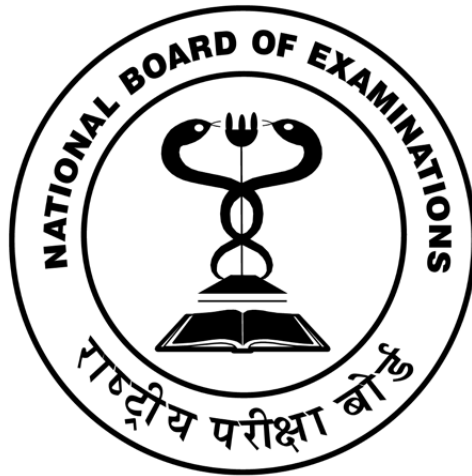


Guidelines  
for  
Competency Based Training Programme  
in  
**DNB- ANESTHESIA**



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# CONTENTS

- I. OBJECTIVES OF THE PROGRAMME
  - a) Programme goal
  - b) Programme objective
- II. ELIGIBILITY CRITERIA FOR ADMISSION
- III. TEACHING AND TRAINING ACTIVITIES
- IV. SYLLABUS
- V. COMPETENCIES
- VI. THESIS & THESIS PROTOCOL
- VII. LOG BOOK
- VIII. NBE LEAVE GUIDELINES
- IX. EXAMINATION –
  - a) FORMATIVE ASSESSMENT
  - b) FINAL THEORY & PRACTICAL
- X. RECOMMENDED TEXT BOOKS AND JOURNALS

## **PROGRAMME GOAL**

To enable the candidate to function as a specialist anaesthesiologist, well trained in practice of Anaesthesia, Critical Care, Pain Management, Resuscitation of all acute or acute on chronic conditions and as a trainer imparting such knowledge to the doctors in training and subordinate ancillary medical staff. To this end he should possess diagnostic skills as well as skills with laboratory procedures, and current technologic tools, their judicious use and sensible interpretation in various clinical settings based on in depth knowledge of all basic sciences and all disciplines of clinical medicine.

He should have dedication to the specialty, to patients under his care, to the institution and be able to work as a team with surgeons, nursing staff, hospital administration and with other clinicians, understanding, adjusting and instructing where necessary with a balanced mind and leadership qualities.

## **PROGRAMME OBJECTIVES**

- A thorough knowledge of the pharmacokinetics and pharmacodynamics of anesthetic drugs and adjuncts.
- Knowledge of cardiovascular, respiratory, neurological, hepatobiliary, renal physiology and endocrine homeostasis and related drugs as relevant to patients undergoing anesthesia.
- Relevant anatomy, physiology, biochemistry, pharmacology and physics.
- A basic idea of the relevant physical principles involved in the construction and functioning of equipment used in anesthesia and monitoring.
- Knowledge to attain expertise of the commonly used techniques in general, regional and local anesthesia, and their applications for routine and emergency anesthesia.
- Develop knowledge and skills in airway management pharmacodynamics
- A clear cut concept of unconsciousness and its implications.
- Relevant knowledge of acute pain and its management.

- Relevant knowledge about chronic intractable pain and its management.
- Relevant knowledge to manage patients in intensive care unit.
- Relevant knowledge of research methodology and medical statistics, medical audit and record maintenance.
- Knowledge & Expertise in cardiopulmonary resuscitation i.e. both BLS & ACLS.

## **ELIGIBILITY CRITERIA FOR ADMISSIONS TO THE PROGRAMME**

### **(A) DNB Anesthesiology Course:**

1. Any medical graduate with **MBBS** qualification , who has qualified the **Entrance Examination** conducted by NBE and fulfill the eligibility criteria for admission to DNB **Broad Specialty** courses at various NBE accredited Medical Colleges/ institutions/Hospitals in India is eligible to participate in the Centralized counseling for allocation of DNB Anesthesiology seats purely on merit cum choice basis.
2. Admission to 3 years post MBBS DNB Anesthesiology course is only through **Entrance Examination** conducted by NBE and Centralized Merit Based Counseling conducted by National Board of Examination as per prescribed guidelines.

### **(B) DNB (Post diploma) Anesthesiology Course:**

1. Any medical graduate with MBBS qualification who has successfully completed **DA** (and fulfill the eligibility criteria for admission to DNB (Post Diploma) Broad Specialty courses at various NBE accredited Medical Colleges/ institutions/Hospitals in India is eligible to participate in the Centralized counseling for allocation of DNB (Post Diploma) Anesthesiology seats purely on merit cum choice basis.
2. Admission to 2 years post diploma DNB Anesthesiology course is only through PDCET Centralized Merit Based Counseling conducted by National Board of Examination as per prescribed guidelines.

### **Duration of Course:**

**For Primary candidates : 3 years**  
**For Secondary Candidates : 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:

Case presentations & discussion- once a week

Seminar – Once a week

Journal club- Once a week

Grand round presentation (by rotation departments and subspecialties)- once a week

Faculty lecture teaching- once a month

Clinical Audit-Once a Month

A poster and have one oral presentation at least once during their training period in a recognized conference.

The rounds should include bedside sessions, file rounds & documentation of case history and examination, progress notes, round discussions, investigations and management plan) interesting and difficult case unit discussions.

The training program would focus on knowledge, skills and attitudes (behavior), all essential components of education. It is being divided into theoretical, clinical and practical in all aspects of the delivery of the rehabilitative care, including 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. These are considered necessary in view of an inadequate exposure to the subject in the undergraduate curriculum.

**Symposia:** Trainees would be required to present a minimum of 20 topics based on the curriculum in a period of three 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 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 in rehabilitation practice.

**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 the research project and write a thesis/ dissertation in accordance with NBE guidelines. He/ she would also be given exposure to partake in the research projects going on in the departments to learn their planning, methodology and execution so as to learn various aspects of research.

## **SYLLABUS**

During the course, the candidate should be exposed to the following areas of clinical anesthesia practice:

- Pre anesthesia clinic
- Pain clinic
- Recovery and Post anesthesia care unit ( PACU )
- Intensive Care Units
- Dialysis and transplant
- All specialty theatre
- Induced hypotensive techniques
- Day care Anesthesia
- Anesthesia outside the OT and in remote locations
- Robotic surgery
- Monitored anesthesia care

The course content shall include the following:

### **1st year Theory to cover the following:**

a) *Anatomy* – Diaphragm, larynx, upper and lower airway; cranial nerves; relevant anatomy for regional anesthesia. Special anatomical area of interest to the anesthesiologist e.g., Orbit of the eyes, Base of Skull, Vertebral Column, Spinal Cord and meninges, Intercostal Space, Nerves and Nerve Plexuses e.g., Brachial, Coeliac, Superior Hypogastric etc.

b) *Physiology* - Theories of mechanism of production of Anesthesia.

Respiratory, Cardiovascular, Central Nervous System, Hepatobiliary, Renal and Endocrine System, Pediatric and Geriatric Physiology, Pregnancy, Blood Groups and Blood Transfusion, Muscle and Neuro Muscular Junction, Regulation of temperature & Metabolism, Stress response, Acid-Base Homeostasis, Fluid and Electrolytes

c) *Biochemistry* –

- i) Biochemistry relevant to fluid balance & blood transfusion, artificial blood and perioperative fluid therapy.
  - ii) Acid base homeostasis in health and diseases.
  - iii) Interpretation of blood gases, electrolytes and other relevant biochemical values. Various function tests related to systems e.g. LFT, KFT and basics of measurement techniques.
- d) *Pharmacology* –
- i) General pharmacological principles.
  - ii) Concepts of pharmacokinetics and pharmacodynamics of various Drugs used during Anaesthesia and relevant to Anaesthesia practice.
- e) Documentation, aspects of medicolegal care, informed consent and record keeping
- iii) Uptake and distribution of inhaled anesthetics agents.
  - iv) Drug interaction in Anesthesiology.
  - v) Drugs used in Anesthesia and treatment of common medical disorder like DM, HT and IHD, Emergency drugs, e.g., Adrenaline; Atropine, Inotropes, Diuretics, prokinetics etc.
  - vi) Theoretical background of the commonly used anesthetic techniques of general and regional anesthesia viz.
- a) GA –Intravenous, Inhalational, Endotracheal etc., using spontaneous and controlled mode of ventilation.
  - b) RA –Spinal, epidural, CSE and Nerve block
  - c) MAC (Monitored Anesthesia Care)

*Medicine related to:*

- I) Cardiovascular System.
- II) Respiratory System.



- III) Hepatobiliary System.
- IV) Genitourinary System.
- V) Endocrine system, Pregnancy.

*e) Involved principles of physics and use of equipment in anesthesia*

- i) Anesthesia machine – checking the machine and assembly of necessary items.
  - ii) Airway equipment including Tracheostomy / Equipments for airway management mask, LMA, fiberoptic laryngoscopes; other devices like Combitube etc.
  - iii) Breathing system continuous flow systems, draw over system - Assembly and checking, vaporizers, Gas laws.
  - iv) Monitoring in Anesthesia with concepts of minimal monitoring.
  - v) Safety in Anesthesia equipments.
  - vi) Medical gases – storage and central pipeline system.
  - vii) Introduction to research methodology, Randomised Controlled trials etc., Basics of biostatistics.
  - viii) Documentation and medico –legal aspects of anesthesia.
  - ix) Stress the importance of accurate documentation.
- 
- Cardiopulmonary Resuscitation; both BLS & ACLS, theories of cardiac pump, thoracic pump, Recent Advances
  - Defibrillation
  - Resuscitation of a patient with overdose of drug/ poisons/ management of unconscious patients. Resuscitation of a severely injured patient.
  - Neonatal Resuscitation.
  - Preoperative assessments and medication –general principles.
  - Introduction to anatomical, physiological, pharmacological and biochemical aspects of pain and pain management both Acute and Chronic
  - Introduction to artificial ventilation.
  - Oxygen therapy.
  - Introduction to the operation theatre, recovery rooms (concepts of PACU), ICU, Pain clinic, Pre-anesthetic check-up (PAC) room

- Recovery from anesthesia.
- Shock – pathophysiology, clinical diagnosis and management.
- Pulmonary function tests – Principles and application.
- Effects of positioning on the OT table and ICU bed.
- General ICU Care

## **2nd year Theory**

a) Relevant anatomy of each system.

b) Physics of equipments used in anesthesia.

Medical gases –gas plant, central pipeline, scavenging system.

- Pressure Reducing valves.
- Anesthesia machine, Humidifiers.
- Flow meters
- Safety measures related to anesthesia equipments

Vaporizers –characteristics and functional specifications.

Breathing systems-Assembly, functional analysis, flow.

Minimum monitoring standards.

Requirements of APL and flow directional valves.

c) Sterilization of equipment

d) Computers, Utility, Computer assisted learning and data storage. Computerized anesthesia records.

e) Pharmacology of drugs used in cardiovascular, respiratory, endocrine, renal diseases and CNS disorders.

f) Principles of monitoring equipment used for assessment of:

- i) Cardiac function viz. Rhythm, pulse, venous and arterial pressures, and cardiac output.
  - ii) Temperature.
  - iii) Respiratory function viz. Rate, volumes, compliances, resistance, blood gases.
  - iv) Intracranial pressure, depth of anesthesia and
  - v) Neuromuscular block.
- g) Working principles of ventilators.
- h) Special anesthesia techniques as relevant to outpatient anesthesia, hypotensive anesthesia, anesthesia in abnormal environments and calamitous situations.
- i) Anesthetic management in special situations – Emergency, ENT, Ophthalmology, Obstetric, Obstetrics analgesia, Plastic, Dental, Radio-diagnosis and Radio therapeutic procedures and patients with systemic diseases.
- j) Medical statistics relevant to data collection, analysis, comparison and estimation of significance.
- Principles of pediatric anesthesia. Management of neonatal surgical emergencies, RA in infants. Pediatrics – Prematurity, Physiology, anatomy of neonate in comparison with adult.
  - Associated Medical disorders in surgical patient – Anesthetic implications and management.
  - Basics of orthopedic anesthesia.
  - Day care anesthesia.
  - Rural anesthesia – anesthesia for camp surgery.
  - Anesthesia for otorhinolaryngology with special emphasis on difficult airway management.

- Blood and blood component therapy. Anesthetic implications on coagulation disorders.
- Maintenance of hemostasis and fluid and fluid management
- Monitored anesthesia care (MAC).
- Anesthetic implications in diabetes mellitus, thyroid and parathyroid disorders. Pheochromocytoma, cushings disease etc.
- Management of acid base disorders.
- Principles of geriatric anesthesia.
- Anesthesia outside the OR and in special situations.
- Principles of management in Trauma and mass casualties.
- Basics and principles of ICU

### **3rd year Theory**

- Anesthesia for patients with severe cardiac, respiratory, renal and hepatobiliary disorders posted for unrelated surgery.
- Management of patients in shock, renal failure, critically ill and / or on ventilator. Management of patients for cardiac surgery / CPB beating heart surgery. Chronic pain therapy and therapeutic nerve blocks.
- Selection, purchase, maintenance and sterilization of anesthesia and related equipment.
- Principles of anesthetic management of neuro/ cardiac/ thoracic/ vascular / transplantation/ burn and plastic surgery.
- Principles of neonatal ventilation and critical care.
- Principles of human resources and material management.
- General principles of medical audit.
- Principle of one lung anesthesia

### **Biostatistics, Research Methodology and Clinical Epidemiology**

## **Ethics**

### **Medico legal aspects relevant to the discipline**

### **Health Policy issues as may be applicable to the discipline**

## **Competencies**

### **ATTITUDE DEVELOPMENT**

The student should develop attitudes that lead to:

Life long learning and updating.

Sympathetic communication with relatives.

Sympathetic communication with patients.

Appropriate communication with colleagues to function in a group in OR/ ICU.

Become a teacher for Technicians, Nurses, Paramedical Staff and undergraduates.

Ability to discuss. Participate in case discussion and scientific presentations.

Ability to function as a leader in the operating room / ICU.

Ability to cope up with stress For example long working hours, night rosters and grave emergency situation.

Decision making abilities

### **SKILL DEVELOPMENT:**

### **Requirement of practical training by Junior Resident (3 years training course)**

Plan and conduct anesthesia, recovery and postoperative pain relief for elective and emergency surgery related to all surgical specialties.

Carry out basic life support (BLS) and advanced life support (ALS) and train medical and emergency staff in BLS and ALS.

Manage unconscious patients: Airway management and long term management of unconscious patient.

Manage patients admitted to an intensive care unit.

Manage patients suffering from chronic intractable pain.

Organize the Hospital environment to manage mass casualty situations.

Critically review and acquire relevant knowledge from the journals about the new development in the specialty.

Should be able to participate in anesthesia audit.

Major stress is on practical training. The Goals of postings i.e. both the general goals and of the specific sub specialty postings will be fulfilled by rotating and Junior Resident in various operating theaters, Intensive Care, Pain Clinic, Emergency Room (Casualty), Emergency / Distress calls in wards, out patient department and peripheral anesthesia facilities. The recommended period of stay in each area is as follows:

<b>Specialty</b>	<b>Months</b>
General Surgery	05
Urology	01
Eye	01
ENT	02
Dental	01
Orthopedic / Trauma / Emergency Medicine	04
Gynecology	03
Obstetrics/ Labour Room	03
Pediatrics Surgery	02
Burns /Plastic Surgery	01
CTVS, Cardiac CATH lab	02
Neurosurgery	03
ICU	04

Pain Clinic	01
Recovery area (PACU)	01
Organ Transplant	06 Cases
Peripheral Theatre / Family Planning OT / Radiology, Radiotherapy, ECT	01

The student is instructed for preoperative preparation of the patients and discussion of the intra-operative problems of cases being conducted on the day. During these postings the students initially observe and then perform various procedures and conduct the anesthetic procedure as listed. Each procedure observed and performed will be listed in the logbook, which is signed by attending faculty.

The trainee will undergo a graded training in the following manner:

**Orientation-** At the beginning of three years training, each student should be given an orientation to the hospital operation theatre, intensive care and pain clinic, and subject of anesthesia. The candidates are assigned thesis guides so as to help them prepare protocols.

**Introductory Lectures** are aimed to familiarize the student with the:

- a) Basic anesthesia delivery equipment, monitors and important principles of physics that govern the function of these equipments.
- b) Intravenous Anesthesia drugs and Inhalation agents, NMB's
- c) Patient evaluation, pre-anesthetic assessment, interpretation of laboratory investigation as applied to the care of the patients planning and conduct of general anesthesia and postoperative care and conduct of spinal and epidural anaesthesia.
- d) Students are taught basic and advanced cardiac life support.

e) The students are familiarized about the principle of the sterilization and universal precautions.

f) The students are encouraged and taught to search literature to be able to write a thesis protocol.

### **1st year Objectives:**

The first year resident is taught to have expertise in the management of ASA I and II cases. To start with, they observe and slowly become independent in giving general anesthesia and spinal anesthesia to ASA I & II cases for minor and major surgery, under graded supervision. They are posted to the following specialties during the first year: Gynecology, General surgery, Orthopedic, ENT, Recovery room and Urology.

### **2nd year Objectives:**

The students are taught to give general anesthesia / regional anesthesia to ASA I, II, III & IV under supervision. They should be able extradural block (EDB), spinal block and peripheral nerve blocks under supervision. Should learn pediatrics and trauma life supports and maintain skills for basic and advanced cardiac life support. They are posted in the following specialties Obstetrics, Dental Surgery, Eye, ICU, Pain Clinic and Peripheral Theatres.

The student should be able to analyze data and write a thesis. They should be able to present scientific data.

### **3rd year Objectives:**

The student should be able to plan and administer to all patients under graded supervision including patients for Cardiac surgery, Neurosurgery, and Pediatric Surgery and for all major surgeries. The aim at the end is to be competent and independent soon after the third year of junior residency in providing anesthesia to elective and emergency cases. They should also know how to organize mass casualty.



## **Minimum Procedures / Cases to be entered in logbook**

### **I. Regional**

Subarachnoid (SAB)	= 50 SAB
Lumbar epidural (EDB)	= 50 including continuous EDB
Caudal epidural block	= 30
CSE	= 20
Sciatic / Femoral nerve blocks	= 5 + 5
Bier block	= 5
Ankle block	= 5
Stellate Ganglion	= 5 (observe)
Brachial Plexus	= 5 (observe) 10 (do)
Coeliac Plexus Block	= 3 (observe)
Trigger Point Injection	= 5
Other peripheral N. Block	= 10
Ophthalmic Blocks	= 5 (observe)
Field Block	= 5
Filter block intubation	=5

### **II. Anesthesia for:**

Open Heart	= 10 (observe)
Closed Heart	= 10 (observe)
Craniotomy	= 10 (observe)
Spine Surgery	= 10 (observe)
Joint replacement	= 10 (observe)

### **III. Procedures:**

Internal Jugular Cannulation	= 10+10 do/ observe
External Jugular Cannulation	= 10
Subclavian Vein Cannulation	= 10+10(do/ observe)
Peripheral Central Line	= 10

Arterial Line Cannulation = 10+10(do/observe)

#### **IV. Conduct of Cases:**

ASA I	= 100 (as independent)
ASA II	= 50 (as independent / Observation)
ASA III	= 30 (observation/ supervision)
ASA IV	= 10 (observation/ supervision)
Labour Analgesia	= 10 (observation)
Organ Transplant	= 5 (observation)
Ext. Cardiac compression	= 15
Cardiac defibrillation	= 15
O2 failure drill	= 10
Cardiac arrest drill	= 5
Mass casualty drill	= 1
Difficult Airway Drill	=20

### **Detailed Curriculum for Postings**

#### **II. Objectives:**

##### **(A) Learn to perform preoperative evaluation**

- Learn to collect and synthesize preoperative data and to develop a rational strategy for the perioperative care of the patient.
- Learn a thorough and systematic approach to preoperative evaluation of patients with systemic diseases. Perform preoperative medical evaluations of patients undergoing many different types of operations, both of inpatients and outpatients but especially elderly patients with complex medical illnesses such as alcoholism, chronic obstructive pulmonary diseases, congestive heart failure, coronary artery disease, hepatic failure, hypertension, myocardial infarction, renal failure, and stroke.

- Learn to prioritize problems and to present cases clearly and systematically to attending consultants.
- Develop working relationships with consultants in other specialties to assist in preoperative evaluation. Learn to get a good consultation.
- Learn to interact with preoperative patients and develop effective counseling techniques for different anesthetic techniques and preoperative procedures.
- Learn to assess and explain risk of procedure and take informed consent.

**(B) Learn anesthetic techniques & skills:**

- Understand operation of different equipment used by anesthetist; develop optimum plans depending on patients' condition.
- Know the special considerations and techniques required to anesthetize patient in location inside and outside of the operating room, for example, the Cardiac
- Catheterization laboratory, Electroconvulsive Therapy, Genitourinary Clinic, Magnetic Resonance Imager, Radiology & Radiotherapy.
- Perform the anesthesia machine check and prepare basic equipment necessary for all anesthetic cases.
- Prepare drug table: select appropriate drugs for a case and develop a good system for arranging the drug and work tables.
- Place standard monitors, for example, electrocardiogram, noninvasive blood pressure device, precordial stethoscope, neuromuscular blockade monitor, pulse oximeter and capnograph.
- Learn proper techniques of preoxygenation.
- Learn how to induce anesthesia, both routine induction and rapid sequence induction, and the pertinent mechanical skills and choice of drugs.
- Perform airway management by knowing various procedures and equipment:

They should know how to use/ do

- Oropharyngeal/ nasopharyngeal airway.
- Direct laryngoscopy using curve and straight blade.
- Laryngeal mask airway (classic LMA, ILMA, Proseal LMA, flexible LMA, Ambu LMA)
- Combitube
- Fiberoptic techniques
- Light wand techniques
- Blind techniques
- Laryngeal Tube Insertion

Failed Intubation or difficult airway algorithms:

- a. All techniques for endotracheal intubation
- b. Additional techniques such as retrograde wire intubation and surgical cricothyroidotomy, both of which will be learned on a mannequin.

Awake Intubation

- A. Topical / Local anesthesia for airway.
- B. Airway nerve blocks, e.g., superior laryngeal nerve and glossopharyngeal nerve block.

Learn anesthesia maintenance: appropriate choice and use of anesthetic drugs and adjuvant drugs such as muscle relaxants.

- a. Assessment of anesthesia depth.
- b. Assessment of volume status.
- c. Replacement of intraoperative fluid losses.
- d. Appropriate use of blood and blood products.

Effect of different types of surgical procedures on anesthetic management, e.g., effects of aortic cross-clamping.

Appropriate use of intraoperative laboratory tests blood gas coagulation tests etc.

Become skilled in catheterizing or cannulating the following vessels for sampling blood, measuring concentrations or pressures, or administering drugs or fluids.

a Veins: all ages and all sizes

b Arteries: radial and other sites.

c Central vessels: internal jugular, subclavain, external jugular, femoral vein and “long arm” routes.

Become skilled in using and interpreting the following routine noninvasive and invasive monitors intraoperatively.

- Electrocardiogram with ST segment analysis
- Noninvasive blood pressure
- Capnograph: value and changes in value and waveform
- Pulse oximetry : values and changes in values
- Neuromuscular blockade monitor
- Invasive arterial pressure : waveform and changes in the waveform
- Central venous pressure : value and waveform
- Pulmonary artery pressure : values and waveforms, Pulmonary capillary wedge (PCW) tracing
  - a. Cardiac output.
  - b. Mixed venous oxygen saturation
    - Evoked potential: Brainstem Auditory, visual and somatosensory evoked potential
    - Transesophageal echocardiography (TEE): basic understanding
    - Temperature monitoring

Become skilled in techniques for regional anesthesia

- a. Brachial plexus blockade: interscalene, supraclavicular, axillary, infraclavicular, techniques with and without nerve stimulator for localization with ultrasound guidance.
- b. Spinal anesthesia (including continuous spinal where appropriate)
- c. Epidural anesthesia: lumbar, caudal and thoracic
- d. Lower extremity blockade: femoral, sciatic, lateral femoral cutaneous nerve, post tibial and popliteal nerves
- e. Upper extremity blockade: ulnar, median, and radial nerves
- f. Bier's block
- g. Cervical plexus block: superficial and deep cervical plexus

Become skilled in discontinuing anesthesia and monitoring emergence from anesthesia

- a. Reversal of neuromuscular blockade
- b. Determination of appropriate time for extubation
- c. Monitoring of airway function during and after emergence

Become familiar with skills in preoperative pain management

- a. Postoperative epidural infusion (opiates. Local anesthesia)
- b. Postoperative
- c. Patient – controlled analgesia (PCA)
- d. Adjunctive nerve blockade

Become skilled in use of techniques for conscious sedation and monitored anesthesia care

- a. Selection of patient for conscious sedation
- b. Selection of drugs for use in conscious sedation
- c. Monitoring techniques helpful in controlling depth of sedation
- d. Recognition of when conscious sedation has become unconscious sedation

Know how to successfully resuscitate, and develop skills of Basic Life Support (BLS) and Advance Cardiac Life Support (ACLS)

Work with other members of the OR team, including surgeons and nurses, to optimally care for surgical patients, especially develop communications skill.

## **ANESTHESIA OUTSIDE OPERATING ROOM**

1. Radiology and interventional neuroradiology: know special anesthetic considerations in these settings:

- a. Dye allergies/ Anaphylaxis
- b. Embolization
- c. Examination for magnetic resonance imaging (MRI)
  - I. Monitoring in CATH Lab
  - II. Equipment options in the MRI suite
  - III. General anesthetic / sedation techniques
  - IV. Radiotherapy
  - V. CT Scan and Radiological procedure

2. Electroconvulsive shock therapy (ECT)

- I. Preoperative
- II. Anesthetic techniques and drug effects on seizure duration
- III. Hemodynamic responses and appropriate treatment

## **III. Evaluation to Determine Goal Achievement**

a. The resident will be evaluated at the end of every 3 months by all attending consultants who worked with them. The attending physicians complete a Departmental Resident Evaluation Form, which is reviewed by the Clinical Competence Committee. Inform them of any problems

identified. The serious problem will be discussed with them immediately after they occur.

b. Residents will complete a log book. After each posting it will be checked and signed by the faculty concerned.

## **Trauma & Resuscitation**

All residents must achieve basic and advanced cardiac life support, advanced trauma life support, and pediatric life support training. They should start with the training of Airway breathing circulation (ABC) training and master the skills repeatedly and then proceed to advanced cardiac life support.

### **I. GOALS OF TRAUMA / TRAUMATISED PATIENT AND DISASTER MANAGEMENT**

- a. Acquire improved ability to evaluate & triage the patient and formulate anesthetic plans, especially in the trauma patient
- b. Acquire ability to administer operative anesthesia safely and rapidly
- c. Acquire ability to identify, prevent and care for postoperative complications.

### **II. Objectives**

A. Manage anesthesia for severely traumatized patients by doing the following as rapidly as possible

- 1. Evaluation
- 2. Placement of intravascular catheters
- 3. Airway intubation
- 4. Choose among anesthetic options, induce and maintain anesthesia safely

B. Perform a thorough preoperative evaluation and documentation

C. Postoperative Management



## **POST ANESTHESIA CARE UNIT (PACU)**

### **I. Goals:**

Understand the importance, purpose and components of the anesthesia record and the report from the anaesthetizing anesthesiologist. Use information about the patient that is received and observed on admission to the PACU and during the stay for the following purposes:

1. To create a care plan
2. To score the patient's condition according to scoring system
3. To assess the patient's recovery and condition for a safe discharge or transfer

Observe, recognize and learn to treat the most commonly occurring problems likely to arise in the Post Anesthesia Care Unit (PACU). Understand the parameters patients must meet for safe discharge from the PACU to the following:

1. Home
2. Inpatient Ward
3. Intensive care Unit

### **II. Detection of Hypoxemia and Oxygen therapy should be learned in this posting. Students should be able to recognize:**

1. Airway integrity and compromise
2. Arrhythmia
3. Hypertension
4. Hypotension
5. Pain prevention and relief
6. Nausea and vomiting
7. Decreased urine output
8. Emergence delirium
9. Delayed emergence from anesthesia

10. Maintenance of body temperature
11. Post obstructive pulmonary edema
12. Hypoxia
13. Hypercarbia

III. Evaluation to Determine Goal Achievement (End of posting- Summative)

## **INTENSIVE CARE UNIT**

### **I. Goal**

Understand the spectrum of critical illnesses requiring admission to ICU recognize the critically ill patient who needs intensive postoperative care from the patient who does not require such are

## **PRINCIPLES OF MANAGING A CRITICALLY ILL MEDICAL PATIENT**

### **Airway**

Recognize, and manage airway obstruction.

Care of Tracheotomy

### **Cardiovascular**

Recognition and management of shock (all forms), Cardiac arrhythmias, cardiogenic pulmonary edema, Acute cardiomyopathies, Hypertensive emergencies and Myocardial infarction.

### **Respiratory**

Recognition and management of acute and chronic respiratory failure, status asthmaticus, smoke inhalation and airway burns, upper airway obstruction, including foreign bodies and infection, near drowning, adult respiratory distress syndrome. Use of Pulmonary function tests including bedside Spirometry.

## **Renal**

Recognition and acute management of fluid and electrolyte disturbances. Students should be able to prescribe fluids in Renal failure and Acid-basis disorders and should be able to prescribe drugs based on principles of drug dosing in renal failure. They should know when to use Dialysis / hemofiltration.

## **Central Nervous System**

Recognition and acute management of Coma, Drug overdose. Know Glasgow coma scale (GCS)

**Metabolic and Endocrine**, emergencies like Diabetic ketoacidosis Hypo adrenal crisis, pheochromocytoma, Thyroid storm, myxedema coma

## **Infectious diseases**

Recognition and acute management of Hospital acquired and opportunistic infections, including acquired immunodeficiency syndrome.

Students should know how to protect against cross infection risks to healthcare workers.

## **Hematological disorders**

Recognition and acute management of defects in hemostasis & hemolytic disorders

Should be able to prescribe component therapy based on the result of coagulation profile in thrombotic disorders

To diagnose Deep Vein thrombosis and know principle of Anticoagulation and fibrinolytic therapy. Know the indication of plasmapheresis for acute disorders, including neurologic and hematologic disease.

## **Gastrointestinal disorders**

- To recognize and manage gastrointestinal bleeding (prescribe prophylaxis against stress ulcer bleeding)
- Hepatic failure

To do the following (ideally) at the end of the posting:

- A. 1. Radial arterial catheters and other sites as necessary
2. Central venous catheters
- a. Subclavian route
  - b. Internal or external jugular route

Pulmonary artery (PA) catheters (observe only)

B. Understand and interpret the following PA catheters variables, initiate appropriate therapy in response to change in them:

1. PA waveform
  - a. Normal
  - b. Pathologic
  - c. PA wedge
2. Mixed venous oxygen saturation
3. Right ventricular ejection fraction
4. Thermodilution Cardiac output
  - a. Technological basis for cardiac output measurement
  - b. Factors producing errors in cardiac output measurements

C. Manage cardiovascular instability

1. Know different fluid therapy option and when to use them
2. Know the different inotropic drugs and when to use them
3. Know how to use invasive monitoring devices to guide therapeutic use of fluids and inotropic drugs

D. Manage respiratory failure and postoperative pulmonary complications

1. Know how to use arterial blood gas and ventilatory variables to evaluate postoperative patients with respiratory failure.

2. Understand the operation of mechanical ventilators including different ventilatory modalities and how each is best used for management of respiratory failure and noninvasive including modes complications and mode of weaning.
3. Principles and applications of oxygen therapy.

E. Pathophysiology and clinical manifestation of septicemia and its treatment

1. Recognize sepsis in the postoperative patient including all the typical hemodynamic findings.
2. Know the appropriate tests to diagnose sepsis.
3. Use various monitoring devices to assist in managing sepsis; specifically understand the optimization of oxygen delivery to tissues in the septic patient and the appropriate management of fluids and vasopressors to accomplish these goals.
4. Know the different classes of antibiotics and antifungal agents and their use in treating sepsis.

F. Deliver appropriate nutritional support

1. Learn about the use of enteral nutrition in the patient who cannot tolerate input per oral.
2. Learn about the use of parental nutrition in the critically ill surgical / medicine patient.
3. Interact with nutrition support services in planning nutrition for the critically ill patient.

G. Provide effective pain management and sedation postoperatively

1. Learn the appropriate use of pain management modalities in the ICU including:
  - a. Patient controlled analgesia (PCA)
  - b. Epidural and subarachnoid narcotics

2. Learn use of sedative / hypnotic drugs in the ICU for:
  - a. For patient on ventilator.

**Monitoring and Biostatistics:**

Should be able to use prognostic indices such as acute physiology and chronic health evaluation (APACHE), therapeutic intervention scoring system (TISS) and know the concept of audit.

**Ethical and legal aspects of critical care:**

Know the legal importance of informed consents, Do not resuscitate orders; (DNAR) withdrawing of therapy: Brain dead: consent for organ retrieval explain / prepare.

**Psychosocial issues:**

Student should be able to communicate with distressed relatives

Student should be able to give the correct picture of a critical patient, but with compassion in view of critical nature of the illness

Student should be able to Transport a critically ill patient/ resuscitate patient with acute traumatic injury.

**CARDIOVASCULAR ANESTHESIA**

**Goals:**

- Understand cardiac physiology, develop knowledge of cardiovascular anesthesia (anesthesia for the patient with cardiovascular disease), Choose appropriate anesthetic techniques for patients with different types of cardiovascular disease and skills for lifelong continuing education.
- Develop technical and monitoring skills necessary for cardiovascular anesthesia,
- Administer anesthesia for a wide variety of cardiothoracic cases and develop interest in further learning.

- Perform a thorough preoperative assessment of the patient undergoing cardiovascular surgery.
- Know intraoperative anesthetic management for the patient undergoing cardiopulmonary bypass. Know how cardiopulmonary bypass is instituted and discontinued. Understand cardiopulmonary bypass and discuss the mechanical aspects of it as follows:
  1. Different types of pumps – pulsatile and nonpulsatile
  2. Physiology of hypothermia, cardiac and cerebral protection
  3. Effects of bypass on volumes of distribution and clearness of anesthetic drugs and anesthetic maintenance, including amnesia
- Know how and why to use inotropic support, vasodilators and antiarrhythmic drugs that may be necessary before but are especially necessary after cardiopulmonary bypass.
- Pathophysiology of HT, Drug therapy, anesthetic implication and peri operative management of Hypertensive patient coming for surgery
- IHD – MI Pathophysiology, drug therapy, anesthetic implication and management in patient coming for surgery
- Develop understanding of the major issue involved in the preoperative care of the child with congenital heart disease.
- Pacemaker in anesthesia
- Insert vascular catheters or cannulas for adult and pediatric patients. Observe / know about a Transesophageal echocardiography (TEE) probe and interpret TEE image.
- Manage care during cardiac surgery as follows:
  - a. Blood replacement
  - b. Monitoring the effect of heparin and its reversal
  - c. Postcardio pulmonary bypass coagulopathy

Rationale for various therapies such as aprotinin designed to prevent coagulopathy.

- Know following procedures and anesthetic implications:
  - i. Aortic repairs
  - ii. Congenital repairs – pediatric
  - ii. Coronary artery bypass grafting and valves – adults
  - iv. Thoracic surgery and vascular surgery
  
- Work as a team member with fellow anesthesiologists, surgeons, perfusionists and nurses
  
- Evaluation to Determine Goal Achievement

## **Neuroanesthesia**

### **I. Goals**

- a) Administer anesthesia safely to patients with neurologic disease who are undergoing neurologic or non-neurologic surgery, diagnostic procedures requiring anesthesia or nonsurgical interventions requiring anesthesia.
- b) Understand the basic concepts of central nervous system (CNS) physiology as they relate to neuroanesthesia specifically mastery of autoregulation of blood flow, blood flow response to CO<sub>2</sub>, blood flow response to cerebral oxygen (CMRO<sub>2</sub>) and glucose (CMRglu) metabolic rates and cerebrospinal fluid physiology.
- c) Know the effect (s) of commonly used anesthetic agents and adjuvant agents, for example antihypertensive on cerebral physiology.
- d) Understand the anesthetic implication of the most common neurosurgical procedures likely to occur during neurosurgery that will affect anesthetic management.
- e) Understand the basic concepts behind electrophysiologic monitoring of the brain and spinal cord.



- f) Understand how concurrent medical illnesses affect anesthesia during neurologic surgery.
- g) Cerebral Neuroprotection strategies for Cerebral Resuscitation

## **II. Objectives**

Review the medical history and physical examination of patients; assess their major neurosurgical problem. Evaluate the patients' Glasgow Coma scale score as well as other medical problems that may affect anesthetic care; and know what information about nervous system function and pathology are important to be anesthesiologist

- Recognize both the adult and pediatric patient with increased intracranial pressure (ICP)
- Methods of Neuroprotection techniques
- Knows the general principle of neuro anesthesia and spinal surgery including stereotactic surgeries and neuro surgical procedures
- Airway management of patient with unstable cervical spine and Monitoring during neuro anesthesia
- Detect and treat air embolism during neurosurgery:
  - a. Know use of monitors to detect air embolism and what monitoring patterns are associated with air embolism.
  - b. Recognize the relative risks of different procedures and positions for air embolism
- Know general principles of positioning the patient for neurologic surgery and the advantages and disadvantages of each position

- Understand the basic indications and techniques, and if possible perform the following special procedures used during neuroanesthesia:
  - a. Induced hypotension
  - b. Moderate Hypothermia
- Know the management of Head Trauma, and its anesthesia management.

## **PEDIATRIC ANESTHESIA**

- General principle, monitoring, fluid therapy, temperature control, pain relief in children including neonates
- Emergency and elective surgery in neonates and infants
- Special equipment used in pediatric anaesthesia
- Ventilation strategies
- Skill development related to procedures performed in neonates, infants and older children

## **PAIN MANAGEMENT**

### **I. Goals**

- Should understand pathophysiology of acute and chronic pain and differentiate between the two types of pain
- Know the multidisciplinary approach to chronic pain management and cancer pain management.
- Manage acute (Postoperative pain, Labour pain) pain syndromes proficiently.

### **II. Objectives:**

Know the cancer pain guidelines:

Treatment based on WHO treatment ladder

- a. Drugs: Analgesic, Opiates, Sedatives and stimulants
- b. Nerve block
- c. Neurolytic Block
- d. Palliative Care

### **Postoperative**

- Transport safely and manage immediate postoperative care in the following areas:
- Ventilation, Oxygen administration, temperature control, cardiovascular monitoring, fluid balance and pain relief.
- Recognize postoperative crup and treat it.
- Understand post anesthesia apnea factors associated with it, the appropriate duration of monitoring and treatment.

### **D. Special problems**

1. Manage the following in pediatric patients undergoing anesthesia and surgery:
  - a) Blood replacement
  - b) Drug administration and anesthetic requirement (minimum anesthetic concentration)
  - c) Fluid and electrolyte balance, glucose requirement and renal maturation
  - d) Hypocalcaemia
  - e) Hypoglycemia
  - f) Metabolism
  - g) Temperature control
  - h) Vitamin K administration

## **OBSTETRIC**

### **I. Goals:**

- Physiology of normal pregnancy alters the response to anesthesia.

- Pertinent aspects of fetal and placental physiology.
- Implications of Pregnancy on obstetric and non obstetric surgery and emergency and elective situations
- Principles of labor analgesia

## **II. Objectives:**

- Principle and techniques for anesthesia for cesarean section
- Know the risk factor, prevention and treatment of maternal aspiration
- Evaluate difficult airways and manage failed intubation and aorticaval compression
- Recognize high-risk factors in obstetric patients and how they affect anesthetic management for example
  1. Morbid obesity
  2. Preeclampsia and Eclampsia
  3. Concurrent medical disease
  4. Neurologic disease and pregnancy
- Understand anesthetic choices for the pregnant patient with heart disease.
- Identify and manage common medical emergencies in the post-parturient.

## **REGIONAL ANESTHESIA**

### **I. Goals:**

- To teach anesthesia residents the art and sciences of regional anesthesia.
- Anatomy, pathophysiology and appropriate management of complications and side effects of regional anesthesia techniques

- To understand general principles of local anesthetic pharmacology, including the pharmacodynamics and pharmacokinetics of various local and adjuvant anesthesia.
- Understand the indications and the contraindications to regional anesthetic techniques.

## **II. Objectives**

Learn the anatomy of the sympathetic nervous system, specifically the anatomy of the epidural and subarachnoid spaces and the location of sympathetic and parasympathetic ganglia.

### **OBJECTIVES OF DENTAL ANESTHESIA**

Understand the principles of conscious sedation

Principles of anesthesia in a Dental Chair

Local Blocks for Dental Surgery

### **OBJECTIVES OF TRANSPLANT ANESTHESIA**

Know the basic principles of anesthetizing an immuno compromised patient,

Principles of anesthetizing patient with end stage, renal / liver disease.

### **OBJECTIVES FOR OPHTHALMOLOGY ANESTHESIA**

⇒ Principle of intra and extraocular surgery

⇒ Monitored Anesthesia Care (MAC) and sedation technique

⇒ Ophthalmic blocks

### **OBJECTIVES FOR ENT POSTING**

- Principle anesthesia for Ear, Nose and Throat surgery
- Anesthesia for MLS

- Anesthesia for laser surgery of airway
- Vascular malformations/ tumors of nose and oral cavity
- To give anesthesia for major / cancer surgery of upper airway including laryngectomy, maxillectomy

## **SPECIAL ANESTHESIA**

### Liver and Kidney Anesthesia

- Basic Anatomy, physiology, pathophysiology
- Principles, management and anesthetic consideration in a patient with hepatobiliary disease, jaundice, portal hypertension, cirrhosis and Kidney diseases
- Anemia for organ transplantation – liver and kidney

### Endocrine anesthesia

- Knowledge of various endocrine disorders and their anesthetic management related to surgery of that endocrine disorder or with other surgical procedures – Thyroid, Adrenal, Thymus, Pancreas, Pituitary

### GIT and Anesthesia

- Principle of GI surgery, laproscopic, minimal access, bariatric and robotic surgeries

### Miscellaneous

- Anemia
- Coagulopathies and bleeding disorders
- Neuropathies
- Geriatric Anaesthesia

## **THESIS PROTOCOL & THESIS**

The candidates are required to submit a thesis at the end of three 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

The proposed study must be approved by the institutional ethics committee and the protocol of thesis should have been approved by NBE.

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:

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.

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.

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

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



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:

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.

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

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.

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.

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.

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.

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**

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

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**

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

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.

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

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

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](http://www.natboard.edu.in)

Thesis should be bound and the front cover page should be printed in the standard format. A bound thesis should be accompanied with:

- A Synopsis of thesis.
- Form for submission of thesis, duly completed
- NBE copy of challan (in original) towards payment of fee as may be applicable.
- Soft copy of thesis in a CD duly labeled.
- Copy of letter of registration with NBE.

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.

## ***The detailed guidelines and forms for submission of Thesis***

***Protocol & Thesis are available at***

***[www.natboard.edu.in.thesis.php](http://www.natboard.edu.in.thesis.php)***

## **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 .

Personal profile of the candidate

Educational qualification/Professional data

Record of case histories

Procedures learnt

Record of case Demonstration/Presentations

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.

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

## 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.

<b>DNB COURSE</b>	<b>NO. OF ACADEMIC LEAVE</b>
DNB 3 years Course (Broad & Super Specialty)	14 Days
DNB 2 years Course (Post Diploma)	10 Days
DNB Direct 6 years Course	28 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 extraordinary 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

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

### Theory Examination

The theory examination comprises of **Three/ Four** papers, maximum marks 100 each.

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.

Maximum time permitted is 3 hours.

Candidate must score at least 50% in the aggregate of **Three/ Four** papers to qualify the theory examination.

Candidates who have qualified the theory examination are permitted to take up the practical examination.

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

**Paper I:** Basic Sciences as applied to Anesthesiology, including ethics, statistics, Quality Assurance and Medico legal Aspects

**Paper II:** Anesthesia in relation Associated Systemic

**Paper III:** Anesthesia in relation to subspecialties such as cardiac, neuro, obstetrics and Pediatrics etc

**Paper IV:** Intensive care medicine, Pain medicine and recent advances in Anesthesiology

**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 TEXT BOOKS AND JOURNALS

- Miller RD, ed. Anesthesia,
- Wylie Churchill Davidson, 7th edn.
- Stoelting RK, Miller RD, eds. Basics of Anesthesia & co-existing diseases & Pharmacology
- JA Kaplan: Cardiac Anesthesia
- Lee's Synopsis of Anesthesia
- ICU Book, Paul Marino
- ECG by Shamroth/Goldman
- Physics for Anesthesia by Sir Robert Macintosh
- Physics applied to Anesthesia by Hill
- Pediatric Anesthesia by Gregory
- Medicine for Anesthetists by Vickers

### Reference

The Management of Pain, Bonica  
Hatch and Sumner's Textbook of Pediatric Anesthesia  
Textbook of Obstetric Anesthesia, Chestnut  
Neuro Anesthesia, Cottrill

### List of Journals

Indian Journal of Anesthesia  
Journal of Anesthesiology and Clinical pharmacology  
Anesthesia  
British Journal of Anesthesia  
Anesthesia and Analgesia  
Anesthesiology  
Anesthesia and Intensive Care  
Canadian Anesthesia Society Journal  
Acta Anesthesia Scandanavia  
Regional Anesthesia and Pain Medicine

## **Year Books**

Anesthesia Clinic of North America  
International Anesthesiology Clinics  
Year book of Anesthesia  
Recent Advances in Anesthesia  
Anesthesia Review

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