

Guidelines
for
Competency Based Training Programme
in
**FNB- NEURO ANESTHESIA AND CRITICAL
CARE**



NATIONAL BOARD OF EXAMINATIONS

Medical Enclave, Ansari Nagar, New Delhi-110029, INDIA
Email: mail@natboard.edu.in Phone: 011 45593000

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PROGRAMME GOAL

The course has been designed to train candidates by the anesthesiologists in the principles and practice of Neuroanaesthesia and Neurocritical care.

The training program should enable the candidates to function independently as faculty / consultant in the anaesthetic / intensive care management of the patients with neurological disorders coming for neurosurgical / radiological intervention.

PROGRAMME OBJECTIVES

At the end of the course, the candidate should be able to:

- Understand physiological and pathological basis of central nervous system disorders.
- Understand the theoretical basis of organ dysfunction and critical illness
- Develop the knowledge and skills to diagnose critical illnesses and their complications
- Critically evaluate published literature
- Learn to practice evidence-based medicine in managing neurological patients
- Develop skills of communication with family members of critically ill patients
- Apply the highest ethical standards in the practice of medicine

ELIGIBILITY CRITERIA FOR ADMISSIONS TO THE PROGRAMME

(A) FNB Neuro Anesthesia and Critical Care Course:

1. Any medical graduate with DNB/MD Anesthesiology qualification, who has qualified the ***Entrance Examination*** conducted by NBE and fulfill the eligibility criteria for admission to DNB courses at various NBE accredited Medical Colleges/ institutions/Hospitals in India is eligible to participate in the Centralized counseling for allocation of DNB Neuro Anesthesia and Critical Care seats purely on merit cum choice basis.
2. Admission to 2 years FNB Neuro Anesthesia and Critical Care course is only through ***Entrance Examination*** conducted by NBE and Centralized Merit Based Counseling conducted by National Board of Examination as per prescribed guidelines.

Duration of Course: 2 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

The fundamental components of the teaching programme should include:

1. Case presentations & discussion- once a week
2. Seminar – Once a week
3. Journal club- Once a week
4. Grand round presentation (by rotation departments and subspecialties)- once a week
5. Faculty lecture teaching- once a month
6. Clinical Audit-Once a Month
7. One poster and one oral presentation at least once during their training period in a recognized conference.

The training program would focus on knowledge, skills and attitudes (behavior). It is divided into theoretical, clinical and practical training in all aspects of the delivery of care. It also includes methodology of research and teaching.

Theoretical: The theoretical knowledge would be imparted to the candidates through discussions, journal clubs, symposia and seminars. The students are exposed to recent advances through discussions in journal clubs.

Symposia: Trainees would be required to present a minimum of 20 topics based on the curriculum over a period of two years to the combined class of teachers and students. A free discussion would be encouraged in these symposia. The topics of the symposia would be given to the trainees with the dates for their presentation.

Clinical: The trainee would be attached to a faculty member to be able to pick up methods of history taking, examination, prescription writing and management.

Bedside: The trainee would work up cases, learn management of cases by discussion with faculty of the department.

Journal Clubs: This would be a weekly academic exercise. A list of suggested Journals is given towards the end of this document. The candidate would summarize and discuss the scientific article critically. A faculty member will suggest the article and moderate the discussion, with participation by other faculty members and resident doctors. The contributions made by the article in furtherance of the scientific knowledge and limitations, if any, will be highlighted.

Research: The student would carry out a research project and write a thesis/ dissertation in accordance with NBE guidelines. He/ she would also be given exposure to take part in the research projects going on in the departments.

Syllabus:

Basic Sciences

- Anatomy of the central & peripheral nervous system
- Physiology of Central Nervous System
 - a) Cerebral blood flow/metabolism
 - b) Cerebrospinal fluid dynamics
 - c) Intracranial pressure
 - d) Electrophysiology of CNS
- Pathophysiology of Cerebral ischemia/Traumatic brain injury
- Pharmacology of Anaesthetic/adjuvant drugs and emergency drugs
- Neuromicrobiology as applicable to operating rooms and critical care units, neuroinfections
- Basics of statistical Methods/Research methodology
- Fundamental of Biomedical Engineering : Basics of instrumentation, Biological signal processing

Clinical Sciences

- Anaesthetic Management of :
 - a) Brain tumours
 - b) Neurovascular surgery
 - c) Hydrocephalus
 - d) Spinal surgery
 - e) Surgery for epilepsy
 - f) Awake craniotomy
 - g) Neuroendoscopy
 - h) Head injury
 - i) Pituitary surgery
 - j) DBS and other functional neurosurgery
- Cerebral protection
- Stroke
- Intraoperative and Postoperative Monitoring

- Neuroimaging techniques
- Neurointerventional procedures
- Airway related issues in neuroanaesthesia

Monitoring:

- Cardiac:
- Respiratory:
- Neurological: EEG, Evoked potentials, TCD, NIRS, SjVO₂, PbtO₂, cranial nerve monitoring
- Renal:
- Coagulation:

Intensive care:

Respiratory management

- Principles of ventilatory management
- Pulmonary edema –
- Adult respiratory distress syndrome
- Severe asthma and COPD
- Respiratory infections community and hospital acquired
- Chest trauma

Principles of cardiac and haemodynamic management

- Haemodynamic instability and shock
- Cardiac arrest
- Acute myocardial infarction
- Unstable angina
- Severe heart failure
- Common arrhythmias and conduction disturbances - Cardiomyopathies
- Cardiac tamponade
- Pulmonary embolism

Neurology

- Coma
- Status epilepticus
- Head trauma
- Subarachnoid haemorrhage
- intracranial hypertension
- Cerebrovascular accidents and cerebral vasospasm
- Meningo-encephalitis
- Acute neuromuscular disease (including myasthenia & Guillain Barre syndrome)
- Post anoxic brain damage
- Acute confusional states

- Spinal cord injury
- Neurosurgery and post-operative care
- Brain death
- Stroke

Renal

- Oliguria/ anuria
- Acute renal failure
- Renal replacement therapy (RRT)
- Continuous RRT
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Metabolic and Nutritional

- Fluid balance
- Electrolyte balance and its disorders
- Acid-base disorders
- Endocrine disorders (including diabetes mellitus, acute adrenal insufficiency, pituitary disorders, hyper and hypothyroidism)
- Nutrition in critical illness
- Enteral and Parenteral nutrition
- Monitoring of nutrition

Hematological

- Disseminated intravascular coagulation and other coagulation disorders
- Thrombocytopenia
- Hypercoagulable states and anticoagulation
- Haemolytic syndromes
- Acute blood loss and anaemia
- Neutropenia
- Blood component therapy
- Immunological disorders

Infections

- Severe infection due to aerobic and anaerobic bacteria
- Acute severe viral infection
- Fungal and parasites infections with sepsis and organ failure
- Nosocomial infection
- Infection in the immunocompromised host
- Tropical disease
- Antimicrobial therapy

Gastrointestinal and hepatic disorders

- Prevention and treatment of acute upper G.I. bleeding
- Management of acute lower GI bleeding
- Perforated viscus and Peritonitis
- Acute hepatic failure and Ascitis

Clinical skills to be acquired:

- a) Preanaesthetic evaluation for elective and emergency neurosurgery
- b) Anaesthetic and Perioperative management of various neurosurgical conditions
- c) Intensive Care

PROCEDURES, TECHNIQUES, AND MINIMALLY INVASIVE MONITORING

- Airway Management and Endotracheal Intubation
- Central Venous Catheterization
- Arterial Line Placement and Care
- Temporary Cardiac Pacing
- Cardioversion and Defibrillation
- Pericardiocentesis
- Chest Tube Insertion and Care
- Bronchoscopy
- Percutaneous Tracheostomy
- Cerebrospinal Fluid Aspiration
- Interventional Ultrasound
- Cardiopulmonary Resuscitation
- Management of Pain in the Critically Ill Patient
- Routine Monitoring of Critically Ill Patients
- Minimally Invasive Hemodynamic Monitoring
- Neurologic Multimodal Monitoring
- Echocardiography in the Intensive Care Unit
- Mechanical ventilation in neurological patients
- Haemodynamic management in a neuro-ICU patient including ACLS,
- Fluid & electrolyte management in neuro-ICU patient
- ICP monitoring

- TCD monitoring
- Basics interpretation of EEG, Evoked potential
- Management of blood gases and acid – base status
- Infection control in a neuro – ICU
- Bedside echocardiography

Diagnostic:- Ultrasound evaluation of critically ill patients

- Cardiac: Tamponade, ejection fraction estimation, intravascular volume status assessment, assessment of contractility
- Abdomen: Detection of fluid/hemoperitoneum, liver/spleen tear
- Vascular: Deep vein thrombosis, placement of IV canula, CVP lines, arterial canuala

NON TECHNICAL SKILLS

- Orders and prioritizes appropriate investigations
- Principles of informed consent
- Principles of crisis management, conflict resolution, negotiation and debriefing
- Understand nonverbal communication with critically ill patients
- Principles of delivering bad news to patients and families
- Strategies to communicate complicated critical care issues to the general population

Biostatistics, Research Methodology

Ethics

Medico legal aspects relevant to the discipline

Health Policy issues as may be applicable to the discipline

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

1. There is no provision of maternity or paternity leave during the FNB tenure. However, if a FNB trainee avails maternity (90 days) or paternity (7 days) leave during the FNB tenure, her or his tenure will be extended by an equal number of days.
2. FNB trainees are required to complete their training by a prescribed cut off date (as per information bulletin of Exit exam) for being eligible to FNB Exit examination. Trainees whose FNB tenure is extended beyond this cut off date only due to the maternity/paternity leave availed by them shall be permitted to take exit examination, if otherwise eligible, with other registered candidates of same session.
3. No kind of study leave is permissible to FNB candidates. However, candidates may be allowed an academic leave of 10 days across the entire duration of training program to attend the conferences/CMEs/Academic programs/Examination purposes.
4. Under normal circumstances, leave of one year should not be carry forward to next year, however, in exceptional cases like prolonged illness or any meritorious ground the leave across the training program may be clubbed together with prior approval of NBE.
5. Any other leave which is beyond the above stated leave is not permissible and shall lead to extension/cancellation of FNB course.
6. Any extension of FNB training for more than 2 months beyond 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.
7. Unauthorized absence from FNB training for more than 7 days may lead to cancellation of registration and discontinuation of the FNB training and rejoining shall not be permitted.

MEDICAL LEAVE

1. 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.
2. The supporting medical documents have to be certified by the Head of the Institute/hospital where the candidate is undergoing FNB training and have to be sent to NBE.
3. The medical treatment should be taken from the Institute/hospital where the candidate is undergoing FNB training. Any deviation from this shall be supported with valid grounds and documentation.
4. 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 FNB training.
5. 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.
6. Total leave period which can be availed by FNB candidates is $40+10 = 50$ days. This includes all kinds of eligible leave including academic leave. Any kind of leave including medical leave exceeding the aforementioned limit shall lead to extension of FNB training. It is clarified that prior approval of NBE is necessary for availing any such leave.
7. The eligibility for FNB Exitl Examination shall be determined strictly in accordance with the criteria prescribed in the respective information bulletin.
8. Extension of training due to maternity leave shall not be affected while deciding the cutoff date of FNB training

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.

FELLOWSHIP EXIT EXAMINATION

The summative assessment of competence will be done in the form of Fellowship Exit Examination leading to the award of the degree of Fellow of National Board in Reproductive Medicine. The FNB final is a two-stage examination comprising the theory and practical part

Theory Examination:

1. The Theory examination comprises of one paper with maximum marks of 100.
2. There are 10 short notes of 10 marks each in the Theory paper
3. Maximum time permitted is 3 hours.

Practical Examination:

1. Maximum marks : 300

2. Comprises of Clinical Examination and viva

- The candidate has to score a minimum of 50% marks in aggregate i.e. 200 out of total 400 marks (Theory & Practical) with at least 50% marks in theory examination to qualify in the Fellowship Exit Exam.
- The Theory and Practical of Fellowship Exit Examination shall be conducted at the same examination centre of the concerned specialty.

Declaration of FNB Results

1. Fellowship Exit Examination is a qualifying examination.
2. Results of Fellowship Exit Examination (theory & practical) are declared as PASS/FAIL.
3. FNB degree is awarded to a FNB trainee in the convocation of NBE.

RECOMMENDED TEXT BOOKS AND JOURNALS

Textbooks

- A Practical Approach to Neuroanesthesia edited by Paul Mongan, Soriano, Sloan 2013
- Cottrell and Patel's Neuroanesthesia edited by James Cottrell, Piyush Patel 6th edn 2016
- Neurocritical Care Monitoring edited by Chad Miller, Michel Torby 2015
- Handbook of Neuroanesthesia edited by Newfield, Cottrell 2015
- Clinical Neuroanatomy edited by Richard Snell 7th edn
- Intraoperative Neurophysiological Monitoring edited by Aage Moller 2nd edn
- Fundamentals of Neuroanesthesia edited by Ruskin, Rosenbaum, Rampil 2014
- Intensive Care in Neurology and Neurosurgery edited by Godoy 1st edn 2013
- Textbook of Neurointensive Care edited by Layon, Gabrielli, Friedman 2nd edn
- Text book of critical care by Shoemaker
- Procedures and monitoring for the critically ill patients by William Shoemaker
- ICU by Paul Marino

Journals

- Journal of Neurosurgical Anesthesiology
- Journal of Neurosurgical Anesthesiology
- Journal of Neuroanesthesiology and Critical Care
- Neurocritical Care
- New England Journal of Medicine
- Anesthesia and Analgesia
- Journal of Clinical Anesthesia
- Journal of Clinical Monitoring and Computing
- European Journal of Anesthesiology
- European Journal of Anesthesiology
- Critical Care Medicine
- Current Opinion in Anesthesiology
- Intensive Care Medicine