Guidelines

for

Competency Based Training Programme

in

DNB- Neurosurgery

NATIONAL BOARD OF EXAMINATIONS

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CONTENTS

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 DNB 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 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.

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 intraarterial thromobolysis; 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.

- 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

(A) DNB Neurosurgery Course (3 years course)

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

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

Training curriculum for 3 yrs course

1st 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.
2nd 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.
3rd 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.

Desirable:

Exposure to sub-specialites including

- Cerebrovascular surgery including endovascular procedures
- Functional Neurosurgery and Epilepsy surgery
- Neuro-endoscopy
- Peripheral nerve surgery
- Minimal invasive spinal & cranial surgery.

Practical Surgical training curriculum: 3 years

1st 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).
2nd Year	Neurotrauma: contusion and intracerebral hematoma, Elective craniotomy and spinal exposures
3rd Year	Elective exposures, supervised surgery, Sub-speciality 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): Minimum 1

(In case an Institution is unable to fulfill the bare requirements, e.g. absence of a particular sub-speciality, the trainees should be allowed to go and train for a stipulated period at any other Institute, where that particular surgery is practiced.)

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, craniovertebral anamolies, 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 secondaries
   i. 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 a thesis at the end of Three/Six years of training as per the rules and regulations of NBE.

Guidelines for Submission of Thesis Protocol & Thesis by candidates

Research shall form an integral part of the education programme of all candidates registered for DNB degrees of NBE. 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**.

Guidelines for Thesis Protocol

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 NBE 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.

Research Ethics: Ethical conduct during the conduct and publication of research is an essential requirement for all candidates and guides, with the primary responsibility of ensuring such conduct being on the thesis guide. Issues like Plagiarism, not maintaining the confidentiality of data, or any other distortion of the research process will be viewed seriously. The readers may refer to standard documents for the purpose.

The NBE reserves the right to check the submitted protocol for plagiarism, and will reject those having substantial duplication with published literature.

PROTOCOL REQUIREMENTS

1. All of the following will have to be entered in the online template. 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]

2. 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 and the protocol of thesis should have been approved by NBE.

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 DNB 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.

General Layout of a DNB Thesis:

- **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/non-randomized)); 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. Do not attach the master chart.

Thesis Protocol Submission to NBE

1. DNB candidates are required to submit their thesis protocol within 90 days of their joining DNB training.

2. Enclosures to be submitted along with protocol submission form:
   a) Form for Thesis Protocol Submission properly filled.
   b) Thesis Protocol duly signed.

c) Approval letter of institutional Ethical committee. *(Mandatory, non receivable of any one is liable for rejection)*

Thesis Submission to NBE

1. As per NBE norms, writing a thesis is essential for all DNB candidates towards partial fulfillment of eligibility for award of DNB degree.

2. DNB candidates are required to submit the thesis before the cut-off date which shall be 30th June of the same year for candidates appearing for their scheduled December final theory examination. Similarly, candidates who are appearing in their scheduled June DNB final examination shall be required to submit their thesis by 31st December of preceding year.

3. Candidates who fail to submit their thesis by the prescribed cutoff date shall NOT be allowed to appear in DNB final examination.

4. Fee to be submitted for assessment (In INR): 3500/-

5. Fee can be deposited ONLY through pay-in-slip/challan at any of the Indian bank branch across India. The challan can be downloaded from NBE website www.natboard.edu.in

6. Thesis should be bound and the front cover page should be printed in the standard format. A bound thesis should be accompanied with:
   a. A Synopsis of thesis.
   b. Form for submission of thesis, duly completed
   c. NBE copy of challan (in original) towards payment of fee as may be applicable.
   d. Soft copy of thesis in a CD duly labeled.
   e. Copy of letter of registration with NBE.

7. A declaration of thesis work being bonafide in nature and done by the candidate himself/herself at the institute of DNB training need to be submitted bound with thesis. It must be signed by the candidate himself/herself, the thesis guide and head of the institution, failing which thesis shall not be considered.

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.

The detailed guidelines and forms for submission of Thesis Protocol & Thesis are available at
www.natboard.edu.in.thesis.php

Leave Rules

1. DNB Trainees are entitled to leave during the course of DNB training as per the Leave Rules prescribed by NBE.

2. A DNB candidate can avail a maximum of 20 days of leave in a year excluding regular duty off/ Gazetted holidays as per hospital/institute calendar/policy.

3. MATERNITYLEAVE:
    a. A female candidate is permitted a maternity leave of 90 days once during the entire duration of DNB course.
    b. The expected date of delivery (EDD) should fall within the duration of maternity leave.
    c. Extension of maternity leave is permissible only for genuine medical reasons and after prior approval of NBE. The supporting medical documents have to be certified by the Head of the Institute/hospital where the candidate is undergoing DNB training. NBE reserves its rights to take a final decision in such matters.
    d. The training of the candidate shall be extended accordingly in case of any extension of maternity leave being granted to the candidate.
    e. Candidate shall be paid stipend during the period of maternity leave. No stipend shall be paid for the period of extension of leave.

4. Male DNB candidates are entitled for paternity leave of maximum of one week during the entire period of DNB training.

5. No kind of study leave is permissible to DNB candidates. However, candidates may be allowed an academic leave as under across the entire duration of training program to attend the conferences/CMEs/Academic programs/Examination purposes.

DNB COURSE	NO. OF ACADEMIC LEAVE
DNB 3 years Course (Broad & Super Specialty)	14 Days
DNB 2 years Course (Post Diploma)	10 Days

6. Under normal circumstances leave of one year should not be carried forward to the next year. However, in exceptional cases such as

prolonged illness the leave across the DNB training program may be clubbed together with prior approval of NBE.

7. Any other leave which is beyond the above stated leave is not permissible and shall lead to extension/cancellation of DNB course.

8. Any extension of DNB training for more than 2 months beyond the scheduled completion date of training is permissible only under extra-ordinary circumstances with prior approval of NBE. Such extension is neither automatic nor shall be granted as a matter of routine. NBE shall consider such requests on merit provided the seat is not carried over and compromise with training of existing trainees in the Department.

9. Unauthorized absence from DNB training for more than 7 days may lead to cancellation of registration and discontinuation of the DNB training and rejoining shall not be permitted.

10. Medical Leave

   a. Leave on medical grounds is permissible only for genuine medical reasons and NBE should be informed by the concerned institute/hospital about the same immediately after the candidate proceeds on leave on medical grounds.

   b. The supporting medical documents have to be certified by the Head of the Institute/hospital where the candidate is undergoing DNB training and have to be sent to NBE.

   c. The medical treatment should be taken from the institute/ hospital where the candidate is undergoing DNB training. Any deviation from this shall be supported with valid grounds and documentation.

   d. In case of medical treatment being sought from some other institute/hospital, the medical documents have to be certified by the Head of the institute/hospital where the candidate is undergoing DNB training.

   e. NBE reserves its rights to verify the authenticity of the documents furnished by the candidate and the institute/hospital regarding Medical illness of the candidate and to take a final decision in such matters.

11.

    a. Total leave period which can be availed by DNB candidates is 120+28 = 148 days for 6 years course, 60+14=74 days for 3 years course and 40+10 = 50 days for 2 years course. This includes all kinds of eligible leave including academic leave. Maternity / Paternity leave can be availed separately by eligible candidates. Any kind of leave including medical leave exceeding the aforementioned limit shall lead to extension of DNB training. It is clarified that prior approval of NBE is necessary for availing any such leave.

    b. The eligibility for DNB Final Examination shall be determined strictly in accordance with the criteria prescribed in the respective information bulletin.

EXAMINATION

FORMATIVE ASSESSMENT

Formative assessment includes various formal and informal assessment procedures by which evaluation of student's learning, comprehension, and academic progress is done by the teachers/ faculty to improve student attainment. Formative assessment test (FAT) is called as "Formative "as it informs the in process teaching and learning modifications. FAT is an integral part of the effective teaching .The goal of the FAT is to collect information which can be used to improve the student learning process.

Formative assessment is essentially positive in intent, directed towards promoting learning; it is therefore part of teaching. Validity and usefulness are paramount in formative assessment and should take precedence over concerns for reliability. The assessment scheme consists of Three Parts which has to be essentially completed by the candidates.

The scheme includes:-

Part I:- Conduction of theory examination

Part-II :- Feedback session on the theory performance

Part-III :- Work place based clinical assessment

Scheme of Formative assessment

PART – I	CONDUCT OF THEORY EXAMINATION	Candidate has to appear for Theory Exam and it will be held for One day.
PART – II	FEEDBACK SESSION ON THE THEORY PERFORMANCE	Candidate has to appear for his/her Theory Exam Assessment Workshop.
PART – III	WORK PLACE BASED CLINICAL ASSESSMENT	After Theory Examination, Candidate has to appear for Clinical 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

1. Personal attributes:

- **Behavior and Emotional Stability:** Dependable, disciplined, dedicated, stable in emergency situations, shows positive approach.
- **Motivation and Initiative:** Takes on responsibility, innovative, enterprising, does not shirk duties or leave any work pending.
- **Honesty and Integrity:** Truthful, admits mistakes, does not cook up information, has ethical conduct, exhibits good moral values, loyal to the institution.
- **Interpersonal Skills and Leadership Quality:** Has compassionate attitude towards patients and attendants, gets on well with colleagues and paramedical staff, 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.

FINAL EXAMINATION

The summative assessment of competence will be done in the form of DNB Final Examination leading to the award of the degree of Diplomate of National Board in Neurosurgery. The DNB final is a two-stage examination comprising the theory and practical part. An eligible candidate who has qualified the theory exam is permitted to appear in the practical examination.

For 3 yrs course

Theory Examination

1. The theory examination comprises of *Three/ 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 *Three/ Four* papers to qualify the theory examination.
5. Candidates who have qualified the theory examination are permitted to take up the practical examination.
6. The paper wise distribution of the Theory Examination shall be as follows:

PAPER 1: Basic sciences applied to the specialty, General and critical care in neurosurgery, Tumors, Trauma & Research methodology

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

a) Practical Examination:
1. Maximum Marks: 300.
2. Comprises of Clinical Examination and Viva.
3. Candidate must obtain a minimum of 50% marks in the Clinical Examination (including Viva) to qualify for the Practical Examination.
4. There are a maximum of three attempts that can be availed by a candidate for Practical Examination.
5. First attempt is the practical examination following immediately after the declaration of theory results.

6. Second and Third attempt in practical examination shall be permitted out of the next three sessions of practical examinations placed alongwith the next three successive theory examination sessions; after payment of full examination fees as may be prescribed by NBE.

7. Absentation from Practical Examination is counted as an attempt.

8. Appearance in first practical examination is compulsory;

9. Requests for Change in center of examination are not entertained, as the same is not permissible.

10. Candidates are required not to canvass with NBE for above.

Declaration of DNB Final Results

1. DNB final is a qualifying examination.

2. Results of DNB final examinations (theory & practical) are declared as PASS/FAIL.

3. DNB degree is awarded to a DNB trainee in the convocation of NBE.

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
- Acta Neurochirurgica
- Surgical Neurology
- Paediatric Neurosurgery
- Neurosurgical Clinics of North America
- Neurosurgical Focus
- Journal of Neurosurgery: Paediatrics
- Spine

- Neurosurgery
- Surgical Neurology
- Neurology India

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