SUMANDEEP VIDYAPEETH

(Declared as Deemed to be University under Section 3 of the UGC Act 1956)
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Category – I deemed to be university under UGC Act - 2018
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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)

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AMENDED UP TO DECEMBER -2020

urriculum
MCh.NEUROSURGERY

Theinfrastructureandfacultyofthedepartmentofneurosurgerywillbeasper MCIguidelines

1. Goals

ThegoalofMChcourseistoproduceacompetentsurgeonwho:

- RecognizesthehealthneedsofadultsandcarriesoutprofessionalobligationsinkeepingwithprinciplesofNationalHealthPolicyandprofessionalethics;
- Hasacquiredthecompetenciespertainingtoneurosurgerythatarerequiredtobe
- practicedinthecommunityandatalllevelsofhealthcaresystem;
- Hasacquiredskillsineffectivelycommunicatingwiththepatients,familyandthecommunity;
- Isawareofthecontemporaryadvancesanddevelopmentsinmedicalsciences.Acquiresaspiritofscientificenquiryandisorientedtoprinciplesofresearchmethodology;and
- Hasacquiredskillsineducatingmedicalandparamedicalprofessionals.

2. Objectives

AttheendoftheMChNeuroSurgery,thestudentshouldbeableto:

- Recognizethekeyimportanceofmedicalproblemsinthecontextof thehealthpriorityofthecountry;
- PracticethespecialtyofNeurosurgeryinkeepingwiththeprinciplesofprofessionalethics;
- Identifysocial,economic,environmental,biologicaland emotionaldeterminantsofadultNeuroSurgeryandknowthetherapeutic,rehabilitative,preventiveand
- promotionmeasurestoprovideholisticcaretoall patients;
- Takedetailedhistory,performfullphysicalexaminationandmakeaclinicaldiagnosis;
- Perform andinterpretrelevantinvestigations(Imaging andLaboratory);Perform andinterpretimportantdiagnosticprocedures;
- Diagnoseillnessesinadultsbasedontheanalysisofhistory,physicalexamination
- andinvestigativeworkup;
- Planandelivercomprehensivetreatment forillnessinadultsusingprinciplesofrationaldrugtherapy;
- Planandadvisemeasuresforthepreventionofdiseases;
- Planrehabilitationofadultssufferingfromchronicillness,andthosewithspecialneeds;
- Manageemergencieseefficiently;
- Demonstrate skills in documentation of case details, and of morbidity and mortality datarelevanttotheassignedsituation;
- Demonstrate empathy and humane approach towards patients and their families andrespecttheirsensibilities;
- Demonstratecommunicationskillsofahighorderinexplainingmanagementandprognosis,providingcounselingandgivinghealtheducationmessagestopatients,familiesandcommunities.
  Develop skills as a self-directed learner, recognize continuing educational needs; useappropriate learning resources, and critically analyze relevant published literature
- inordertopracticeevidence-basedmedicine;

- emonstrate competence in basic concepts of research methodology andepidemiology;
- Facilitatelearningofmedical/nursingstudents,practicingsurgeons,para-medical
- healthworkersandotherprovidersasa teacher-trainer;
- Play the assigned role in the implementation of national health programs, effectively andresponsibly;
- Organizeandsupervisethedesiredmanagerialandleadershipskills;
- Functionasaproductivememberofateamengagedinhealthcare,researchandeducation.

3. Syllabus:

Theory

The theory syllabusshould include thehistory,epidemiology,etiology,genetics,pathogenesis,clinical manifestations, complications, differential diagnosis, investigations, treatment with specialstressonsurgicalprocedures),preventionandprognosisofallneurologicaldiseasesinadults.

1. **Landmarksinthehistoryofneurosurgery,**microneurosurgery,neuroradiology.
2. **Clinical evaluation of the nervous system** – history taking and clinical examination ofcognitive functions, cranial nerve examination , neuroopthalmology , examination of motorandsensorysystemsandreflexes.
3. **Applicationsofprinciplesofcellularandmolecularbiologyinneurosurgicaldisorders**
4. **Diagnostictests**–examinationofCSFandrelatedprocedures,electrodiagnostictests(NCV ,EMG ,EEG ,Evoked potentials , Trans Cranial Doppler , Pet scan , Spect , Angiography ,BrainBiopsy)
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 dementiaandtreatmentofnormalpressurehydrocephalus,Blood-Brianbarrier;cerebraledema,increased intracranial pressure, Brain Herniation, and their control, Pseudotumor cerebri,Neurology,Preoperativeevaluationofa
6. Neurosurgicalpatient,Bloodcoagulation,Neuroanesthesia,Intensivecare,Spasticity,Adv anceinmoleculargeneticsinrelationtoneurogeneticdiseases
7. **Neurosurgical and related techniques-Principles** of neurosurgical operative technique,PrinciplesofNeurosurgicaloperativetechnique,Endoscopicneurosurgery,Prophylacti cantibiotics , Patient positioning, Intraoperative neurophysiologic Monitoring, Highspeed drills, Intraoperative use of topical hemostatic agents in neurosurgery, Use of fibringlueinneurosurgery,Calciumphosphateceramicsasbonesubstitute,Endovasculartherapyo fvascularlesionsofthecentralnervoussystem
8. **Neuro** - Oncology -Oncogenes and Nervous system tumor, genetic factors in brain tumors,neurofibromatosis and other phakonatoses, Tumor markers, Primary brain tumor: Aspects ofimagingandfunctionallocalization.
9. **Tumors in the region of the pineal gland-Classification** and pathology, Clinical featuresandsurgicalmanagement,Surgicalapproachestopinealtumors.
10. **Cerebellopontine angle tumor-Tumor** of the cerebellopontine angle: Pathology, Tumor ofthecerebellopontineangle:Neuro-otologicaspectsofdiagnosis,tumorofthecerebelloponineangle:clinicalfeaturesandsurgical management viaaretrosigmoidapproach.
11. **Posteriorfossatumors-Imaging**ofposteriorfossatumors,MicrosurgicalAnatomyofthe

ourthventricle,CerebellarAstrocytomas,Medulloblastomas,pediatricbrainstemgliomas,Ependymoma,Subependymomas

12. **SellarandParasellartumors-**
MicrosurgicalanatomyofsellarregionImagimgofSellarandParasellarLesions,Classificationand PathologyofPituitarytumors,Prolactinomas,Cushing's Disease and Nelson's Syndrome, Pituitary Apoplexy, Trans-sphenoidal Appraochto the Pituitary Gland, Transcranial approaches to the germinomas, Lateral and Third VentricleTumours,Tumours oftheOrbit.

13. **Neuro-Oncology-Tumours** of the skull, Chordomas and Chondrosarcomas of the CranialBase,trigeminalNeurinomas,OthercranialNerveSchwannomas,Transfacial-Transmaxillary Approach to the Anterior Skull Base, Transoral Approaches to the clivus andupper cervical spine, Anterolateral cervical approach to the craniovertebral junction, Surgicalanatomy of the cavernous sinus, Surgical treatment of tumors involving the cavernous sinus,Approachestopetroclivaltumors.,primitiveneuroectodermaltumors,primarycentralnervoussystemlymphomas.

14. **Spinal Tumors-Spinal**Intradural tumors, Paragangliomas of the cauda equine , Spinalepiduraltumors,PrimaryNeoplasmsofthespine.

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

16. ascularDiseasesofTheNervousSystem

17. Generalinformation,Measurementofcerebralbloodflow,Occlusivecerebrovasculardisease, Pathology of ischemic cerebrovascular disease, Thrombolytic therapy for occlusivecerebrovascular disease, surgery for acute brain infarction with mass effect, Extracrainal toIntracrainalbypassgrafting,AneurysmsandSubarachnoidhaemorrhageMicrosurgicalanatomy of saccular aneurysms, Pre- and postoperativemanagementof apatientwithruptured aneurysm, Ophthalmic segment aneurysm,other aneurysmsof internal carotidartery, Middle cerebral artery aneurysms , Anterior communicating artery aneurysms, Distalanteriorcerebralarteryaneurysms,posteriorcirculationaneurysms,managementofintracranialaneurysmsandarteriovenousmalformationsduringpregnancy.
18. Vascular malformations and fistulas Intracranial arteriovenous malfor mations, Vein of Galen malformation, Stereotactic radiosurgery of intracranial arteriovenous malformations, Spinalvascularmalformations.OthervasculardisordersSpontaneousintraspinalhemorrhage,Spontaneousintraparenchymalbrainhemorrhage.

19. CranialAndSpinalTrauma

20. Cranial trauma-Pathophysiology of traumatic brain injury , pathology of closed head injury ,Neurological evaluation of a patient with head trauma , Radiological evaluation of headtrauma , Pediatric head injury, Minor head injury management and outcome , Skull fractures,Growingskullfracturesofchildhood,Traumaticintracranialhematomas,Delayedandrecurrentintracranialhematomas,and[posttraumaticcoagulopathies,Penetratingwoundsofthe head, Sequelae of head injury, Pathophysiology and pathology of spinal cord injury,Managementofacutespinalcordinjury,Cervicalspineinjuries:Diagnosisandmanagement.

21. **Disordersofperipheralandcranialnervesandtheautonomicnervoussystem.-Thoracic** outletsyndromes,EntrapmentNeuropathies,
22. **NerveInjuries-**
Peripheralnerveinjuries:Types,Causes,andGrading,Brachialplexusinjuries,Techniquesofnerverepair.
23. **Infections-** Antimicrobials for use in neurosurgical patients, Diagnosis and management ofbrain abscess, Acute bacterial meningitis, Spinal epidural and subdural abscesses, Fungalinfection.Developmentalanomaliesandneurosurgicaldisordersofchildhood-

euroembryology,Spinaldysraphism,Tetheredcordsyndrome,Diastematomyia,Chiarimalformations, Hydromyelia, Syringomyelia, Hydrocephalus: Pathophysiology and clinicalfeatures,Hydrocephalus:Treatment, Shuntsystem,Shuntcomplications,

24. **Dandy-walker**malformation.
25. **Intervertebral disc disease and selected spinal disorders-Cervical** disc disease andcervical spondylosis, Cervical ossification of the posterior Longitudinal ligament, lumber discdisease,Postoperativeintervertebraldiscspaceinfections.Lumberspondylolisthesis,Posterolaterallumberspinalfusion,Thefailedbacksurgerysyndrome.
26. **Pain-Anatomy** and physiology of pain, Craniofacial pain syndromes: An overview Trigeminalneuralgia:- Introduction,Trigeminalneuralgia:Problemsastocauseandconsequent,Trigeminal neuralgia: treatment by glycerol Rhizotomy, Trigeminal neuralgia: Treatment bymicrovasculardecompression,Deepbrainstimulationforpainrelief,
27. **Stereotactic** And Functional Neurosurgery- stereotactic surgery; principles and techniques,image guided stereotactic surgery, radiofrequency lesion- making in the nervous system,surgicaltherapyofmovementdisorders, surgicaltreatmentofepilepsy.
28. **Epilepsy surgery:** Epilepsy surgery, Concept of presurgical evaluation in epilepsy, Varioussubstratesassociatedwithdrugresistantepilepsy,Basicconceptsofvariousepilepsysurgery procedures including temporal lobectomty, lesionectomy, corpus callosotomy, andHemispherotomy,Corticalstimulationandfunctionalmappingduringepilepsysurgery,Intraoperativeelectrocorticographyduringepilepsysurgery,Minimalinvasivesurgicalprocuressuchasendoscopiccorpuscallosotomy,andHemispherectomy,Conceptsofstereo-EEG,Indications andoutcomesofRadio-frequencyablationsandlaserablation,Outcomesofepilepsysurgery
29. **Cerebrovasculardiseasesandneuro-interventions**:Cerebrovascularandneuro-interventionsConceptsofcerebralangiography,Conceptofdiffusionandperfusionmismatchand diffusionFLAIRmismatch
30. **Parkinsonism andmovement disorders:**Recent advancesin deepbrainstimulationand transplanttherapyforParkinson'sdisease.

(BoardofStudiesletterno.: SBKSMIRC/Dean/874,dated18/06/2020andVideNotificationofBoardofManagementResolutionRef: No.SVDU/R/3383-A/2019-20dated31/07/2020)

Practical:

History,examinationandwritingofrecords:

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

Detailed physical examination should include general examination and systemic examination(Chest,Cardio-vascularsystem,Abdomen,Centralnervoussystem,locomotorsystem andjoints), with detailed examination of the abdomen. Skills in writing up notes, maintaining problem-orientedrecords,progressnotes,andpresentationofcasesduringwardrounds,planninginvestigations andmakinga treatmentplanshouldbetaught.

Bedsideprocedures&Investigations:

Therapeutic skills: Venepuncture and establishment of vascular access, Administration of fluids,blood, blood components and parenteral nutrition, Nasogastric feeding, Urethral catheterization,Administrationof oxygen,Cardiopulmonaryresuscitation,Endotrachealintubation.

ClinicalTeaching

General, Physical and detailed examinations of CNS should be mastered. The resident shouldable to analyse history and correlate it with clinical findings. He should be well versed with allradiological procedures like CT Angio, MRI,CT , X- rays ,SPECT,DSA. He should present hisdailyadmissionsinmorningreportandtrytoimprovemanagementskills,fluidbalance,and

choiceofdrugs.HeshouldclinicallyanalyzethepatientdecideforpertinentInvestigationsrequiredfor specificpatient.

4. TeachingProgramme

GeneralPrinciples

Learninginpostgraduateprogramisessentiallyself-directedandprimarilyemanatingfromclinicalandacademicwork.Theformalsessionsaremerelymeanttosupplementthiscoreeffort.

TeachingSessions

Theteachingmethodologyconsistsofbedsidediscussions,wardrounds,casepresentations,clinicalgrandrounds,statisticalmeetings,journalclub,lecturesandseminars.Alongwiththeseactivities,traineesshouldtakepartininter-departmentalmeetingsi.eclinico-pathological and clinico-radiological meetings that are organized regularly. Trainees are expectedto 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 ofguidelinesavailableformanagingvariousdiseases.

TeachingSchedule

FollowingisthesuggestedweeklyteachingprogrammeintheDepartmentofPlasticSurgery:

Sr. No	Description	Frequency
1.	CentralTeaching	Onceaweek
2.	Seminar/Journalclub	Onceaweek
3.	CasePresentation	Onceaweek
4.	Cathconference	Onceaweek
5.	FileAudit/StatMeet.	Oncemonth
6.	GrandRound/Interdepartmental	Oncemonth

Each unit should have regular teaching rounds for residents posted in that unit. The rounds shouldinclude bedside case discussions, file rounds (documentation of case history and examination,progress notes, round discussions, investigations and management plan), interesting and difficultcase unit discussions. Central hospital teaching sessions will be conducted regularly and MCh.residentswouldpresentinterestingcases,seminarsandtakepartinclinic-pathologicalcasediscussions.

At the end of second year residency the trainee should be able to present –

- Journal clubs on a prescribed Evidence Based format with emphasis on critical appraisal. A designated teacher/facilitator will assess every post graduate student for each Journal club presentation.

Conferences

Aresidentmustattendatleastoneconferenceperyear.Onepaper mustbepresentedinatleast3years.

5. ScheduleofPosting:

OPD	Twice aWeek
OT	Twice aWeek
Emergency	Twice aWeek

- TheMChresidentshoulddothe dressingsofthe patientthathavebeenoperated/assistedbythem.
- TheMChresidentshouldnotedowntheHistoryandexaminationofadmittedpatientsandshoulddaily

putprogress notesinfiles.

- Thenormalworkinghourswillbefrom**8.00AMto8.00PM.**Whenonemergencyduty,the

residentissupposedtostayovernightintheresidentroom.

- TheMChresidentshallbepostedinotherdepartmentsasperthefollowingschedule

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

LogBook: Alltheworkdoneduringthecoursewillberecordedbythecandidateinthelogbookdulysignedbyth econsultant.

6. ResearchProjects

Everycandidateshallcarryoutworkonanassignedresearchprojectundertheguidanceofarecognized postgraduate teacher, the project shall be written and submitted in the from of a Project.Everycandidateshallsubmitprojectplantouniversitywithintimeframesetbyuniversity.Thesisshallbes ubmittedtotheUniversitywithin9months ofjoiningthecourse.

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 thestudy, (vi) prepare a study protocol, (viii) undertake a study according to the protocol, (viii) analyzeandinterpretresearchdata,anddrawconclusion,(ix)writea researchpaper.

- *To introduce New chapter / topic 'Intellectual Property Rights (IPR) forallthe FirstyearPostgraduateResidentDoctorsfromacademicyear2020-2021 of duration of 4hrs (Board of Studies letter no.: SBKS/DEAN/742/2021,dated 05/06/2021 and Vide Notification of Board of Management Resolution Ref no.:SVDU/R/3051-1/2020-21, dated - 29" July 2021)*

List of topics :

1. *Introduction-ConceptofIntellectualProperty,Historicalviewof Intellectual Property system in India and International Scenario, Evolution of Intellectual Property Laws in India, Legal basis of Intellectual Property Protection, Need for Protecting Intellectual Property, Theories on concept of property - Major IP Laws in India.*
2. *Types of IPR: Patents, Copyright, Trademark Industrial Designs, TradeSecrets.*
3. *Patents: Concept of Patent, Criteria of Patentability, Inventions NOT patentable, Process of Obtaining a Patent, Duration of Patents, Rights of Patentee, Limitation of rights, Infringement andEnforcement.*
4. *Copyrights: Meaning of Copyright, Copyright Vs. Moral rights, Copyrighteligibility,TermofCopyright,RegistrationofCopyright, Infringement andRemedies*
5. *Trademark: Meaning of Trademark, Criteria for trademark, Procedure for Trademark Registration, Term of protection, Infringement andRemedies.*
6. *Industrial Designs: Meaning of Industrial Designs, Rights in Industrial Designs: Nature, Acquisition and duration ofrights.*
7. *Trade Secrets: Meaning of Trade Secrets, Need to protectTrade secrets, Criteria of Protection, Procedure for registration, Infringement.*
8. *Commercialization of IPR: Traditional IP and Evolving IP, Assignment, Licensing, Cross License, Patent Pool, Negotiations, Defensive Publications, TechnicalDisclosures,*

Patent Pooling, Patent Trolling, Brand Management, Brand and Pricing Strategies.

7. Assessment

AllthePGresidentsareassesseddailyfortheiracademicactivitiesandalsoperiodically.

GeneralPrinciples

The assessment is valid, objective and reliable. It covers cognitive, psychomotor and affectivedomains.Formative,continuingandsummative(final)assessmentisalsoconductedintheory aswellaspractical.Inaddition, researchprojectisalsoassessedseparately.

FormativeAssessment

The formative assessment is continuous as well as end of term. The former is based on thefeedback from the consultants concerned. Formative assessment will provide feedback to thecandidate about his/her performance and help to improve in the areas they lack. Record ofinternal assessment should be presented to the board of examiners for consideration at the timeoffinalexamination.

InternalAssessment

Theperformanceoftheresidentduringthetrainingperiodshouldbemonitoredthroughout the course and duly recorded in the log books as evidence of the ability and dailyworkofthestudent. Marks shouldbeallottedoutof100asfollowed.

Sr.No	Items	Marks
1.	PersonalAttributes	20
2.	ClinicalWork	20
3.	Academicactivities	20
4.	Endoftermtheoryexamination	20
5.	Endoftermpracticalexamination	20

1. **Personalattributes:**

   Behavior and Emotional Stability: Dependable, disciplined, dedicated, stable in emergencysituations,showspositiveapproach.

   Motivation and Initiative: Takes on responsibility, innovative, enterprising, do not shirk dutiesorleaveanyworkpending.

   Honesty and Integrity: Truthful, admits mistakes, does not cook up information, has ethicalconduct,exhibitsgoodmoral values,loyaltotheinstitution.

   Interpersonal Skills and Leadership Quality: Has compassionate attitude towards patientsand attendants, gets on well with colleagues and paramedical staff, is respectful to seniors, hasgoodcommunicationskills.

2. **ClinicalWork:**

   Availability: Punctual, available continuously on duty, responds promptly on calls and takesproperpermissionforleave.

   Diligence: Dedicated, hardworking, does not shirk duties, leaves no work pending, does not sitidle,competentinclinicalcaseworkupandmanagement.

   Academic ability: Intelligent, shows sound knowledge and skills, participates adequately inacademicactivities,andperformswellinoralpresentationanddepartmentaltests.

   ClinicalPerformance: Proficientinclinicalpresentationsandcasediscussion during rounds and OPD work up. Preparing Documents of the case history/examination andprogressnotesinthefile(dailynotes,rounddiscussion,investigationsandmanagement)Skill ofperformingbedside proceduresandhandlingemergencies.

3. **Academic Activity:** Performance during presentation at Journal club/ Seminar/ Casediscussion/Statmeetingandotheracademicsessions.Proficiencyinskillsasmentionedinjobr esponsibilities.

4. **Endoftermtheoryexamination**conductedatendof1st,2ndyearandafter2years9months

5. **Endoftermpractical/oralexaminations**after2years9 months.

Marks for **personal attributes** and **clinical work** should be given annually by all the consultantsunder whom the resident was posted during the year. Average of the three years should be put asthe finalmarksoutof20.

Marks for **academic activity** should be given by the all consultants who have attended the sessionpresentedbytheresident.

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

SummativeAssessment

- Ratioofmarksintheoryandpracticalwillbeequal.Thepasspercentagewillbe50%.
- Candidatewillhavetopasstheoryandpracticalexaminationsseparately.

A. Theoryexamination

Paper	Title	Marks
Paper–I	BasicSciencesasrelatedtoNeuroSurgery	100
Paper-II	ClinicalNeuroSurgery	100
Paper-III	OperativeNeuroSurgery	100
Paper-IV	RecentadvancesinNeuroSurgery	100
Total		**400**

B. Practical&Viva-VoceExamination

Paper	Title	Marks
Paper–I	LongCase(1)	100
Paper-II	ShortCases(2)75markseach	150
Paper-III	Procedure	50
Paper-IV	GrandVivaincludingInstruments/Radiology/Pathology	100
Total		**400**

8. JobResponsibilities

OutdoorPatient(OPD)Responsibilities

- TheworkingoftheresidentsintheOPDshouldbefullysupervised.
- TheyshouldevaluateeachpatientandwritetheobservationsontheOPDcardwithdateandsignature
- Investigationsshould beordered asandwhennecessary,usingprescribedforms.Residents should discuss all the cases with the consultant and formulate managementplan.
- Patient requiring admission according to resident's assessment should be shown to theconsultantonduty.
- Patientrequiringimmediatemedicalattentionshouldbesenttothecasualtyserviceswithdetailsoftheclinicalproblemclearlywrittenonthecard.
- Patientshouldbeclearlyexplainedastothenatureoftheillness,thetreatmentadviceandtheinvestigationstobedone.
- Residentshouldspecifythedateandtimewhenthepatienthastoreturnforfollowup.

In-PatientResponsibilities

Each resident should be responsible and accountable for all the patients admitted under his care.Thefollowingarethegeneralguidelinesforthefunctioningoftheresidentsintheward:

Detailedworkupofthecaseandcasesheetmaintenance:

- He /She should record a proper history and document the various symptoms. Perform aproperpatientexaminationusingstandardmethodology.Heshouldevelopskillstoensurepatient comfort/consent for examination. Based on the above evaluation he/she should beable to formulate a differential diagnosis and prepare a management plan. Should developskills for recording of medical notes, investigations and be able to properly document theconsultantround notes.
- Toorganizehis/herinvestigationsandensurecollectionofreports.
- Bedsideproceduresfortherapeuticordiagnosticpurpose.
- Presentation of a precise and comprehensive overview of the patient in clinical rounds tofacilitatediscussionwithseniorresidentsandconsultants.
- Toevaluatethepatienttwicedaily(andmorefrequentlyifnecessary)andmaintainaprogressreportinthecasefile.

- oestablishrapportwiththepatientforcommunicationregardingthenatureofillnessandfurtherplan management.
- Towriteinstructionsaboutpatient'streatmentclearlyintheinstructionbookalongwithtime, dateandthebednumberwithlegiblesignatureoftheresident.
- Alltreatmentalterationsshouldbedonebytheresidentswiththeadviceoftheconcernedconsultan tsandseniorresidentsoftheunit.

Admissionday

- Followingguidelinesshouldbeobservedbytheresidentduringadmissionday.
- Residentshouldworkupthepatientindetailandbereadywiththepreliminarynecessaryinvestigati onsreportsfortheeveningdiscussionwiththeconsultantonduty.
- Aftertheeveningroundtheresidentshouldmakechangesinthetreatmentandplanouttheinvestig ationsforthenextdayinadvance.

DoctoronDuty

- DutydaysforeachResidentshouldbeallottedaccordingtothedutyroster.
- Theresidentondutyforthedayshouldknowaboutallsickpatientsinthewardsandrelevant problems of all other patients, so that he could face an emergency situationeffectively.
- Inthemorning,detailedover(writtenandverbal)shouldbegiventothenextresidentonduty.Thi spracticeshouldberigidlyobserved.
- Ifapatientiscriticallyill,discussionaboutmanagementshouldbedonewiththeconsultant atanytime.
- Thedoctorondutyshouldbeavailableinthewardthroughoutthedutyhours.

CareofSickPatients

- Careofsickpatientsinthewardshouldhaveprecedenceoverallotherroutineworkforthedocto ronduty.
- Patientsincriticalconditionshouldbemeticulouslymonitoredandrecordsmaintained.
- IfpatientmeritsICUcarethenitmustbediscussedwiththeseniorresidentsandconsultantsfort ransfertoICU.

Resuscitationskills

- At the time of joining the residency programme, the resuscitation skills should bedemonstratedtotheresidentsandpracticaltrainingprovidedatvariousworkstations.
- Residentsshouldbefullycompetentinprovidingbasicandadvancedcardiaclifesuppo rt.
- Theyshouldbefullyawareofalladvancedcardiacsupportalgorithmsandbeawareofthe use of common resuscitative drugs and equipment like defibrillators and externalcardiac pacemakers.
- Theresidentshouldbeabletoleadacardiacarrestmanagementteam.

DischargeofthePatient

- Patientshouldbeinformedabouthis/herdischargeonedayinadvanceanddischargecardssh ouldbeprepared 1daypriorto theplanneddischarge.
- Thedischargecardshouldincludethesalientpointsinhistoryandexamination,comple tediagnosis,importantmanagementdecisions,hospitalcourseandproceduresdone duringhospitalstayandthefinal advicetothepatient.
- ConsultantsandMCHResidentsshouldchecktheparticularsofthedischargecardand countersign it.

- atientshouldbebriefedregardingthedate,timeandlocationofOPDforthefollowupvisit.

InCaseofDeath

- Incaseitisanticipatedthataparticularpatientisinaseriouscondition,relativesshouldbe informedaboutthecriticalconditionofthepatientbeforehand.
- Residentsshouldbeexpectedtodevelopappropriateskillsforbreakingbadnewsandbereave ments.
- Followupdeathsummary shouldbewritteninthefileandfacesheetnotesmustbefilledupandthesisterinchargeshouldb erequestedtosendthebodytothemortuarywithrespectanddignityfromwherethepatient'srel ativescanbehandedoverthebody.
- Incaseofamedicolegalcase,deathcertificatehastobepreparedintriplicateandthebody handedovertothemortuaryandthelocalpoliceauthoritiesshouldbeinformed.
- Autopsy shouldbeattemptedforallpatientswhohavediedinthehospitalespeciallyifthe patientdied ofan undiagnosedillness.

BedsideProcedures

Thefollowingguidelinesshouldbeobservedstrictly:

- Be aware of the indications and contraindications for the procedure and record it in thecase sheet. Rule out contraindications like low platelet count, prolonged prothrombintime,etc.Plantheprocedureduringroutineworkinghours,unlessitisanemergen cy.
- Explain the procedure with its complications to the patient and his/her relative andobtain written informed consent on a proper form. Perform the procedure under strictasepticprecautionsusingstandardtechniques.Emergencytrayshouldbereadyduringt he procedure.
- Make a brief note on the case sheet with the date, time, nature of the procedure andimmediate complications,ifany.
- Monitorthepatientandwatchforcomplications(s).

OTresponsibilities

- The 1st year resident observes the general layout and working of the OT, understandsthe importanceofmaintainingsanctityoftheOT,scrubbing,working
- andsterilizationofalltheOTInstrument,knowhowofmicroscopes.He/Sheisresponsible shifting of OT patients, for participating in surgery as 2nd assistant and forpostoperativemanagementofpatientinrecoveryandinward.The2ndyearresidentis responsible for pre opworkup ofthe patient,surgical planningand understandingthe rationale of surgery. He/she is the first assistant in surgery and is responsible foranticipating intra op and post op complications and managing them. The final yearresident should be able to perform minor/medium/major surgeries independently andassist in medium/major/extra major surgeries. He/she should be able to handle allemergenciesandpostopcomplicationsindependentlyandisresponsibleforsupervisionan d guidance ofhis/herjuniors.

Medico-LegalResponsibilitiesoftheResidents

- Alltheresidentsaregiveneducationregardingmedico-legalresponsibilitiesatthetimeofadmissioninashortworkshop.
- Theymustbeawareoftheformalitiesandstepsinvolvedinmakingthecorrectdeathcertificates, mortuaryslips, medico-legalentries,requisitionforautopsyetc.
- Theyshouldbefullyawareoftheethicalangleoftheirresponsibilitiesandshouldlearnhowtotakelegallyvalidconsentfordifferenthospitalprocedures&therapies.
- Theyshouldensureconfidentialityateverystage.

9. SuggestedBooks&Journals:

SuggestedBooks

Michael,L.J.Apuzzo	BrainSurgery:Complicationavoidanceandmanagement
DeJong's	NeurologicalExaminationPartA
AdamsBrazis	PrincipalsOfNeurologyLocalizationinClinicalNeurologyNeurologicalSurgery
Youmans	OperativeNeurosurgerytechniques
Schmidek/Sweet	NeurosurgeryMicroneurosurgeryin4 VolumeRengachary
Wilkins/Rengachary	TextBookOfNeurology&Neurosurgery
Yasargil	Neuropathology1976
PrincipalOfNeurosurgery	BrainSurgery:Complicationavoidanceandmanagement
Ramamurthi	NeurologicalExaminationPartA
Greenfield	PrincipalsOfNeurologyLocalizationinClinicalNeurologyNeurologicalSurgery

SuggestedJournals

JNeurotraumaNeurosurgery
Spine
JNeurosurgery
JNeurosurgerySpine
ActaNeurochirurgica
SurgicalNeurology
Pediatricneurosurgery
NeurosurgicalClinicsofNorthAmerica
NeurosurgicalFocus
Journalofneurosurgery:Pediatrics