ORDINANCE No. V (144)

ORDINANCE RELATING TO

M Ch (Neurosurgery)
COURSE AND SYLLABUS

CHAPTER-1

1. This ordinance may be called the "ordinance relating to MCh neurosurgery course and syllabus"
2. It shall come into force with immediate effect.

CHAPTER-2

SELECTION PROCEDURE AND ELIGIBILITY

1. Students for Broad Super Speciality medical courses shall be selected strictly on the basis of their academic merit.
2. For determining the academic merit, the university shall follow the criterion of: merit as determined by the competitive test conducted by a competent authority
3. The minimum percentage of marks for eligibility for admission to Broad Super Speciality medical courses shall be as per the guidelines issued by apex regulatory body and Central and state government
4. The eligibility for the MCh Neurosurgery course shall be strictly as per the NMC rules and regulations

CHAPTER-3 CURRICULUM

SUBHARTI MEDICAL COLLEGE, MEERUT

MCh Neurosurgery

(Programme code – MM-)

Year of Implementation: 2023 – 24

ORDINANCE

DEPARTMENT OF NEUROSURGERY

SUBHARTI MEDICAL COLLEGE

SWAMI VIVEKANAND SUBHARTI UNIVERSITY

MEERUT (U.P.) 250005

AIM

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.

The end product should have acquired knowledge, skills, aptitude and attitudes to be able to function as an independent clinician/consultant and a teacher acquainted with research methodology.

PROGRAMME GOAL

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

Recognizes the health needs of patients and carries out professional obligations in keeping with principles of National Health Policy and professional ethics

• Has acquired the competencies pertaining to neurosurgery 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.

• Has acquired skills in educating medical and paramedical professionals

PROGRAMME OBJECTIVES

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 The objectives of postgraduate degree training programme - in terms of knowledge and skills – are to enable a candidate 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 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 patients based on the analysis of history, physical examination and investigative work up.

• Plan and deliver comprehensive treatment for illness to his patients using principles of rational drug therapy; Plan and advise measures for the prevention of diseases.

• Plan rehabilitation of patients 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;

• Demonstrate competence in basic concepts of research methodology and epidemiology; Facilitate learning of medical/nursing students, practicing surgeons , par-medical health workers and other providers as a teachertrainer

• 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

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

➢ 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 etc.

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

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

➢ 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.

➢ Possess basic knowledge in Neurochemistry, Neurogenetic and molecular biology related to neurosurgery

➢ 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.

➢ Acquire knowledge in the interpretation of special investigations such as Video EEG, autonomic function tests, Transcranial Doppler tests, Magnetic Encephologram etc..

SKILLS

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

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

➢ Acquire skills in the interpretation of special investigations such as DSA, Video EEG monitoring, EEG – Telemetry, autonomic function tests, Transcranial Doppler tests, CT scanning, PET scanning, MRI scanning, MR and Digital subtraction angiography, MR spectroscopy and Single Photon Emission Computerized Tomography etc.

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

➢ Acquire exposure in sophisticated neuromodulation procedures such as planning of deep brain stimulation, vagal nerve stimulation etc. 7

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

➢Be able to teach undergradute MBBS and Post Graduate Students in the subject of Neurosurgery.

➢Be able to perform Clinical and Investigative studies and to present in Seminars, meetings and conference etc.

➢ Have the ability to organise specific teaching and training programmes for paramedical staff, associated professionals and patient education programmes.

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

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

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

➢ Develop skills as self-directed learner recognizes continuing educational needs: select and use appropriate learning resources.

ELIGIBILITY CRITERIA FOR ADMISSIONS TO THE PROGRAMME

MCh Neurosurgery Course (3 years course)

(A) Any medical graduate with MS/DNB in General Surgery, ENT qualification, who has qualified the Entrance Examination conducted by NMC and fulfill the eligibility criteria for admission to MCh Super Specialty courses at various NMC accredited Medical Colleges in India is eligible to participate in the Centralized counseling for allocation of MCh Neurosurgery seats purely on merit cum choice basis.

(B) Duration of Course: • Post MS/DNB - 3 Years Every candidate admitted to the training programme shall pursue a regular course of study (on whole time basis) in the concerned recognized institution under the guidance of recognized post graduate teacher for assigned period of the course

TEACHING AND TRAINING ACTIVITIES

First year	Basic Neurosciences (Neuroanatomy, Neurophysiology, Neurochemistry, Neuropathology, Neuropharmacology, Clinical Neurology), by way of didactic lectures, symposia, etc. Patient care, history taking and neurological examination, case-sheet writing, preparing discharge summaries, supervised emergency calls, Academic activity
Second Year	Overall in-charge of ward work, OPD, Emergency calls, Neurology posting for one month at the end of the second year and 2 weeks posting in neuro interventional lab.
Third year	Academic activity, Emergency calls, assisting and managing operation theatres, Posting in other Neurosurgical centre(s) for 1 month in the beginning of final year. Desirable : Training in skill lab

Minimum operative surgical exposure required for the trainees:

Mandatory: - 200-250 cases exposure at least for the whole training program. Minimum 30 independent surgeries for 3-year course; performed independently/ under supervision in the OT.

- At least 2 OTs a week including trauma - About 1/3 cranial and 1/3 spinal cases - Spectrum of surgeries should include Neuro-trauma, Neuro-oncology, Stroke and cerebrovascular surgery, Pediatric Neurosurgery, Spinal surgery and peripheral nerve surgery.

- If any of the sub specialities is not available, the trainee may be posted to other centres where such sub speciality is available for 4 weeks and 8 weeks respectively for 3 years and 6 years course.

Practical Surgical training curriculum: 3 years

First Year	Lumbarpuncture, external ventricular drainage, tracheostomy, endotracheal intubation, emergency scalp suturing, Simple neuro-trauma including chronic subdural hematoma, extradural hematoma, learning elective case exposures, VP shunt (under supervision)
Second Year	Neurotrauma: contusion and intracerebral hematoma, Elective craniotomy and spinal exposures
Third Year	Elective exposures, supervised surgery, Subspeciality exposure depending on interest, independent elective surgical procedures (as outlined below)

Independent surgery (supervised):

Neuro-trauma: Chronic SDH, EDH, depressed fractures, ICH, contusions, (Experience with conventional craniotomy required).

Elective cases: VP shunt, Gliomas (at least 2 anatomical regions), Surface meningiomas, Chiari malformation, Midline suboccipital exposure and surgery, Lumbar disc and cervical disc surgery. Simple spinal instrumentation, laminectomy, extradural intradural spinal exposure.

Attendance (paper/ poster presentation) in Neurosurgical conferences/workshops: • Minimum 1 for 3 year and

Publication of papers (in peer reviewed journals):1

SYLLABUS

1. Basics in Neuroanatomy, Neurophysiology, Neuropathology, Electrophysiology, Neruopharmacology, Neurobiochemistry, Neuroimmunology with reference to neurosurgery

2. Neuroradiology: Normal skull & spine, changes in skull and spine due to SOL, special views. Contrast studies – DSA, Isotopic scanning & diagnostic procedures – C.T. Scan, M.R.I & P.E.T Scan etc.

3. Neurology Methods of clinical examination, General diagnostic principles, Localisation With specific reference to function of brain & spinal cord.

4. Neurosurgery a. Basic principles b. Vascular Neurosurgery c. Neuro- oncology d. Surgery for congenital malformation like Hydrocephlus, craniovertebralanamolies, syringomyelia , spinal dysraphism management etc. e. Traumatic brain and spinal & peripheral nerve Injuries f. Spinal instrumentation g. Different approaches for disc surgeries h. Management of brain secondariesi. Infection of CSF j. Pediatric neurosurgery k. Minimal Invasive and neuroendoscopy. l. Functional neurosurgery

Other areas in which knowledge is to be acquired:

• Biostatistics, Research Methodology and Clinical Epidemiology

• Ethics

• Medico legal aspects relevant to the discipline

• Health Policy issues as may be applicable to the discipline

TRANING ON SUB-SPECIALITY OF NEUROSCIENCES

Neuro-Anaesthesiology : The candidate must learn the resuscitation management of coma, life supporting system & monitoring of patients. The neurosurgery training should also know the interaction of anaesthetic drugs with systemic disease condition. The major thrust would be on continuing training for the Neurosurgery trainees in the operation theatre as a result of the informal discussions which would be taking place during the training period.

Neuroradiology: Combined Neuroradiology rounds or meetings twice or thrice a week.

Neuropathology: It is suggested that there should be a 4 week capsuled training for Neurosurgery trainees or regular once a week Neuropathology conference in which they should be familiarized with the techniques of grossing, staining procedures, brain cutting, autopsy methods and tissue processing including frozen sections and should be able to identify histological features of the common neurosurgical disorders.

THESIS PROTOCOL & THESIS

The candidates are required to submit the thesis before 6 months of final year .Guidelines for Submission of Thesis Protocol & Thesis by candidates Research shall form an integral part of the education programme of all candidates registered forMCh. The Basic aim of requiring the candidates to write a thesis protocol & thesis/dissertation is to familiarize him/her with research methodology. The members of the faculty guiding the thesis/dissertation work for the candidate shall ensure that the subject matter selected for the thesis/dissertation is feasible, economical and original. The protocol for a research proposal (including thesis) is a study plan, designed to describe the background, research question, aim and objectives, and detailed methodology of the study. In other words, the protocol is the ‘operating manual’ to refer to while conducting a particular study. The candidate should refer to the NMC Guidelines for preparation and submission of Thesis Protocol before the writing phase commences. The minimum writing requirements are that the language should be clear, concise, precise and consistent without excessive adjectives or adverbs and long sentences. There should not be any redundancy in the presentation. The development or preparation of the Thesis Protocol by the candidate will help her/him in understanding the ongoing activities in the proposed area of research. Further it helps in creating practical exposure to research and hence it bridges the connectivity between clinical practice and biomedical research. Such research exposure will be helpful in improving problem solving capacity, getting updated with ongoing research and implementing these findings in clinical practice.

Guidelines for protocol

The thesis protocol should be restricted to the following word limits.

• Title : 120 characters (with spacing) page

• Synopsis [structured] : 250-300 •

Introduction : 300-500

• Review of literature : 800-1000

• Aim and Objectives : Up to 200

• Material and Methods : 1200-1600 • 10-25 References [ICMJE style]

It is mandatory to have ethics committee approval before initiation of the research work. The researcher should submit an appropriate application to the ethics committee in the prescribed format of the ethics committee concerned.

Guidelines for Thesis

1. The proposed study must be approved by the institutional ethics committee

2. The thesis should be restricted to the size of 80 pages (maximum). This includes the text, figures, references, annexures, and certificates etc. It should be printed on both sides of the paper; and every page has to be numbered. Do not leave any page blank. To achieve this, following points may be kept in view:

a. The thesis should be typed in 1.5 space using Times New Roman/Arial/ Garamond size 12 font, 1" margins should be left on all four sides. Major sections viz., Introduction, Review of Literature, Aim & Objectives, Material and Methods, Results, Discussion, References, and Appendices should start from a new page. Study proforma (Case record form), informed consent form, and patient information sheet may be printed in single space.

b. Only contemporary and relevant literature may be reviewed. Restrict the introduction to 2 pages, Review of literature to 10-12 pages, and Discussion to 8-10 pages.

c. The techniques may not be described in detail unless any modification/innovations of the standard techniques are used and reference(s) may be given.

d. Illustrative material may be restricted. It should be printed on paper only. There is no need to paste photographs separately.

3. Since most of the difficulties faced by the residents relate to the work in clinical subject or clinically-oriented laboratory subjects, the following steps are suggested:

a. The number of cases should be such that adequate material, judged from the hospital attendance/records, will be available and the candidate will be able to collect case material within the period of data collection, i.e., around 6-12 months so that he/she is in a position to complete the work within the stipulated time.

b. The aim and objectives of the study should be well defined.

c. As far as possible, only clinical/laboratory data of investigations of patients or such other material easily accessible in the existing facilities should be used for the study.

d. Technical assistance, wherever necessary, may be provided by the department concerned. The resident of one specialty taking up some problem related to some other specialty should have some basic knowledge about the subject and he/she should be able to perform the investigations independently, wherever some specialized laboratory investigations are required a co-guide may be co-opted from the concerned investigative department, the quantum of laboratory work to be carried out by the candidate should be decided by the guide & co-guide by mutual consultation.

4. The clinical residents are not ordinarily expected to undertake experimental work or clinical work involving new techniques, not hitherto perfected OR the use of chemicals or radioisotopes not readily available. They should; however, be free to enlarge the scope of their studies or undertake experimental work on their own initiative but all such studies should be feasible within the existing facilities.

5. The residents should be able to freely use the surgical pathology/autopsy data if it is restricted to diagnosis only, if however, detailed historic data are required the resident will have to study the cases himself with the help of the guide/co-guide. The same will apply in case of clinical data.

6. Statistical methods used for analysis should be described specifically for each objective, and name of the statistical program used mentioned.

• Title- A good title should be brief, clear, and focus on the central theme of the topic; it should avoid abbreviations. The Title should effectively summarize the proposed research and should contain the PICO elements.

• Introduction- It should be focused on the research question and should be directly relevant to the objectives of your study.

• Review of Literature - The Review should include a description of the most relevant and recent studies published on the subject.

• Aim and Objectives - The ‘Aim’ refers to what would be broadly achieved by this study or how this study would address a bigger question / issue. The ‘Objectives’ of the research stem from the research question formulated and should at least include participants, intervention, evaluation, design.

• Material and Methods- This section should include the following 10 elements: Study setting (area), Study duration; Study design (descriptive, case-control, cohort, diagnostic accuracy, experimental (randomized/nonrandomized)); Study sample (inclusion/exclusion criteria, method of selection), Intervention, if any, Data collection, Outcome measures (primary and secondary), Sample size, Data management and Statistical analysis, and Ethical issues (Ethical clearance, Informed consent, trial registration).

• Results- Results should be organized in readily identifiable sections having correct analysis of data and presented in appropriate charts, tables, graphs and diagram etc.

• Discussion–It should start by summarizing the results for primary and secondary objectives in text form (without giving data). This should be followed by a comparison of your results on the outcome variables (both primary and secondary) with those of earlier research studies.

• Summary and Conclusion- This should be a précis of the findings of the thesis, arranged in four paragraphs: (a) background and objectives; (b) methods; (c) results; and (d) conclusions. The conclusions should strictly pertain to the findings of the thesis and not outside its domain.

• References- Relevant References should be cited in the text of the protocol (in superscripts). • Appendices - The tools used for data collection such as questionnaire, interview schedules, observation checklists, informed consent form (ICF), and participant information sheet (PIS) should be attached as appendices. Attach the master chart.

LOG BOOK

A candidate shall maintain a log book of operations (assisted / performed) during the training period, certified by the concerned post graduate teacher / Head of the department / senior consultant.

This log book shall be made available to the board of examiners for their perusal at the time of the final examination.

The log book should show evidence that the before mentioned subjects were covered (with dates and the name of teacher(s) The candidate will maintain the record of all academic activities undertaken by him/her in log book .

1. Personal profile of the candidate

2. Educational qualification/Professional data

3. Record of case histories

4. Procedures learnt

5. Record of case Demonstration/Presentations

6. Every candidate, at the time of practical examination, will be required to produce performance record (log book) containing details of the work done by him/her during the entire period of training as per requirements of the log book. It should be duly certified by the supervisor as work done by the candidate and countersigned by the administrative Head of the Institution.

7. In the absence of production of log book, the result will not be declared

Leave Rules --- As per the rules notified by NMC from time to time

EXAMINATION

Theory Examination

1. The theory examination comprises of four papers ,maximum marks 100 each.

2. There are 10 short notes of 10 marks each, in each of the papers. The number of short notes and their respective marks weightage may vary in some subjects/some papers.

3. Maximum time permitted is 3 hours.

4. Candidate must score at least 50% in the aggregate of Fourpapers to qualify the theory examination.

5. The paper wise distribution of the Theory Examination shall be as follows:

PAPER 1: Basic sciences applied to the speciality,

Paper 2: Vascular disorders, Spinal disorders, Congenital and developmental anomalies, Cranial peripheral and autonomic nervous system disorders

Paper 3: Pain and infection, Stereotactic and functional neurosurgery Recent advances and investigations

Paper 4: Recent advances

Practical Examination:

1. Maximum Marks: 300.

2. Comprises of Clinical Examination and Viva.The details are as follow

a One long case

b. Two short cases

c Radiology viva

d. Pathology specimens viva

e Grand Viva

3. MCh candidates shall also be examined in surgical procedures.

4. Oral examination shall be comprehensive enough to test the candidate's overall knowledge of the subject.

5. Candidate must obtain a minimum of 50% marks to qualify for the Practical Examination

RECOMMENDED BOOKS & JOURNALS SUGGESTED BOOKS

• Brain Surgery: Complication avoidance and management - Michael, L.J. Apuzzo. 2 vol, Elsevier,

• Neurological Examination Part A - De Jong's, Lippincott,

• Principals of Neurology – Adams, MGH,

• Localization in Clinical Neurology – Brazis., Lippincott,

• Neurological Surgery – Youmans., Elsevier,

• Operative Neurosurgery techniques - Schmidek/Sweet. Elsevier,

• Microneurosurgery - Yasargil. 4 Volume, Thieme, New youk,

• Principal Of Neurosurgery Rengachary, , Elsevier,

• Neuropathology - Greenfield, Holdder, .Apuzzo

• Brain Surgery: Complication avoidance and management

• De Jong's Neurological Examination Part A

• Brazis Localization in Clinical Neurology

• Youmans Neurological Surgery

• Wilkins/Rengachary Neurosurgery

• Ramamurthi Text Book Of Neurology & Neurosurgery

• Greenfield's Neuropathology

SUGGESTED JOURNALS

• J Neurotrauma

• J Neurosurgery

• J Neurosurgery Spine

- ActaNeurochirurgica
- Surgical Neurology
- Paediatric Neurosurgery
- Neurosurgical Clinics of North America
- Neurosurgical Focus
- Journal of Neurosurgery: Paediatrics