



College of Physicians and Surgeons of Mumbai

Syllabus for CPS-PG-Course

DOrtho - DIPLOMA IN ORTHOPAEDICS

College of Physicians and Surgeons of Mumbai

CPS House, Dr. E. Borges Marg, Parel, Mumbai – 400012.

DOrtho - DIPLOMA IN ORTHOPAEDICS

GOALS :

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

- Aware of the current concepts in quality care in Orthopaedics and 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 centers for more qualified care of cases which warrant such referral.
- Aware of research methodology
- 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

OBJECTIVES:

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

- Skill to take a proper history for musculoskeletal disorder.
- 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 of 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.

COURSE DESCRIPTION

Eligibility: A candidate should possess MBBS degree/ equivalent degree as per provisions of Indian Medical Council Act.

Duration: 2 Years

Skills and competencies to be acquired

A. Cognitive domain

At the end of the student should be able to:

1. Demonstrate sufficient understanding of the basic sciences relevant to orthopaedic speciality through a problem based approach.
2. Describe the principles of injury, its mechanism, clinical presentation, plan and interpret the appropriate investigations, and institute the management of musculoskeletally injured patient.
3. Define and describe the pathophysiology of shock
4. Describe the principles and stages of bone and soft tissue healing
5. Understand and describe the metabolic, nutritional, endocrine, social impacts of trauma and critical illness.
6. Enumerate, classify and describe the various bony/soft tissue injuries affecting the axial and appendicular skeletal system in adults and children.
7. Describe the mechanism of homeostasis, fibrinolysis and methods to control haemorrhage.
8. Describe the coagulation cascade and its abnormalities.
9. Describe the pharmacokinetics and pharmacodynamics of drug metabolism, excretion of analgesics, anti-inflammatory, antibiotics, disease modifying agents and chemotherapeutic agents in bone and soft tissue tumours.
10. Describe the principles of internal and external fixation or stabilization of bone and joint injuries
11. Describe the clinical presentation, plan and interpret investigations, institute management and prevention of the following disease conditions
 - a. Nutritional deficiency diseases affecting the bones and joints
 - b. Deposition arthropathies
 - c. Endocrine abnormalities of the musculoskeletal system
 - d. Metabolic abnormalities of the musculoskeletal system

- e. Congenital anomalies of the musculoskeletal system
 - f. Developmental skeletal disorder of the musculoskeletal system
12. Describe the pathogenesis, clinical features plan and interpret investigations and institute the management in adults and children in:
- a. Tubercular infections of bone and joints (musculoskeletal system)
 - b. Pyogenic infections of musculoskeletal system
 - c. Mycotic infections of musculoskeletal system
 - d. Autoimmune disorders of the musculoskeletal system
 - e. Rheumatoid arthropathy, Ankylosing spondylitis, seronegative arthropathy
 - f. Osteoarthritis and spondylosis
13. Describe the pathogenesis, clinical presentation, plan and interpret investigations and institute appropriate treatment in the following conditions :
- a. Post polio residual paralysis
 - b. Cerebral palsy
 - c. Muscular dystrophies and myopathies
 - d. Nerve Injuries e. Entrapment neuropathies
14. Understand the basics of research and biostatistics.
15. Describe the aetiopathogenesis, identify, plan and interpret investigation and institute the management of osteonecrosis of bones.
16. Identify situations requiring rehabilitation services and prescribe suitable orthotic and prosthetic appliances and act as a member of the team providing rehabilitation care
17. Identify and manage emergency situation in disorders of musculoskeletal system
18. Understanding the basics of diagnostic imaging in orthopaedics like:
- a. Plain x-ray
 - b. Ultrasonography
 - c. Computerised axial tomography
 - d. Magnetic resonance imaging
 - e. PET scan
 - f. Radio-isotope bone scan
 - g. Digital Subtraction Angiography (DSA)
 - h. Dual energy x-ray Absorptiometry
 - i. Arthrography

19. Describe the aetiopathogenesis, clinical presentation, Identification, Plan investigation and institute treatment for oncologic problems of musculoskeletal system both benign and malignancies, primary and secondary.
20. Describe social, economic, environmental, biological and emotional determinants of health in a given patient with a musculoskeletal problem.

B. Affective Domain:

1. Should develop communication skills to interact effectively with patients, relatives and colleagues and other hospital staff.
2. Should always adopt ethical principles and practices
3. Should be able to work a member of a team for effective care delivery system
4. Should develop an attitude to contribute effectively in the improvement, maintenance of health care delivery system of the country and to contribute in improving the health indicators of our country in comparison with the other developed world.

C. Psychomotor domain.

1. Elicit a clinical history from a patient, do a physical examination, document in a case record, order appropriate investigations and make a clinical diagnosis
2. Impart wound care where applicable
3. Apply all types of POP casts/slabs, splints and tractions as per need
4. Identify shock and provide resuscitation
5. Perform aspiration of joints and local infiltration of appropriate drugs
6. Perform appropriate wound debridement
7. Perform arthrotomy of knee joint
8. Perform incision and drainage of abscess
9. Perform split thickness skin grafting
10. Perform fasciotomes
11. Apply external fixators

12. Apply skeletal tractions including skull tongs
13. Triage a disaster situation and multiple trauma patients in an emergency room
14. Perform on bone models, interfragmentary compression screws, external fixation, Tension band wiring and Broad plating
15. Perform closed reduction of common dislocations like shoulder and common fractures like Colle's fracture, supracondylar fracture.
16. Take an informed consent for standard orthopaedic procedures
17. Perform closed/open biopsies for lesions of bone, joints and soft tissues
18. Perform split thickness skin grafting and local flaps
19. Perform on bone models, internal fixation with k-wires, screws, plates. Dynamic hip/condylar screws/nailing.
20. Perform sequestrectomy and saucerisation
21. Perform arthrotomy of joints like hip/shoulder, ankle, elbow
22. Perform repair of open hand injuries including tendon repair
23. Perform arthodesis of small joints
24. Perform diagnostic arthroscopy on models and their patients
25. Perform carpal tunnel/tarsal tunnel release
26. Apply ilizarov external fixator
27. Perform soft tissue releases in contractures, tendon lengthening and correction of deformities
28. Perform amputations at different levels
29. Assist in the surgical management of polytrauma patient
30. Assist in Arthroplasty surgeries of hip, knee, shoulder and the ankle TKR, THR and RSA of shoulder it.
31. Assist in spinal decompressions and spinal stabilizations
32. Assist in operative arthroscopy of various joints

33. Assist /perform arthrodesis of major joints like hip, knee, shoulder, elbow
34. Assist in corrective osteotomies around the hip, pelvis, knee, elbow, finger and toes
35. Assist in surgical operations on benign and malignant musculoskeletal tumour including radical excision and custom prosthesis replacement
36. Assist in open reduction and internal fixations of complex fractures of acetabular, pelvis, IPSI lateral floating knee/elbow injuries, shoulder girdle and hand
37. Assist in spinal deformity corrections
38. Independently perform closed/open reduction and internal fixation with DCP, LCP, intramedullary nailing, LRS
39. Assist in limb lengthening procedures
40. Assist in revision surgeries
41. Provide pre and post Op care
42. Perform all clinical skills as related to the speciality

SYLLABUS

I. Basic Sciences

- Gross and radiologic anatomy of bones and joints
- Embryology and organogenesis of bones, soft tissues
- Growth and development of bones
- Calcium metabolism and phosphorus metabolism
- Nutrients and vitamins
- Pathology involving bones and joints
- Common microbes
- Ethical issues and medico-legal issues

II. 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 Non-neoplastic 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
- Congenital abnormalities of upper extremity

➤ **Peripheral Nerve Injuries**

- Diagnosis and management

➤ **Microsurgery**

- Basic principles and techniques

➤ **Imaging in Orthopaedics**

➤ **Other Non-traumatic Disorders**

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

III. 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
- Mal-united Fractures
- Delayed Union and non-union 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
- Muller's complications of the fractures

➤ **Regional Orthopaedics**

- **Spine**
 - Spinal Anatomy And Surgical Approaches
 - Fractures, Dislocations, And Fracture-Dislocations Of Spine
 - Arthrodesis Of Spine
 - Paediatric Cervical Spine
 - Scoliosis And Kyphosis
 - Lower Back Pain And Disorders Of Intervertebral Discs
 - Infections Of Spine
 - Management of Paraplesia
- **Sports Medicine**
 - Ankle Injuries
 - Knee Injuries
 - Shoulder And Elbow Injuries
 - Recurrent Dislocations
- **The Hand**
 - Basic Surgical Technique and After-care
 - Acute Hand Injuries
 - Flexor and Extensor Tendon Injuries
 - Wrist Disorders
 - Paralytic Hand

- Cerebral Palsy of the Hand
 - Arthritic Hand
 - Compartment Syndromes and Volkmann's Contracture
 - Dupuytren Contracture
 - Carpal Tunnel Syndrome, Ulnar Tunnel Syndrome, and Stenosing Tenosynovitis
 - Tumors and Tumorous Conditions of Hand.
 - Hand Infections
 - Congenital Anomalies of Hand.
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- **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

IV. Operative Orthopaedics

- **Surgical Techniques and Approaches**

V. Arthrodesis

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

VI. Arthroplasty

- Arthroplasty of Ankle and Knee
- Arthroplasty of Hip
- Arthroplasty of Shoulder and Elbow

VII. Amputations

- General Principles of amputations
- Amputations about foot
- Amputations of lower extremity
- Amputations of hip and pelvis
- Amputations of upper extremity
- Amputations of Hand

VIII. Arthroscopy

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

IX. 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
- Inter-fragmentary 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
- Hemi-arthroplasty hip
- Caudal epidural injections
- Facet block
- Vertebroplasty
- Exposure of posterior spine
- Laminectomy
- Bone Skills Lab
 - i. Tension Band Wiring
 - ii. Lag Screw Inter-Fragmentary Compression
 - iii. Broad plating
 - iv. Narrow plating
 - v. External Fixation
 - vi. Cancellous Screw Fixation
 - vii. Dynamic Hip Screw Fixation
 - viii. Dynamic Condylar Screw Fixation
 - ix. Tibia Intramedullary Interlocking Nailing
 - x. Femur Intramedullary Interlocking Nailing
 - xi. Tibial Condyle Fixation
 - xii. Elbow fractures Fixation
 - xiii. Ankle Fractures Fixation
 - xiv. Pelvis – External Fixation
 - xv. Pubic Symphysis – ORIF
 - xvi. Acetabulum Fracture Fixation
 - xvii. MIPPO Tibia
 - xviii. Hemi-arthroplasty
 - xix. Spine - Posterior 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
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- 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.

Teaching Program

General Principles

Acquisition of practical competencies being the keystone of postgraduate medical education, postgraduate training is skills oriented. Learning in postgraduate program is essentially self-directed and primarily emanating from clinical and academic work. The formal sessions are merely meant to supplement this core effort.

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).
- How to give certificates and prescription of diseases

D-Ortho. - DIPLOMA IN ORTHOPAEDICS**Examination Pattern****Theory Examination:**

PAPER I	PAPER II	PAPER III
ANATOMY, PHYSIOLOGY, PHARMACOLOGY AND PHARMACO THERAPEUTICS IN ORTHOPAEDICS	CLINICAL ORTHOPAEDICS & ORTHOPAEDICS SURGERY	TRAUMATOLOGY, CLINICAL ORTHOPAEDICS, PROSPECTS, REHABILITATION AND RECENT ADVANCES
Section I	Section I	Section I
Q.1. 10 Marks Q.2. 10 Marks Q.3. 10 Marks Q.4. 10 Marks Q.5. 10 Marks Total 50 Marks	Q.1. 10 Marks Q.2. 10 Marks Q.3. 10 Marks Q.4. 10 Marks Q.5. 10 Marks Total 50 Marks	Q.1. 10 Marks Q.2. 10 Marks Q.3. 10 Marks Q.4. 10 Marks Q.5. 10 Marks Total 50 Marks
Section II	Section II	Section II
Q.6. 10 Marks Q.7. 10 Marks Q.8. 10 Marks Q.9. 10 Marks Q.10. 10 Marks Total 50 Marks	Q.6. 10 Marks Q.7. 10 Marks Q.8. 10 Marks Q.9. 10 Marks Q.10. 10 Marks Total 50 Marks	Q.1. 10 Marks Q.2. 10 Marks Q.3. 10 Marks Q.4. 10 Marks Q.5. 10 Marks Total 50 Marks
Section I + II = 100 Marks	Section I + II = 100 Marks	Section I + II = 100 Marks
Total Theory = 300 Marks, Passing = 150 (i.e. 50%) Marks in aggregate		

Practical Examination:		Marks
Paper - IV	Short Case 60, Long Case 40	100
Paper - V	Anatomy, clinical orthopaedics, Pre & Post-Operative care & Rehabilitation	100
Paper - VI	Splints, Appliances, Pathology Specimens & Viva-Voce	100
Total Marks	[Passing = 150 (i.e. 50%) Marks in aggregate]	300