Department of Orthopaedics
COURSE 452

UNDERGRADUATE ORTHOPAEDIC CURRICULUM

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CURRICULUM COMMITTEE MEMBERS

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Aim and Scope of Curriculum

The aim of this curriculum is to improve the competencies of all future doctors in the assessment and management of musculoskeletal conditions and to produce competent graduates with the knowledge and skills to manage common or important musculoskeletal conditions irrespective of future specialty. To achieve this, **the minimum level of competence** in musculoskeletal conditions for all medical students, that is all future doctors, has been defined in this curriculum.

A competency-based approach has been utilized to design this curriculum. In a competency-based curriculum, 452 courses, must demonstrate that the students are competent in the assessment and management of common or important musculoskeletal conditions irrespective of future specialty. This approach defines desired graduate abilities (outcomes) and allows those outcomes to guide the development of curricula, assessment, and evaluation.

Goals

By the end of the course, students will have demonstrated the ability to:

1. Demonstrate essential knowledge required to diagnose, initially manage and to know when to immediately refer a patient with a condition that requires urgent specialist management.
2. Demonstrate knowledge to specify the symptoms, signs and immediate complications; to outline the assessment and appropriate investigation and; to outline the immediate and long term management of patients with common and community related orthopedic conditions and musculoskeletal trauma.
3. To take a relevant and a focused MSK history in the knowledge of the characteristics of the major conditions of: bone; joints; connective tissue; nerve tissue and; muscle tissue.
4. To perform a focused physical examination of major joints (shoulder, hip, knee, foot and ankle, PN and spine)
5. To order and to demonstrate an appropriate use and interpretation of appropriate investigations including: radiography, CT/MRI/bone scan, MSK U/S, serology, synovial fluid analysis, and EMG/NCS.
6. The ability to perform a common non-surgical orthopaedic procedures like joint aspirations and ability to apply and remove a cast.

Orthopaedic Core Competencies

1. **EMERGENCIES / RED FLAGS**
2. **FRACTURES / TRAUMA**
3. **PEDIATRIC ORTHOPAEDIC CONDITIONS**
4. **NON-TRAUMATIC ORTHOPAEDIC CONDITIONS**
5. **CLINICAL ASSESSMENT & DIAGNOSIS SKILLS**

COMPETENCY 1
EMERGENCIES / RED FLAGS

Learning Outcome:

- The ability to demonstrate knowledge, the ability to diagnosis, initially manage and to know when to immediately refer a patient with a condition that requires urgent specialist management. This requires the ability to indentify, characterize and differentiate through patient inquiry, examination and limited investigation, within the context of knowledge and outline management of:

1. **Open Fractures**
2. **Fractures with nerve or vascular compromise**
3. **Compartment Syndrome**
4. **Cauda Equina Compression**
5. **Bone, Joint and Soft Tissue Infection**
6. **Multiple Trauma (Pelvic Fracture)**
7. **Acute Joint Dislocations**

COMPETENCY 2
FRACTURES / TRAUMA

Learning Outcome 1 (clinical assessment):

1. The ability to specify the symptoms, signs and immediate complications; to outline the assessment and appropriate investigation and; to outline the immediate and long term management of patients with: (see the list down)
2. To be able to describe and interpretate the radiological findings of the fractures and to identify abnormality from normality with respect to fracture displacement, comminuation, and intra- or extra-articular involvements.

Learning Outcome 2 (Management):

1. To be able to understand and contrast between adult and pediatric with respect to growth plate injury, healing and remodeling, principles of treatment, and expected complications.
2. To demonstrate knowledge of indication of non operative treatment and to know the most common non-operative procedures for fracture and dislocation. This includes closed reduction, immobilization such as Plaster of Paris or elastic wraps. e.g. distal radius fracture / shoulder dislocation.
3. To be able to describe the surgical principles of reduction, fixation and immobilization for fracture and multiple trauma management. This includes familiarity with the treatment of the most common fractures such as hip, wrist and ankle fractures. To know the most common operative procedures for fracture and dislocation. This includes open reduction, the use of internal and external fixation devices.

- **Common Adult Fractures**

    a. **Upper Limbs**
        - Clavicle

- Humerus (proximal and shaft)
- Both Bone Forearm
- Distal Radius

b. Lower Limbs

- Femur (shaft)
- Hip Fractures (neck, IT)
- Tibia (shaft)
- Ankle (M.M., L.M., B.M.)

c. Pelvic

- **Common Pediatric Fractures and Trauma**

d. Upper Limbs

- supracondy. Fracture
- Distal (Radius)
- Clavicle

e. Lower Limbs

- Femur Fracture

- **Peripheral Nerve Injuries**
  -Types
  -Management

- **Acute Spine Injuries**
  - Stable vs. Unstable Injuries
  - Principles of Management

- **Soft tissue injuries**
  - Muscle, tendon, and ligament injuries
  - Knee - ACL
    - MCL
    - Meniscus
  - Ankle Sprain

- **Joint dislocation**
  - Anterior Shoulder Dislocation

COMPETENCY 3
PEDIATRIC

Learning Outcome:

- The ability to outline the clinical features; to specify the symptoms and signs; to outline the assessment and investigations; to propose a differential diagnosis and; outline the principles of management of pediatric patient with conditions including:

1. **Hip Conditions**
    - SCFE
    - DDH
2. **Lower Extremities Condition**
    - Alignment / Rotational conditions
    - Gait Problems
    - Lower extremities deformities

COMPETENCY 4:
NON-TRAUMATIC ORTHOPAEDIC CONDITIONS

1. Spine

Learning Outcomes:

- The ability to take a relevant history in the knowledge of the characteristics of the major conditions:
    1. **Degenerative/Mechanical neck/back pain**
    2. **Spinal cord or root entrapment (for example, herniated lumbar disc)**
    3. **Vertebral fracture of osteoporotic origin**
    4. **Spinal deformity (scoliosis)**
    5. **Destructive (infectious and tumor related) back pain (for example, tuberculosis, metastasis, certain cancers)**

- The ability to specify the symptoms and signs; outline the assessment and appropriate investigation; propose a limited differential diagnosis and; outline the principles of management of a patient with:
    - **Low back pain and sciatica**

2. Tumor

Learning Outcomes:

- The ability to specify the symptoms and signs; outline the assessment and appropriate investigation; propose a limited differential diagnosis and; outline the principles of management of a patient with:

    - **Metastatic bone disease**

    - **Primary bone lesions**
        - **Benign tumors**
            - Osteoid osteoma
            - Bone Cyst
                - UBC
                - ABC
                - GCT
            - Osteochondroma
        - **Malignant tumors**
                - Osteosarcoma / Ewing's sarcoma

3. Metabolic

Learning Outcomes:

- The ability to specify the symptoms and signs; outline the assessment and appropriate investigation; propose a limited differential diagnosis and; outline the principles of management of a patient with:

    - **Osteoporosis**

    - **Osteomalacia and Rickets**

4. Joint Conditions

Learning Outcomes:

- The ability to specify the symptoms, signs, and predisposing factors; outline the assessment and appropriate investigation; propose a limited differential diagnosis and; outline the principles of management of a patient with:
    - **Degenerative OA**
    - **Shoulder Chronic Condition**

COMPETENCY 5
Skills

Clinical Assessment & diagnosis skills

1. History taking

Learning Outcomes:

- To identify abnormality from normality with respect to pain, displacement, dislocation stiffness, swelling, and limitation of activities by a history relevant to the musculoskeletal system
- To be able to take a relevant history in the knowledge of the characteristics of the major conditions of: bone; joints; connective tissue; nerve tissue and; muscle tissue as they relate to both acute and chronic injury or other disease process and to understand the impact on the individual of a chronic musculoskeletal condition due to impairment of function, limitation of activities and restriction of participation

2. Physical Examination

Learning Outcomes:

- The ability to: identify normality and abnormality by examination of the musculoskeletal system; to be able to perform focused physical examination of major joints in order to identify and characterize by examination, pain, tenderness, swelling, dislocation, displacement, deformity, muscle wasting, weakness, abnormal movement, and functional impairment.

    - **Upper Extremity**

- **Shoulder**
- **Hip**
- **Knee**
- **Foot and ankle**
- **Spine**
- **Peripheral nerve**

3. Investigation

Learning Outcomes:

- The ability to order and to demonstrate an appropriate use and interpretation of appropriate investigations including: radiography, CT/MRI/bone scan, MSK U/S, Blood work (WBC, differential, ESR/CRP) synovial fluid analysis, and EMG/NCS.

4. Attitude and communication skills

Learning Outcomes:

- To demonstrate the appropriate attitude and communication skills for the management of people with acute and chronic musculoskeletal conditions; to have an understanding of the problems of people with musculoskeletal conditions and the full impact on the individual and their care givers (for example, focus on chronic low back pain) and to have a holistic approach to the patient

5. Procedural Skill

Learning Outcomes:

- The ability to perform a common orthopaedic procedures performed at ER like:
    - **Closed reduction of fractures and dislocated joints and understand the principles of management and to know when to refer to further subspecialty care.**
    - **Knee joint aspirations.**
    - **Apply and remove a cast**

Educational Strategies

Teaching and learning methods and places:

1. **Lecture (Large group):**
    a. Only to provide a core knowledge materials.

2. **Case-based learning –CBL- (Small groups):**
    a. Problem solving sessions:
        i. Limping child.
        ii. Febrile patient with painful swelling joint.
        iii. Patient with a pathological fracture.
        iv. Soft tissue/NV injuries.
        v. Chronic painful joint.
        vi. Low back pain
    a. Topics will be assigned in a head of time to the students with clear objectives.
3. **"Hands-on" small groups sessions:**
    a. Physical examination skills
    b. Splinting and casting technique skills
    c. Principles of fractures & joints dislocation reduction.
    d. Joint aspirations.
4. **Ambulatory care teaching**
    a. History taking skills
    b. Each student will have a chance of take, present, and discuss patient history with the attending staff tow times during the course.
5. **Plaster room**
    a. Each student will have chance to observe, apply and remove the cast/splint during the course for at least tow times.

Learning Resources:

- Books
- Tutorials / Lectures
- CBL
- Handouts

Assessment

Domains need to be assessed:

1. Knowledge
    a. High order thinking
    b. Decision making

    c. Knowledge application
    d. Minimize the factual knowledge Qs.
2. Skills
    a. History taking
    b. Physical examination
3. Attitude/ communications

Purpose of assessment

1. Summative
2. Formative

Type of assessment:

1. Continues assessment (20%)
    a. History taking at OPD (5%)
    b. CBL (10%)
    c. Hands-on skills sessions (5%)
2. OSCE (35%)
    a. History taking
    b. Physical examination
    c. Procedural skills
    d. Communication skills
3. Written (45%)
    a. Computer based
    b. Clinical scenarios / Images
    c. MCQs/ single best answer