

P.G. Curriculum

M.S. Orthopaedics

The infrastructure and faculty will be as per MCI Guidelines

1. Goals

The goal of MS course in Orthopaedics is to produce a competent orthopaedic surgeon who is:

- musculoskeletal trauma and also of diagnosis, therapeutic, medical and surgical management of orthopaedic problems
- Able to offer initial primary management of acute orthopaedic and trauma emergencies
- Aware of the limitations and refer readily to major centres for more qualified care of cases which warrant such referral
- Aware of research methodology and be able to conduct research and publish the work done
- Able to effectively communicate with patients, their family members, people and professional colleagues
- Able to exercise empathy and a caring attitude and maintain high ethical standards
- Able to continue taking keen interest in continuing education irrespective of whether he / she is in teaching institution or in clinical practice
- Dynamic, available at all times and proactive in the management of trauma victims and orthopaedic emergencies

2. Objectives

At the end of MS course, the resident should be adept in the following domains:

- Skill to take a proper history for musculoskeletal disorders
- Clinical examination of all musculoskeletal disorders
- Application of history & clinical findings in making an appropriate clinical diagnosis
- Interpretation of investigations
- Discussion of options of treatment and follow up rehabilitation for the diagnosis made
- Have an in-depth theoretical knowledge of the syllabus with emphasis on current concepts
- Learn basic skills in musculoskeletal surgery including training on bone models and on patients by assisting or performing under supervision or perform independently as required.
- Have basic knowledge of common disorders of the spine, PIVD, degenerative disorders of spine, trauma spine and infections of spine for diagnosis and evaluation of the common spine disorders

Develop a familiarity to major topics under “Sports Medicine” - to gain exposure to the basic surgery, master the pathophysiology of the conditions usually encountered and develop a sound foundation to add new knowledge in the future

Learn basic principles of Hand Surgery with emphasis on applied anatomy, understanding pathophysiology of common conditions, planning of treatment and post operative protocols

Develop understanding of principles of soft tissue coverage and learn basic techniques used in extremity surgery

3. Syllabus

3.1 Theory

General Orthopaedics

Infections

- General Principles of Infection
- Osteomyelitis
- Infectious Arthritis
- Tuberculosis and Other Infections

Tumors

- General Principles of Tumors
- Benign Tumors of Bone
- Malignant Tumors of Bone
- Soft Tissue Tumors and Nonneoplastic Conditions Simulating Bone Tumors

Congenital Anomalies

- Congenital Anomalies of Lower Extremity
- Congenital and Developmental Anomalies Of Hip and Pelvis
- Congenital Anomalies of Trunk and Upper Extremity

Peripheral Nerve Injuries

- Diagnosis and management

Microsurgery

- Basic principles and techniques

Imaging in Orthopaedics

Other Nontraumatic Disorders

- Osteochondrosis
- Rickets and osteomalacia
- Metabolic bone disease
- Cerebral Palsy
- Paralytic Disorders
- Neuromuscular Disorders
- Genetic disorders
- Osteonecrosis

Traumatology

Fractures and Dislocations

- General Principles of Fracture Treatment
- Fractures of Lower Extremity
- Fractures of Hip
- Fractures of Acetabulum And Pelvis

Fractures of Shoulder, Arm, and Forearm
Malunited Fractures
Delayed Union and Nonunion Of Fractures
Acute Dislocations
Old Unreduced Dislocations
Fractures, Dislocations and Ligamentous Injuries of the hand
Fractures and Dislocations of Foot
Fractures and Dislocations In Children

Regional Orthopaedics

Spine

Spinal Anatomy And Surgical Approaches
Fractures, Dislocations, And Fracture-Dislocations Of Spine
Arthrodesis Of Spine
Pediatric Cervical Spine
Scoliosis And Kyphosis
Lower Back Pain And Disorders Of Intervertebral Discs
Infections Of Spine

Sports Medicine

Ankle Injuries
Knee Injuries
Shoulder And Elbow Injuries
Recurrent Dislocations

The Hand

Basic Surgical Technique and Aftercare
Acute Hand Injuries
Flexor and Extensor Tendon Injuries
Wrist Disorders
Paralytic Hand
Cerebral Palsy of the Hand
Arthritic Hand
Compartment Syndromes and Volkmann Contracture
Dupuytren Contracture
Carpal Tunnel, Ulnar Tunnel, and Stenosing Tenosynovitis
Tumors and Tumorous Conditions of Hand
Hand Infections
Congenital Anomalies of Hand

The Foot and Ankle

Surgical Techniques
Disorders of Hallux
Pes Planus
Lesser Toe Abnormalities
Rheumatoid Foot
Diabetic Foot
Neurogenic Disorders
Disorders of Nails and Skin
Disorders of Tendons and Fascia

Operative Orthopaedics

Surgical Techniques and Approaches

Arthrodesis

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Arthrodesis of Ankle, Knee and Hip
Arthrodesis of Shoulder, Elbow and Wrist

Arthroplasty

Arthroplasty of Ankle and Knee

Arthroplasty of Hip

Arthroplasty of Shoulder and Elbow

Amputations

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General Principles of Amputations
Amputations about Foot
Amputations of Lower Extremity
Amputations of Hip And Pelvis
Amputations of Upper Extremity

Amputations of Hand

Arthroscopy

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General Principles Of Arthroscopy
Arthroscopy Of Lower Extremity
Arthroscopy Of Upper Extremity

3.2 Practical

Closed Reduction of Fractures, Dislocations

Mastering Plastering Techniques

Debridement of Open Fractures

External Fixator application

Internal Fixation of minor fractures with K-wires

Closed manipulative correction of congenital problems like CTEV & other skeletal deformities.

Biopsies – FNAB, FNAC, Trocar needle, open

Excision of benign lesions

Tendon lengthening

Incision and drainage, acute Osteomyelitis / Septic Arthritis

Skull tongs application

Tension band wiring

Interfragmentary compression

Plate Osteosynthesis of Forearm bones

Carpal Tunnel Release

Bone grafting

Soft tissue releases

Interlocking IM Nailing of Tibia & Femur

Humerus Plating

Ankle Fracture Fixations

DHS Fixation

Hemiarthroplasty Hip

Caudal epidural injections
Facet Block
Vertebroplasty
Exposure of posterior spine
Laminectomy
Anterior and posterior instrumentation of spine
Bone Skills Lab
Tension Band Wiring
Lag Screw Interfragmentary Compression
Broad Platin

Narrow Plating
External Fixation
Cancellous Screw Fixation
Dynamic Hip Screw Fixation
Dynamic Condylar Screw Fixation
Tibia Intramedullary Interlocking Nailing
Femur Intramedullary Interlocking Nailing
Tibial Condyle Fixation
Elbow fractures Fixation
Ankle Fractures Fixation
Pelvis – External Fixation
Pubic Symphysis – ORIF
Acetabulum Fracture Fixation
MIPPO Tibia
Hemiarthroplasty
Spine - Posterior Instrumentation
Spine – Anterior Instrumentation
To clinically diagnose, assess, investigate and initially manage all surgical and medical emergencies
To learn to assess ABC and perform CPR
To perform
Endotracheal intubation
Peripheral and Central intravenous cannulation
Intercostal drainage tube insertion
Peritoneal aspiration
Splintage of the spine and limbs for fracture-dislocations
To learn the use of certain emergency drugs – adrenaline, atropine, dopamine, Steroids, analgesics etc.
To learn to apply
Glasgow Coma Scale (GCS)
AO classification of fractures
Gustillo Anderson grading of open fractures
Mangled Extremity Severity Scoring
To learn to communicate with patient's attendants on death of patient
To learn to handle confidentiality issues

4. Teaching Program

4.1. General Principles

Acquisition of practical competencies being the keystone of postgraduate medical education, postgraduate training is skills oriented.

primarily emanating from clinical and academic work. The formal sessions are merely meant to supplement this core effort.

4.2. Teaching Sessions

Bedside teaching rounds

Journal club

Seminar

PG case discussion

X – Ray discussion

Ortho-radio meet

Ortho-Pathology Meet

Central session (held in hospital auditorium regarding various topics like CPC, guest lectures, student seminars, grand round, sessions on basic sciences, biostatistics, research methodology, teaching methodology, health economics, medical ethics and legal issues).

4.3 Teaching Schedule

In addition to bedside teaching rounds, in the department there will be daily hourly sessions of formal teaching per week. The suggested time distribution of each session for department's teaching schedule as follows:

1. Journal club	Once a week
2. Seminar	Twice a week
3. PG case discussion	Twice a week
4. Ortho-radio meet	Once a month
5. Ortho-Pathology Meet	Once a month
6. Central session	As per hospital schedule

Note:

All sessions are supervised by faculty members. It is mandatory for all residents to attend the sessions except those posted in emergency.

All the teaching sessions are assessed by the faculty members at the end of session and marks are given out of 10 and kept in the office for internal assessment.

Attendance of the residents at various sessions has to be at least 75%.

5. Posting

The postgraduate student rotates through the clinical units in the department

6. Thesis

6.1 Every candidate shall carry out work on an assigned research project under the guidance of a recognized Post Graduate Teacher; the project shall be written and submitted in the form of a thesis.

6.2 Every candidate shall submit thesis plan to the University within the timeframe set by the University.

6.3 Thesis shall be submitted to the University six months before the

commencement of theory examination i.e. for examination May/June session, 30 November of the preceding year of examination and for November/December session 31 May of the year of examination.

6.4 The student will (i) identify a relevant research question; (ii) conduct a critical review of literature; (iii) formulate a hypothesis; (iv) determine the most suitable study design; (v) state the objectives of the study; (vi) prepare a study protocol; (vii) undertake a study according to the protocol; (viii) analyze and interpret research data, and draw conclusions; (ix) write a research paper.

7. Assessment

All the PG residents are assessed daily for their academic activities and also periodically.

7.1. General Principles

The assessment is valid, objective, and reliable.

It covers cognitive, psychomotor and affective domains.

Formative, continuing and summative (final) assessment is also conducted in theory as well as practical/clinicals. In addition, thesis is also assessed separately.

7.2 Formative Assessment

The formative assessment is continuous as well as end-of-term. The former is to be based on the feedback from the senior residents and the consultants concerned. End-of-term assessment is held at the end of each semester. Formative assessment will not count towards pass/fail at the end of the program, but will provide feedback to the candidate.

7.3 Internal Assessment

The performance of the Postgraduate student during the training period should be monitored throughout the course and duly recorded in the log books as evidence of the ability and daily work of the student. Marks should be allotted out of 100 as followed.

Sr. No.	Items	Marks
1.	Personal Attributes	20
2.	Clinical Work	20
3.	Academic activities	20
4.	End of term theory examination	20
5.	End of term practical examination	20

1. Personal attributes:

Behavior and Emotional Stability: Dependable, disciplined, dedicated, stable in emergency situations, shows positive approach.

Motivation and Initiative: Takes on responsibility, innovative, enterprising, does not shirk duties or leave any work pending.

Honesty and Integrity: Truthful, admits mistakes, does not cook up information, has ethical conduct, exhibits good moral values, loyal to the institution.

Interpersonal Skills and Leadership Quality: Has compassionate attitude towards patients and attendants, gets on well with colleagues and paramedical staff, is respectful to seniors, has good communication skills.

2. Clinical Work:

Availability: Punctual, available continuously on duty, responds promptly on calls and takes proper permission for leave.

Diligence: Dedicated, hardworking, does not shirk duties, leaves no work pending, does not sit idle, competent in clinical case work up and management.

Academic ability: Intelligent, shows sound knowledge and skills, participates adequately in academic activities, and performs well in oral presentation and departmental tests.

Clinical Performance: Proficient in clinical presentations and case discussion during rounds and OPD work up. Preparing documents the case

history/examination and progress notes in the file (daily notes, round discussion, investigations and management) Skill of performing bed side procedures and handling emergencies.

3. Academic Activity: Performance during presentation at Journal club/ Seminar/ Case discussion/Stat meeting and other academic sessions. Proficiency in skills

as mentioned in job responsibilities.

4. End of term theory examination conducted at end of 1 , 2 years 9 months

5. End of term practical/oral examinations after 2 years 9 months.

Marks for **personal attributes** and **clinical work** should be given annually by all the consultants under whom the resident was posted during the year. Average of the three years should be put as the final marks out of 20.

Marks for **academic activity** should be given by the all consultants who have attended the session presented by the resident.

The Internal assessment should be presented to the Board of examiners for due consideration at the time of Final Examinations.

7.4 Summative Assessment

Ratio of marks in theory and practicals will be equal.

The pass percentage will be 50%.

Candidate will have to pass theory and practical examinations separately.

A. Theory examination (Total = 400 marks)

Title	Marks
Paper 1: Basic Sciences and related Orthopaedics	100
Paper 2: Principles & Practice of Orthopaedic diseases & Operative Orthopaedics	100
Paper 3: Traumatology and its related aspects	100
Paper 4: Recent Advances in Orthopaedics	100

B. Practical & Viva voce examination (Total = 400 marks)

		300 marks	
Cases-	One-		150 marks
Long case	Three- 50×3 =		150 marks
Short cases			
Oral/ Viva-			100 marks
Pathology specimens & X-Rays			25 marks
Bones			25 marks
Implants & Instruments			25 marks
Orthosis & Prosthesis			25 marks

8. Job responsibilities

Evaluation of patients in emergency, completing the file work and their management including resuscitation, wound cleaning and splintage
History taking and examination of patient admitted to ward, their diagnostic workup, follow up of investigations, making a diagnosis and a treatment plan
Preparation of OT List
Pre-operative planning
Preparation of patients for surgery and post operative care
Assisting in operation theater
Daily rounds for evaluation of patients, ordering relevant investigations and following them up, dressing of patients and completing daily progress notes
Preparation of discharge slip and advising the patient accordingly
Work-up of patients in Out-patient department

9. Suggested Books

9.1. Core books

Apley's System of Orthopaedics & Fractures
Campbell's Operative Orthopaedics
Mercer's Orthopaedic Surgery
Mc Rae – Clinical Examination
Hamilton Bailey Demonstration of Clinical Signs & Symptoms
Snell's Anatomy
Pye's Surgical Handicraft
Stewart's Manual

9.2. Reference books

Rockwood & Green – Fractures in Adults
Rockwood & Green – Fractures in Children
Chapman Orthopaedic Surgery
Turek's Textbook of Orthopaedics
Hoppenfield – Surgical Exposures
Mc Rae – Surgical Exposures

Insall & Scott – Surgery of the Knee
Miller & Cole Textbook of Arthroscopy
Tachdjian Paediatric Orthopaedics

9.3. Journals

Journal Bone & Joint Surgery – American
Journal Bone & Joint Surgery – British
Orthopaedic Clinics of North America
Clinical Orthopaedics & Related Research
Indian Journal of Orthopaedics
Spine
Hand Clinics
Rheumatology Clinics
Injury
Journal of Orthopaedic Trauma
Arthroscopy