and osteomalacia PART 1**
2. **ORT 2** **Med 2** **Diagnosis and management of Osteoporosis and Osteomalacia PART 2**
3. **ORT 2** **Med 3** **Clinical features, diagnosis and management of Hyperparathyroidism & Hypoparathyroidism**
4. **ORT 2** **Med 4** **Diagnosis and management of Rheumatoid arthritis**
5. **ORT 2** **Med 5** **DIAGNOSE AND MANAGE PATIENT WITH GOUT**

6. **ORT 2 Med 6** **Clinical features, diagnosis and management of patient with sero- negative spondyloarthropathies**
7. **ORT 2 Med 7** **Clinical features and diagnosis and management of SLE**

PEDIATRICS

1. **ORT 2 Ped 1** **Checklist at birth, congenital dislocation of hip**
2. **ORT 2 Ped 2** **Deformities, leg calf perthes disease, scoliosis, club foot, slipped capital femoral epiphysis and achondroplasia.**
3. **ORT 2 Ped 3** **Clinical features, differential diagnosis and management of rickets**
4. **ORT 2 Ped 4** **Approach a child with arthritis**
5. **ORT 2 Ped 5** **Short stature, endocrine, metabolic and other related disorders.**
6. **ORT 2 Ped 6** **Muscular dystrophies**

Case Based Learning (CBL)

1. **ORT 2 Cbl 1** **Metabolic bone disorders (osteoporosis/osteomalacia)**
 - Discuss the metabolic bone disease
 - Highlight the investigations you will like to do and give reasons for doing all investigations
 - Discuss protocol for treatment of Osteomalacia
 - Understand the role of counseling for this case
2. **ORT 2 Cbl 2** **Osteo myelitis**
 - Discuss the Osteomyelitis.
 - Highlight the investigations.
 - Describe the patho –physiology.
 - Discuss the treatment
3. **ORT 2 Cbl 3** **Trauma (fractures)**
4. **ORT 2 Cbl 4** **Bone tumors**
 - Classify the bone tumours
 - Highlight the basic Haematological investigation for bone tumors
 - Illustrate imaging studies
 - Discuss the management plan of different bone tumour

SKILL LAB SESSIONS, LEARNING OBJECTIVES

FIRST AID SKILLS PART 1 (BLEEDING, SOFT TISSUE INJURIES)

FIRST AID SKILLS PART 2 (BURNS, FRACTURES, VERTEBRAL INJURY)

INTRODUCTION/RATIONALE:

This is one of the essential skills required to handle an injured victim or patient with acute medical emergency before reaching the hospital in order to prevent disability and death.

LEARNING OBJECTIVES

After this session the student should be able to:

1. Assemble a First Aid Kit with at least twelve essential contents.
2. Demonstrate appropriate communication skills while handling a patient requiring first aid.(especially reassurance to patient)

Following five common injuries will be addressed:-

I- Bleeding

- 3- Demonstrate the appropriate methods of managing external bleeding. (Direct pressure, compressing pressure points, elevation).

II- Soft Tissue Injuries

- 4- Demonstrate proper management of wounds including assessment, cleaning and dressing (head, forearm and hand, leg and ankle).

III. Vertebral column Injury

- 5- Demonstrate correct rolls, moves, and lifts in transporting a patient to avoid spinal cord injury (log roll, spine stabilization).

IV. Bony Injuries (Fractures)

- 6- Demonstrate the correct method of splinting fractures in the leg and arm.

ASSESSMENT PLAN

ORTHOPAEDIC MODULE

	WEIGHTAGE
ANNUAL EXAM	80%
MODULE EXAM INTERNAL EVALUATION	
THEORY	10%
PRACTICAL	10%

CONTACT HOURS (DISCIPLINE WISE)

Discipline	Contact Hours
Anatomy	3
Biochemistry	4
Radiology	4
Pathology	7
Physiology	1
Pharmacology	8
Community Medicine	11
Orthopaedics	11
CBL	12
Paediatrics	5
Medicine	7
Behavioural science	1

CREDIT HOURS**Orthopaedics****4 + 2**

BOOKS

ANATOMY

- **CLINICALLY ORIENTED ANATOMY**
KEITH.L.MOORE, Arthur F. Dalley, Anne M.R. Agur
7th or Latest EDITION
- **GRAY'S ANATOMY FOR STUDENTS**
Drake & Vogl & Mitchell
3rd or Latest EDITION
- **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

EMBRYOLOGY

- **LANGMAN'S MEDICAL EMBRYOLOGY**
T.W.SADLER
13th EDITION
- **THE DEVELOPING HUMAN CLINICALLY ORIENTED EMBRYOLOGY
(REFERENCE BOOK)**
MOORE & PERSAUD & TORCHIA
10th EDITION

HISTOLOGY

- **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
11th or Latest EDITION

PHYSIOLOGY

- **GUYTON AND HALL TEXTBOOK OF MEDICAL PHYSIOLOGY**
GUYTON AND HALL
13th EDITION
- **GANONGS REVIEW OF MEDICAL PHYSIOLOGY**
25TH EDITION

BIOCHEMISTRY

- **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

PATHOLOGY

- **ROBBINS BASIC PATHOLOGY**
KUMAR & ABBAS

9TH EDITION

- **ROBBINS & COTRAN PATHOLOGIC BASIS OF DISEASE (REFERENCE BOOK)**
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 (REFERENCE BOOK)**
BERTRAM G. KATZUNG
11th EDITION

MICROBIOLOGY

- **REVIEW OF MEDICAL MICROBIOLOGY AND IMMUNOLOGY**
WARREN LEWINSON
14th EDITION

MEDICINE & MEDICAL SPECIALTIES

- **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**

PEDIATRICS

- **NELSONS'S ESSENTIALS OF PEDIATRICS MARCDANTE & KLIEGMAN 7th or Latest Edition**

SURGERY & SURGICAL SPECIALTIES

- **SHORT PRACTICE OF SURGERY ROBERT JOHN MCNEILL LOVE, HENRY HAMILTON BAILEY 26TH EDITION or Latest Edition**
- **CURRENT DIAGNOSIS AND TREATMENT SURGERY GERARD M. DOHERTY 14TH OR LATEST EDITION**
- **BROWSE'S INTRODUCTION TO THE SYMPTOMS & SIGNS OF SURGICAL DISEASE NORMAN L BROWSE 5TH OR LATEST EDITION**

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