

## Chapter III

# Post Graduate Courses in Orthopedics

## M.S. Orthopedics

### Objectives:

At the end of the course, the candidate should be:

1. aware of the current concepts in quality care in orthopedics and musculo-skeletal trauma and also of diagnosis, therapeutic, medical or surgical management of orthopedic problems,
2. able to offer initial primary management of acute orthopedic and trauma emergencies.
3. aware of the limitations and refer readily to major centers for more qualified care of cases which warrant such referral.
4. aware of research methodology and be able to conduct research and publish the work done.
5. able to effectively communicate with patients, their family members, people and professional colleagues.
6. able to exercise empathy and a caring attitude and maintain high ethical standards.
7. continue to evince keen interest in continuing education irrespective of whether he/she is in a teaching institution or in clinical practice .

### Course contents:

#### *Essential theoretical knowledge*

### I. BASIC SCIENCES

#### Anatomy

- i) Musculo skeletal anatomy – Anatomy of the shoulder girdle, pelvic girdle, upper & lower limbs anatomy of the spine
- ii) Embryology and development of musculo skeletal system.
- iii) Histology.

#### Physiology

- i) Physiology of musculo skeletal system
- ii) Metabolism of bone, hormonal influence on musculo skeletal system & other related orthopaedic physiology

**Pathology**

- i) General pathology.
- ii) Tumour pathology in musculo skeletal system
- iii) Other orthopaedic pathology.

**Biochemistry**

- i) General Biochemistry.
- ii) Biochemical aspects related to orthopaedic diseases

**II. CLINICAL ORTHOPAEDICS****General Orthopaedics**

- i) General principal of healing of injury & musculoskeletal trauma.
- ii) Systemic management of the injured & body response to trauma.
- iii) Head injury & fascio maxillary injury.
- iv) General principal of management of Neurovascular injury.
- v) Management of poly trauma.
- vi) Consequences of musculoskeletal trauma & rehabilitation of the injured.
- vii) General principal of management musculoskeletal trauma- surgical and conservative.
- viii) Compound injuries – management and stabilisation procedures in orthopaedics.
- ix) General principal of management musculo skeletal trauma – in children.

**III. ORTHOPAEDIC TRAUMATOLOGY**

- i) Musculoskeletal trauma in shoulder girdle and upper limb.
- ii) Musculoskeletal trauma in pelvic girdle and lower limb.
- iii) Injuries of the spine and management of paraplegia.
- iv) Pathological fractures and management.

**IV. DISEASES IN ORTHOPAEDICS**

- i) Congenital malformations.
- ii) Metabolic, developmental & hormonal disorders in musculoskeletal system.
- iii) Epiphyseal and neuromuscular affections in children.
- iv) Infective Diseases in musculo-skeletal system including polio & Leprosy.
- v) Arthritis and Rheumatic disease.
- vi) Tumours of musculoskeletal system.
- vii) Amputations.
- viii) Prosthetics and orthotics.
- ix) Physical medicine.

**V. SPORTS MEDICINE INCLUDING ARTHROSCOPY.**

**VI. ESSENTIAL DIAGNOSTIC SKILLS – INSTRUMENTATION****Radiology**

- a) General muskuloskelatal radiology – plain X-ray.
- b) MRI.
- c) CT Scan.
- d) Scintigraphy & Bone scan.
- e) Stress radiography.
- f) Ultrasonography.

**Interventional Radiography**

- a) Sinogram.
- b) Myelography
- c) Epidurogram
- d) CT Guided biopsy.
- e) Arthrogram

**Arthroscopy****Biopsy**

- a) Trocar
- b) FNAC

**VII. SURGICAL SKILLS****Anaesthesia****Regional anaesthesia**

- a) Wrist block & Digital block.
- b) Femoral block.
- c) Ankle block.
- d) Brachial block & inter scalene block.
- e) Spinal anaesthesia.
- f) IVRA.

**VIII. SURGICAL PROCEDURES****Pelvic girdle & lower limb**

- a) Fracture fixation.
- b) Osteotomies and Arthrodesis in lower limb.
- c) HRA in Hip joint
- d) Soft tissue surgeries.
- e) Foot and ankle surgery.
- f) Management of nonunion of fractures with illizarov.

- g) Deformity correction with illizarov.
- h) Ligamentous reconstruction of knee joint.
- i) Plastic reconstruction and other reconstructive procedures in musculoskeletal trauma.
- j) Arthroscopic surgeries.
- k) Total hip arthroplasty.
- l) Total Knee arthroplasty.
- m) Total Ankle arthroplasty
- n) Stabilisation of pelvic fracture by external fixator.
- o) Acetabular fracture fixation and pelvic osteotomies

## **IX. SHOULDER GIRDLE & UPPER LIMB**

- a) Fracture fixation, Osteotomies and Arthrodesis in upper limb.
- b) Reconstructive surgeries in shoulder joint.
- c) Soft tissue surgeries
- d) Elbow and Hand surgery.
- e) Management of nonunion of fractures with illizarov
- f) Deformity correction with illizarov
- g) Plastic reconstruction and other reconstructive procedures in musculoskeletal tumours
- h) Arthroscopic surgeries
- i) Total shoulder arthroplasty.
- j) Total Elbow arthroplasty.

## **X. SPINE SURGERIES**

- a) Posterior spinal fusion.
- b) Disc surgery & decompressive procedures in spine.
- c) Instrumentation in spine.
- d) Endoscopic surgery in spine.
- f) Deformity correction in spine.
- g) Surgical procedures in TB Spine.

## **XI. SURGICAL PROCEDURES – EMERGENCY**

- a) Primary wound debridement & External fixator application.
- b) Emergency amputations.
- c) Primary internal fixation for compound fractures.

### **2.1 Graded responsibility in care of patients and operative work**

#### **I YEAR**

##### **Trauma care**

Closed reductions of fractures, Plaster application,

Debridement of open fractures, External fixations  
Internal fixations of minor fractures with K wire

**Non-traumatic conditions:**

Manipulative correction of congenital problems like CTEV  
Biopsies  
Excision of benign lesions  
Tendon lengthening

**II year**

**Trauma**

Tension band wiring of fracture patella, fracture olecranon, etc  
DCP of forearm bones, tibia, etc  
DHS

**Non-traumatic conditions:**

Carpal tunnel release  
Bone grafting  
Soft tissue release under supervision

**III YEAR**

**Trauma**

Hemi replacement arthroplasty of femur  
Dynamic condylar screw fixation  
Interlocking nailing of long bone fractures

**Non-traumatic conditions**

Osteotomies  
Soft tissue release  
Tendon transfers  
Basic arthroscopy (diagnostic)

**Teaching Learning Activities**

**Participation in departmental activities**

1. Clinical rounds – bedside clinical discussion, treatment modalities, record maintenance, discussion of alternate methods of management, PG notes, etc
2. Journal review meeting  
Review of recent journals and presentation of the same in the departmental meetings. Should include indexed international and national journals. At least four presentations should be made by each candidate in each year of the course.
3. Seminars – on Musculo skeletal trauma and Diseases in orthopaedics. Arthroplasty, spinal instrumentation and Recent advances in orthopedics. At least 4 seminars per year by each MS candidate.

4. Should attend CPCs
5. Interdepartmental meetings – Ortho-radiology and Ortho-pathology meetings should be attended by PGs
6. Preparation and presentation of dissertation work – should present to the dept the review of literature in the first year and whole work by the second year to the dept.

### **Rotation and posting in other depts**

#### **Basic sciences**

Anatomy – one hour every week in anatomy dissection hall for 6 months in the first year

#### **Applied subjects -posting in second year**

Casualty / emergency medicine for 2 weeks

Anaesthesia for 2 weeks

Radiology including CT/MRI for one month

Neurosurgery for one month

Plastic surgery for one month

Surgical ICU/ general surgical unit for one month

#### **Allied subjects**

Posting in artificial limb centre / physical medicine and rehabilitation for one month

#### **Training in teaching skills**

Bedside clinic for undergraduates for 20 hours

Bedside clinic for first year PG by THIRD Year PG for 10 hours.

Should have attended at least one National CME during the course

Should have presented at least one paper in any of the Orthopedic conferences during the course

### **Dissertation**

Every candidate pursuing MS degree course is required to carry out work on a selected research project under the guidance of a recognised post graduate teacher. The results of such a work shall be submitted in the form of a dissertation.

The dissertation is aimed to train a post graduate student in research methods and techniques. It includes identification of a problem, formulation of a hypothesis, search and review of literature, getting acquainted with recent advances, designing of a research study, collection of data, critical analysis, comparison of results and drawing conclusions.

Every candidate shall submit to the Registrar (Academic) of the University in the prescribed proforma, a synopsis containing particulars of proposed dissertation work

within six months from the date of commencement of the course on or before the dates notified by the University. The synopsis shall be sent through the proper channel.

Such synopsis will be reviewed and the dissertation topic will be registered by the University. No change in the dissertation topic or guide shall be made without prior approval of the University.

The dissertation should be written under the following headings:

- i. Introduction
- ii. Aims or Objectives of study
- iii. Review of Literature
- iv. Material and Methods
- v. Results
- vi. Discussion
- vii. Conclusion
- viii. Summary
- ix. References
- x. Tables
- xi. Annexures

The written text of dissertation shall be not less than 50 pages and shall not exceed 150 pages excluding references, tables, questionnaires and other annexures. It should be neatly typed in double line spacing on one side of paper (A4 size, 8.27" x 11.69") and bound properly. Spiral binding should be avoided. The dissertation shall be certified by the guide, head of the department and head of the Institution.

Four copies of dissertation thus prepared shall be submitted to the Registrar (Evaluation), six months before final examination on or before the dates notified by the University.

The dissertation shall be valued by examiners appointed by the University. Approval of dissertation work is an essential precondition for a candidate to appear in the University examination.

Change of guide: In the event of a registered guide leaving the college for any reason or in the event of death of guide, guide may be changed with prior permission from the university.

For some more details regarding Guide etc., please see Chapter I and for books on research methodology, ethics, etc., see Chapter IV.

1. Methods – theory examinations  
Clinical examinations
2. Frequency – theory exams once 6 months  
Clinical examinations once a year
3. Log book records

### Orientation programmes

- a. Use of library – use of periodicals, Use of electronic library  
Use of Internet,
- b. Laboratory procedures - FNAC, bone marrow aspiration
- c. National programmes – attending postgraduate teaching programs  
advised
- d. Regulations – medical ethics.
- e. Research Methodology

### Monitoring Learning Progress

It is essential to monitor the learning progress of each candidate through continuous appraisal and regular assessment. It not only helps teachers to evaluate students, but also students to evaluate themselves. The monitoring be done by the staff of the department based on participation of students in various teaching / learning activities. It may be structured and assessment be done using checklists that assess various aspects. Checklists are given in Chapter IV.

The learning out comes to be assessed should included: (i) Personal Attitudes, (ii) Acquisition of Knowledge, (iii) Clinical and operative skills, (iv) Teaching skills and (v) Dissertation.

i) **Personal Attitudes.** The essential items are:

- Caring attitudes
- Initiative
- Organisational ability
- Potential to cope with stressful situations and undertake responsibility
- Trust worthiness and reliability
- To understand and communicate intelligibly with patients and others
- To behave in a manner which establishes professional relationships with patients and colleagues
- Ability to work in team
- A critical enquiring approach to the acquisition of knowledge

The methods used mainly consist of observation. It is appreciated that these items require a degree of subjective assessment by the guide, supervisors and peers.

ii) **Acquisition of Knowledge :** The methods used comprise of 'Log Book' which records participation in various teaching / learning activities by the students. The number of activities attended and the number in which presentations are made are to be recorded. The log book should periodically be validated by the supervisors. Some of the activities are listed. The list is not complete. Institutions may include additional activities, if so, desired.



*Journal Review Meeting ( Journal Club):* The ability to do literature search, in depth study, presentation skills, and use of audio- visual aids are to be assessed. The assessment is made by faculty members and peers attending the meeting using a checklist ( see Model Checklist – I, in Chapter IV)

*Seminars / Symposia:* The topics should be assigned to the student well in advance to facilitate in depth study. The ability to do literature search, in depth study, presentation skills and use of audio- visual aids are to be assessed using a checklist (see Model Checklist-II, Chapter IV)

*Clinico-Pathological conferences :* This should be a multidisciplinary case study of an interesting case to train the candidate to solve diagnostic and therapeutic problems by using an analytical approach. The presenter(s) are to be assessed using a check list similar to that used for seminar.

*Surgical Audit:* Periodic morbidity and mortality meeting be held. Attendance and participation in these must be insisted upon. This may not be included in assessment.

### iii) *Clinical Operative skills*

*Day to Day work :* Skills in outpatient and ward work should be assessed periodically. The assessment should include the candidates' sincerity and punctuality, analytical ability and communication skills (see Model Checklist III, Chapter IV).

*Clinical meetings :* Candidates should periodically present cases to his peers and faculty members. This should be assessed using a check list (see Model checklist IV, Chapter IV ).

*Clinical and Operative skills :* The candidate should be given graded responsibility to enable learning by apprenticeship. The performance is assessed by the guide by direct observation. Particulars are recorded by the student in the log book. (Table No.3, Chapter IV)

iv) *Teaching skills :* Candidates should be encouraged to teach undergraduate medical students and paramedical students, if any. This performance should be based on assessment by the faculty members of the department and from feedback from the undergraduate students (See Model checklist V, Chapter IV)

v) ***Dissertation in the Department*** : Periodic presentations are to be made in the department. Initially the topic selected is to be presented before submission to the University for registration, again before finalisation for critical evaluation and another before final submission of the completed work (See Model Checklist VI & VII, Chapter IV)

vi) ***Periodic tests***: The departments may conduct three tests, two of them be annual tests, one at the end of first year and the other in the second year. The third test may be held three months before the final examination. The tests may include written papers, practicals / clinicals and viva voce.

vii) **Work diary / Log Book**- Every candidate shall maintain a work diary and record his/her participation in the training programmes conducted by the department such as journal reviews, seminars, etc. Special mention may be made of the presentations by the candidate as well as details of clinical or laboratory procedures, if any conducted by the candidate.

viii) ***Records***: Records, log books and marks obtained in tests will be maintained by the Head of the Department and will be made available to the University or MCI.

### **Log book**

The log book is a record of the important activities of the candidates during his training. Internal assessment should be based on the evaluation of the log book. Collectively, log books are a tool for the evaluation of the training programme of the institution by external agencies. The record includes academic activities as well as the presentations and procedures carried out by the candidate.

**Format for the log book** for the different activities is given in Tables 1,2 and 3 of Chapter IV. Copies may be made and used by the institutions.

***Procedure for defaulters***: Every department should have a committee to review such situations. The defaulting candidate is counselled by the guide and head of the department. In extreme cases of default the departmental committee may recommend that defaulting candidate be withheld from appearing the examination, if she/he fails to fulfill the requirements in spite of being given adequate chances to set himself or herself right.

## Scheme of examination

### A. Theory

There shall be four question papers, each of three hours duration. Each paper shall consist of two long essay questions each question carrying 20 marks and 6 short essay questions each carrying 10 marks. Total marks for each paper will be 100. Questions on recent advances may be asked in any or all the papers. Details of distribution of topics for each paper will be as follows:

Paper I - Basic and clinical sciences as applied to Orthopedics

Paper II - Musculo-skeletal Trauma

Paper III - General Orthopedics, Joint Disorders and Spine

Paper IV - Regional Orthopedics.

### B. Clinical 200 Marks

There shall be one long case and three short cases to be examined and presented by each candidate. Marks shall be 200.

### C. Viva Voce: 100 Marks

#### 1) Viva-Voce Examination: (80 Marks)

All examiners will conduct viva-voce conjointly on candidate's comprehension, analytical approach, expression and interpretation of data. It includes all components of course contents. In addition candidates may be also be given case reports, charts, gross specimens, pathology slides, instruments, X- rays, ultrasound, CT scan images, etc., for interpretation. It includes discussion on dissertation also.

#### 2) Pedagogy Exercise: (20 Marks)

A topic be given to each candidate in the beginning of clinical examination. He/she is asked to make a presentation on the topic for 8-10 minutes

### D.

Maximum marks for M.S. in Orthopedics	Theory	Practical	Viva	Grand Total
	400	200	100	700

### Recommended books and Journals

1. Campbell's Operative Orthopaedics 8<sup>th</sup> edition, S. Terry Canale, editorial assistance by Kay Daughtery published by MOSBY, St. Louis, USA, 1998, 400 U K \$
2. Fractures in adults & Children 4<sup>th</sup> edition Charles A. Rockwood Jr., David P. Green, Robert E. Bucholz, and James D Heckman, 1996, Lippincott-Raven Publishers, USA
3. Orthopaedic, 5<sup>th</sup> edition, edited by Samuel Turek, published by Jay Pee Brothers New Delhi, 1993
4. Mercer's Orthopaedic surgery 9<sup>th</sup> edition Robert B Duthie & George Bentley, Published in Great Britain in 1996 by ARNOLD
5. J.N.Wilson Watson – Jones Fracture and Joint injuries 6<sup>th</sup> edition, published by B.I. Churchil. Livingstone pvt. Ltd. NewDelhi – 1992, price: Rs 1400-00
6. Knee Surgery edited by Paul M. Aichroth & W. Dilworth Cannon, Jr. Published in USA by Raven Press in 1992, \$3127.
7. Total Hip Joint Replacement edited by Eftekhar NS
8. Total Knee Arthroplasty edited by James A. Rand published by Raven press; New York 1993
9. Tureks text book of orthopedics
10. Rockwood and Green - text book of fractures and joint injuries
11. Browner – fractures and dislocations
12. Gustilo – fractures and joint injuries
13. Sharrard – paediatric orthopedics
14. Tachdian – paediatric orthopedics
15. Enneking – bone tumors
16. Campanacci – bone tumors

### Journals

1. Journal of bone and Joint Surgery.
2. American journal of Orthopaedics.
3. Clinical Orthopaedics and Related Research.
4. Orthopaedic clinics of North America.
5. TRAUMA.
6. Arthroscopy.
7. Indian Journal of Orthopaedics.
8. Journal of Arthroplasty.
9. Journal of Spine Surgery.
10. Acta orthopedica Scandinavia
11. J. paed. Ortho

# **SRI SIDDHARTHA UNIVERSITY**

## **M.S. Degree Examination – Model Question Paper**

[Time: 3 Hours]

[Max. Marks: 100]

### **ORTHOPAEDICS**

#### **BASIC AND CLINICAL SCIENCES as applied to ORTHOPAEDIC SURGERY including RECENT ADVANCES**

#### **PAPER - I**

### **Q.P. CODE :**

Your answers should be specific to the questions asked.  
Draw neat labeled diagrams wherever necessary. Answer all questions

#### **LONG ESSAY**

**2 X 20 = 40 Marks**

1. Describe the mechanism of blood coagulation. Discuss the orthopaedic manifestations of haemophilia
2. Discuss the Pathophysiology of compartmental syndrome. Discuss the clinical features and management of a child with impending Volkman's ischaemia due to a supracondylar fracture of humerus

#### **SHORT ESSAY**

**6 X 10 = 60 Marks**

3. Secondary hyperparathyroidism
4. Phantom limb
5. Structure of the growth plate
6. Jaipur foot
7. Singh index
8. Compound palmar ganglion

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# **SRI SIDDHARTHA UNIVERSITY**

## **M.S. Degree Examination – Model Question Paper**

[Time: 3 Hours]

[Max. Marks: 100]

### **ORTHOPAEDICS**

#### **PAPER - II**

### **Q.P. CODE :**

Your answers should be specific to the questions asked.  
Draw neat labeled diagrams wherever necessary. Answer all questions

#### **LONG ESSAY**

**2 X 20 = 40 Marks**

1. What are the complications of total hip replacement and explain in detail about any one of them
2. Classify osteoporosis in adults. Discuss its investigations and management

#### **SHORT ESSAY**

**6 X 10 = 60 Marks**

3. Renal rickets
4. Kienbock's disease
5. Osteochondritis dissecans
6. Torticollis
7. Congenital pseudoarthrosis of tibia
8. SACH foot

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# **SRI SIDDHARTHA UNIVERSITY**

## **M.S. Degree Examination – Model Question Paper**

[Time: 3 Hours]

[Max. Marks: 100]

### **ORTHOPAEDICS**

#### **PAPER - III**

### **Q.P. CODE:**

Your answers should be specific to the questions asked.  
Draw neat labeled diagrams wherever necessary. Answer all questions

#### **LONG ESSAY**

**2 X 20 = 40 Marks**

1. Classify posterior dislocation of the hip. Describe the clinical and radiological features. Discuss briefly the methods of closed reduction of posterior dislocation of the hip
2. Discuss the management of a flexor tendon injury of the index finger involving both the profundus and sublimis tendons in "No man's land"

#### **SHORT ESSAY**

**6 X 10 = 60 Marks**

3. Dislocation of the carpal lunate
4. Tension band principle
5. Galeazzi fracture dislocation
6. TILLAUX fracture
7. Pivot shift test
8. Erb's palsy

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# **SRI SIDDHARTHA UNIVERSITY**

## **M.S. Degree Examination – Model Question Paper**

[Time: 3 Hours]

[Max. Marks: 100]

### **ORTHOPAEDICS**

#### **PAPER - IV**

### **Q.P. CODE:**

Your answers should be specific to the questions asked.  
Draw neat labeled diagrams wherever necessary. Answer all questions

#### **LONG ESSAY**

**2 X 20 = 40 Marks**

1. Classify subtrochanteric fractures. Describe the clinical features and management of the same
2. Describe the components of deformity in CTEV. Discuss the management of their condition up to the age of seven years

#### **SHORT ESSAY**

**6 X 10 = 60 Marks**

3. Pavlik harness
4. Volkman's ischemic contracture
5. Cryosurgery
6. Synovial chondromatosis
7. De quervain's disease
8. Tetanus

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