SUMANDEEP VIDYAPEETH

(Declared as Deemed to be University under Section 3 of the UGC Act 1956)

Accredited by NAAC with a CGPA of 3.53 out of four-point scale at 'A' Grade

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CURRICULUM

Master of Chirurgiae (M.Ch.) in NEURO- SURGERY

Attested CTC

15/2/2021

Vice-Chancellor
Sumandeep Vidyapeeth
An Institution Deemed to be University
Vill. Piparia, Taluka: Waghodia.
Dist. Vadodara-391 760. (Gujarat)

2015

Dean

Curriculum
MCh. NEURO SURGERY

The infrastructure and faculty of the department of neurosurgery will be as per MCI guidelines

1. Goals

The goal of MCh course is to produce a competent surgeon who:

- Recognizes the health needs of adults and carries out professional obligations in keeping with principles of National Health Policy and professional ethics;
- Has acquired the competencies pertaining to neuro surgery that are required to be
- practiced in the community and at all levels of health care system;
- Has acquired skills in effectively communicating with the patients, family and the community;
- Is aware of the contemporary advances and developments in medical sciences. Acquires a spirit of scientific enquiry and is oriented to principles of research methodology; and
- Has acquired skills in educating medical and paramedical professionals.

2. Objectives

At the end of the MCh Neuro Surgery, the student should be able to:

- Recognize the key importance of medical problems in the context of the health priority of the country;
- Practice the specialty of Neuro surgery in keeping with the principles of professional ethics;
- Identify social, economic, environmental, biological and emotional determinants of adult Neuro Surgery and know the therapeutic, rehabilitative, preventive and
- promotion measures to provide holistic care to all patients;
- Take detailed history, perform full physical examination and make a clinical diagnosis;
- Perform and interpret relevant investigations (Imaging and Laboratory); Perform and interpret important diagnostic procedures;
- Diagnose illnesses in adults based on the analysis of history, physical examination
- and investigative work up;
- Plan and deliver comprehensive treatment for illness in adults using principles of rational drug therapy;
- Plan and advise measures for the prevention of diseases;
- Plan rehabilitation of adults suffering from chronic illness, and those with special needs;
- Manage emergencies efficiently;
- Demonstrate skills in documentation of case details, and of morbidity and mortality data relevant to the assigned situation;
- Demonstrate empathy and humane approach towards patients and their families and respect their sensibilities;
- Demonstrate communication skills of a high order in explaining management and prognosis, providing counseling and giving health education messages to patients, families and communities.
- Develop skills as a self-directed learner, recognize continuing educational needs; use appropriate learning resources, and critically analyze relevant published literature in order to practice evidence-based medicine;

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- Demonstrate competence in basic concepts of research methodology and epidemiology;
- Facilitate learning of medical/nursing students, practicing surgeons , para-medical
- health workers and other providers as a teacher-trainer;
- Play the assigned role in the implementation of national health programs, effectively and responsibly;
- Organize and supervise the desired managerial and leadership skills;
- Function as a productive member of a team engaged in health care, research and education.

3. Syllabus:

3.1 Theory

The theory syllabus should include the history, epidemiology, etiology, genetics, pathogenesis, clinical manifestations, complications, differential diagnosis, investigations, treatment with special stress on surgical procedures), prevention and prognosis of all neurological diseases in adults.

1. **Landmarks in the history of neurosurgery,** micro neurosurgery , neuroradiology.
2. **Clinical evaluation of the nervous system** – history taking and clinical examination of cognitive functions, cranial nerve examination , neuroopthalmology , examination of motor and sensory systems and reflexes.
3. **Applications of principles of cellular and molecular biology in neurosurgical disorders**
4. **Diagnostic tests** – examination of CSF and related procedures, electrodiagnostic tests (NCV ,EMG ,EEG ,Evoked potentials , Trans Cranial Doppler , Pet scan , Spect , Angiography , Brain Biopsy)
5. **General and peri operative care-Initial** evaluation and treatment of the comatose patient, Seizure disorders and their medical management, Evaluation of the patient with dementia and treatment of normal pressure hydrocephalus, Blood-Brian barrier; cerebral edema, increased intracranial pressure, Brain Herniation, and their control, Pseudotumor cerebri, Neurology, Preoperative evaluation of a
6. Neurosurgical patient, Blood coagulation, Neuroanesthesia, Intensive care, Spasticity, Advance in molecular genetics in relation to neurogenetic diseases
7. **Neurosurgical and related techniques-Principles** of neurosurgical operative technique, Principles of Neurosurgical operative technique, Endoscopic neurosurgery, Prophylacticantibiotics , Patient positioning, Intraoperative neurophysiologic Monitoring, High speed drills, Intraoperative use of topical hemostatic agents in neurosurgery, Use of fibrin glue in neurosurgery, Calcium phosphate ceramics as bone substitute , Endovascular therapy of vascular lesions of the central nervous system
8. **Neuro** - Oncology -Oncogenes and Nervous system tumor, genetic factors in brain tumors, neurofibromatosis and other phakonatoses, Tumor markers, Primary brain tumor: Aspects of imaging and functional localization.
9. **Tumors in the region of the pineal gland-Classification** and pathology, Clinical features and surgical management , Surgical approaches to pineal tumors.
10. **Cerebellopontine angle tumor-Tumor** of the cerebellopontine angle: Pathology, Tumor of the cerebellopontine angle: Neuro-otologic aspects of diagnosis, tumor of the cerebellopontine angle: clinical features and surgical management via a retrosigmoid approach.
11. **Posterior fossa tumors-Imaging** of posterior fossa tumors, Microsurgical Anatomy of the

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fourth ventricle, Cerebellar Astrocytomas, Medulloblastomas, pediatric brain stem gliomas, Ependymoma, Subependymomas

12. **Sellar and Parasellar tumors-** Microsurgical anatomy of sellar region, Imagimg of Sellar and Parasellar Lesions, Classification and Pathology of Pituitary tumors, Prolactinomas, Cushing's Disease and Nelson's Syndrome, Pituitary Apoplexy, Trans-sphenoidal Appraoch to the Pituitary Gland, Transcranial approaches to the germinomas, Lateral and Third Ventricle Tumours, Tumours of the Orbit.

13. **Neuro-Oncology-Tumours** of the skull, Chordomas and Chondrosarcomas of the Cranial Base, trigeminal Neurinomas, Other cranial Nerve Schwannomas, Transfacial-Transmaxillary Approach to the Anterior Skull Base, Transoral Approaches to the clivus and upper cervical spine, Anterolateral cervical approach to the craniovertebral junction, Surgical anatomy of the cavernous sinus, Surgical treatment of tumors involving the cavernous sinus, Approaches to petroclival tumors., primitive neuroecto dermal tumors, primary central nervous system lymphomas.

14. **Spinal Tumors-Spinal** Intradural tumors, Paragangliomas of the cauda equine , Spinal epidural tumors , Primary Neoplasms of the spine.

15. **Adjunctive therapy of central nervous system tumors -** Principles of radiotherapy of central nervous system tumors , Radiosurgery for tumors , Radiation injury of the brain and the spinal cord

16. **ascular Diseases of The Nervous System**
17. General information, Measurement of cerebral blood flow, Occlusive cerebrovascular disease, Pathology of ischemic cerebrovascular disease, Thrombolytic therapy for occlusive cerebrovascular disease, surgery for acute brain infarction with mass effect, Extracrainal to Intracrainal bypass grafting, Aneurysms and Subarachnoid haemorrhage Microsurgical anatomy of saccular aneurysms, Pre- and postoperative management of a patient with ruptured aneurysm, Ophthalmic segment aneurysm, other aneurysms of internal carotid artery, Middle cerebral artery aneurysms , Anterior communicating artery aneurysms, Distal anterior cerebral artery aneurysms, posterior circulation aneurysms, management of intracranial aneurysms and arteriovenous malformations during pregnancy .
18. Vascular malformations and fistulas Intracranial arteriovenous malfor mations, Vein of Galen malformation, Stereotactic radiosurgery of intracranial arteriovenous malformations, Spinal vascular malformations. Other vascular disorders Spontaneous intraspinal hemorrhage, Spontaneous intraparenchymal brain hemorrhage.
19. **Cranial And Spinal Trauma**
20. Cranial trauma-Pathophysiology of traumatic brain injury , pathology of closed head injury , Neurological evaluation of a patient with head trauma , Radiological evaluation of head trauma , Pediatric head injury, Minor head injury management and outcome , Skull fractures, Growing skull fractures of childhood, Traumatic intracranial hematomas, Delayed and recurrent intracranial hematomas, and [post traumatic coagulopathies, Penetrating wounds of the head, Sequelae of head injury, Pathophysiology and pathology of spinal cord injury, Management of acute spinal cord injury, Cervical spine injuries: Diagnosis and management.

21. **Disorders of peripheral and cranial nerves and the autonomic nervous system.- Thoracic** outlet syndromes, Entrapment Neuropathies,
22. **Nerve Injuries-Peripheral** nerve injuries:Types, Causes, and Grading, Brachial plexus injuries, Techniques of nerve repair.
23. **Infections-** Antimicrobials for use in neurosurgical patients, Diagnosis and management of brain abscess, Acute bacterial meningitis, Spinal epidural and subdural abscesses, Fungal infection. Developmental anomalies and neurosurgical disorders of childhood-

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Neuroembryology, Spinal dysraphism, Tethered cord syndrome, Diastematomyia, Chiari malformations, Hydromyelia, Syringomyelia, Hydrocephalus: Pathophysiology and clinical features, Hydrocephalus: Treatment, Shunt system, Shunt complications,

24. **Dandy-walker** malformation.
25. **Intervertebral disc disease and selected spinal disorders-Cervical** disc disease and cervical spondylosis, Cervical ossification of the posterior Longitudinal ligament, lumber disc disease, Postoperative intervertebral disc space infections. Lumber spondylolisthesis, Posterolateral lumber spinal fusion, The failed back surgery syndrome.
26. **Pain-Anatomy** and physiology of pain, Craniofacial pain syndromes: An overview Trigeminal neuralgia:- Introduction, Trigeminal neuralgia: Problems as to cause and consequent, Trigeminal neuralgia: treatment by glycerol Rhizotomy, Trigeminal neuralgia: Treatment by microvascular decompression, Deep brain stimulation for pain relief,
27. **Stereotactic** And Functional Neurosurgery- stereotactic surgery; principles and techniques, image guided stereotactic surgery, radiofrequency lesion- making in the nervous system, surgical therapy of movement disorders, surgical treatment of epilepsy.
28. **Epilepsy surgery:** *Epilepsy surgery, Concept of presurgical evaluation in epilepsy, Various substrates associated with drug resistant epilepsy, Basic concepts of various epilepsy surgery procedures including temporal lobectomty, lesionectomy, corpus callosotomy, and Hemispherotomy, Cortical stimulation and functional mapping during epilepsy surgery,* Minimal *invasive surgical procures such as endoscopic corpus callosotomy, and Hemispherectomy, Concepts of stereo-EEG, Indications and outcomes of Radio-frequency ablations and laser ablation, Outcomes of epilepsy surgery*
29. **Cerebrovascular diseases and neuro-interventions** : Cerebrovascular and neuro-interventions Concepts of cerebral angiography, Concept of diffusion and perfusion mismatch and diffusion FLAIR mismatch
30. **Parkinsonism and movement disorders:** Recent advances in deep brain stimulation and transplant therapy for Parkinson's disease.

(Board of Studies letter no.: SBKSMIRC/Dean/874, dated 18/06/2020 and Vide Notification of Board of Management Resolution Ref: No. SVDU/R/3383/2019-20 dated 31/07/2020)

3.2. Practical:

History, examination and writing of records:

History taking should include the back ground information, presenting complaints and history of present illness, history of previous illness, family history, social and occupational history and treatment history.

Detailed physical examination should include general examination and systemic examination (Chest, Cardio-vascular system, Abdomen, Central nervous system, locomotor system and joints), with detailed examination of the abdomen. Skills in writing up notes, maintaining problem-oriented records, progress notes, and presentation of cases during ward rounds, planning investigations and making a treatment plan should be taught.

Bedside procedures & Investigations:

Therapeutic skills: Venepuncture and establishment of vascular access, Administration of fluids, blood, blood components and parenteral nutrition, Nasogastric feeding, Urethral catheterization, Administration of oxygen, Cardiopulmonary resuscitation, Endotracheal intubation.

3.3. Clinical Teaching

General, Physical and detailed examinations of CNS should be mastered. The resident should able to analyse history and correlate it with clinical findings. He should be well versed with all radiological procedures like CT Angio, MRI,CT , X- rays ,SPECT,DSA. He should present his daily admissions in morning report and try to improve management sk[illegible], fluid balance, and

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choice of drugs. He should clinically analyze the patient & decide for pertinent Investigations required for specific patient.

4. Teaching Programme

4.1 General Principles

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.

4.2 Teaching Sessions

The teaching methodology consists of bedside discussions, ward rounds, case presentations, clinical grand rounds, statistical meetings, journal club, lectures and seminars. Along with these activities, trainees should take part in inter-departmental meetings i.e clinico-pathological and clinico-radiological meetings that are organized regularly. Trainees are expected to be fully conversant with the use of computers and be able to use databases like the Medline, Pubmed etc. They should be familiar with concept of evidence-based medicine and the use of guidelines available for managing various diseases.

4.3 Teaching Schedule

Following is the suggested weekly teaching programme in the Department of Plastic Surgery:

Sr. No	Description	Frequency
1.	Central Teaching	Once a week
2.	Seminar / Journal club	Once a week
3.	Case Presentation	Once a week
4.	Cath conference	Once a week
5.	File Audit/Stat Meet.	Once month
6.	Grand Round/Interdepartmental	Once month

Each unit should have regular teaching rounds for residents posted in that unit. The rounds should include bedside case discussions, file rounds (documentation of case history and examination, progress notes, round discussions, investigations and management plan), interesting and difficult case unit discussions. Central hospital teaching sessions will be conducted regularly and MCh. residents would present interesting cases, seminars and take part in clinic-pathological case discussions.

4.4 Conferences

A resident must attend at least one conference per year. One paper must be presented in at least 3 years.

5. Schedule of Posting:

OPD	Twice a Week
OT	Twice a Week
Emergency	Twice a Week

- The MCh resident should do the dressings of the patient that have been operated/assisted by them.
- The MCh resident should note down the History and examination of admitted patients and should daily put progress notes in files.

The normal working hours will be from **8.00 AM to 8.00 PM.** When on emergency duty, the

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resident is supposed to stay overnight in the resident room.

- The MCh resident shall be posted in other departments as per the following schedule

Pathology	15 Days
Oncology / Radiotherapy	15 Days
Radiology	15 Days
Anaesthesia	15 Days

Log Book: All the work done during the course will be recorded by the candidate in the log book duly signed by the consultant.

6. 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 from of a Project.
Every candidate shall submit project plan to university within time frame set by university. Thesis 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, (viii) undertake a study according to the protocol, (viii) analyze and interpret research data, and draw conclusion, (ix) write a research paper.

7. Assessment

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

7.1. General Principles

The assessment is valid, objective and reliable. It covers cognitive, psychomotor and affective domains. Formative, continuing and summative (final) assessment is also conducted in theory as well as practical. In addition, research project is also assessed separately.

7.2. Formative Assessment

The formative assessment is continuous as well as end of term. The former 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.

7.3. Internal Assessment

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

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

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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, do not shirk duties or leave any work pending.

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

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

2. **Clinical Work:**

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

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

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

Clinical Performance: Proficient in clinical presentations and case discussion during rounds and OPD work up. Preparing Documents 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 the all consultants who have attended the session presented by the resident.

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

7.4. Summative Assessment

- Ratio of marks in theory and practical will be equal. The pass percentage will be 50%.
- Candidate will have to pass theory and practical examinations separately.

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A. Theory examination

Paper	Title	Marks
Paper –I	Basic Sciences as related to Neuro Surgery	100
Paper-II	Clinical Neuro Surgery	100
Paper-III	Operative Neuro Surgery	100
Paper-IV	Recent advances in Neuro Surgery	100
Total		**400**

B. Practical & Viva-Voce Examination

Paper	Title	Marks
Paper –I	Long Case (1)	100
Paper-II	Short Cases (2) 75 marks each	150
Paper-III	Procedure	50
Paper-IV	Grand Viva including Instruments/Radiology/Pathology	100
Total		**400**

8. 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 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 should develop skills to ensure patient comfort/consent for examination. Based on the above evaluation he/she should be able to formulate a differential 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.

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- 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 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 workstations.
- 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 1 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.

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- 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 and bereavements.
- 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.

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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.

9. Suggested Books & Journals:

9.1 Suggested Books

Michael, L.J. Apuzzo	Brain Surgery: Complication avoidance and management
De Jong's	Neurological Examination Part A
Adams Brazis	Principals Of Neurology Localization in Clinical Neurology Neurological Surgery
Youmans	Operative Neurosurgery techniques
Schmidek/Sweet	Neurosurgery Microneurosurgery in 4 Volume Rengachary
Wilkins/Rengachary	Text Book Of Neurology & Neurosurgery
Yasargil	Neuropathology 1976
Principal Of Neurosurgery	Brain Surgery: Complication avoidance and management
Ramamurthi	Neurological Examination Part A
Greenfield	Principals Of Neurology Localization in Clinical Neurology Neurological Surgery

9.2 Suggested Journals

J Neurotrauma Neurosurgery
Spine
J Neurosurgery
J Neurosurgery Spine
Acta Neurochirurgica
Surgical Neurology
Pediatric neurosurgery
Neurosurgical Clinics of North America
Neurosurgical Focus
Journal of neurosurgery: Pediatrics

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