M.Ch Neurosurgery
Curriculum and Syllabus 2013
Branch Code: 402

SRM Medical College Hospital & Research Centre
SRM University
SRM Nagar, Kattankulathur
Kancheepuram (Dt). 603 203
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1. GOALS:

The aim of teaching postgraduate students in neurosurgery is to prepare them to have adequate knowledge in the subject, covering both theoretical and practical knowledge, in accordance with the institutional goals.

OBJECTIVES:

KNOWLEDGE:

At the end of the course, upon successful completion of training and passing the examination the student is expected to

1. Acquire comprehensive knowledge of the basics of neurosurgery including all allied specialities related to neurosurgery like Neuroanatomy, neuropathology, Neuroinfections, neuroimmunology, Preventive Neurology, Neuroepidemiology, Paediatric Neurology.

2. Possess a complete knowledge of all the commonly used Neurosurgery procedure diagnostic tests like Electroencephalography, evoked Potentials, etc…

3. Possess knowledge of the recent advances in the subject of Neurosurgery and all its allied specialities and working knowledge of the sophisticated and routine equipments, consumables used in Neurosurgery especially with respect to Neurochemistry, neurogenetic and molecular diagnostic techniques.

4. Possess knowledge of principles of research work in the field of Neurology and Neurosurgery in both the clinical and experimental field with the ability to analyse data.
5. Acquire knowledge in the performance and interpretation of special investigations such as Polysomnography, Video EEG, autonomic function tests, Transcranial Doppler tests, Magnetic Electrical Stimulations.

6. Acquire knowledge in interpretation of common neuroimaging investigations such as CT scanning, MRI scanning, MR and Digital subtraction angiography, MR spectroscopy and Single Photon Emission Computerized Tomography.

SKILLS

1. Diagnose and manage majority of conditions in the specialty of Neurosurgery on the basis of clinical assessment, and appropriate investigations.

2. Possess complete clinical Diagnostic Skills for the recognition of common Nervous system diseases.

3. Acquire skills in the performance and interpretation of special investigations such as Polysomnography, Video EEG monitoring, EEG – Telemetry, autonomic function tests, Transcranial Doppler tests.

4. Acquire skills in invasive procedures such as lumbar puncture, intrathecal drug administration, CSF manometry; assisting in digital subtraction angiography and intraarterial thrombolysis; and Nerve and muscle biopsy and their interpretation of relevant histopathology.

5. Acquire exposure in sophisticated neuromodulation procedures such as planning of deep brain stimulation, vagal nerve stimulation.

6. Able to apply sound clinical judgement and rational cost effective investigations for the diagnosis and management of Neurosurgery Cases in the OPD, WARDs, Emergency Room and Intensive Care Unit.

7. Be able to teach undergraduate students MBBS and Post Graduate Students MS General Surgery or Paediatric Surgery as well as investigative Neurosurgery.
8. Be able to perform Clinical and Investigative studies and to present in Seminars, meetings and conference etc...

9. Have the ability to organise specific teaching and training programmes for para medical staff, associated professionals and patient education programmes.

10. Should be able to develop good communication skills and give consultations to all other departments of the hospital.

11. Demonstrate skills in documentation of individual case details as well as morbidity and mortality data relevant to the assigned situation.

12. Demonstrate empathy and humane approach towards patients and their families and exhibit interpersonal behaviour in accordance with the societal norms and expectation.

13. Develop skills as self-directed learner, recognize continuing educational needs: select and use appropriate learning resources.

14. Develop skills in using educational methods and techniques as applicable to the teaching of medical / nursing students, general physicians and paramedical health workers.

**HIGHLIGHTS**

This curriculum has at its core MCI recommendations. An attempt has been made to incorporate newer trends in teaching methodology as well as to include recent advances in Neurosurgery in the syllabus. This holistic approach is designed so that a graduate once he/she acquires the Degree is able to discharge the responsibility of a neurosurgeon.

Clinical subjects must essentially be based on bedside teaching. Therefore clinical posting in Neurosurgery is oriented towards teaching in ward, OPD emergency departments. Teaching takes a personal bearing since no. of students is less.
Curriculum objective has been to impart essential clinical knowledge so that he/she becomes capable of working up and treating a neurosurgical problem in a logical way inculcating preventive and socioeconomic aspects also in care.

MCI has allocated approximately 300 hours for teaching neurosurgery including didactic lectures, demonstration and the seminars in addition to clinical postings.

These recommendations have been taken into consideration while designing the curriculum & the teaching hours have been spread over the three year course.

During the period of training, the students follow in-service training – cum-residency programme. He/She works as a Senior Resident and is given gradually increasing responsibility in decision making process in the clinical and investigative aspects of Neurosurgery and its allied specialities such as Neuroanatomy, Neuropsychiatry, Neuropathology, Neurophysiology, Neurochemistry, Neuroradiology, Neuroanaesthesiology, Neurorehabilitation and Neurology. The day – to day work of the trainees is supervised by the Professors in the department of Neurosurgery. The posting is so organized that the trainee gets posted in various areas of the department like OPD, wards, Laboratories etc... He/She participates in the consultation service provided by the department to the Institute. Besides in-service activities, a programme of bedside demonstrations, seminars, tutorials, group discussion, workshops, journal clubs and lectures is also organized. He/she will also be exposed to various surgical procedures. He/she will also be allowed to visit other Neurosurgical centres where special procedures and are like DBS, Stereotactic, Radio managing etc...
2. COURSE OVERVIEW

DURATION OF THE COURSE

The period of certified study and training for the Post – Graduate M.Ch., Neurosurgery shall be Three Academic Years (Six Academic Terms). The academic terms shall mean six months training period.

COMMENCEMENT OF ACADEMIC SESSION

The academic session for the Post Graduate shall commence from August/ September of the Academic Year.

DATE OF EXAMINATION

The candidates admitted up to 30th September of the academic year shall be registered for that academic year and shall take up their Final Third Year regular examination in August/September of the due year and February/March of the academic year after completion of three (3) years.

NUMBER OF EXAMINATIONS

The University shall conduct not more than two examinations in a year, for any subject, with an interval of not less than 4 and more than 6 months between the two examinations.

ATTENDANCE

All students joining the postgraduate training programme shall work as full time residents during the period of training, attending not less than 80% of the training during each calendar year, and will be given full time responsibility, assignments and participation in all facets of the educational process.
The period of training for obtaining the degree shall be three completed years including the period of examination.

3. DETAILED SYLLABUS

M.Ch., (Neurosurgery) 1st year Topics

1. Basic Neuroanatomy
2. Neurophysiology
   a. Basic
   b. Neurophysiology of pain
   c. Spasticity, memory, limbic systems
   d. Basal ganglia, cerebellum
3. Neuro chemistry
4. Neuro Pathology
   a. Tumor – Classification, clinical signs and symptoms
   b. Brain edema
   c. Blood brain barrier
   d. Immunology
   e. Genetic disorders

IInd year

5. Clinical Neurology – Localization, Neurophysiological studies
6. Neuro diagnosis – CT scan, MRI, PET, X-Rays, Radionucleotide Angiography

IIIrd year

7. Neuro surgery
   a. Basic principles
   b. Vascular Neurosurgery
   c. Tumor Neurosurgery
   d. Surgical management of pituitary tumour, craniopharyngioma, pineal tumors.
   e. Surgery for congenital malformation
   f. Special subjects: craniovertebral anomalies, syringomyelia, spinal dysraphism management.
g. Traumatic brain injury, pathophysiology, Intracranial haematomas.
h. Management of spinal cord injury.
i. Spinal instrumentation
j. Different approaches for disc surgeries
k. Management of brain secondaries
l. Functional neurosurgery
   i. Principles of stereotaxic surgery
   ii. Selection of targets, disorders of different psychiatric disorders
   iii. Deep brain stimulation
m. Special surgical procedures for epilepsy.

TEACHING SCHEDULE FOR M.Ch., NEUROSURGERY

➢ MONDAY:

Operation Theatre Days

✓ 8.00 - 9.00 a.m : Preoperative discussion
✓ 9.00 a.m onwards : Operative Surgery.
✓ 4.00 p.m. : Post OP rounds in Neuro ICU

➢ TUESDAY:

✓ 09.00 a.m. – 12.00 noon - OPD case
✓ 12.00 noon –1.00 p.m. - Case Presentation & Clinical discussion
✓ 01.30 p.m. – 02.30 p.m. - Theory class by Professors.
➢ **WEDNESDAY:**

Operation Theatre Days

- 8.00 - 9.00 a.m : Preoperative discussion
- 9.00 a.m onwards : Operative Surgery.
- 4.00 p.m.: : Post OP rounds in Neuro ICU

➢ **THURSDAYS:**

- 09.00 a.m. – 12.00 noon – OPD case
- 12.00 noon – 01.00 p.m. - Journal club meeting
- Alternate Week: Symposium
- Neuro Radiology / Clinical Neuro Pathology discussion

➢ **FRIDAY:**

Operation Theatre Days

✓ 8.00 - 9.00 a.m : Preoperative discussion
✓ 9.00 a.m onwards : Operative Surgery.
✓ 4.00 p.m. : Post OP rounds in Neuro ICU
SATURDAY:

- 09.00 a.m. – 12.00 noon - OPD case
- 12.00 noon – 01.00 p.m. - Theory class by Professor / Associate Professor / Assistant Professor
- 1.00 – 2.00 pm - Case sheet indexing / Monthly once grand rounds & Special Lectures by invites from other departments.

TEACHING PROGRAMME

CUMULATIVE DURATION OF THE STUDY PROGRAM

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<tr>
<th>S.NO.</th>
<th>PLACES</th>
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<th>2ND YEAR</th>
<th>3RD YEAR</th>
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<tr>
<td>1</td>
<td>Ward +CCU/Neuro OT</td>
<td>8 months</td>
<td>8 months</td>
<td>1 month</td>
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<td>Anatomy Dissection</td>
<td>15 days</td>
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<td>3</td>
<td>ENT Posting</td>
<td>15 days</td>
<td>-</td>
<td>-</td>
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<tr>
<td>4</td>
<td>Neurology</td>
<td>1 month</td>
<td>1 month</td>
<td>-</td>
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<td>5</td>
<td>Neuroradiolgy</td>
<td>1 month</td>
<td>-</td>
<td>-</td>
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<td>6</td>
<td>Neuroanaesthesia</td>
<td>15 days</td>
<td>15 days</td>
<td>-</td>
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<tr>
<td>7</td>
<td>Neuro pathology</td>
<td>15 days</td>
<td>-</td>
<td>-</td>
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<tr>
<td></td>
<td>Elective Postings – other</td>
<td>-</td>
<td>2 months</td>
<td>2 months</td>
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<td>Institutions</td>
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Conferences

It is preferable that a post graduate student during the course to present one poster presentation and / or platform presentation at a national / state conference and / or to present one research paper which can be published / accepted for publication / sent for publication during the period of his / her postgraduate studies.

4. MAINTENANCE OF LOG BOOK

1. The Post Graduate Students shall maintain a record of day to day activities carried out by them and training program undergone including details of procedure carried out individually or assisted. They will also incorporate details of rare cases discussed in the clinical discussions and references from the literatures for the rare case.

2. The students shall record the details of the journals they discussed in the journal club.

3. The log book should contain various CME’s conferences (National & International) attended by the student during the study period.

4. The students should record the teaching sessions and the topic discussed by the faculty during their visit to other centres of excellence during the second year.
RESEARCH PROJECTS

Every candidate shall carry out work on an assigned research project under the guidance of a recognized postgraduate teacher, the project shall be written and submitted in the form of a Project.

Every candidate shall submit project plan to university within the time frame set by the university.

Thesis topic shall be submitted to the University within 9 months of joining the course.

The student will (i) identify a relevant research problem, (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 conclusion, (ix) write a research paper.

ASSESSMENT

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

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. In addition, research project is also assessed separately.

Formative Assessment

The formative assessment is continuous as well as end of each term.
It is based on the feedback from the consultants concerned.
Formative assessment will provide feedback to the candidate about his/her performance and help to improve in the areas they lack.

Record of internal assessment should be presented to the board of examiners for consideration at the time of final examination.

**Internal Assessment**

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

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<th>Sr. No.</th>
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<th>Marks</th>
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<tr>
<td>1.</td>
<td>Personal Attributes</td>
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<td>2.</td>
<td>Clinical Work</td>
<td>20</td>
</tr>
<tr>
<td>3.</td>
<td>Academic activities</td>
<td>20</td>
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<tr>
<td>4.</td>
<td>End of term theory examination</td>
<td>20</td>
</tr>
<tr>
<td>5.</td>
<td>End of term practical examination</td>
<td>20</td>
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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, respectful to seniors, and 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 of 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 1st, 2nd year and after 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 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.

**JOB RESPONSIBILITIES**

**Outdoor Patient (OPD) Responsibilities**

- The working of the residents in the OPD should be fully supervised.
- They should evaluate each patient and write the observations on the OPD card with date and signature.
- Investigations should be ordered as and when necessary using prescribed forms.
- Residents should discuss all the cases with the consultant and formulate a management plan.
- Patient requiring admission according to resident’s assessment should be shown to the consultant on duty.
- Patient requiring immediate medical attention should be sent to the casualty services with details of the clinical problem clearly written on the card.
- Patient should be clearly explained as to the nature of the illness, the treatment advice and the investigations to be done.
- Resident should specify the date and time when the patient has to return for follow up.

**IN-PATIENT RESPONSIBILITIES**

Each resident should be responsible and accountable for all the patients admitted under his care. The following are the general guidelines for the functioning of the residents in the ward:
• Detailed work up of the case and case sheet maintenance:
• He/She should record a proper history and document the various symptoms.
  Perform a proper patient examination using standard methodology. He/she should develop skills to ensure patient comfort/consent for examination. Based on the above evaluation he/she should be able to formulate adifferential diagnosis and prepare a management plan. Should develop skills for recording of medical notes, investigations and be able to properly document the consultant round notes.
• To organize his/her investigations and ensure collection of reports.
• Bedside procedures for therapeutic or diagnostic purpose.
• Presentation of a precise and comprehensive overview of the patient in clinical rounds to facilitate discussion with senior residents and consultants.
• To evaluate the patient twice daily (and more frequently if necessary) and maintain a progress report in the case file.
• To establish rapport with the patient for communication regarding the nature of illness and further plan management.
• To write instructions about patient’s treatment clearly in the instruction book along with time, date and the bed number with legible signature of the resident.
• All treatment alterations should be done by the residents with the advice of the concerned consultants and senior residents of the unit.

**ADMISSION DAY**
Following guidelines should be observed by the resident during admission day.
• Resident should work up the patient in detail and be ready with the preliminary necessary investigations reports for the evening discussion
with the consultant on duty.

• After the evening round the resident should make changes in the treatment and plan out the investigations for the next day in advance.

**DOCTOR ON DUTY**

• Duty days for each Resident should be allotted according to the duty roster.

• The resident on duty for the day should know about all sick patients in the wards and relevant problems of all other patients, so that he/she could face an emergency situation effectively.

• In the morning, detailed over (written and verbal) should be given to the next resident on duty. This practice should be rigidly observed.

• If a patient is critically ill, discussion about management should be done with the consultant at any time.

• The doctor on duty should be available in the ward throughout the duty hours.

**CARE OF SICK PATIENTS**

• Care of sick patients in the ward should have precedence over all other routine work for the doctor on duty.

• Patients in critical condition should be meticulously monitored and records maintained.

• If patient merits ICU care then it must be discussed with the senior residents and consultants for transfer to ICU.

**RESUSCITATION SKILLS**

At the time of joining the residency programme, the resuscitation skills should be demonstrated to the residents and practical training provided at various work stations.

• Residents should be fully competent in providing basic and advanced
cardiac life support.

- They should be fully aware of all advanced cardiac support algorithms and be aware of the use of common resuscitative drugs and equipment like defibrillators and external cardiac pacemakers.
- The resident should be able to lead a cardiac arrest management team.

**DISCHARGE OF THE PATIENT**

- Patient should be informed about his/her discharge one day in advance and discharge cards should be prepared one day prior to the planned discharge.
- The discharge card should include the salient points in history and examination, complete diagnosis, important management decisions, hospital course and procedures done during hospital stay and the final advice to the patient.
- Consultants and MCH Residents should check the particulars of the discharge card and counter sign it.
- Patient should be briefed regarding the date, time and location of OPD for the follow up visit.

**IN CASE OF DEATH**

- In case it is anticipated that a particular patient is in a serious condition, relatives should be informed about the critical condition of the patient beforehand.
- Residents should be expected to develop appropriate skills for breaking bad news.
- Follow up death summary should be written in the file and face sheet notes must be filled up and the sister in charge should be requested to send the body to the mortuary with respect and dignity from where the
patient’s relatives can be handed over the body.

- In case of a medico legal case, death certificate has to be prepared in triplicate and the body handed over to the mortuary and the local police authorities should be informed.

- Autopsy should be attempted for all patients who have died in the hospital especially if the patient died of an undiagnosed illness.

**BEDSIDE PROCEDURES**

The following guidelines should be observed strictly:

- Be aware of the indications and contraindications for the procedure and record it in the case sheet. Rule out contraindications like low platelet count, prolonged prothrombin time, etc.

- Plan the procedure during routine working hours, unless it is an emergency. Explain the procedure with its complications to the patient and his/her relative and obtain written informed consent on a proper form. Perform the procedure under strict aseptic precautions using standard techniques. Emergency tray should be ready during the procedure.

- Make a brief note on the case sheet with the date, time, nature of the procedure and immediate complications, if any.

- Monitor the patient and watch for complications(s).

**OT RESPONSIBILITIES**

- The 1st year resident observes the general layout and working of the OT, understands the importance of maintaining sanctity of the OT, scrubbing, working and sterilization of all the OT Instrument, know how of microscopes. He/ She is responsible shifting of OT patients, for
participating in surgery as 2nd assistant and for post operative management of patient in recovery and in ward. The 2nd year resident is responsible for pre op work up of the patient, surgical planning and understanding the rationale of surgery. He/she is the first assistant in surgery and is responsible for anticipating intra op and post op complications and managing them. The final year resident should be able to perform minor/medium/major surgeries independently and assist in medium/major/extra major surgeries. He/she should be able to handle all emergencies and post op complications independently and is responsible for supervision and guidance of his/her juniors.

**MEDICO-LEGAL RESPONSIBILITIES OF THE RESIDENTS**

- All the residents are given education regarding medico-legal responsibilities at the time of admission in a short workshop.
- They must be aware of the formalities and steps involved in making the correct death certificates, mortuary slips, medico-legal entries, requisition for autopsy etc.
- They should be fully aware of the ethical angle of their responsibilities and should learn how to take legally valid consent for different hospital procedures & therapies.

They should ensure confidentiality at every stage.
5. THESES:

Every student registered as post graduate shall carry out work on an assigned research project under the guidance of a recognized post graduate teacher, the result of which shall be written up and submitted in the form of a thesis.

Work for writing the Thesis is aimed at contributing to the development of a spirit of enquiry, besides exposing the students to the techniques of research, critical analysis, acquaintance with the latest advances in medical science and the manner of identifying and consulting available literature. Thesis shall be submitted at least six months before the theoretical and clinical / practical examination.

The thesis shall be a bound volume of a minimum of 50 pages and not exceeding 75 pages of typed matter (Double line spacing and on one side only) excluding certification, acknowledgements, annexure and bibliography. Thesis should consist of:

- Introduction
- Review literature
- Aims and objectives
- Material and methods
- Result
- Discussion
- Summary and conclusion
- Tables
- Annexure
- Bibliography
- Ethics committee clearance certificate

Four copies of thesis shall be submitted six month prior to the commencement of the theory examination on the date prescribed by the Controller of Examination of this University. The thesis should be approved by the Professor of the branch and the same has to be forwarded to the Controller of Examination, by the Head of the Department through the Dean of the college.

Two copes in addition are to be submitted as an electronic version of the entire thesis in a standard C.D. format by mentioning the details and technicalities used in the C.D. format.
The thesis shall be examined by a minimum of three examiners; one internal and two external examiner, who shall not be the examiners for Theory and clinical; and on the acceptance of the thesis by two examiners, the candidate shall appear for the final examination.

**EVALUATION OF THESIS:**

**ACCEPTED /NOT ACCEPTED**

No marks will be given

**Final Examination:**

**Eligibility:**

The candidate should have

1. Attendance of 80% percentage in each calendar year.
PRACTICAL TRAINING

There will be operative surgical training for **three days in a week**.

**THE FIRST YEAR:**

Student will be taught to do diagnostic procedures, preparations of the cases for surgery, also act as a 2nd assistant in all the neurosurgical procedures and to be introduced in post operative care.

**SECOND YEAR:**

He/she will be allowed to do craniotomy / laminectomy and other procedures like dural opening for the surgeon and to help the surgeon for the removal of the lesions. He also will be allowed for closure of the wound and subsequent post operative management.

**THIRD YEAR:**

He/she will be allowed to dissect the brain, helping in localizing the lesion and allowing him to deliver the tumor or lesion and also to do bleeding control during surgery with the help of the surgeon.

**SPECIAL PROCEDURES TRAINING:**

He/she will be also exposed to learn other special procedures like deep brain stimulation, steriotatic functional neurosurgery, interventional neurosurgical procedure etc… by deputing them to various medical colleges where the special neurosurgical procedures are performed as a part of teaching curriculum and he/she has to spend two months outside the institution during second and third year of training.
6. SCHEME OF EXAMINATIONS:

EXAMINATIONS – THEORY PAPERS:

<table>
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<tr>
<th>Theory</th>
<th>Title</th>
<th>Duration</th>
<th>Marks</th>
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<tbody>
<tr>
<td>Paper – I</td>
<td>Basic Sciences as Related to Neurosurgery</td>
<td>3 hrs</td>
<td>100</td>
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<tr>
<td></td>
<td>Neurobasics including General Sciences</td>
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<td></td>
<td>Neuroanatomy and Neurophysiology.</td>
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<td>Neuro Basics including Neurochemistry,</td>
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<td></td>
<td>Neuropathology and Neuropharmacology</td>
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<tr>
<td>Paper – II</td>
<td>Clinical Neurosurgery</td>
<td>3 hrs</td>
<td>100</td>
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<td>Clinical Neurology</td>
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<td>Neurodiagnostics, Laboratory Diagnosis.</td>
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<td>Paper – III</td>
<td>Operative Neurosurgery</td>
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<td>Neurosurgery – Basic Aspects &amp; Surgical</td>
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<td>Management, operative approaches and</td>
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<td>trauma.</td>
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<td>Paper – IV</td>
<td>Recent Advances in Neurosurgery</td>
<td>3 hrs</td>
<td>100</td>
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<td>Recent Advances &amp; Neuro Radiology.</td>
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<td>Total</td>
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<td>400</td>
</tr>
</tbody>
</table>

Distribution of Marks:-

2 Essays 2 X 20 = 40 Marks

10 Short Notes 10X6 = 60 Marks

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Total 100 Marks

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Total 400 marks
**SCHEME FOR PRACTICAL EXAMINATION:**

<table>
<thead>
<tr>
<th>S.NO.</th>
<th>PROCEDURE</th>
<th>MARKS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>LONG CASE (1)</td>
<td>100</td>
</tr>
<tr>
<td>2</td>
<td>SHORT CASE (2) 75 MARKS EACH</td>
<td>150</td>
</tr>
<tr>
<td>3</td>
<td>PROCEDURE</td>
<td>50</td>
</tr>
<tr>
<td>4</td>
<td>GRAND VIVA INCLUDING / WARD ROUNDS / INSTRUMENTS / RADIOLOGY / PATHOLOGY</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>400</strong></td>
</tr>
</tbody>
</table>

**THESIS:** Approved / not approved (No Marks)

<table>
<thead>
<tr>
<th>Marks qualifying for a pass Theory and Clinical examination</th>
<th><strong>Maximum marks</strong></th>
<th>Qualifying for a pass 50% marks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Theory</td>
<td>400</td>
<td>200</td>
</tr>
<tr>
<td>Clinical &amp; Oral / Viva</td>
<td>400</td>
<td>200</td>
</tr>
</tbody>
</table>

A student shall secure not less than 50% marks in each head of passing, which shall include 1. Theory 2. Practical including clinical and viva voice examination.

* “The postgraduate medical students are required to pass theory and practical examinations separately. An examinee should obtain minimum 40% marks in each theory paper and not less than 50% marks cumulatively in all the four papers for Degree examination to be cleared as “Passed” at the said Degree examination”

*As per Medical Council of India notification date 03.09.2014 and the same approved in the 28th Academic council meet of SRM University held on 23/03/2015.*
7. EXAMINATION AND EVALUATION

APPRAISAL:

To Improve the M.Ch Training Programme by having appraisal for Postgraduate trainees.

Accordingly, the assessment of the postgraduate, review of the progress and appraisal infrastructure and facilities will be carried out.

The Department shall conduct periodic assessment tests of the Postgraduate student as per the guidelines issued from time to time.

At the end of 3 years the appraisal report will be submitted.

(1) EXAMINERS

(a) All the post graduate examiners shall be recognized post graduate teachers holding recognized post graduate qualifications in the subject concerned.

(b) For all post graduate examinations, the minimum number of examiners shall be four, out of which at least two (50%) shall be external Examiners, who shall be invited from other recognized universities from outside the State and other two will be internal examiners for M.Ch.

(c) Under exceptional circumstances, examinations may be held with 3 (Three) examiners provided two of them are external and Medical Council of India is intimated the justification of such action prior to publication of result for approval. Under no circumstances, result shall be published in such cases without the approval of Medical Council of India.

(d) In the event of there being more than one centre in one city, the external examiners at all the centers in that city shall be the same. Where there is more than one centre of examination, the University shall appoint a Supervisor to coordinate the examination on its behalf.

(e) The guidelines regarding appointment of examiners are as follows:

1. No person shall be appointed as an examiner in any subject unless he/she fulfils the minimum requirements for recognition as a Post Graduate teacher as laid down by the Medical Council of India and has teaching experience of 8 (Eight) years as a Lecturer / Assistant Professor out of which he/she has not less than 5 (five) years teaching
experience after obtaining Post Graduate degree. For external examiners, he/she should have minimum three years experience of examinership for Post Graduate diploma in the concerned subject. Out of internal examiners, one examiner shall be a professor or Head of Department.

2. There shall be at least four examiners in each subject at an examination out of which at least 50% (Fifty percent) shall be external examiners. The external examiner who fulfils the condition laid down in clause – 1 above shall ordinarily be invited from another recognized university, from outside the State: provided that in exceptional circumstances examinations may be held with 3 (three) examiners if two of them are external and Medical council of India is intimated with the justification of such examination and the result shall be published in such a case with the approval of Medical council of India.

3. An external examiner may be ordinarily been appointed for not more than three years consecutively. Thereafter he/she may be reappointed after an interval of two years.

4. The internal examiner in a subject shall not accept external examiner ship for a college from which external examiner is appointed in his/her subject.

5. The same set of examiners shall ordinarily be responsible for the written, practical or part of examination.

6. There shall be a Chairman of the Board of paper – setters who shall be an external examiner and shall moderate the question papers.

7. Where there is more than one centre of examination, there shall be Co –ordinator appointed by the University who shall supervise and Co – ordinate the examination of behalf of the University with independent authority.

(2). Number of candidates:

The maximum number of candidates to be examined in Clinical / practical and Oral on any day shall not exceed three for M.Ch degree examination.
(3). Number of examination: -

The university shall conduct not more than two examinations in a year, for any subject, with an interval of not less than 4 and not more than 6 months between the examinations.

Master of Chirurgery (M.Ch) Neurosurgery.

The examination shall consist of: Theory and Clinical /Practical and Oral.

(a). Theory

There shall be four theory papers; one paper out of these shall be one Basic Medical Sciences, and another paper on Recent Advances. The theory examination will be held sufficiently earlier than the Clinical and Practical examination, so that the answer books can be assessed and evaluated before the start of the clinical / Practical and Oral examination.

(b). Clinical / Practical and Oral

Practical examination shall consist of carrying out special investigation technique for Diagnosis and Therapy. Oral examination shall be comprehensive to test the candidate’s overall knowledge of the subject.

A candidate shall secure not less than 50% marks in each head of passing which shall include (1) Theory (2) practical including clinical and viva voce examination.

Evaluation of Answer Scripts

The answer books shall be valued by two examiners. One of the two examiners will be from this university and the other will be from any other university. The average of the two marks secured by the candidate will be taken into account. If the difference between two marks exceeds 20%, the answer script shall be valued by the third examiner. The average of the nearest two marks shall be considered as the final marks.
MODEL QUESTION PAPERS

M.Ch Neurosurgery
Paper-I
Basic Sciences as Related to Neurosurgery

Maximum Marks : 100 Time : 3 Hours

- Attempt ALL questions.
- Answer each question and its parts in SEQUENTIAL ORDER.
- Illustrate your answer with SUITABLE DIAGRAMS.

Two Essay Questions 2x20=40

1. Microsurgical anatomy of CP angle.

Short Notes 10x6=60

1. Pathophysiology of Spasticity.
2. Blood Brain Barrier.
3. Principles of CT scan and MRI.
5. Internuclear Ophthalmoplegia.
7. Cerebral edema – Types & Management
8. False localizing signs in CNS examinations
9. III Cranial nerve Nuclei
10. Physiology of CSF flow.
# Model Question Papers
## M.Ch Neurosurgery
### Paper-II
#### Clinical Neurosurgery

<table>
<thead>
<tr>
<th>Maximum Marks : 100</th>
<th>Time : 3 Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>\cdot Attempt ALL questions.</td>
<td>\cdot Answer each question and its parts in <strong>SEQUENTIAL ORDER</strong>.</td>
</tr>
<tr>
<td>\cdot Illustrate your answer with <strong>SUITABLE DIAGRAMS</strong>.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Two Essay Questions</th>
<th>2x20=40</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Management of <strong>NEUROCYSTICERCOSIS</strong>.</td>
<td></td>
</tr>
<tr>
<td>2. Intraoperative Imaging – options &amp; practical applications.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Short Notes</th>
<th>10x6=60</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Cavernous malformations of Brainstem- Clinical presentation and management options</td>
<td></td>
</tr>
<tr>
<td>2. Cushing’s disease – Evaluation and management.</td>
<td></td>
</tr>
<tr>
<td>3. Vasospasm – pathophysiology and management.</td>
<td></td>
</tr>
<tr>
<td>4. Role of ICP monitoring in Head Injury.</td>
<td></td>
</tr>
<tr>
<td>5. <strong>TRIGEMINAL NEURALGIA</strong> – treatment options.</td>
<td></td>
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<tr>
<td>6. Surgical management of spinal cord compression by metastasis.</td>
<td></td>
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<tr>
<td>7. Intramedullary spinal cord tumor – management.</td>
<td></td>
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<tr>
<td>8. Treatment of spinal vascular malformations.</td>
<td></td>
</tr>
<tr>
<td>9. Colloid cyst of 3\textsuperscript{rd} Ventricle</td>
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<tr>
<td>10. Split cord malformation – types &amp; management</td>
<td></td>
</tr>
</tbody>
</table>
Model Question Papers
M.Ch Neurosurgery
Paper-III
Operative Neurosurgery

Maximum Marks : 100 Time : 3 Hours

- Attempt ALL questions.
- Answer each question and its parts in SEQUENTIAL ORDER.
- ALL questions carry equal marks.
- Illustrate your answer with SUITABLE DIAGRAMS.

Two Essay Questions 2x20=40

1. Approaches to CP angle tumours.
2. Management of AAD.

Short Notes 10x6=60

2. TRANSPHENOIDAL SURGERY for pituitary tumours.
3. Approaches to IIIrd ventricle.
4. Lumbar microdiscectomy.
5. Brain metastasis – Various Management Options
6. Management of AVM’s.
7. Management of Brain abscess.
8. Management of Pott’s Spine.
9. Endoscopic third ventriculostomy
10. Surgery for craniosynostosis
Model Question Papers
M.Ch Neurosurgery
Paper- IV
Recent Advances in Neurosurgery

Maximum Marks : 100
Time : 3 Hours

- Attempt ALL questions.
- Answer each question and its parts in SEQUENTIAL ORDER.
- Illustrate your answer with SUITABLE DIAGRAMS.

Two Essay Questions 2x20=40

1. Nanotechnology.

2. Gamma knife for Vascular malformations of Brain.

Short Notes 10x6=60

1. Role of surgery in epilepsy.

2. Gene therapy for brain tumours.

3. Use of Tactography during surgery.

4. Role of neuro surgery in Parkinsonism.

5. Neuroendoscopy in spine surgery.


7. Stem Cell Therapy in Neurosurgery.

8. Role of Neurosurgery in Stroke management.

9. Onyx Embolisation

10. Awake craniotomy
RECOMMENDED BOOKS & JOURNALS:

SUGGESTED BOOKS


SUGGESTED JOURNALS

J Neurotrauma
Neurosurgery
Spine
J Neurosurgery
J Neurosurgery Spine
Acta Neurochirurgica
Surgical Neurology
Paediatric Neurosurgery
Neurosurgical Clinics of North America
Neurosurgical Focus
Journal of Neurosurgery: Paediatrics
**ANNEXURE**

1). Proforma for Internal evaluation

<table>
<thead>
<tr>
<th></th>
<th>Clinical</th>
</tr>
</thead>
</table>

Guidance for scoring: 1 2 3 4 5

- Poor
- Below average
- Average
- Above average
- Good

<table>
<thead>
<tr>
<th>Evaluation form</th>
<th>Clinical work</th>
</tr>
</thead>
</table>

(To be completed once in six (6) months by respective Unit Heads)

Name:  
Date:  

**Points to be considered:**

1. Punctuality
2. Regularity of Attendance
3. Quality of Ward Work
4. Maintenance of case records
5. Presentation of cases during rounds
6. Investigation work – up
7. Bedside manners
8. Rapport with patients
9. Undergraduate teaching (if applicable)
10. Others:

**Signature:**
2). Evaluation form: Clinical case presentation:

Name:                                              Date:

Points to be considered:

1. Completeness of history
2. Whether all relevant points elicited
3. Cogency of presentation
4. Logical order
5. Mentioned all positive and negative points of importance
6. Accuracy of general physical examination
7. Whether all physical signs missed or misinterpreted.
8. Whether any major signs missed or misinterpreted.
9. Diagnosis: Whether it follows logically from history and findings.

10. Investigations required:
    - Complete list
    - Relevant order
    - Interpretation of investigation

11. Overall:
    - Ability to react to questioning – Whether answers relevant and complete
    - Ability to defend diagnosis
    - Ability to justify differential; diagnosis confidence

12. Others:

Signature:
3). Evaluation form: **Journal club:**

Name: ___________________________ Date: ________________

**Points to be considered:**

1. Choice of articles.
2. Cogency of presentation
3. Whether he has understood the purpose of the article
4. How well did he defend the article
5. Whether cross references have been consulted
6. Whether other relevant publications have been consulted
7. His overall impression of articles:
   - If good - reasons:
   - If poor - reasons:

8. Audiovisual aids.
9. Response to questioning
10. Overall presentation
11. Others

**Signature:**