

# AJK Medical College, Muzaffarabad

## Locomotor System & Rheumatology

(LMR-II-309)

(4<sup>th</sup> Year)



**Pre-requisite:**

CHP, Hematology, RES-II, GIT-II, SPS-II, Endocrine, Renal & NEU Modules

**Starting:**

**DEPARTMENT OF MEDICAL EDUCATION**

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### Module Team

<b>Prof. Anwar ul Haque</b>	<b>(Module Planner)</b>
<b>Col. Dr. Zubiar</b>	<b>(Module Coordinator)</b>
<b>Brig® Prof. Dr. Ahmed Khan</b>	<b>(Member)</b>
<b>Dr. Ziayd Afzal Kiyani</b>	<b>(DME)</b>
<b>Prof. javed Rathore</b>	<b>(Member)</b>
<b>Dr. Shuakat Hayat</b>	<b>(Member)</b>
<b>Dr. Shuakat Dar</b>	<b>(Member)</b>
<b>Maj. Dr. Omer Jamshaid Khan</b>	<b>(Member)</b>
<b>Dr. Liaqat Awan</b>	<b>(Member)</b>

## **Rationale:**

People in the Kashmir, like rest of the world are living longer with each passing decade and remain healthier and more active as they age. The prevalence of musculoskeletal problems in the population is increasing with longevity and may continue to increase over time. An increased morbidity by virtue of musculoskeletal disorders may compromise their quality of life and impose burden on health economics. The cost of treatment and inability to remain employed full time will have a significant financial impact on the economy of a resource constrained developing country. It warrants that trainee physicians should recognize and appreciate fully the importance of common musculoskeletal conditions.

“...although the diseases that kill attract much of the public’s attention, musculoskeletal or rheumatic diseases are the major cause of morbidity throughout the world, having a substantial influence on health and quality of life, and inflicting an enormous burden of cost on health systems ...”

(World Health Organization 2003)

Undergraduate Medical Education Programs are primarily responsible in Pakistan for preparing medical graduates/doctors to care for common clinical disorders prevalent in the country. Therefore, it is mandatory for medical schools to provide learning experiences that allow students to gain an appreciation of the importance of these conditions and the challenges inherent in caring for those patients. Traditional Medical Schools may not be accomplishing this educational goal since the attention paid to the conditions in the usual medical school curriculum is not commensurate with the prevalence of these conditions. We have developed LMR Module, which would provide appropriate learning experiences necessary for effective training of future physicians’ knowledge, skills, and attitudes relevant to musculoskeletal conditions that all medical students should acquire prior to graduation. This module has been designed to unfold the structural organization, functions, congenital anomalies and some of the disorders of the limbs and back. It explains the mechanism of neuromuscular transmission, its biochemical basis and the importance of Ca<sup>++</sup> in the body along with neurotransmitters/drugs acting at this level.

It also highlights the main components of primary survey in a trauma patient along with identification of common fractures of long bones on radiographs and examination of musculoskeletal system along with joint examination. Teaching methodology includes lectures, PBL, SGD and demonstration in pathology lab.

### **Teaching Strategy**

The content of this module will be delivered by a combination of different teaching strategies. These include small group discussions (SGD), large group interactive sessions (LGIS), demonstrations in dissection hall, lab practical, general club and clinical skill sessions at skill lab. Group projects will be assessed at the end of the block.

### **Organization of Module**

The module consists of seven themes, and 8 PBLs each based on a real life situation. Each theme has its explicate LOs. The module will employ different modes of instruction, briefly described below. Major emphasis will be on discussion, analysis and deductions; all by the students and guided by the faculty.

### **Content Delivery**

Entire curriculum will be delivered by clinical case scenarios each covering a theme. Read the cases and the objectives of the theme which you are supposed to encounter next day, understand and explain the case to yourself and read the relevant information. Following learning/teaching strategies will be employed to discuss the cases:

#### **Small Group Discussion**

Main bulk of the course content will be delivered in small group sessions. Each theme has an associated case. The case will be the centre around which learning will take place. Depending on the case you might be required to deduce objectives and learning issues or only learning issues. Every group will have a facilitator assigned to it. The facilitator will be there to keep you on track, giving you maximum liberty to discuss and achieve the objectives as a group. Small groups will be followed by a wrap up session to standardize learning. Rest of the information will be in the schedule/ time table.

#### **Large group**

Large group instruction will be employed at times sparingly. Attend large group sessions with the following focus

- a. Identify important points
- b. Ask questions on concepts not well understood in the text books
- c. Measure your learning comprehension

#### **Hands-on Activities/ Practical**

Practical activities, linked with the case, will take place.

**Lab:**

Attend your scheduled lab and take advantage of free time for study .Use your labs to correlate text structures to actual specimens in lab practice.

**Self Directed Learning**

A few SDLs have been added in between to create an environment for you to search literature as well as to deduce and synthesize information from different sources to meet the learning objectives. It will also help in breaking the monotonous / strenuous schedule and make you life- long learner.

**Assessment**

In this 2-weeks duration module, you will have formative surprise quizzes and intermittent short tests. A full-fledged summative assessment will be conducted at the end of module. This will give you an idea about the format of the examination that you will go through at the end of the year. Of course, this will be followed by feedback on your performance in the exam.

Marks obtained in the module examination will contribute 30% (internal assessment) towards end of year Professional University Examination. There is no resit exam for module written assessment and block IPE. If you miss them, your internal assessment will be recorded as zero. No excuse of any kind is permissible for absence in module or IPE assessment.

**TOS**

<b>Sr.#</b>	<b>Theme</b>	<b>Weight%</b>
<b>1</b>	<b>Trauma</b>	<b>15</b>
<b>2</b>	<b>Bony deformities</b>	<b>20</b>
<b>3</b>	<b>Painful Joints</b>	<b>20</b>
<b>4</b>	<b>Myopathy</b>	<b>15</b>
<b>5</b>	<b>Swollen limb</b>	<b>30</b>
	<b>Total</b>	<b>100%</b>

**Learning Objectives**

**1. Theme (Trauma)**

At the end of the module the Students should be able to

- 1- Define, classify and diagnose fracture
- 2- Enlist fracture's complications
- 3- Diagnose shoulder dislocation. Describe its clinical features and management
- 4- Describe the primary and secondary survey in a trauma patient
- 5- Define triage
- 6- Discuss initial management of trauma patient
- 7- Define AVN
- 8- Enlist bones which are prone to develop AVN in trauma
- 9- Neck: mechanical/myofascial neck pain, cervical radiculopathy, (cervicalmyelopathy)
- 10- Shoulder: rotator cuff tendinitis/opathy, AC joint problems (arthritis, separation), anterior dislocation, biceps tendinitis/rupture
- 11- Elbow: lateral and medial epicondylitis, radial head fracture, olecranon bursitis
- 12- Wrist: DeQuervain's tenosynovitis, carpal tunnel syndrome, scaphoid fracture
- 13- Hip: trochanteric bursitis, osteoarthritis
- 14- Lumbar spine: mechanical low back pain, lumbar radiculopathy, lumbar spinal stenosis, lumbar spondylolysis, and listhesis
- 15- Knee: ligament sprains, including anterior cruciate ligament, meniscal tears, patellofemoral pain
- 16- Ankle/foot: inversion sprains, Achilles tendinitis, plantar fasciitis

- 17- Define and Classify Disaster.
- 18- Enlist various levels of disaster.
- 19- Describe Disaster management.
- 20- Describe the disaster impact & preparedness.
- 21- Discuss the Disaster preparation.
- 22- Differentiate between Accident, Injury & Handicap
- 23- Discuss various types of accident and its preventions

## **2. Theme (Bony deformities)**

1. Enumerate the congenital bone disease
2. Describe the pathogenesis of Osteogenesis imperfecta and Achondroplasia
3. State the pathogenesis and lab diagnosis of congenital myopathies
4. Enumerate different types of metabolic bone disorders.
5. Describe the pathogenesis of metabolic bone diseases.
6. Identify osteogenesis imperfecta and developmental dysplasia of hip (DDH) on radiographs/pictures/videos.
7. Identify and interpret congenital anomalies of the limbs and correlate with their embryological basis.
8. Describe Radiological findings in osteomyelitis, & osteomalacia

## **3. Theme (Painful joints)**

1. Enumerate benign and malignant bone lesions
2. Describe the pathogenesis and lab diagnosis of infectious bone disease.
3. Pathological features and lab diagnosis of benign and malignant bone tumors.
4. Enumerate the different types of arthritis
5. Describe the pathology and lab diagnosis of arthritis
6. Identify/illustrate components of clinically important joints on imaging modalities.
7. Outline plan for taking history of joint disorder and the important components of their examination.
8. Counsel the patient suffering from immunological and/or degenerative arthritis for prevention and lifestyle modifications.
9. Describe clinical features, investigations and management of Rheumatoid Arthritis.
10. Describe clinical features, investigations and management of systemic lupus erythematosus
11. Enlist different causes of backache and describe the clinical features and management of ankylosing spondylitis.

## **4. Theme (Myopathies)**

1. Classify the myopathies.
2. Differentiate the types of muscular dystrophies on the basis of their pathogenesis.
3. Describe the pathogenesis of Myasthenia gravis.
4. Enumerate the skeletal muscle tumors. Give their histopathological features.

## **5. Theme (Swollen Limb)**

1. Classify different types of soft tissue lesions
2. Describe the pathogenesis of fibroma, fibrosarcoma, lipoma, liposarcoma, chondroma, chondrosarcoma.
3. Enumerate the benign and malignant skin lesions
4. Describe the pathogenesis of benign and malignant skin lesions
5. Describe clinical features and management of compartment syndrome.

## Clinical Scenarios

### Osteosarcoma

A 22-year-old male with periosteal osteosarcoma of the right femur with an associated bone marrow lesion is presented. The juxtacortical tumor, 16 x 11 x 9 cm, was located on the bone cortex of the upper diaphysis and extended into the surrounding soft tissues. A minimal bone marrow lesion was present, although the bone cortex was quite intact. Microscopically, the tumor consisted exclusively of atypical chondroblastic cells with a small osteoblastic area. The bone marrow lesion, interestingly, contained both multiple nodules of well-differentiated chondrosarcomatous components and a few demarcated foci of atypical spindle cells producing a fine osteoid matrix. It was reasonable to conclude, therefore, that this tumor was a periosteal osteosarcoma with an unusual secondary bone marrow lesion rather than a conventional (central) chondroblastic osteosarcoma with soft tissue invasion.

X-ray: Sunburst periosteal reaction

### Duchene muscular dystrophy

A five year old boy who was referred by his pediatrician to neurology department because of an abnormal gait. His parents have noticed that he is clumsy when he runs. He falls often. He runs on his tiptoes, which has occurred since they started taking care of him. Otherwise, he has no other problems. He is doing well in kindergarten despite his language difficulty. His teacher notes that he has trouble getting up from a sitting position at school. His parents deny that he has chronic fevers, leg pain, weight loss, seizures, skin rash, urinary or bowel incontinence, or frequent colds.

His immunizations are up-to-date and his PPD this year has been negative.

GP Exam: His vital signs are normal. His height, weight and head circumference are at the 50th percentile. He is alert, active, shy, well-nourished and slim in no distress. His skin shows no neurocutaneous stigmata. His head is normocephalic and atraumatic. His pupils are equal, round, reactive to light. No nystagmus is evident. His fundi are normal with sharp disk margins. His TMs are clear. His throat is normal with a uvula midline. His lungs, heart, and abdomen are normal. His back shows no sacral dimples.

**Neurologic exam:** A standard cranial nerve exam reveals no deficits. His strength is +4/5 in his deltoids, knee flexors and extensors; +5/5 in his biceps and triceps.

His calves are visibly enlarged with a firm, rubbery feeling. He gets up to a standing position using a Gowers' maneuver. No dysdiadochokinesia. Negative Romberg sign. Sensation to light touch is intact. His reflexes are +2/4 in his biceps, triceps, brachioradialis, patella and ankle. His plantar reflex is downgoing (negative Babinski sign). No clonus is elicited. Normal anal wink and abdominal reflexes are present. His gait is best described as a wide based waddling. When running, he tends to run on his toes. He is unable to jump.

### Aneurysmal bone cyst with giant cell tumor

A 30-year-old female presented to AIMS OPD with swelling of the right shoulder since 1 year, along with the complaints of restricted mobility of the right arm. On local examination, a globular swelling was present at the right shoulder, measuring 6 × 4.5 cm and having a cystic to firm consistency. There were dilated veins over the swelling and the local temperature was raised.

### Labs:

X-ray of the right shoulder showed an expansile lytic lesion with soap bubble appearance of the lateral part of the acromion of the right scapula; there was destruction of periosteum and a prominent overlying soft tissue shadow.

Magnetic resonance imaging showed a large heterogeneous mass in the acromion. Serum calcium level, phosphorus, alkaline phosphatase, and parathormone level, were within the normal range. Renal and liver function tests were also within the normal range.

### Trauma

Naseem 20 year of age presented in emergency department of AIMS with history of RTA. His pulse is 100/min, BP is 90/60, his GCS is 14/15. He has got pain swelling and deformity of left arm. X-rays were done confirming fracture shaft of left humerus.

1. Which X-rays are advised in trauma patient during primary survey?
2. What will be the initial management in this patient?
3. What nerve is likely to be damaged in this patient?

# PBLs

## PBL -1

50 years old man presented in Orthopaedic OPD with history of pain and discharging wound on anterior aspect of right leg. He has got history of open fracture right Tibia/fibula 6 months back. There was no other significant injuries.

On examination he was afebrile. There was a discharging sinus on anterior aspect of middle 1/3<sup>rd</sup> of right leg. It was pussy discharge, his ESR was 70. CRP was positive. On X-rays there was radiolucent area on anterior cortex of Tibia near fracture site.

## RECOMMENDED BOOKS

1. Appley's book of orthopedic.
2. Campbell orthopedics
3. Robin's Pathology
4. [medscape.com](http://www.medscape.com)
5. Google Search
6. Basic and Clinical Pharmacology by Katzung BG, Masters SB, Trevor AJ.
7. Katzung & Trevor's Pharmacology by Trevor AJ, Katzung BG, Kruidering

# AJK Medical College, Muzaffarabad

## LMR-II Module – Class of 2017 (4<sup>th</sup> Year)

### Week-1

TIME	Monday	Tuesday	Wednesday	Thursday	Friday
8:00am-09:00am	Written Assessment Hematology & CHP Module Time: 8-11 AM	LGIS Rheumatoid Arthritis <b>Dr. Khalid Awan</b>	IPA s Hematology & CHP Module	LGIS Ankylosing Spondylitis <b>Maj. Dr. Omer Jamshed</b>	LGIS Muscular dystrophies & Myopathies <b>Maj. Dr. Omer Jamshed</b>
09:00am- 10:00am		LGIS Congenital & Genetic diseases of bone <b>Prof. Anwar ul Haque</b>		LGIS Metabolic disorders of bone <b>Dr. Wafa Omer</b>	LGIS Arthritis and its types <b>Dr. Maj. Asif</b>
10:15 am - to 11:15 am	Clinical Rotation	Clinical Rotation	Clinical Rotation	Clinical Rotation	<b>PBL-1A</b>
11:15 am - to 12:15 pm					<b>Prof. Anwar &amp; Team</b>
12:15 pm - to 01:00 pm					
01:00 pm-01:45 pm	Introduction to LMR-II Module <b>Prof. Anwar &amp; Module Team</b>	LGIS ATLS <b>Dr. Shaukat Hayat</b>	LGIS Bone tumors-I <b>Prof. Saroosh Majid</b>	LGIS Bone tumors-II <b>Prof. Saroosh Majid</b>	<b>Jumma Prayer</b>
<b>Prayer Break 1:45- 2:00</b>					
02:00 pm – 04:00 pm	SDL	SDL	DSL	SDL	DSL



# AJK Medical College, Muzaffarabad

## LMR-II Module – (4<sup>th</sup> Year)

Week-2

TIME	Monday	Tuesday	Wednesday	Thursday	Friday
8:00am-09:00am	<b>LGIS</b> Arthritis (1) <b>Prof. Anwar UI Haque</b>	<b>LGIS</b> Disaster Management <b>Brig.(r) Ahmed Khan</b>	<b>LGIS</b> OVERVIEW OF Fractures & Dislocations.  Fractures & Dislocations. of Lower limb <b>Dr. Shaukat Hayat</b>	<b>LGIS</b> Compartment Syndrome <b>Dr. Sarmard Latif Awan</b>	<b>LGIS</b> Soft lesions including tumors <b>Team-3</b> <b>Wrap-up</b> <b>Prof. Anwar UI Haque</b>
09:00am-10:00am	<b>LGIS</b> Disaster Management <b>Brig.(r) Ahmed Khan</b>	Arthritis (2) <b>Prof. Anwar UI Haque</b>	<b>SGD</b> Imaging of Bone & Soft tissue diseases <b>Dr. Shaukat Dar</b>	<b>LGIS</b> Metabolic Disorders of Bone <b>Maj. Saba Irum</b>	<b>LGIS</b> Imaging of Joint Diseases <b>Dr. Shaukat Dar</b>
10:15 a m - to 12:30 p m	<b>Clinical Rotation</b>	<b>Clinical Rotation</b>	<b>Clinical Rotation</b>	<b>Clinical Rotation</b>	<b>LGIS</b> Fractures & dislocation (Upper limb) <b>Lt. Col. Zubair PBL-1B</b>
12:30 pm-1:30 pm	<b>LGIS</b> Bone tumors-I <b>Prof. Saroosh Majid</b>		<b>LGIS</b> Benign skin lesions <b>Dr. sadaf fasih</b>		<b>Prof. Anwar &amp; Team</b>
<b>Prayer Break 1:30- 2:00</b>					
02:00 pm – 04:00 pm	<b>PBL-1A</b> <b>Prof. Anwar &amp; Team</b>	<b>SGD</b> Malignant skin lesions <b>Prof. Anwar &amp; Team-3</b> <b>Wrap-Up</b> <b>Dr. sadaf fasih</b>	<b>Practical</b> Practical (Pathology) <b>Dr. Saroosh &amp; Team-3</b>	<b>LGIS</b> Accidents and its prevention <b>Brig.(r) Ahmed Khan</b> <b>LGIS</b> Bone tumors-II <b>Prof. Saroosh Majid</b>	DSL



Inquires & trouble shooting

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