# M.Ch. - PAEDIATRIC ORTHOPAEDICS

# THE TAMIL NADU Dr. MGR MEDICAL UNIVERSITY, CHENNAI

# Syllabus – M.Ch. PAEDIATRIC ORTHOPAEDICS

## 1.AIMS AND OBECTIVES

The syllabus for M.Ch ( Paediatrics orthopaedics ) should comprehensively cover all the subjects in paediatric orthopaedics during 3 years of study period. The student who undergoes the course should have an exposure to all the facets of paediatrics orthopaedics including preventive, curative and rehabilitative aspects to competently treat children with musculoskeletal conditions after acquiring the degree.

Assessment to be done at Periodic intervals and at the end of the training period before being awarded the Mch degree.

## 2. THEORY

## SYLLABUS GENERAL

1. Embryology and development
2. Disorders of normal growth and development
3. Genetic aspects of paediatric orthopaedics
4. Skeletal surgical anatomy, healing and fixation principles
5. General pathophysiology of metabolic and endocrine bone disease
6. Skeletal dysplasias and limb deficiencies
7. Management of child with developmental disabilities
8. Biomechanics of gait and abnormal gait patterns in children
9. Basics of paediatric anaesthesia, paediatric surgery, general paediatric medical problems and critical care including pharmacology of anaesthetics, common paediatric antibiotics, local anaesthetic agents, fluid and electrolytes, shock management.
10. Imaging – conventional radiographic technique, computed tomography, bone scintigraphy, magnetic resonance imaging, positron emission tomography (PET), should be able to interpret ultrasound of musculo skeletal system
11. Osteomyelitis and Neonatal infections
12. Septic arthritis

13. Sysytemic diseases associated with infections- sickle cell, chronic granulomatosis diseases
14. Microbiology of causative organisms and appropriate management of infection.

## Arthritis

15. Juvenile rheumatoid arthritis
16. Spodyloarthropathies
17. Transient synovitis of hip
18. Neuropathic arthropathies
19. Tuberculous arthritis
20. Tuberculosis of spine

## Congenital disorders of foot

21. Normal variations, odteochondroses
22. Flat foot, skew foot
23. Congenital talipeseuinovarus (clubfoot)
24. Tarsal coalitions
25. Cavus foot
26. Congenital vertical talus
27. Toe deformities – hallux valgus, polydactyly, syndactyly, hallux rigidus,curly toes

## Knee

28. Congenital hyperextension of knee
29. Patellofemoral instability
30. Bipartite patella,discoid meniscus
31. Congenital tibial deficiency
32. Congenital fibular deficiency

## Hip

33. Developmental dyslasia of hip
34. Congenital coxavara
35. Congenital femoral deficiency

## Spine

36. Congenital scoliosis

37. Congenital kyphosis
38. Spondylolisthesis

## Upper limb

39. Radial deficiency
40. Ulnar deficiency
41. Syndactyly , polydactyly

## Trauma

42. Care of the multiply injured child
43. Open fractures
44. Compartment syndrome
45. Vascular injuries
46. Child abuse

## Upper limb

47. Fractures of clavicle
48. Fractures and dislocation around the elbow
49. Fractures of the forearm
50. Fractures and dislocations of the wrist and hand

## Lower limb

51. Pelvis and acetabulum fractures
52. Hip fractures and dislocations
53. Femur fractures
54. Patella fractures and dislocations
55. Tibial spine fractures
56. Meniscal and ligamental injury
57. Tibia and fibula fractures
58. Open fractures tibia
59. Ankle fractures and dislocations
60. Ligament injuries of ankle
61. Talar fractures and dislocations
62. Calcaneal fracture
63. Lisfranc and open injuries of foot
64. Metatarsal and phalangeal fractures
65. Spinal injuries, spinal inury without radiological abnormalities

## Tumors

66. General principles of tumor management, paedtric surgical, medical and radio oncology of musculo skeletal tumor
67. Biopsy and staging
68. Benign tumors – cystic lesions of bones
69. Fibrous dysplasia, osteofibrous dysplasia
70. Osteochondroma
71. Hereditary multiple exostosis
72. Chondroblastoma, chondromyxoid fibroma
73. Langerhans cell histiocytosis
74. Primary synovial chondromatosis , pigmented villonodularsynovitis
75. Osteoid osteoma, osteoblastoma
76. Malignant tumors – staging, general principles, management of paedtric malignancy
77. Ewing's sarcoma
78. Osteosarcoma
79. Soft tissue sarcomas

## Metabolic and endocrine diseases

80. General pathophysiology
81. Nutrition and vitamin D deficiency rickets
82. Vitamin D resistant rickets, renal osteodystrophy
83. Hypoparathyroidism and hyperparathyroidism
84. Scurvy
85. Idiopathic juvenile osteoporosis
86. Osteogenesis imperfect

## Orthopaedic related syndromes

87. Downs syndrome (trisomy 21), marfans syndrome
88. Neurofibromatosis
89. Fibrodysplasiaossificans progressive
90. KlippelTrenaunay Weber and Proteus syndrome
91. Paediatrics congenital anomalies associated with general paediatric conditions and syndromes

## Bioethics

1. Respect human life and dignity of every individual

2. Refrain from supporting or committing crimes against humanity and condemn all such acts

3. Treat the sickand injured with competence and compassion and without prejudice and apply the knowledge and skills when needed

4. Protect the privacy and confidentiality of those for whom we care and breach that confidence only when keeping it seriously threaten their health and safety or that of others
5. Work freely with colleagues to discover, develop and promote advances in medicine and public health that ameliorate suffering and contribute to human well being.

6. Educate the public about present and future threats to the health of humanity.

7. Advocate for social , economic, educational and political changes that ameliorate suffering and contribute to human wellbeing.

8. Teach and mentor those who follow us , for they are the future of our caring profession.

## Clinical training and postings

The candidate will be posted and trained in the parent department (paediatric orthopaedics department) for 32 months, the remaining 4 months of postings will be as follows

| | | |
|---|---|---|
| Paediatric casualty | - | 2weeks |
| Paediatric ICU/ neonatology | - | 2weeks |
| Physical medicine and rehabilitation (including splints, prosthetics and Orthotics) | - | 2weeks |
| Paediatric oncology | - | 2weeks |
| Paediatric surgery | - | 2weeks |

| | | |
|---|---|---|
| Paediatric endocrinology | - | 1weeks |
| Paediatric rheumatology | - | 1weeks |
| A.O technique ( trauma course) | - | 1weeks |
| Basic science (anatomy, embryology, cadaver dissection, skills lab) | - | 2weeks |
| Epidemiology ; statistics | - | 1weeks |
| **Total** | **-** | **4 months** |

During 2nd year , students are encouraged to undergo special postings for learning new advanced techniques/procedures/skills in institutions of higher repute where the requisite facilities are available without affecting the duties of the parent department.

## Skills training

## 1st year

| **Should have assisted at the following surgeries** | **Should have performed the following surgeries under guidance** |
|---|---|
| Club foot surgery – soft tissue release | Tibialis anterior tendon transfer |
| DDH surgery – open reduction / closed reduction | spica casting |
| Perthes – varusderotation osteotomy | Trochanteric epiphysiodesis |
| SCFE – surgical dislocation, insitu pinning | Insitu fixation |
| Congenital knee dislocation- quadricepsplasty | Assisted in quadricepsplasty / casting |
| Congenital vertical talus – soft tissue release, open reduction | Reverse ponseti casting |
| Genu varum/valgum<br>Rab's corrective osteotomy | "8-plating" epiphysiodesis |
| Benign cystic lesions<br>Trauma | ESIN / curettage and BG |
| Femur fractures | Femoral fractures- ESIN ; plating / spica casting |

| | |
|---|---|
| Tibia fractures | Debridement and external fixation |
| Forearm fractures | ESIN/ plating/ casting |
| Elbow fractures | Closed / open reduction ; k- wiring |
| Pelvics fractures | External fixation |
| Wrist / metacarpal/metatarsal fractures | Closed / open reduction and k wiring |

## 2nd year

| **Should have assisted at the following surgeries** | **Should have performed the following surgeries under guidance** |
|---|---|
| Tumors | Planning for endoprosthesis |
| Malignant tumor reconstruction | Biopsy or staging for malignant tumors |
| Tibial or fibular hemimelia reconstruction planning limb equalisation/ prosthesis | Perform T.A tenotomy ; limited soft tissue release |
| Club foot surgery- ilizarov's fixation | Adductor tenotomy and closed reduction DDH |
| DDH surgery – open reduction;pelvic osteotomy | "8-plating" epiphysiodesis-angular deformity<br><br>Closed reduction/ open reduction and stabilisation of elbow/ forearm / femur/ tibia/ankle/ wrist fracture |

## 3rd year

| **Should have assisted at the following surgeries** | **Should have performed the following surgeries under guidance** |
|---|---|
| Club foot surgery – ilizarov fixation | Osteotomy/triple arthrodesis/ STR |
| Benign bone tumors of pelvis or hip-reconstruction | Benign bone tumors excision biopsy |
| Malignant bone tumors (complex reconstruction) | Bone cyst- ESIN, curettge and BG<br>Excision of osteoid osteoma;osteochondroma |
| Radial club hand reconstruction | Casting for radial or fibular deficiencies |

| | |
|---|---|
| Pelvic osteotomy- DDH | DDH open reduction |
| Complex orthofix/ ilizarov reconstruction | Planning/ frame assembly |
| Complex trauma and complex deformity correction | Plating / ESIN of femur / forearm fractures<br>Closed / open reduction of supracondylar/ lateral condyle<br>Corrective osteotomy for coxavaracubitusvarus<br>Genu valgum/varum |

## 5. TEACHING METHODOLOGY

1. planning session with entire faculty and students - once in a week.
2. OP clinics including club foot and cerebral palsy – 2 days /week
3. ward rounds – 2days/week
4. per-operative teaching sessions - 2 days/week
5. classroom lectures - once a week
6. video teaching session - once in a week
7. journal club/paper reading – once a week
8. symposium - once in a month
9. guest lectures – once in a 6 months

## 6. RESEARCH WORK

The candidate is introduced to the field of research in paediatric orthopaedic surgery; both at clinical and laboratory level.

The candidate will be trained in the ability to

- Frame a research question
- Plan a study to answer the question

- Collect the relevant information and
- Evaluate appropriately the collected data to draw a conclusion.

The candidate should become conversant wit the reporting of these results as a research paper, in journals and as a presentation in conferences.

A postgraduate student of a postgraduate degree course in board specialities / super specialities would be required to present one poster presentation to read one paper at a National/ State conference and to present for publication during the period of his postgraduate studies so as to make him eligible to appear at the Postgraduate degree examination.

**The activities would consist of:**

Planning and organising relevant studies to be submitted as a research paper at the end of the course.

Students should be compulsorily attend research methodology workshop conducted by the university within first six months of M.Ch course.

## 7. LOG BOOK

The postgraduate student of a postgraduate degree course in super specialities shall maintain log book of the work carried out by them and the training programme undergone during the period of training including details of surgical operations assisted or done independently.

The logbook shall be checked and assessed by the faculty members imparting the training.

Periodical evaluation of logbook to be done by the Head of department as per 52$^{nd}$ SAB.

The evaluation of the candidates in both theory and practical aspects will help the candidate in the improvement of his/her knowledge skills and attitude.

## 8. COMPETENCY ASSESSENT:

### Overall :

1. Communication/commitment/ contribution/ compassion towards the patients and innovation - 10 marks

2. Implementation of newly learnt techniques - 10 marks

3. Documentatin of casesheets/discharge Summary/review - 10 marks

4. Number of cases presented in clinical meetings/ journal clubs/ seminar/ papers presented in conference - 10 marks

5. No. of medals/ certificates won in the conference / quiz copetitions and other academic meetings with details. - 10marks

**Total** **- 50 marks**

| | | | | |
|---|---|---|---|---|
| Assessment I | - | February | - | First year |
| II | - | August | - | Fisrt year |
| III | - | February | - | Second year |
| IV | - | August | - | Second year |
| V | - | February | - | Third year |
| VI | - | May | - | Third year |

VIVA INCLUDING COMPETENCY ASSESSMENT – 100 MARKS(50+50)

## 9.THEORY EXAM

PAPER I - Basic science
PAPER II - Basic paediatric orthopaedics
PAPER III - Applied paediatric orthopaedics (including cerebral palsy and oncology)
PAPER IV - Recent advances in paediatric orthopaedics

Each paper will contain

1. Essay questions (2) - 2 * 15 =30 marks
2. Short notes (10) - 10 * 7 = 70 marks

**Total** **= 100 marks**

## 10. PRACTICAL SCHEME

| PARTICULARS | Time for the candidate to examine the case | Time for examiners to question the case | Maximum marks |
|---|---|---|---|
| Long case | 1 case * 60minutes | 60 minutes | 100 |
| Shortcase | 2 cases * 15 minutes | 30 minutes | 100 |
| Ward rounds | 3 patients * 10 minutes | 30 minutes | 100 |
| OSCE | 5 stations * 3 minutes | 15 minutes | 50 |
| Viva voce | | 15 minutes | 100 |
| Logbook | | | 50 |
| | | | 500 |

As per Medical council of India Postgraduates Medical Education Regulations 2000 (amended upto 10th august 2016) clause **13.9 A postgraduate student of a post graduate degree course in board specialities / super specialities would be required to present one poster presentation to read one paper at a National / state conference and to present one research paper which should be published /accepted for publication/ sent for publication during the period of his postgraduate studies so as to make him eligible to appear at the postgraduate degree examination.**

Apart from Poster / oral paper presentation in National/State conferences, the research paper published by the candidate in the University Journal of Medical Sciences but case reports will not be considered as research paper.

The candidate can also present Research paper as per the Clause 13.9 of Post graduate education regulation 2000, and if the article sent for publication by the candidate as primary author or corresponding author which has not yet been published/accepted for publication, the candidate shouldsubmit a letter from the HOD , stating that the article sent for publication is of publishable merit and the proof of the Research Article submitted to the journal for publication should be sent to the university forwarded through the HOD(AS PER 53RD SAB)

The student can submit articles for the University Journal anytime from the time of registration till 6 months prior to the theory examination.

## 11.OSCE: 5 STATIONS

1. Clinical photograph of clinical scenario
2. Clinical photograph of clinical scenario

3. Clinical photograph/ appliance used in operative surgery

4. Photograph of recent advances in paediatric orthopaedics or equipment related to paediatric orthopaedics

5. Photograph of rehabilitation aids

## 12. REFERENCE BOOKS


1. Paediatric orthopaedics – A system of decision making by Benjamin joseph, S. Nayagam, R. Loder, I. Torode

2. Lowell and Winter's paediatric orthopaedics by R.T Morrissy and S.L.Weinstein- 2 volumes

3. Tachdjian's paediatric orthopaedics by John Anthony Herring- 2 volumes

4. Operative techniques in paediatric orthopaedic surgery by J.Flynn, W.N.Sankar

5. Tumors of the Musculoskeletal System by M Malawer

6. Practice of paediatric orthopaedics by Mohammed Diab and Lynn T. Staheli


****Note:** The editions are as applicable and the latest editions shall be the part of the syllabi

## 13. Journals

1. JPO A&B : journal of paediatrics orthopaedics

2. JCO : journal of children orthopaedics/

3. JBJS A&B journal of bone and joint surgery.

4. IJO Indian journal of Orthopaedics.

5. IJPO Indian journal of paediatric Orthopaedics (POSI).