DPU

Dr. D. Y. PATIL VIDYAPEETH, PUNE

(DEEMED UNIVERSITY)

(Accredited by NAAC with 'A' grade)

SYLLYBUS
FOR
SUPER SPECIALITY

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NEUROSURGERY

Guidelines for M.Ch. Neurosurgery Training

Aims & Objectives of Training:

1. The end products should have acquired knowledge so as to be able to functions as an independent consultant.
2. Should have learned performed skills of common neurosurgical operations.
3. Should be well acquainted with the research methodology &the relevant current literature.
4. Should be able to investigate, diagnose & treat common neurosurgical conditions.

Training methods:

1. Clinical teaching in the OPD and in the Operation theatre
2. Clinical teaching round in Neurosurgery ward
3. Bedside presentations
4. Lectures/seminars//journal cluds
5. Mortality /morbidity meetings
6. Regular weekly meetings with allied branches like Neuro-radiology meet, neuro-pathology meet, neuro-ophthalmology meet,Neuro-otology meet,
   Neuro-anaesthesiology meet, Neurology-Neurosurgery meet etc.
7. Assisting & Performing neurosurigical operations
8. Treatment-planning & Decision-making sessions
9. Preparation of manuscript for publication
10. Paper presentations at conferences
11. Training in an experimental microsurgical laboratory where candidates learn
    dissection / suturing of fine arteries / nerves under microscope & Skull-base
    dissections

12. Visit to other neurosurgical institutions for about 4 weeks to be able to observe difference in approaches to various eurosurgical problems

Course Contents:

1. Knowledge of history of neurosurgery
2. Clinical Neurosurgery & Clinical Neurology
3. Basic medical science relevant to the practical of Neurosurgery
4. Performance of common neurosurgical operations in supra_&infra-tentorial Compartments, in the spinal canal and on the peripheral nerves; initially under supervision later independently.
5. Ability to use the operating microscope is mandatory.
6. Training in an experimental microsurgical laboratory where candidates learns dissection / suturing of fine arteries / nerves under microscope & Skull-base dissections

Examination

Paper setting
PracticalS
Thesis

One internal Examiner
Three external Examiners

Neurosurgery Examination

Paper I – Basic Science
Paper II – Neurosurgery
Paper III – Neurosurgery Special Branches
Paper IV – Neurosurgery Recent Advances
Requirements of Thesis / Dissertation
Pattern of examination

JOURNAL

1. JOURNAL OF NEUROSURGERY
2. NEUROSURGERY – WFMS
3. CLINICAL VOL NORTH AMERICA
4. SPINE

NEUROSURGERY

SR. NO.	NAME OF THE BOOKS
1.	**YOUMANS VOL. I – VI** KEMPEES- OP NEUROSURGERY- I KEMPEES- OP NEUROSURGERY- II RENGACHARY PRINCIPLES OF NEUROSURGERY KUMAR- PRADIATRICS NEUROSURGERY LINDSAY- NEUROLOGY NEUROSURGERY ILLUSTRATED
2.	**NEURO ANATOMY** WARNER- ATLAS NUROANOTOMY 1ST EDITION

3. **NEUROPATHOLOGY**

GREEN FIELD- NEUROPATHOLOGY
VOL-I NELSON- NEUROPATHOLOGY

4. **NEUROLOGY**

ADAMS- PRINCIPLE OF NEUROLOGY
RUSELL- BAILLEY & LOVE – SHORT PRACTICE

5. **NEURORADIOLOGY**

GROSSMAN - NEURORADIOLOGY
OSBORNS – DIAGNOSTIC IMAGINE
BRAIN 2004 BEAVER ATLAS OF SPINAL OPERATIONS

6. **NEURO EXAMINATION**

DEMYER- TECH OF NEURO EXAMINATION FULLER – NEUROLOGICAL EXAMINATION 2004 EDITION DEJONG – NEUROLOGICAL EXAMINATION

7. **NEUROANGIOGRAPHY BRAIN & SPINE**

P. LASJAUINEA, BARENSTEIN, KARLTER BRUGGE

8. **HIV / AIDS, CARNIAL NERVES SPEECH**

9. **SPINE**

REGAN – ATLAS OF MIN ACCESS SPINE SURGERY

7. Familiarity with Neuro-radiology, Neuro-pathology, Neuro-anesthesiology, Neuro-ophthalmology, Neuro- otology, Neuro-biochemistry, Neuro- anatomy, Neuro- physiology & Neuro-immunology. There should be didactic lecture & inter-departmental meetings once a week regularly. **Weightage** to these sub- specialties (all taken together) should be around **five percent** of the theory & practical examination.
8. Knowledge of percent advance in neurosurgery.
9. Stereotaxy, Functional neurosurgery, Gamma X- Knife etc.

Essential Pre- requesting for appearing for M.Ch. (Neurosurgery) examination:

1. Logbook of work done (surgical procedures assisted/ performed & academic activities)
2. Publications- a paper on review of available clinical material from the dept.
3. Dissertation / Thesis
4. Attendance, as per rules of the institute

Evaluation Pattern for M.Ch. (Neurosurgery):

1. **Internal Assessment- 20% weightage**

   To be done by all the teachers concerned in the training of the candidate independently and entered into logbook on a standard marking system. The course director will average out and put the final evaluation.
2. **Theory Examination- 30% weightage**

   (Equally distributed for each paper)
   Three Papers- a. Basic Neurosciences (applied)
   b. Clinical Neurology & Clinical Neurosurgery
   c. Advance & Operative Neurosurgery

The Theory Examination will be held at the end of 36 months of training.
Minimum pass marks- 50% in each paper

3. **Practical Examination- 50% weightage**
   Distributed as follows:
   a. Clinical (1 Long case & 2 Short case) – 20%
   b. Actual Operative demonstration – 20%
   c. Radiology, Pathology & General Viva- 10%
   Minimum pass marks- 50%

MCH NEUROSURGERY----PROGRAME

1. A book (no.of book=25)
   B Tutorial/journalMin3)
   C Log book
   (OT work OPD work theory work), conference-CMEs & sysposia attended

2. **PRESENTATION STUDIES FROM THE mch STUDENT**
   A. Clinical case presentation
   B. Neuroradiology presentation
   C. Speech on topics designation by the guide
   D. CPC
3. Rotation program of the MCh student as decided by the guide for 9 months in the following order, The completion certification from the HOD's along with a separate letter mentioning assessment of the student is required at the end of the rotation (Ref. book –A to G)
   A. Plain radiology- Skull& Spine- 15 days
   B. CT MRI 6 weeek
   C. NEUROLOGY at AFMC &ruby hall guide 3 months

D.	Neuropathology & Neuroanatomy	15 days
E.	Neuroanaethaesia	15days
F.	Neuro angiography- brain/spine	3month
G.	OT work	1 year

4. Thesis ---topic--- comparative, prospective or some new ideas
5. Examination

   Internal examination of the student &assessment at the end of 1 year(September 2008)

A. Theory: four days & four papers -3hrs..each

B. Practical

1st day

Clinical case presentation 1 long case & 3 short cases followed by operation – case

Operation – pre op evaluation, differential and post op management.

2nd day Operation

3rd day VIVA----2 hours

Syllabus for Mch NEUROSURGERY

History of Neurosurgery and Micro-Neurosurgery

Microanatomy Neurophysiology

CLINICAL AND DIAGNOSTIC EVALUTION OF THE NERVOUS SYSTEM

Approach to the patient with a neurological illness Clinical evaluation

Coma

Seizures- diagnosis and management

Dementia

NPH

Nystagmus and relation ocular movements

Neuro- ophthalmology
Neuro-otology
Neuro- urology
Neuro-imaging-CT,MRI ,PRT,SPECT,DSA,USG etc
Neuro—psychology
Ancillary Diagnostic test –CSF , Brain biopsy etc
Electro diagnostic in neurology and neurosurgery- EMG ,EEG ,Evoked potential ,NCV etc
Ultrasound in neurosurgery
Intra clinical pressure monitoring

FUNDAMENTAL OF OPERATIVE NEUROSURGERY

Pre- operative evaluation
Preparation for neurosurgical procedures
Micro- surgical anatomy
Positioning
Antibiotics
Principles of cranial and spinal surgery
Cerebral oedema and control of raised ICP
Blood brain barrier
Instrumentation in neurosurgical procedures
Intra operative monitoring
Neuro anesthesia and intensive care
Blood coagulation and blood transfusion
Thrombo- embolic complications- prevention and treatment
Ultrasonic aspirators CUSA
LASERS COZ, ETC
Interventional Neuroradiology

NEURO ONCOLOGY

General considerations
Cell Kinetics & biochemistry
Genetics
Phakomatosis
Etiological factors
Immunology
Tissue culture and monoclonal antibodies
Tumor markers
Adjuvant therapies-RT,CT, other agent, hormones etc
Immunotherapy
Heavy particle irradiation, Brachytherapy
Hyperthermia
Recent advances in neuro- oncology

INTRINSIC TUMORS

Gliomas
Primitive neuroectodermal tumors
Pineal tumor and 3rd ventricular tumors
Germ cell tumors
Medulloblastoma
Ependymomas
CNS Lymphomas
Haemangioblastomas
Metastatic brain tumors
Cerebellar tumors-Astrocytoma etc
Brain stem tumors
Intracranial sarcomas
Intracranial lipomas
Etc

EXTRISIC TUMORS
Meningiomas
Hemangiopericytomas
Meningeal sarcomas
CP angle tumors and Acoustic Schwannomas
Sellar and parasellar tumors, functional non –functional
Craniopharyngiomas
Epidermoid, dermoid& neurenteric cysts
Etc

VENTRICULAR TUMORS
Chorid plexus tumors
Meningiomas
Ependymomas
Cysts
Etc

SKULL AND SKULL BASE TUMORS
General considerations
Chondroma and chondrosarcoma
Glomus jungulare tumors
Neoplasm of para nasal sinuses
Esthesioneuroblastomas
Tringeminal schwannoma and other schwannomas
Juvenile angiofibromas
Etc

ORBITAL TUMORS

SKULL TUMORS

SCALP TUMORS

MISCELLANEOUS TUMORS

LESION MIMISKING BRAIN TUMORS

Pseudotumor cerebri
Multiple sclerosis

SPINAL TUMORS

Intradural tumors
Epidural tumors
Tumors of the bone
Masses of sacrum
Etc

NEUROVASCULAR SYSTEM

General consideration
Investigations of neurovascular system
Neurovascular anatomy
Pathophysiology of brain ischaemia
Medical management of stroke and cerebral ischaemia
Cerebral protection
Vasospasm
Occlusive Cerebrovascular disease
Cerebral venous sinus thrombosis
Spontaneous Intra cerebral hemorrhage
Vascular trauma
Surgery for anterior and posteror circulation
Coagulopathies and hypertension

CEREBRALAN EURYSMS

General consideration , surgical anatomy, diagnosis & evaluation
Surgical approaches to cerebral aneurysm
Endovascular treatment of an aneurysm
Multi modality management of complex intracranial aneurysms
Revascularization procedures

ARTERIO- VENOUS MALFORMATIOM

General consideration , surgical anatomy, diagnosis & evaluation
Surgical approaches to cerebral AVM
Endovascular treatment of AVM'S
Multi modality management of complex intracranial AVM'S
Cavernous malformations
Spinal AVM"S
Pregnancy and treatment of vascular disease

NEURO TRAUMA

Modes of trauma
Cellular basis of injury
Pathophysiology
Evaluation
Glasgow coma scale
Grades of Traumatic Brain Injury
Imaging Management
Paediatric Head Injury
Outcome and predications
Minor Head injury
Growing skull frature

Scalp injuries
CSF Fistula
Traumatic intracranial haematomas
Coagulopathies
Sequalae of head injury
Cranial defect and Cranioplasty
Vascular injuries of the head
Penetrating injuries of the head
Etc

SPINAL TRAUMA

High cervical , mid cervical and low cervical injuries
Whiplash injuries
Traction and immobilization
Management of cervical injuries
Thoracic and lumbosacral injuries
Instrumention in spinal injuries
Penetrating wounds of the spine
Syringomyelia

PERIPHERAL NERVOUS SYSTEM

General principles and clinical evaluation
Anatomy and physiology
General principles & management of peripheral nerve injuries
Peripheral nerves and their injuries
Neurovascular compression sandrome
Plexopathy
Nerve and muscle biopsy
Sympathectomy

INFECTIONS OF CENTRAL NERVOUS SYSTEM

Bacterial infections
Meningitis
Brain and spinal abscess
Viral Infections
HIV and CNS
Parasitic diseases
Fungal Infections
Granulomatous lesions
Thromboembolism of venous sinuses and cortical veins

DEVELOPMENTAL ANOMALIE AND PAEDIATRIC NEUROSURGERY

General consideration
Genetics
Neurological evaluation of infants and children
Spinal dysraphism
Encephalocoels
Craniosynostosis and craniofacial anomalies
Dandy- Walkar syndrome
Arnold Chiari Malformations
Arachnoid cysts
Hydrocephalus
Sacral agenesis
Sacrococcygeal teratoma
Congenital defects of skull and scalp
Craniophagus twins
C V junction anomalies
Anten diagnosis and treatment of congenital abnormalities
Neonatal intracranial haemorrhage
Stroke in children, subdural haematoma and effusions in children

DISEASE OF SPINE

General consideration and biomechanics of spine
Osteoporosis
Degenerative diseases of spine
Cervical disc disease and spondylosis
Rheumatoid Arthritis of cervical spine
Tuberculosis of the spine
OPLL
Lumber spondylosis and spinal stenosis
Thoracic and lumber disc disease
Intervertebral disc disease
Chemonucleolysis
Disc space infections
Lateral recess syndrome
Redundant nerve root syndrome of cauda equine
Lumber spondylolisthesis
Failed back syndrome
Post laminectomy kyphosis
Scoliosis
Spinal bracing
Principle of spinal fixation Instrumention

PAIN

Anatomy and physiology of pain
Clinical evaluation &psychological assessment
Pain syndrome –craniofracial, trigeminal ,glossopharyngeal ,postherpetic, postspinal injuries,neuralgia phantom limb pain etc
Management of chronic and intractable pain
Multisciplinary pain clinics
Peripheral nerve stimulation

TENS
Percutaneous spinal epidural stimulation
DBS
Ablative procedures-Rhizotomy, DREZ ,Myelotomy ,tractotomy , chordotomy etc
Stereotactic procedures and hypophysectomy

Seminar topics for neurosurgery

1. Development of the CNS
2. Surface Anatomy of the cerebral Hemisphere with functional Significance
3. CSF pathways and cisternal anatomy
4. Anatomy and functions of cerebellum
5. The basal Ganglia and the Thalamus anatomy and functions
6. The spinal Cord
7. Blood supply of the CNS Arterial- Venous
8. Higher mental functions
9. The Oculomotor systems
10. optic pathways
11. auditory pathway
12. Trigeminal facial nerves & other cranial nerves
13. lower cranial nerves
14. Brain stem syndromes
15. Traumatic Brain injury- Current Concepts
16. Classification of tumors of the CNS
17. Management of Gliomas
18. Pineal Tumors
19. posterior fossa tumors
20. Sub Arachnoid Haemorrhage
21. Aneurysms and AVM'S management
22. Movement disorder-Surgical management
23. Neural tube disorders

24. Hydrocephalus and its management
25. Antiepileptics
26. Surgery for epilepsy
27. History of neurosurgery
28. Neuro Anaesthesia- concepts
29. Neuro protection