Department of Orthopaedics
College of Medicine
King Saud University

Surgery Course 452

Orthopaedic Surgery and Trauma Curriculum for the Undergraduate Students

Student's Guide Booklet

2019-2020

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Introduction:

Orthopedic Department at King Saud University welcomes all students joining in the Course 452: Orthopedic and Trauma Surgery.

452 Course is a mandatory course during 4th year. All medical students need to take this course in order to fulfill the requirement of the graduation.

We believe that our course has been received well by all previous student groups especially during last two years after it has been re-developed with the aim of improving competencies of all future doctors in the assessment and management of musculoskeletal conditions.

This booklet provides a general introduction for Surg. Course 452 and will serve as a guide for both students and teaching faculty members. It will include the following; learning outcomes & objectives, core curriculum contents, teaching and learning methods, teaching and learning places and events, learning resources, assessment, methods and course evaluation.

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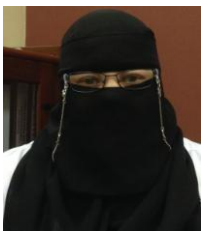

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Curriculum Overview

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 **urgent** musculoskeletal conditions ***irrespective*** of future specialty. To achieve this, the **minimum level of competencies** required 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 the urgent and common 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 of the Course:

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

1. Diagnose, initially manage and to know when to immediately refer a patient with a condition that requires **urgent** specialist management.
2. 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. Take a relevant and a focused MSK history in the knowledge of the characteristics of the major MSK conditions affecting the bone, joints, connective tissue, nerve tissue, and muscle tissue.
4. Perform a focused physical examination of major joints (shoulder, hip, knee, foot and ankle, PN and spine) in order to identify normality and abnormality.
5. 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. Perform a common non-surgical orthopaedic procedure likes joint aspirations and application or removal of a limb cast/splint.

7. Demonstrates interpersonal and communication skills that result in the effective exchange of information and collaboration with colleagues, nurses, teaching faculty, patient, and health professionals.
8. Demonstrates a commitment to carrying out professional responsibilities by exhibit appropriate professional behaviors during the course, including honesty, integrity, commitment, compassion, respect and confidentiality.

Curriculum Core Contents & Competencies:

I. EMERGENCIES / RED FLAGS

II. FRACTURES / TRAUMA

III. PEDIATRIC ORTHOPAEDIC CONDITIONS

IV. NON-TRAUMATIC ORTHOPAEDIC CONDITIONS

V. CLINICAL & DIAGNOSTIC SKILLS

VI. PROCEDURAL SKILLS

VII. INTERPERSONAL AND COMMUNICATION SKILLS

VIII. ATTITUDE AND PROFESSIONALISM

I. EMERGENCIES / RED FLAGS

Learning Outcome:

The ability to demonstrate knowledge, the ability to diagnosis, initially manages 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:

Open Fractures

Fractures with nerve or vascular compromise

Compartment Syndrome

Cauda Equina Compression

Bone, Joint and Soft Tissue Infection

Multiple Trauma (Pelvic Fracture)

Acute Joint Dislocations

II. FRACTURES / TRAUMA

Learning Outcome 1 (clinical assessment):

1. To be able 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 interpret the radiological findings of the fractures and to identify abnormality from normality with respect to fracture displacement, angulation, comminuted 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 indications 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.

1. Common Adult Fractures

- **Upper Limb fractures**

Clavicle

Humerus (proximal and shaft)

Both Bone Forearm

Distal Radius

- **Lower Limb fractures**

Femur (shaft)

Hip Fractures (neck, IT)

Tibia
(shaft)

Ankle (M.M., L.M., B.M.)

- **Pelvic fractures**

Unstable
fractures

Stable
fractures

2. Common Pediatric Fractures

- **Upper Limbs**

Supracondylar Fracture

Distal (Radius)

Clavicle

- **Lower Limbs**

Femur Fracture

- **Growth plate injuries**

3. Peripheral Nerve Injuries and neuropathies

- Radial N
- Median N
- Ulnar N
- Sciatic N
- Common Peroneal N

4. **Acute Spine Injuries**
    - Stable vs. Unstable Injuries
    - Principles of Management
5. **Soft Tissue Injuries**
    - Muscles, tendons, and ligaments injuries
    - Knee
        - Anterior cruciate ligament (ACL)
        - Posterior cruciate ligament (PCL)
        - Medial collateral ligament (MCL)
        - Lateral collateral ligament (LCL)
        - Meniscus
    - Ankle ligaments Sprain
6. **Joint dislocation**
    - Anterior Shoulder Dislocation
    - Knee dislocation

III. PEDIATRIC ORTHOPAEDIC CONDITIONS

Learning Outcome:

To be able 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**
    - Slipped capital femoral epiphysis (*SCFE)*
    - Developmental Dysplasia of the Hip (*DDH)*
2. **Lower Extremities Condition**
    - Alignment / Rotational conditions
    - Gait Problems
    - Lower Extremities Deformities

IV. NON-TRAUMATIC ORTHOPAEDIC CONDITIONS

1. Common Spine disorders

Learning Outcomes:

To be able to take a relevant history in the knowledge of the characteristics of the major conditions:

- Degenerative/Mechanical neck/back pain
- Spinal cord or root entrapment (for example, herniated lumbar disc)
- Vertebral fracture of osteoporotic origin
- Spinal deformity (scoliosis)
- 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. MSK Tumors

Learning Outcomes:

To be able 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
    - Unicameral bone cyst (UBC)
    - Aneurysmal bone cyst (ABC)
    - Giant-cell tumor (GCT)
  - Osteochondroma
- **Malignant tumors**
  - Osteosarcoma
  - Ewing's sarcoma

3. Metabolic Bone Diseases

Learning Outcomes:

To be able 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. Degenerative and Inflammatory Arthritis

Learning Outcomes:

To be able 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**
- **Inflammatory arthritis**

  Rheumatoid Arthritis

  Gout

  Seronegative spondyloarthropathy

5. Common Shoulder Conditions

Learning Outcomes:

To be able 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:

- Impingement syndromes
- Instability
- Rotator cuff tendinopathies and tears
- Adhesive capsulitis
- AC joint problems

6. Common Foot and Ankle 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:

- Hallux valgus
- Plantar fasciitis
- Flat feet
- Diabetic & Charcot foot

V. CLINICAL AND DIAGNOSTIC SKILLS

1. History Taking skills

Learning Outcomes:

a) 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.

b) 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 skills

Learning Outcomes:

a) The ability to: identify normality and abnormality by examination of the musculoskeletal system; to be able to perform focused physical examination of major joints:

1) Shoulder

2) Hip

3) Knee

4) Foot and Ankle

5) Spine

6) Peripheral Nerve

The objectives for the joints physical examinations were summarized on table, which attached at the appendix.

Shoulder Examination

Objectives:

By the end of the teaching session, Students should be able to identify normality and abnormality by of the shoulder joint by performing a proper physical examination of shoulder joints in order to identify and characterize the following:

a) **Look**:
   a. Expose both shoulder and upper limbs properly.
   b. Inspect front, side and back.
   c. Look for Limb/joints position, alignment (deformity), swelling, or skin changes
   d. Muscle contour/wasting: Deltoid, Supra- Infraspinatus muscles

b) **Feel**:
   a. Boney prominences and soft tissues for swelling or tenderness.
   b. Temperature.

c) **Move**:
   a. Start with active ROM :
      i. Forward Flexion. The motion involved in reaching forward and up to a cupboard above the head. This is measured from zero (lowest) to 180 degrees.
      ii. Abduction: 0 degree beside body and 180 at maximum Abduction
      iii. External rotation: Ask the patient to keep the upper arms flat against his/her sides and rotate the forearms outward. The range is from zero (straight ahead) to 80-90 degrees.
      iv. Internal Rotation: Ask the patient to rotate his arm across his back and walk the fingers as far up the back as possible, recording this by vertebral level. (inferior tip if scapula is =T7, Iliac crest=T5)

b. Note if painful/painless.
c. Attempt passive ROM if active ROM is limited or painful.

d) **Do special tests**:
   a. Rotator cuff integrity and strength:
      - Supraspinatus: (empty can test/Jobe test) : Resisted abduction with the arm in 90 abduction, 30 of forward elevation in the plane of the scapula and maximally internally rotated. A positive test occurs when there is pain with weakness.
      - Subscapularis: lift-off test
      - Infraspinatus+Teres minor: resisted external rotation with arm against body side
   b. Stability
      - Apprehension test: can be done in any position
   c. Impingement syndrome:
      - Neer's impengment sign: pain with FF with humerus in Internal rotation position
      - Hawkin's test: With the arm in the throwing position (90 degree of FF) and flexed forward about 30 degrees, forcibly internally rotate the humerus. Pain suggests impingement of the supraspinatus tendon against the coraco-acromial ligament.

Hip Examination

Goals:

To be able to perform a proper hip examination and identify any abnormality that aids in diagnosis

Examination

Standing

Look:

Pelvic Obliquity (Shoulder level, pelvis level, Lumbar lordosis, Spinal deformities) Gait (Antalgic, Trendelenburg)

Do Special Test (standing position)

Trendelenburg s Sign

Supine

Exposure: Umbilicus to mid-thigh and cover the genetalia

Look:
Skin Changes
Ms Wasting (Glutei)
Feel:
Skin Temperature, tenderness GT or other
Bony Landmarks (ASIS, Iliac crest, GT, Pubic Tub.)

Move:
Start with **Thomas Test** to assess for FFD by fully flexing opposite side
If **Thomas Test** is positive, assess flexion and extension with the patient lying on side while stabilizing the pelvis.
Passive Abd/Add on Supine position and stabilize the pelvis, IR/ER at 90 hip flexion
Do Special Test:
Measure True LLD
If there is difference, Do the **Galeazzi sign**

Knee Examination

Objective:

To be able to perform examination of the knee and to distinguish and identify an abnormal finding that suggests a pathology.

1. Standing:

    - Expose both lower limbs from mid-thigh down
    - Comment on knee alignment while standing (varus/valgus and wither physiological or pathological))
    - Look for abnormal motion of the knees while walking
    - Look for ankle and foot alignment and position
    - Gait

2. Supine:

    - Expose to mid thigh
    - Look:
        - Skin changes
        - Swelling
        - deformity
        - Muscle wasting (quadriceps)
        - Inspect the back of the knee.

- Feel:
    - Check and compare temperature
    - Palpate joint line in flexion of 90 degrees for tenderness
    - Feel for any bony or soft tissue tenderness
    - Palpate for any lumps in the soft tissue or bone around the knee

- Move:
    - Active R.O.M and compare to normal side
    - Passive ROM if abnormal.
    - Be able to approximately describe ROM in degrees OR use goniometer for proper measurement
    - Comment on pain or crepitus with movement

- Special tests:
    - ACL: 1. Anterior Drawer Test |(ADT) at 90 degrees and 2. Lachman at 30 degrees (most sensitive)
    - PCL: Posterior Drawer Test (PDT) at 90 degrees
    - MCL: Valgus stress Test
    - LCL: Varus stress Tets
    - Tests for effusion:
        - Milking test: in extension milk then knee medially upwards to fill the suprapatellar pouch and hold fluid in pouch with one hand then run other hand laterally downwards and look for filling medially (moderate effusion)
        - Patellar tap: in extension tap the patella downward and feel the patella bounce on the femur (large effusion)
        - A warm knee can be suggestive of mild effusion.
    - Patella instability: Apprehension test for patellar instability: start in extension with relaxed quadriceps, push patella laterally, then ask patient to start flexing the knee to 30 degrees, at any point if patient contracts his quadriceps aggressively or becomes apprehended stop and identify test as positive

Foot and Ankle Examination

Objectives

To be able to perform examination of the foot and ankle and to distinguish and identify an abnormal finding that suggests pathology.

Examination

Look (weight bearing and none weight bearing)
Proper bilateral exposure, at least mid leg, compares Rt and Lt, front , side and back.
A. Alignment.
B. Deformity (hind foot: varus or valgus, mid foot: cavus, flat foot. Forefoot: HV)
C. Skin changes (callosities)
D. Swelling or mass
E. Muscle wasting (leg)
F. Gait:

Feel
A. palpate for Soft tissue and bony tenderness, swelling, and tempreture

Move
Active and passive ankle and subtalar ROM

Special tests:
A. lateral ankle ligament: Anterior drawer test with ankle planterflection to evaluate anterior talofibular ligament (8mm diff)
B. flat feet: If pt has flat foot: you will ask the pt to tip toe to check if it is flexible or rigid flatfoot, you have to observe if the heel will correction from valgus to varus or not as well as mid foot arch reconstitution.
C. Achilles tendon test: Thompson test.
D. How to differentiate between Achilles tightness or only gastroc. Tightness, by dorsal flexion of ankle while the knee extended then flexed will help for spine session but not for ankle and foot itself)

Back (Thoraco-Lumbar Spine) Examination

Goal:
To establish competence in physical examination of the thoraco-lumbar spine

Method:

1. First: standing/walking position:
    a. **Look**:
        i. Expose thetrunk and lower limbs properly.
        ii. Examine front and back.
        iii. Anydeformity, swelling, or skin changes (scars, hairy tuft, "café au lait" spots).
        iv. Are shoulders & pelvis level.

        v. Gait:
            1. Abnormal types: Antalgic, Trendelenberg, waddling.
            2. Heel and toe walking: unable to heel walk= L4 weakness, unable to toe walk= S1 weakness
    b. **Feel**:
        i. Palpate spinous processes for tenderness, steps or gaps.
        ii. Soft tissues: temperature, tenderness.
    c. **Move**:
        i. Start with active ROM in all 6-directions
            1. Flexion. Record as such: able to touch toes/shins/knee/thighs…etc.
            2. Extension: normal around 30°
            3. Lateral bending: normal around 30°
            4. Rotation: normal around 40°
        ii. Note if painful/painless.
        iii. Attempt passive ROM if active ROM is limited and painless, record.

        Special tests:
        iv. Adams Forward bending test: full forward flexion until back is horizontal to the floor. If thoracic scoliosis is present, then rib hump will become visible.

2. **Second: Supine position.**
    a. Look:
        i. Note any muscle wasting in the lower limbs.
    b. Feel:

i. Check for Leg length discrepancy (ASIS to medial malleolus).

c. Special tests:

i. Straight leg raising test (SLRT):

1. With the patient supine, passively elevate the leg –the examiner's hand behind the heel- with knee extended while observing the patient's face for sign of discomfort.
2. A positive test is reproduction of sciatica-i.e. sharp shooting pain that radiates below the knee- between 30° and 70°of hip flexion.
    a. The pain is aggravated with dorsiflexion of the ankle and relieved with knee flexion.
    b. Hamstring tightness and knee or hip pain should be distinguished from a true positive SLR.
        i. Screening Hip and knee examination (e.g. rotation of the hips, joint line tenderness at the knees) should be done to rule out hip or knee OA which can be confused with sciatica.

d. Neurologic examination:

i. Motor: Hip flexion=L2, knee extension=L3, Ankle dorsiflexion=L4, EHL=L5, Ankle plantar flexion=S1.
ii. Sensory: dermatomes.
iii. Tone: normal, flaccid or rigid.
iv. Reflexes: knee & ankle jerks.

Peripheral Neuro-vascular Examination

Goals:

To be able to perform upper & lower limb peripheral nerve and vascular examination properly – as an adjunct to orthopedic examination of any limb-and identify any abnormality that aids in diagnosis

Examination:

1. Upper limb:
    a. Median nerve:
        i. Inspection: Thenar muscle wasting.
        ii. Motor: Thumb abduction or opposition (opposition of thumb to little finger and NOT to index finger for OK sign).
        iii. Sensory: fine touch over volar aspect of index finger
    b. Ulnar nerve:
        i. Inspection: hypothenar muscle wasting, claw hand
        ii. Motor: finger abduction, Froment's sign
        iii. Sensory: fine touch over volar aspect of little finger
    c. Radial nerve:
        i. Inspection: drop wrist
        ii. Motor: wrist extension
        iii. Sensory: fine touch over dorsal aspect of first web-space

2. Lower limb:
    a. Femoral nerve:
        i. Inspection: Quadriceps wasting
        ii. Motor: knee extension
        iii. Sensory: medial aspect of leg and foot (saphenous nerve).
    b. Common peroneal:
        i. Inspection: drop foot, anterior leg muscle wasting
        ii. Motor: ankle dorsiflexion
        iii. Sensory: dorsal aspect of foot
    c. Tibial:
        i. Inspection: calf muscle wasting
        ii. Motor: ankle plantar flexion
        iii. Sensory: plantar aspect of foot

3. Vascular exam:

a. Look: Thin, shiny, hairless skin. Ulcers. Pallor.
b. Feel: temperature
c. Special tests:
    i. Capillary refill (normal is <2 seconds).
    ii. Pulses

3. Interpretation skills (investigations)

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.

VI. Procedural Skills

Learning Outcomes:

The ability to perform common orthopaedic procedures performed at ER like:

1. Closed reduction of fractures and dislocated joints and understand the principles of management and to know when to refer to further subspecialty care.
2. Knee joint injection/aspirations.
3. Application and removal of a cast/splint

Skill 1:
Knee Aspiration

Goal:
The student demonstrates procedural skills to perform a knee aspiration and analyze the synovial fluid.

Objectives:

To be able to perform knee joint effusion aspiration properly, and to be able to differentiate between different appearance and consistencies of the synovial fluid. The students will be performing this procedure on a manikin in the education center skill lab, under the supervision of the orthopedic surgeon assigned.

Principles of Knee Joint Aspiration:

- Explaining the procedure and risks for the patient
- Identifying boney landmarks of the knee joint.
- Instruments needed: sterile gloves and cleaning set, antiseptic solution, syringe, local anesthesia.
- Tubes needed and for what:
    - CBC: cell count (WBC and RBC).
    - 4-5 sterile tubes: gram stain, C/S, histopathology, biochemistry, and if suspecting ask for T.B- brucella- and fungus.
    - 2 blood culture tubes: aerobe and anaerobe.
- Cleaning and draping the knee under aseptic conditions.
- Possible entry points: joint line or supra patellar pouch.
- How to aspirate and exchange syringes.
- How to analyze the aspirate: amount, color, consistency, any content, and viscosity.
- Cover and bandage the aspiration site.

KEYPOINTS
Knee Aspiration (Arthrocentesis)

The knee joint is the most common and the easiest joint for the physician to aspirate. Knee joint aspiration and is performed to establish a diagnosis, relieve discomfort or instill medication.

Indications

A. Diagnostic

- Diagnosis of suspected septic arthritis.
- Identification of crystal arthropathy.

B. Therapeutic (Rare)

- Relief of pain by aspirating effusion or blood and Injection of medications.

Contraindications

Relative contraindications include the following:

- Cellulitis overlying the joint.
- Uncontrolled coagulopathy.

Equipment

- Sterile gloves and drapes
- Gauze pads, 4 × 4 in.
- Skin preparatory solution (alcohol or chlorhexidine)
- Lidocaine 1%.
- Syringes: 60 mL.
- Needles, 18 gauge.
- Patients who are morbidly obese might require a 21-gauge spinal needle for arthrocentesis.
- Specimen tubes, blood culture tubes: specimen will be sent for (cell count, Gram stain, AFB, aerobic and none aerobic cultures, fungal, TB cultures and crystals.
- Bandage.

Patient Preparation

Explain the procedure to the patient

Adult patient should be relaxed.

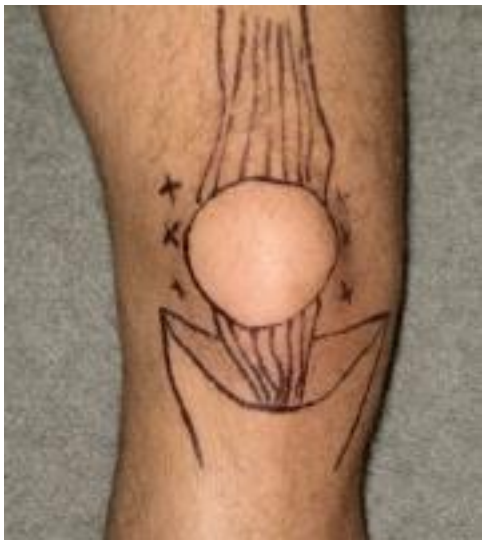
For pediatric patient, it should be done in operating room or under conscious sedation.

Approach

Lateral suprapatellar approach

Knee extended on the bed.

Insert the needle 1 cm above and 1 cm lateral to the superior lateral aspect of the patella at a 45-degree angle.



Please note that this picture for the location of entry point.
But handles (doctor) MUST have full field prepped and draped under full aseptic technique.

Skill2:
Closed Reduction of acute Joint Dislocation and Displaced bone Fracture

Objectives:

The students should be able to perform a closed reduction, and maintain the reduction for an acutely dislocated joint (e.g. shoulder) or a displaced closed long bone fracture (e.g. distal radius).

Principles of Reduction:

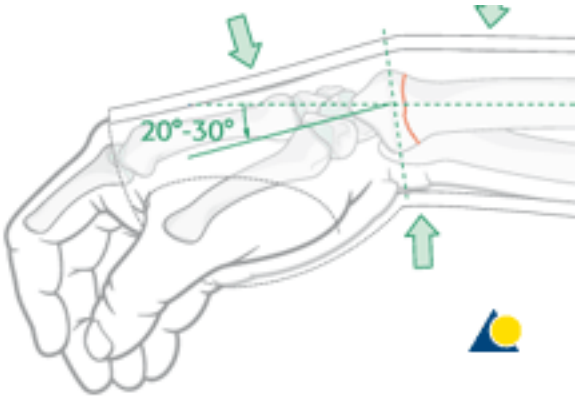
1. ***Activate ATLS if it is a high energy trauma or associated with other injuries***
2. ***Analgesia++***
3. ***Quick clinical/NV assessment***
4. ***2 view x-rays***
5. ***Urgent reduction OR alignment***
6. ***Check stability and safety zone (for joint dislocated joint)***
7. ***Re-check neurovascular status after reduction***
8. ***Examine the compartment to R/O Compartment syndrome***
9. ***Post reduction 2 view X-rays***
10. ***Immobilize the joint***
11. ***Consult Orthopaedics***

Reduction technique for anterior Shoulder Dislocation:

- Perform traction-counter traction maneuver.

Reduction technique for Colles Distal Radial Closed Fracture:

- Patient supine in bed with the affected limb towards its edge.
- Identifying boney landmarks of the wrist joint and distal forearm.
- Perform traction then reversal of deformity.
- A pop of reduction can felt and heard, if not maneuver the fracture by the milking the distal fragment during the traction.
- Apply a below elbow full P.O.P cast with three points of preture.
- Check distal neurovascular, and do a post reduction X-ray.
- If reduction achieved and satisfactory, then extend the cast to above elbow in pediatric and below elbow for adults.
- Post casting distal neurovascular status and post reduction orthogonal X-rays.
- To outline the patient care during the cast and after the immobilization ends.


20°-30°

Skill 3
Splinting and Casting

Objectives:

Students should be able to ably and remove:

- Above and below KNEE full cast & splint
- Above and below ELBOW full cast & splint

General Application Procedures

The physician should carefully inspect the involved extremity and document skin lesions, soft-tissue injuries, and neurovascular status before splint or cast application. Following immobilization, neurovascular status should be rechecked and documented.
Pay attention to the patient comfort status and pain level; never re-align a fracture without adequate analgesia.
The patient's clothing should also be covered with sheets to protect it and the surrounding area from being soiled by water and plaster or fiberglass.

General roles for cast fixation:

- Immobilize the joint above and below the fracture
- Try not to immobilize any joint unnecessarily
- Immobilize the joint in functional position whenever possible; e.g. knee 10-15 degree flexion, elbow 90 degree flexion, ankle and wrist are neutral
- At the wrist stop just proximal to the distal palmer crease, to keep metacarpophalangeal joint free
- Proximally: A. Below elbow: two finger width distal to the elbow crease
  B. Above elbow: just below deltoid insertion
- For the foot; distally keep all the toes exposed
- Proximally: A. Below knee: Just below The tibial tuberosity
  B. Above knee: upper third of the

Types and techniques

A. Complete cast:

- Measure the length
- The physician hold the limb reduced and the assistant apply stockinet
- Stockinet; 10 cm longer than the required length, therefore can be folded
- Soft roll application; in the same position the limb will be immobilized, avoid folds at joint line, apply extra padding at bony prominence (each layer with 50% overlap)
- Assistant immerses P.O.P in warm water until all air bubble within the bandage disappears
- Squeeze the bandage to expel excess water

- P.O.P applied around the limb with gentle firmness, each circle should overlap about half the width
- The plaster should be smoothed and molded
- Limb should be elevated and iced in the first 48hrs to decrease the swelling

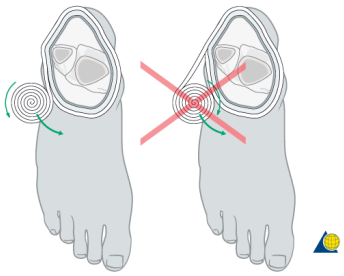


Figure: Note handling the soft rolls and POP cast.

Figure: 50% overlap for the soft rolls when applied.

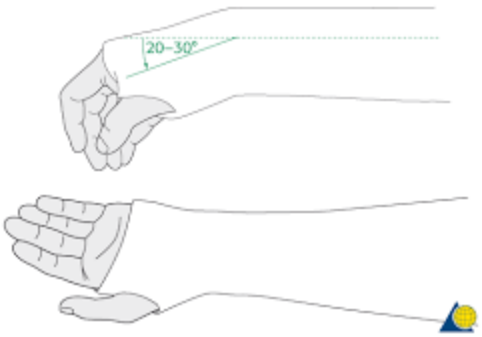


Figure: Distally the distal palmer crease should be seen, for distal lower limbs all the toes are exposed.

Figure: for above knee at upper third of thigh (note folding of the stockinet to make smooth upper end), for below knee the proximal end just below tibial tubercle, for below elbow two fingers width below elbow crease and above elbow just below deltoid insertion.

B. Plaster slab:

- Measure the length
- The physician hold the limb reduced and the assistant apply stockinette
- Stockinette; 10 cm longer than the required length, therefore can be folded
- Soft roll application; in the same position the limb will be immobilized, avoid folds at joint line, apply extra padding at bony prominence
- A longitudinal piece of plaster prepared to the required length, folded in 10 layers
- Assistant immerses P.O.P in warm water until all air bubble within the bandage disappears
- Squeeze the bandage to expel excess water
- Apply dorsally and hold by gauze bandage
- Limb should be elevated and iced in the first 48hrs to decrease the swelling

Cast instructions should be provided to the patient

- Keep limb elevated esp. first 48hrs
- Move fingers/toes
- Exercise all joints not included in the cast
- If fingers/toes become swollen, painful or stiff raise the limb, apply ice and move the fingers/toes
- If no improvement in half hr return to the hospital immediately
- If the cast becomes loose or cracked report to hospital

Cast removal

- A cast saw is a specialized saw made just for taking off casts. It has a flat and rounded metal blade that has teeth and vibrates back and forth at a high rate of speed.
- The cast saw is made to vibrate and cut through the cast but not to cut the skin underneath.

- After several cuts are made in the cast (usually along either side, in and out technique), it is then spread and opened with a special tool to lift the cast off.
- The underlying layers of cast padding and stockinet are then cut off with scissors.

Figure: Handling of the saw, in and out controlled cuts.

VII. Interpersonal and Communication Skills

Learning Outcomes:

Demonstrates interpersonal and communication skills that results in the effective exchange of information and collaboration with colleagues, nurses, teaching faculty, patient, and health professionals.

VIII. Attitude and Professionalism

Learning Outcomes:

Demonstrate a commitment to carry out professional responsibilities by exhibiting appropriate professional behavior during the course, which includes honesty, integrity, commitment, compassion, respect and confidentiality.

Educational Strategies:

New teaching and learning strategies have been implemented in this course. The main goal is to engage students in the learning process and hence, resulted in an active learning rather than just a passive learning. Because students learn more when information is presented to them in a variety of modes than when only a single mode is used. Different teaching methods have been utilized in this course in order to engage all learners.

In order to engage the students on an active learning process, the traditional large group teaching method (e.g. lecture) has been minimized as much as possible. Lectures do not usually provide evidence of students' understanding and knowledge application—that is explored in small group teaching and learning. A variety of small group teaching methods have been utilized in this course. Small group work encourages high level of interaction, deep learning and higher-order activities - e.g., problem solving, analysis and synthesis.

Teaching and Learning Methods:

A. Lecture (Large group)

B. Case-based learning –CBL- (Small group) C.

Small group tutorial (Small group)

D. Practical “Hands-on” session (Small group)

E. Clinical “bed-side” session (Small group)

F. Ambulatory care teaching (Small group/One-to-One)

A. Lecture (Large Group):

There will be no more than one lecture per day. Each lecture is 2 hours maximum divided in two parts, with 15 minutes break in between.

1. Introduction to the Orthopaedics
2. Orthopaedic History Taking
3. Diagnostic imaging & investigations in Orthopaedics
4. Principles of Fracture
5. Common Adult Fractures
6. Common Pediatric Fractures
7. Open Facture/ Fracture with NV compromise/Pelvic Fracture
8. Acute Joints Dislocation and Compartment Syndrome
9. Bone and Joint Infection
10. Acute Spinal Injuries and Cauda Equina Syndrome
11. Common Pediatric Hip Disorders
12. Common Pediatric Lower Limb Disorders
13. Common Spine Disorder
14. Sport and Soft Tissue Injuries
15. Inflammatory and Degenerative Joint Disorders
16. MSK Tumors
17. Metabolic Bone Disorders
18. Common Shoulder Problems
19. Common Peripheral Nerve Problems and Injuries
20. Common Foot and Ankle Problems

B. Case-Based Learning - CBL (Small Group):

CBL allows students to develop a collaborative, team-based approach to their education. Also, it helps them to improve their analysis, problem solving, and communication skills. Students learn best through practical applications of what they have learned; they tend to be problem-centered rather than subject-centered learners. Students can acquire new skills and information as they problem solve. In CBL, real clinical case scenario or clinical problem is used to stimulate and underpin the acquisition and application of knowledge and skills, and promote authentic learning.

In this course, there will be six cases, which generally written as problems that provide the student with a background of a patient or other clinical situation. These cases represent the most common problems that can face any general practitioners in their practice.

a. How to approach an adult patient with a fracture?
b. How to approach a pediatric patient with a fracture?
c. How to approach a patient with chronic joint pain?
d. How to approach a patient with acute a traumatic painful joint swelling?
e. How to approach a patient with low back pain?
f. How to approach a limping child?

C. Small Group Tutorial (Small Group):

a. Management of multiple trauma patient in ER

b. Management of open fracture in ER

c. Orthopaedic surgical procedures

D. Practical " Hands -o n" Session (Small Group) :

a. Application and removal of splint/cast:

i. Above and below elbow cast/splint ii.

Above and below knee cast/splint

b. Principles of fractures & joints dislocation reduction. i.

Colles' fracture

ii. Anterior shoulder dislocation

c. Knee joint aspirations.

E. Clinical " bed -side" Session (Small Group) :

There will be six physical examination sessions for each small group. Simulated patients will be utilized for every session.

a. Shoulder Examination

b. Hip Examination

c. Spine Examination

d. Knee Examination

e. Foot and Ankle Examination

f. Peripheral Nerve Examination

F. Ambulatory Care Teaching (Small Group/One-to One)

a. Each student will have a chance of take, present, and discuss patient history with the attending staff two times during the course.

b. Each student will have chance to attend three clinics i.

Two orthopaedic clinic

ii. One fracture clinic

c. The ambulatory care teaching place is an excellent setting for learning the following:

1) History taking & physical examination Skills

2) Images and other investigation interpretation skills

3) Communication skills

Teaching and Learning Places:

1. Lecture Theater
2. Seminar Rooms
3. Simulation Center
4. Outpatient Clinics
5. Operative Room
6. Emergency Room
7. Plaster Room

Learning Resources:

- Books
    - Apley's Concise System of Orthopaedics and Fractures
    - CURRENT Diagnosis & Treatment in Orthopedics
    - Clinical orthopaedic examination. Ronald McRae
- **Tutorials / Lectures (main resourse)**
- CBLs
- Handouts
- Simulation

Although, attending the required and scheduled teaching activities constitute the main source for learning and exam preparation.

Assessment:

The undergraduate committee has made huge efforts in order to provide accurate, reliable, and fair assessment. To pass this course, students have to be competent with the knowledge and skills essential for the provision of patient care. The learning outcomes and objectives for this course will be considered as the main drive for the assessment methods.

In this course, students' achievement of these competencies is assessed through a variety of methods that include; Mini-Clinical Evaluation Exercise (Mini-CEX), Directly Observed Procedural Skills (DOPS), Case-Based Discussion (CBD), Group presentation, written exam (MCQs), Objective Structured Clinical Examination (OSCE), and Objective Structured Assessment of Technical Skills (OSATS).

1. **Continuous Assessment**
    a. 20% of the total marks
    b. Clinical skills (5%)
        i. Assessment method: Mini-CEX
        ii. Will be conducted at OPD
        iii. Each student will have chance to do it at least two times to interview and clinically assess a real patient and discuss it with faculty
        iv. Scope of assessment:
            1. History taking & physical examination Skills

2. Investigation interpretation & diagnostic skills
3. Communication & organization skills

c. CBL (10%)

i. Assessment method: group presentation+ CBD

ii. Total of six CBLs

iii. Each 2-3 students will share in preparing, presenting, and discussing a real case (one CBL only) with their peers. (5%)

iv. The rest of the mark (5%) will be given upon attending the other five CBLs and Clinical skills. However, student need to be well prepared by reading the assigned materials and actively involved in the discussion.

d. Hands-on Skills Sessions (5%)

i. Assessment method: DOPS

ii. Ability to perform all required clinical and procedural skills in a proper technique.

iii. Clinical skills will include six sessions of physical examinations

iv. Procedural skills will include the three sessions

1. Knee aspiration
2. Cast application and removal
3. Fracture reduction

2. Mid-term examination

a. 40% of the total marks

b. Mainly for clinical and procedural skills assessment

c. At least six stations

d. Six minutes for each station

e. Combined OSCE & OSATS

f. OSCE

   i. History Taking skills

   ii. Physical examination skills

   iii. Communication skills

   iv. Counseling skills

g. OSATS

   i. Technical and procedural skills

3. Final Written Examination (40%)

a. Multiple choice questions

b. 60 MCQs and 5 SAQ

c. All questions will be a single best answer questions

d. Exam will be conducted through the computers

e. Clinical Scenarios / Images

f. The undergraduate committee and the course organizer has the authority and the responsibility to develop the number of questions for each topic delivered to the students according to a well structured exam blue-print, which covered all curriculum contents and matched to the learning outcomes and objectives stated earlier.

g. Total written exam time will be 2½ hours (previously 2 hours, students suggested to increase the time based on students' feedback two years back)

h. MCQ sample is provided at the appendix

Examination Policy and Procedures:

All students are expected to take examinations on the date and time they are scheduled. Being unprepared for an exam due to poor time management is not an acceptable excuse for rescheduling an exam.

Only those students with an attendance of at least 75% will be allowed to sit the course exam. No student will be allowed in the examination room if their name did not appear in the student's examination list. They should sit in the exam hall with their respective names only.

A student, who does not attend the final examination without a valid excuse he/she is given a grade of "0". However, if he/she does not attend due to a valid reason accepted by the College Board, then he/she is required to sit a remedial examination.

If a student has an unexpected temporary disability or a medical condition that the bars/prevent him/her to sit for the exam then he/she has to provide a detailed medical report to the Academic Guidance Committee and the student has to sit for re-sit examination, provided that he/she has been granted an approval letter from the Vice Dean for Academic for the final examination.

To pass this course, you need to pass both written examination in the form of MCQs & clinical/ technical skills examination in the form of OSCE+OSATS. Scores obtained from one examination cannot compensate from other examination.

Instructions for the Students on Day of Exam:

A student who arrives in the examination hall within the first 30 minutes after the commencement of the examination shall be permitted to attend the examination, but will not be allowed any extra time. However, students who arrive in the examination hall after 30 minutes of the commencement of the examination shall not be permitted to sit the exam.

Each student shall be asked by the invigilators to show their identification card in each examination. Failure to provide a proof of identification during an exam may result in expulsion from the exam room.

No student is allowed to leave the examination before the first half of the total duration of the exam.

Mobile phones, flash cards, electronic dictionaries, iPods, books, bags, notes, or any electronic devices are not permitted in any examination room. The College does not take any responsibility for materials left by students outside the examination hall.

All students are requested to comply with the college dress code and should wear their proper I.D.

If a student becomes ill during the examination and temporarily leaves the examination room, under supervision, he/she shall not be given extra time as compensation.

If the student is unable to continue the examination, the invigilator shall document the incidence and report the matter to the Assessment and Evaluation Centre, Department of Medical Education. The Vice-Dean for academic affairs shall determine and appropriate action will be taken.

Attendance:

All educational activities are valuable and important components of this course learning experience. It is highly recommended that students **MUST** attend all activities.

Students should contact their course director regarding any requests for being excused from a scheduled session.

All students are expected to come to class in professional dress consistent with College of Medicine Policy.

Students should be on time and attentive during the presentation (laptops closed, cell phones on silent mode, no texting etc).

If a student cannot attend due to illness or other reason, he/she must contact the course director in advance.

If a student misses more than 25% of the course activities, without any valid excuse or reasons he/she shall not be allowed to sit for final course examination and shall be given a grade of Denied (DN).

Course and Teaching Faculty Evaluation

Course evaluations are part of Orthopaedic department commitment to excellence in teaching and learning.

We guide 452-course improvement through evaluating the effectiveness of the educational program in ongoing manner using students' evaluations of their courses and faculty, and documenting the extent to which our curriculum objectives have been met.

Evaluations are your way to comment on the learning environment during the course and improve it for future medical students. The evaluation system is a confidential avenue for submitting honest, constructive feedback about the instructors and courses you experienced. Your full participation is needed to successfully initiate curricular change and improve the course.

Type of evaluation (forms included in appendix)

1. Instructor Evaluation: there will be two forms
    a. Large group (lecture) evaluation
    b. Small group (CBL) evaluation
2. Course Evaluation

Curriculum Map

Competency Domain			Learning outcomes "By the end of the course, students will be able to:"	Curriculum Core Competencies	Teaching and Learning Methods	Teaching Place	Assessment Methods
Knowledge			**Demonstrate essential knowledge required to:** **A) Diagnose, initially manage and to know when to immediately refer a patient with a condition that requires urgent specialist management.** **B) 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.**	**1. EMERGENCIES / RED FLAGS** **2. FRACTURES / TRAUMA** **3. PEDIATRIC ORTHOPAEDIC CONDITIONS** **4. NON-TRAUMATIC ORTHOPAEDIC CONDITIONS**	**1. Lectures** **2. CBL** **3. Small group Tutorial** **4. Ambulatory care teaching**	**1. Lecture Theatre** **2. Seminars Room** **3. Outpatient clinics**	**Continuous assessment: Group presentation** **Final assessment: MCQS**
Skills	**Clinical Skills**	**History Taking**	**Obtain 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.**	**1. History taking in Orthopaedics** **2. Physical Examination sessions:** **Hip** **Knee** **Foot & ankle** **Shoulder** **Peripheral nerves** **Spine**	**1. Clinical bedside teaching** **2. Ambulatory care teaching** **3. CBL**	**1. Outpatient clinics** **2. Seminars room** **3. In-patients floor**	**Continuous Assessment: Mini-CEX DOPS** **Final assessment: OSCE**
		Physical Examination	**Perform a focused physical examination of major joints (shoulder, hip, knee, foot and ankle, PN and spine)**				
	Diagnostic Skills		**Interpret and demonstrate an appropriate use of investigations including: radiography, CT/MRI/bone scan, MSK U/S, serology, synovial fluid analysis, and EMG/NCS.**	**Diagnostic Imaging and Investigations in Orthopaedics**	**1. Lectures** **2. CBL** **3. Small group tutorial** **4. Ambulatory care teaching**	**1. Lecture theater** **2. Seminars room** **3. Outpatient clinics**	**Continuous assessment: Group presentation** **Final assessment: MCQS**
	Procedural Skills		**Perform a common non-surgical orthopaedic procedures**	**1. Application and removal of splint/cast** **2. Fractures and Joints Dislocation Reduction** **3. Knee Joint Aspirations**	**Practical "Hands-on" session:** **1. Cast/Splint application and removal** **2. Fracture reduction** **3. Knee aspiration**	**1. Simulation Center** **2. Plaster room**	**Continuous assessment: DOPS** **Final assessment: OSATS**
	Communication Skills		**Demonstrates interpersonal and communication skills that result in the effective exchange of information and collaboration with patient, their families and health professionals.**		**1. Clinical bedside teaching** **2. Ambulatory care teaching** **3. CBL**	**1. Outpatient clinics** **2. Seminars room** **3. In-patients floor**	**Continuous assessment: Mini-CEX Group presentation** **Final assessment: OSCE**
Attitude			**Demonstrates a commitment to carrying out professional responsibilities by exhibit appropriate professional behaviors during the course, including honesty, integrity, commitment, accountability and respect**		**Attending all teaching activities**		**Performing all required assignments. Attendance all teaching activities Respect colleagues and faculty**

Physical Examination

Joint		Look (Inspection)	Feel (Palpate)	Move	Special Test
Shoulder		Alignment Deformity Muscle wasting Skin changes Swelling Scars Abnormal **G**ait	Bony or soft tissue tenderness Temperature	ROM both actively and passively	Empty can test/Jobe test Lift-off test Resisted external rotation Apprehension test Neer's impingement sign Hawkin's test
Hip					Thomas Test Trendelenburg's Sign Measure true LLD
Knee					Knee effusion ADT Lachman's test PDT Valgus stress T Varus stress T Patella apprehension T
Foot and Ankle					Anterior drawer test Thompson test.
Spine					Adams Forward bending test Straight leg raising test (SLRT) Nerve roots examination
Peripheral Nerve	**Median N**	Thenar muscle wasting	Fine touch sensation over volar aspect of index finger	Thumb abduction or opposition	
	Ulnar N	Hypothenar muscle wasting Claw hand	Fine touch sensation over volar aspect of little finger	Finger abduction strength.	Froment's Sign
	Radial N	Drop wrist sign.	Fine touch sensation over dorsal aspect of first web-space	Wrist extension strength.	
	Femoral N	Quadriceps wasting	Sensation over the medial aspect of leg and foot (Saphenous nerve).	Testing the knee extension strength.	
	Common Peroneal N	Drop foot sign Anterior leg muscle wasting	Sensation over the dorsal aspect of foot	Ankle Dorsiflexion strength	
	Tibial N	Calf muscle wasting	Sensation over the plantar aspect of foot	Ankle plantar flexion strength	

STUDENT'S
ASSESSMENT
AND
ATTENDANCE FORM

College of Medicine
Department of Orthopaedics
Orthopaedic Course 452

CBL Assessment Form

CBL NO.: _____
Student's ID No. Group No. _
Student's Name:_____ _____
Tutor's Name: _____

_____

1=Unsatisfactory 2=Poor 3=Good 4=Very good 5=Excellent

1. **Preparation and participation:**

Ability to:

Contribute actively to discussion	1	2	3	4	5
Use evidence when debate an issue	1	2	3	4	5
Demonstrate critical analysis skills	1	2	3	4	5
Integrate knowledge	1	2	3	4	5
Demonstrate deep understanding	1	2	3	4	5

Total Marks = 25

2. **Professional behaviour:**

Ability to:

Come to tutorials on time	1	2	3	4	5
Communicate effectively	1	2	3	4	5
Demonstrate good manners	1	2	3	4	5
Keep the group focused	1	2	3	4	5
Give and receive feedback	1	2	3	4	5

Total Marks = 25

Tutor's Name: Signature: Total maximum Marks for the case = 50 /10 = 5 marks

Comments:

_____

_____

KING SAUD UNIVERSITY COLLEGE OF MEDICINE

Orthopaedic Surgery Course
MINI-CLINICAL EVALUATION EXERCISE

(MINI-CEX)

Assessor's Name: _____ **Date:**

Student's Name: _____

Patient Problem:					
Case Setting:	**□Out-patient**	**□In -patient**	**□A&E**	**□In the patient: New**	**□Follow-up?**
Case Complexity:	**□Low**	**□Moderate**	**□High**		
Focus of mini-CEX:	**(More than one may be elected)**	**□Data gathering**	**□Diagnosis**	**□Management**	**□Counseling**

Please mark one of the **circles** for each component of the exercise on a scale of **1 (extremely poor)** to **9 (extremely good)** as given below. Please note that your scoring should reflect the performance of the student against that which you would reasonably expect at their stage of training and level of experience. You must justify each score of 1-3 with at least one explanation/example in the comments box. Please feel free to add any other relevant opinions about this doctor's strengths and weaknesses.

		UNSATISFACTORY			SATISFACTORY			ABOVE EXPECTED		
1.	**Medical Interviewing Skills** □ **Not observed or applicable**	□ 1	□ 2	□ 3	□ 4	□ 5	□ 6	□ 7	□ 8	□ 9
2.	**Physical Examination Skills** □ **Not observed or applicable**	□ 1	□ 2	□ 3	□ 4	□ 5	□ 6	□ 7	□ 8	□ 9
3.	**Consideration for patient/ professionalism** □ **Not observed or applicable**	□ 1	□ 2	□ 3	□ 4	□ 5	□ 6	□ 7	□ 8	□ 9
4.	**Clinical Judgement and Management Plan** □ **Not observed or applicable**	□ 1	□ 2	□ 3	□ 4	□ 5	□ 6	□ 7	□ 8	□ 9
5.	**Counseling and Communication Skills** □ **Not observed or applicable**	□ 1	□ 2	□ 3	□ 4	□ 5	□ 6	□ 7	□ 8	□ 9
6.	**Organization / Efficiency** □ **Not observed or applicable**	□ 1	□ 2	□ 3	□ 4	□ 5	□ 6	□ 7	□ 8	□ 9
7.	**OVERALL CLINICAL COMPETENCE**	□ 1	□ 2	□ 3	□ 4	□ 5	□ 6	□ 7	□ 8	□ 9

Student's signature:_____ Assessor's signature:_____

Comment :

DESCRIPTORS OF COMPETENCIES DEMONSTRATED DURING THE MINI-CEX

Medical Interviewing Skills: Facilitates patient's telling of story; effectively uses questions/directions to obtain accurate, adequate information needed; responds appropriately to affect, non-verbal cues.

Physical Examination Skills: Follows efficient, logical sequence; balances screening/diagnostic steps for problem; informs patient; sensitive to patient's comfort, modesty.

Humanistic Qualities/Professionalism: Shows respect, compassion, empathy, establishes trust; attends to patient's needs of comfort, modesty, confidentiality, and information.

Clinical Judgment: Selectively orders/performs appropriate diagnostic studies, considers risks, benefits.

Counseling Skills: Explains rationale for test/treatment, obtains patient's consent, educates/counsels regarding management.

Organization/Efficiency: Prioritizes; is timely; succinct.

Overall Clinical Competence: Demonstrates judgment, synthesis, caring, effectiveness, and efficiency.

KING SAUD UNIVERSITY COLLEGE OF MEDICINE

CBL ATTENDANCE

Tutor's Name: _____

CBL NO.: _____

Student's Name:_____

Date: _____ Signature: _____

No.	Students' Name	Computer No.	Attends Only	Attends and participate to the discussion

KING SAUD UNIVERSITY COLLEGE OF MEDICINE

SKILLS ASSESSMENT ATTENDANCE

Tutor's Name: _____

Skills Type: _____

Student's Name:_____

Date: _____ Signature: _____

No.	Students' Name	Computer No.	Attends only	Performed required skills	Performed required skills correctly

COURSE & FACULTY EVALUATION FORMS

KING SAUD UNIVERSITY COLLEGE OF MEDICINE

Students Evaluation Form for Course and its Assessment System

Dear students, we are conducting this survey to improve the course and its assessment system. Your participation is highly appreciated by the faculty members. This is a confidential and voluntary survey. So, if you don't like to participate, you can ignore either the entire questionnaire or a part of it. This will not affect your relationship with your tutors or your exam scores.

A.	Course Outlines, Objectives & its assessment system	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
1	Course outlines were made clear to me at the beginning of the course					
2	Things to do to succeed in the course, were made clear to me					
3	Contents of course assessment were consistent with the course outlines and objectives					
4	Course assessment system is appropriate					
5	Continuous assessment helped me in understanding the course contents.					
6	All materials assessed were from the curriculum					
7	Marks distribution of the course assessment is appropriate					
8	Feedback was provided on continuous assessment performance					
9	Continuous assessment helped me prepare for the final exam					
10	Assessment directed me to develop my knowledge and skills.					
B	Objective Structured Clinical Examination					
11	Number of OSCE stations was appropriate to cover the course					
12	Instructions for students were clear to complete the task					
13	Time provided for each station was enough to complete the tasks					
14	Patients (simulated) were well trained to act the role provided					
15	This OSCE should minimize the chance of students failing					
16	OSCE covered a wide variety of clinical and procedural skills					
17	OSCE has a positive effect on our learning					
18	Examiner(s) treated me with respect during exam					
19	This OSCE was the most stressful type of clinical skills assessment					
20	The OSCE highlighted our weaknesses in clinical & procedural skills					
21	Exam well organized and administered					

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Instructor Evaluation

Small Group Teaching (CBL)

1=Strongly Disagree / 2= Disagree / 3=Neither Agree nor Disagree / 4= Agree / 5=Strongly Agree / N/A=Not Applicable

	1	2	3	4	5	N/A
Stated expectations/Objectives clearly and concisely.						
Encouraged learners to participate actively in discussion.						
Communication of medical knowledge (e.g., in presentations and in articulation of clinical reasoning)						
Stimulation of problem solving (e.g., asking effective questions)						
Effectively elicited learner's ability to analyze or synthesize medical knowledge.						
Effectively elicited learner's ability to apply medical knowledge to specific patients.						
Guided the group by asking open-ended questions.						
Encouraged learners to bring up concerns.						
Encouraged the integration of learning issues in basic sciences with clinical experiences						
Promoted reasoning skills, which included: problem definition, mechanisms, hypothesis formation, hypothesis testing and hypothesis re-ranking.						
Encouraged students to use evidence and data in presenting their reasoning						
Offered learners suggestions for improvement.						
Encouraged the group to determine appropriate learning issues.						
Showed enthusiasm						
Relationship with students (e.g., supportive, patient, empathetic, approachable, respectful, courteous, punctual, accessible for help, enthusiasm for teaching)						
Provided constructive feedback.						

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Instructor Evaluation

Large Group Teaching (Lecture)

1=Strongly Disagree / 2= Disagree / 3=Neither Agree nor Disagree / 4= Agree / 5=Strongly Agree / N/A=Not Applicable

		1	2	3	4	5	N/A
1	**Quality of Content**						
	Was organized						
	Was clear and easy to take note from						
	Usefulness of instructional material (e.g., Power Points/visual aids/handouts).						
2	**Relevance/important of instructional materials**						
	Relevant to the course						
	Adequately established the importance of the presented material						
	Objectives clearly stated at the beginning						
3	**Constructive interactions/ Teaching skills**						
	Encouraged questions, responded to questions in a timely manner						
	Guided the group by asking open-ended questions.						
	Encouraged learners to participate actively in discussion.						
4	**Professionalism** Please consider whether the faculty demonstrated a high standard of professional behavior in the teaching setting, including showing respect for learners, supportive, patient, empathetic, approachable, respectful, courteous, punctual, accessible for help						
5.	**Effectiveness of Instructor**						
	Ability to motivate and encourage learning						
	Effectively communicate information						
	Demonstration of confidence and content expertise						
	Was enthusiastic						
	Clearly audible						
	Gave clear explanations						
	Accessibility and availability						

STUDENT'S TIMETABLE

KING SAUD UNIVERSITY
COLLEGE OF MEDICINE

DEPARTMENT OF ORTHOPAEDICS
SURG. COURSE 452
Week 1

DAYS	L E C T U R E S 8:00 – 10:00 A.M.	CLINICAL / SKILLS TEACHING (10:00 –12:00)			CLINICAL TEACHING / SMALL GROUPS DISCUSSION 1:00 – 3:00 P.M.		
D A T E		I	II	III	I	II	III
SUNDAY	INTRODUCTION/ ASSIGNMENTS	ORTHOPAEDIC HISTORY TAKING SKILLS			INTRODUCTION TO ORTHOPAEDICS		
MONDAY	PRINCIPLES OF FRACTURES	X-RAY INTERPRETATION SKILLS			KNEE Examination	BACK Examination	SHOULDER Examination
TUESDAY	COMMON ADULT FRACTURE	OPD / PLASTER ROOM	SKILL (2) Cast Application & Removal DR. NADEEM	ED – Management of multiple injured Patient ED DOCTOR	SHOULDER Examination	KNEE Examination	BACK Examination
WEDNESDAY	COMMON PEDIATRIC FRACTURES	ED – Management of multiple injured Patient ED DOCTOR	OPD / PLASTER ROOM	SKILL (2) Cast Application & Removal DR. ASIF	BACK Examination	SHOULDER Examination	KNEE Examination
THURSDAY	EMERGENCIES/ RED FLAGS *Open fracture *Fracture with NV compromise *Pelvic fracture	SKILL (2) Cast Application & Removal	ED – Management of multiple injured Patient ED DOCTOR	OPD / PLASTER ROOM	Peripheral nerves / upper extremities Examination	HIP Examination .	FOOT / ANKLE Examination

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DEPARTMENT OF ORTHOPAEDICS
SURG. COURSE 452
Week 2

DAYS	LECTURES	CLINICAL / SKILLS TEACHING (10:00 –12:00)			CLINICAL TEACHING / SMALL GROUPS DISCUSSION 1:00 – 3:00 P.M.		
DATE	8:00 – 10:00	I	II	III	I	II	III
SUNDAY	Emergency/Red flags Bone & joint infection	SMALL GROUP MEETING	ED - Management of Multiple Injured Patient ED DOCTOR	OPD / PLASTER ROOM	FOOT / ANKLE Examination	Peripheral nerves / upper extremities Examination	HIP Examination
MONDAY	EMERGENCY / RED FLAGS: *Cauda Equina Syndrome *Acute Spinal	OPD / PLASTER ROOM	OPERATING ROOM VISIT	ED - Management of Multiple Injured Patient ED DOCTOR	HIP Examination	FOOT AND ANKLE Examination	Peripheral nerves/ upper extremities Examination
TUESDAY	Emergency/red flags Compartments. Acute joint dislocation	PLASTER ROOM / OPD	SKILLS (3) Management of Open Fracture	SMALL GROUP MEETING	FRACTURE CLINIC / PLASTER ROOM	CBL (1)	CBL (2)
WEDNESDAY	PAEDIATRIC Common Lower Limb Disorder	OPERATING ROOM VISIT	SKILL (1) Knee Aspiration	PLASTER ROOM / OPD	CBL (1)	SMALL GROUP MEETING	PLASTER ROOM / FRACTURE CLINIC
THURSDAY	PAEDIATRIC Common Hip Disorders	ED - Management of Multiple Injured Patient ED DOCTOR	SKILL (2) Cast Application & Removal	SMALL GROUP MEETING	CBL (2)	CBL (2)	CBL (1)

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DEPARTMENT OF ORTHOPAEDICS
SURG. COURSE 452
Week 3

DAYS	L E C T U R E S	CLINICAL / SKILLS TEACHING (10:00 –12:00)			CLINICAL TEACHING / SMALL GROUPS DISCUSSION 1:00 – 3:00 P.M.		
D A T E	8:00 – 10:00 A.M.	I	II	III	I	II	III
SUNDAY	Degenerative JOINT DISORDERS	PLASTER ROOM / OPD	SMALL GROUP MEETING	SKILLS (3) Management of Open Fracture	SMALL GROUP MEETING	CBL (3)	CBL (4)
MONDAY	COMMON SPINE DISORDERS	SKILLS (3) Management of Open Fracture	PLASTER ROOM / OPD	OPERATING ROOM	CBL (4)	FRACTURE CLINIC / PLASTER ROOM	CBL (3)
TUESDAY	PERIPHERAL NERVE INJURIES	SKILL (1) Knee aspiration	OPD / PLASTER ROOM	SMALL GROUP MEETING	CBL (3)	CBL (4)	SMALL GROUP MEETING
WEDNESDAY	MSK TUMOURS	SKILL (2) Cast Application & Removal	SMALL GROUP MEETING	PLASTER ROOM / OPD	CBL (5)	PLASTER ROOM / FRACTURE CLINIC	CBL (6)
THURSDAY	CHRONIC SHOULDER DISORDER	SMALL GROUP MEETING	OPD / PLASTER ROOM	SKILL (2) Cast Application & Removal	CBL (6)	CBL (5)	PLASTER ROOM / FRACTURE CLINIC

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DEPARTMENT OF ORTHOPAEDICS
SURG. COURSE 452
Week 4

DAYS	L E C T U R E S 8:00 – 10:00 A.M.	CLINICAL / SKILLS TEACHING (10:00 –12:00)			CLINICAL TEACHING / SMALL GROUPS DISCUSSION 1:00 – 3:00 P.M.		
D A T E		I	II	III	I	II	III
SUNDAY	SPORT & SOFT TISSUE INJURIES	SMALL GROUP MEETING	PLASTER ROOM / OPD	SMALL GROUP MEETING	SMALL GROUP MEETING	CBL (6)	CBL (5)
MONDAY	METABOLIC BONE DISORDERS	MEETING DISCUSSION	MEETING DISCUSSION	MEETING DISCUSSION	PLASTER ROOM / FRACTURE CLINIC	SMALL GROUP MEETING	SMALL GROUP MEETING
TUESDAY	Common foot & ankle disorders	COURSE REVIEW					
WEDNESDAY	EXAM ORIENTATION						
THURSDAY	**MID TERM EXAM**						

MCQ Sample

20-year-old male twisted his knee 10 days ago while he was playing football. At time of injury, he heard a pop in his left knee and he was unable to return to the game and reports a large amount of swelling in the knee. On examination today he has a moderate effusion, Lachman's test is negative, and lacks of 15 degree of extension both actively and passively. A coronal and Sagittal MRI is shown in Figures A and B, respectively.

Which of the following is the best explanation for why he lacks of full extension?

a. **ACL tear**
b. **MCL tear**
c. **Displaced meniscus tear**
d. **Knee effusion**

Fig. A

Fig. B

Short Answer Question (SAQ)

- 48 year old female, has history of fever, chills and rigors and generalized malaise for few days, no weight loss, no history of tumors, reported progressive neck pain and severe neurological deficit over 4 hours , diagnosed with incomplete spinal cord injury due to the lesion as shown in the MRI as shown below:
  Mention four history questions to further identified the cause of this presentation?

A. History of TB or contact with TB patient
B. History of raw milk ingestion
C. History of drug abuse
D. History of invasive procedure (Dental, dialysis, surgery… etc)
E. History of decrease immunity (corticosteroid, immune suppressed, HIV….etc)

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Orthopedic Surgery
Final Examination
Objective Structured Clinical Examination (OSCE)

Information to the Students

Patient Brief Record / Brief Scenario:

A 20 year-old female presented to the clinic with a history of recurrent swelling and locking of the right knee.

Task: (what is expected from the student)

Perform a focused physical examination of the right knee in supine position.

During examination, **explain** what you are doing, what you are looking for, and what you are finding as you go. When you are finished examining the patient, summarize your findings and diagnosis to the patient.

Orthopedic Surgery
Objective Structured Assessment of technical Skills (OSATS)

Information to the Students

Patient Brief Record / Brief Scenario:

A 35-year-old lady presented to the ER after a twisting injury to her right ankle. She sustained an isolated closed bimalleolar fracture of her right ankle.

Task: (what is expected from the student)

Explain and **demonstrate** how would you immobilize and align her right lower limb in a below knee slab.