

## Jinnah Sindh Medical University

### Spiral II

<b>MODULE TITLE</b>	<b>Locomotor- 2</b>
<b>INTRODUCTION</b>	<p>Locomotor-2 module is designed to integrate the students' knowledge of pathology, pharmacology, community medicine, and forensic medicine, with the basic science knowledge acquired during the Locomotor-1 module in Spiral-1.</p> <p>It revolves around the diagnosis, treatment, and prevention of conditions afflicting the musculoskeletal system, ranging from common disorders of bone and cartilages to severely disabling limb trauma, accidents, and disasters.</p>
<b>TARGET STUDENTS</b>	Third year M.B.B.S., 2022
<b>DURATION</b>	Four Weeks; May to June
<b>MODULE OUTCOMES</b>	<p>By the end of the module, students should be able to:</p> <ul style="list-style-type: none"><li>• justify initial plans of management and prevention of common locomotor-related disorders/injuries based on knowledge of Pathology, Pharmacology, and Community Medicine</li><li>• discuss legal aspects related to the locomotor system</li></ul>
<b>DEPARTMENTS</b>	Community Medicine, Forensic Medicine & Toxicology, Pathology & Microbiology, Pharmacology
<b>OBJECTIVES</b>	By the end of the module, students will be able to:

### **LECTURES**

#### **COMMUNITY MEDICINE**

##### **1. Accidents, Injury and its Prevention**

- Describe accidents
- Describe epidemiology of accidents and injury
- Explain the risk factors for different types of injuries
- Discuss measures in prevention and control of accidents and injury

##### **2. Disaster management**

- Describe disaster
- Enumerate the steps in planning disaster management
- Describe the steps of surveillance cycle

**3. Sports medicine**

- Describe sport medicine
- Explain the role of sports physician in the practice of sports medicine
- Discuss the female triad
- Describe the pharmacological & legal aspects of Ergogenic aids in athletes

**4. Travel Medicine**

- Describe travel medicine
- Describe epidemiology in travel medicine
- Explain the risk for travelers
- List the pathogens causing common travelers diseases
- Discuss the control measures for disease prevention among travelers
- Discuss the role of international health regulation for travelers

**5. Ergonomics**

- Describe concept of Ergonomics in Occupational Health
- Describe the role of ergonomics science in work place

**FORENSIC MEDICINE**

**1. Personal identity-I**

- Define complete and partial identification
- Describe the different methods of identification viz Third party, Subjective and Objective
- Discuss the role of identification in living and dead bodies with examples
- Describe the parameters of identification
- Mention the criteria of determination of race

**2. Personal identity-II**

- Discuss sex determination and intersex states
- Highlight the role of dactylography in identification

**3. Personal identity- III**

- Describe the molecular basis of DNA
- Explain the DNA Typing techniques (RFLP, PCR, STR, MT DNA, Y Chromosome Analysis)

- Discuss the methods of collection and uses of DNA evidence
  - Justify the use of DNA in forensic sciences
- 4. Personal identity-IV**
- Explain the identification of dead and decomposed bodies
  - Discuss the medico legal importance of scars, acquired and congenital deformities, tattoo marks and hair in identification
- 5. Mass disasters**
- Define Mass disasters according to World Health Organization
  - Describe Triage and its types i.e. Simple, Advance and Reverse
  - Explain the methods of identification of decomposed bodies, mutilated & burnt bodies, skeletal & fragmentary remains
  - Describe Super-imposition photography
- 6. Firearm Injuries lecture –I**
- Describe basic terms related to ballistics & its types, types of cartridges/projectiles, and parts of a firearm weapon
  - List the types of gun powder
  - Explain the mechanism of fire in firearm weapons
- 7. Firearm injuries lecture – II**
- Describe characteristic features of wound of entry and exit of firearms
  - Estimate distance of fire
  - List the features of fabricated firearm injuries
  - Explain the postmortem findings in cases of firearm injuries

## **PATHOLOGY & MICROBIOLOGY**

### **1. Overview of bone disease**

- Briefly discuss matrix and cellular component (osteoblast, osteoclast. Osteocytes) of bone
- Summarize development, homeostasis and remodeling of bone.

### **2. Developmental Disorders of Bone and Cartilage**

- Discuss
  - i. Defect in nuclear proteins & transcription factors (Brachydactyly Cleidocranial dysplasia)
  - ii. Defects in hormones & signal transducing Proteins (Achondroplasia)
  - iii. Defects in extracellular structural proteins (Osteogenesis Imperfecta), diseases associated with mutations of Types II, IX, X, and XI collagen)
  - iv. Defect in metabolic pathways (Osteopetrosis).

### **3. Acquired disorders of bone & cartilage I**

- Define osteopenia & osteoporosis
- Categorize generalized osteoporosis
- Discuss the pathophysiology of postmenopausal & senile osteoporosis
- Describe the clinical & morphological features of osteoporosis
- Define Paget disease (osteitis deformans)
- List the three phases of Paget disease
- Discuss the pathogenesis of Paget disease
- Describe the clinical & morphological features of Paget disease

### **4. Acquired disorders of bone & cartilage II**

- Define rickets & osteomalacia.
- Discuss the morphology & clinical features of rickets & osteomalacia.
- Discuss the role of parathyroid hormone in calcium homeostasis.
- Describe the morphological features of hyperparathyroidism.
- Define renal osteodystrophy.
- Discuss the pathogenesis of renal dystrophy

### **5. Fractures & osteonecrosis**

- Define fractures
- List the types of fractures
- Describe the mechanism of bone repair after fractures
- Define osteonecrosis
- List the conditions causes osteonecrosis

- Discuss the morphology & clinical course of osteonecrosis

#### **6. Osteomyelitis**

- Define osteomyelitis
- List the organisms causing osteomyelitis with various predisposing factors.
- Discuss the route & causes of pyogenic osteomyelitis.
- Describe the morphological & clinical features of pyogenic osteomyelitis.
- Briefly discuss mycobacterial osteomyelitis & skeletal syphilis

#### **7. Bone Tumors and Tumor-Like Lesions I**

- Briefly discuss Osteoid Osteoma and Osteoblastoma
- Describe pathogenesis, morphology, clinical course of Osteosarcoma, Osteochondroma, Chondromas, and Chondrosarcoma

#### **8. Bone Tumors and Tumor-Like Lesions II**

- Describe pathogenesis, morphology, clinical course of Ewing Sarcoma, Giant Cell Tumor, and Aneurysmal Bone Cyst.
- Discuss Fibrous Cortical Defect, Non-Ossifying Fibroma, Fibrous Dysplasia, and Metastatic Tumors.

#### **9. Degenerative joint disease (osteoarthritis)**

- Define osteoarthritis
- Describe pathogenesis of osteoarthritis
- Discuss morphological & clinical features of osteoarthritis

#### **10. Autoimmune joint disease (Rheumatoid arthritis)**

- Define rheumatoid arthritis (RA)
- Describe pathogenesis & morphological features of RA
- Discuss clinical & specific laboratory diagnostic features of RA
- Discuss treatment & complications of RA

#### **11. Juvenile idiopathic arthritis, Seronegative spondyloarthropathies, Infectious arthritis**



- Define juvenile idiopathic arthritis(JIA).
- Compare JIA with rheumatoid arthritis.
- Briefly discuss risk factors & its sub classification.
- Features of seronegative spondyloarthritis.
- Briefly discuss ankylosing spondylitis, reactive arthritis, enteritis associated arthritis & psoriatic arthritis.
- Discuss the causative agents & presentation of suppurative, mycobacterial, Lyme & viral arthritis.

## **12. Crystal-induced arthritis (Gout & pseudogout) Joint tumors & tumors like conditions**

- Classify gout.
- Describe the pathogenesis, morphology & clinical features of gout & pseudo-gout
- Briefly discuss ganglion & synovial cyst
- Discuss pathogenesis, morphology & clinical features of tenosynovial giant cell tumor

## **PHARMACOLOGY**

### **1. Pharmacology of Eicosanoids**

- Classify eicosanoids
- Discuss the synthesis, receptor mechanisms and organ system effects of eicosanoids

### **2. Pain Management/ Non-Steroidal Anti-Inflammatory Drugs (NSAIDs)-1**

- Discuss the rationale of pain management
- Classify NSAIDs
- Describe their basic and clinical pharmacology

### **3. Pain Management-II (Opioid Analgesics)**

- Discuss the role of opioids in the management of moderate to severe pain
- Classify narcotic analgesics
- Describe the basic and clinical pharmacology of narcotic analgesics

### **4. Anti-Rheumatic Agents-I & II**

- Classify the drugs used in the treatment of rheumatoid arthritis and osteoarthritis
- Discuss their basic and clinical pharmacology

#### **5. Drug Used in Osteoporosis and Osteomalacia**

- Describe the rationale of management of osteoporosis & osteomalacia
- Classify the drugs used in the treatment of osteoporosis and osteomalacia
- Discuss their basic and clinical pharmacology

#### **6. Drugs Used in Gout**

- Describe the rationale of management of gout
- Describe the drugs used in the treatment of gout
- Discuss their mode of action, pharmacokinetics and adverse effects

### **TUTORIALS**

### **FORENSIC MEDICINE**

#### **1. Personal identity I (Forensic odontology)**

- Determine age from Odontological data and x-rays

#### **2. Personal identity II (Age estimation by Radiology)**

- Describe the medico legal importance of age
- Explain the medicolegal importance of general examination and ossification data in age determination
- Determine age in at least 3 x-rays of long bones

#### **3. Personal identity III (Sex determination from bones)**

- Discuss the features of male vs female skeleton
- Determine sex from the following bones:
  - i. Skull
  - ii. Mandible
  - iii. Thorax
  - iv. Pelvis
- Describe the determination of sex in intersex states

**4. Personal identity IV (Osteometric indices)**

- Describe the role of Osteometric indices of bones in determination of age, sex, and race

**PATHOLOGY**

**1. Synovial fluid analysis in arthritis**

- Correlate synovial fluid analysis with their representative disease

**PHARMACOLOGY**

**5. Pain Management**

- Discuss the basic and clinical pharmacology of NSAIDs, opioids and others used in pain management.

**6. Treatment of Rheumatic Arthritis and Osteoarthritis**

- Classify the drugs used in the management of rheumatoid arthritis and osteoarthritis.
- Discuss the basic and clinical pharmacology of drugs used in RA OA.

<b>INTERNAL ASSESSMENT</b>	<ul style="list-style-type: none"><li>• Internal assessment will be according to JSMU policy. The details of internal assessment will be determined by the respective institutions.</li><li>• Internal assessment carries 20% weightage in the final, end-of-year examination</li></ul>
<b>FINAL EXAMINATION</b>	MCQs and OSPE
<b>COURSE EVALUATION</b>	Course will be evaluated through a feedback form which will be posted on the JSMU website