Curriculum

DrNB Super Specialty

Cardio Vascular & Thoracic Surgery

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I. AIM

The aim of teaching postgraduate students in Cardiovascular and Thoracic surgery is to prepare them to have adequate knowledge in the subject, covering both theoretical and practical knowledge, in accordance with the Institutional goals.

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

II. PROGRAMME GOALS AND OBJECTIVES

1. **Programme Goal:** The goal of DNB course is to produce a competent and efficient Cardiovascular and Thoracic surgeon who:
   a. Recognizes the health needs of patients and carries out professional obligations in keeping with principles of National Health Policy and professional ethics
   b. Has acquired the competencies pertaining to Cardiovascular and Thoracic surgery that are required to be practiced in the community and at all levels of health care system
   c. Has acquired skills in effectively communicating with the patients, family and the community.
   d. Is aware of the contemporary advances and developments in medical sciences.
   e. Acquires a spirit of scientific enquiry and is oriented to principles of research methodology.
   f. Has acquired skills in educating medical and paramedical professionals

2. **Programme Objectives:** Curriculum objective has been to impart essential clinical knowledge so that he/she becomes capable of working up and treating a Cardiovascular and Thoracic surgical problem in a logical way inculcating preventive and socioeconomic aspects also in care.

   The objectives of postgraduate degree training programme - in terms of knowledge and skills – are to enable a candidate to
   a. Recognize the key importance of medical problems in the context of the health priority of the country
   b. Practice the specialty of Cardiovascular and Thoracic surgery in keeping with the principles of professional ethics
   c. Identify social, economic, environmental, biological and emotional determinants of Cardiovascular and Thoracic Surgery and know the

therapeutic, rehabilitative, preventive and promotion measures to provide holistic care to all patients

d. Take detailed history, perform full physical examination and make a clinical diagnosis; Perform and interpret relevant investigations (Imaging and Laboratory); Perform and interpret important diagnostic procedures;
e. Diagnose illnesses in patients based on the analysis of history, physical examination and investigative work up.
f. Plan and deliver comprehensive treatment for illness to his patients using principles of rational drug therapy; Plan and advise measures for the prevention of diseases.
g. Plan rehabilitation of patients suffering from chronic illness, and those with special needs; manage emergencies efficiently.
h. Demonstrate skills in documentation of case details, and of morbidity and mortality data relevant to the assigned situation
i. Demonstrate empathy and humane approach towards patients and their families and respect their sensibilities.
j. Demonstrate communication skills of a high order in explaining management and prognosis, providing counselling and giving health education messages to patients, families and communities.
k. Develop skills as a self-directed learner, recognize continuing educational needs; use appropriate learning resources, and critically analyse relevant published literature in order to practice evidence-based medicine;
l. Demonstrate competence in basic concepts of research methodology and epidemiology; Facilitate learning of medical/nursing students, practicing surgeons, paramedical health workers and other providers as a teacher-trainer
m. Play the assigned role in the implementation of national health programs, effectively and responsibly.
n. Organize and supervise the desired managerial and leadership skills;
o. Function as a productive member of a team engaged in health care, research and education.

Knowledge:

- At the end of the course, upon successful completion of training and passing the examination the student is expected to
- Acquire comprehensive knowledge of the basics of Cardiovascular and Thoracic surgery including all allied specialities related to Cardiovascular and Thoracic

surgery be it anatomy, pathology, microbiology, Preventive aspect, epidemiology, etc.

- Acquire knowledge in interpretation of common Cardiovascular and Thoracic imaging investigations such as CT scanning, PET scanning, MRI scanning, MR and Digital subtraction angiography, MR spectroscopy and Single Photon Emission Computerized Tomography etc.
- Possess a complete knowledge of all the commonly used Cardiovascular and Thoracic surgery procedure diagnostic tests like Electroencephalography, Evoked Potentials, etc.
- Possess knowledge of the recent advances in the subject of Cardiovascular and Thoracic surgery and all its allied specialities and working knowledge of the sophisticated and routine equipment's.
- Possess basic knowledge in genetics and molecular biology related to Cardiovascular and Thoracic surgery
- Possess knowledge of principles of research work in the field of cardiology and Cardiovascular and Thoracic surgery in both the clinical and experimental field with the ability to analyse data.
- Acquire knowledge in the interpretation of special investigations such as Video EEG, autonomic function tests, Transcranial Doppler tests, Magnetic Encephalogram etc.
- Mandatorily enrol and undergo training in at least one Cadaveric workshop every year
- Acquire the basics of knowledge and skills in Online Consultations
- Be aware in basics of Medico legal aspects of practicing Cardiovascular and Thoracic surgery in India
- Periodic Basic sciences exam in the first year with the question papers and answer sheets being evaluated centrally

Skills:

- Diagnose and manage majority of conditions in the specialty of Cardiovascular and Thoracic surgery on the basis of clinical assessment, and appropriate investigations.
- Possess complete clinical Diagnostic Skills for the recognition of common Nervous system diseases.
- Acquire skills in the interpretation of special investigations such as DSA, Video EEG monitoring, EEG – Telemetry, autonomic function tests, Transcranial Doppler tests, CT scanning, PET scanning, MRI scanning, MR and Digital subtraction

angiography, MR spectroscopy and Single Photon Emission Computerized Tomography etc.

- Acquire skills in invasive procedures such as Intracostal tube drainage, tracheostomy, pericardial window, arterial thromboembolectomy, etc. assisting in digital subtraction angiography and intra-arterial thrombolysis; and FNAC from lesions and their interpretation of relevant histopathology etc.
- Able to apply sound clinical judgment and rational cost effective investigations for the diagnosis and management of Cardiovascular and Thoracic Surgery Cases in the OPD, WARDs, Emergency Room and Intensive Care Unit.
- Be able to teach undergraduate MBBS and Post Graduate Students in the subject of Cardiovascular and Thoracic surgery.
- Be able to perform Clinical and Investigative studies and to present in Seminars, meetings and conference etc.
- Have the ability to organize specific teaching and training programmes for paramedical staff, associated professionals and patient education programmes.
- Should be able to develop good communication skills and give consultations to all other departments of the hospital.
- Demonstrate skills in documentation of individual case details as well as morbidity and mortality data relevant to the assigned situation.
- Demonstrate empathy and humane approach towards patients and their families and exhibit interpersonal behaviour in accordance with the societal norms and expectation.
- Develop skills as self-directed learner recognizes continuing educational needs: select and use appropriate learning resources.

III. TEACHING AND TRAINING ACTIVITIES

1. The fundamental components of the teaching program should include:
2. Case presentations & discussion- once a week.
3. Seminar- Once a week.
4. Journal club activities including journal club and journal scan- Once every fortnight.
5. Grand round presentation (by rotation departments and subspecialties) Haematopathology or radiology Conferences-once a week.
6. Faculty lecture teaching- once a month.
7. Clinical Audit/Mortality meet-Once a month.
8. One poster and one oral presentation during their training period in a recognized National/ International conference is mandatory.

Daily ward rounds will be an essential component of training. This should include a review of case history, clinical examination, investigations, and management plan. There should be bedside teaching sessions on all inpatients. The documentation of all patients should be appropriately managed by the residents and reviewed by the consultants.

The training program would focus on knowledge, skills, attitudes, behaviour, and other essential education components. It should be divided into theoretical, clinical, practical, rehabilitative care, research and teaching methodology.

a. **Theoretical:** Basic knowledge on disease pathogenesis, its diagnosis, staging and prognostication, evolution of management and supportive care should be acquired from standard textbooks. Further theoretical knowledge should be acquired through discussions, journal clubs, symposia, and seminars. The students are exposed to recent advances through discussions in journal clubs.

b. **Symposia:** Trainees would be required to present a minimum of 20 topics based on the curriculum during three years of training. A free discussion would be encouraged in these symposia. The topics of the symposia would be given to the trainees with the dates for the presentation.

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

d. **Bedside:** The trainee would work up cases and learn the management after discussion with the faculty of the department.

e. **Journal Club Activities:** This would be a fortnightly academic exercise and will include journal club and journal scan. 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. The contributions made by the article in furtherance of the scientific knowledge and limitations, if any, has to be highlighted.

f. **Research:** The student would carry out the research project and write a thesis dissertation following NBE guidelines. Trainees should also participate in the ongoing research projects in the departments to learn their planning, methodology and execution to learn various aspects of research.

g. **P.G. Training Programme:** The post graduate programme broadly should include lecture/demonstration on applied basic science, bed side clinics, case presentations. Faculty lectures, symposia/ seminar journal clubs, biopsy, radiology discussions and graded clinical responsibility.

h. **Evaluation:** It is essential that the trainee maintains a meticulous account of the work done by him. The record book will in addition remind the trainee of what he should observe, learn and perform in a programmed and phased manner during the course of training. It is hoped that this record will stimulate the trainee towards greater effort in areas where he is below par and also record his progress. It forms the basis for assessment and evaluation of the trainee's progress.

Some of the possible criteria on the basis of which a trainee could be evaluated are as below:

- Soundness of knowledge
- Application & Judgement
- Keenness to learn
- Punctuality and Promptness
- Willingness to work
- Initiative
- Reliability
- Clinical skill
- Behavior with patients
- Attitudes towards patient's relatives, colleagues, seniors and other staff

i. **Ability to express**

Depending on the qualities and the level of attainments a candidate could be considered for appraisal, on the basis, for example, of the following 5 letter grading system.

A	Excellent	Above 75%
B	Good	60% - 65%
C	Satisfactory	50% - 60%
D	Poor	30% - 50%
E	Bad	Below 30%

IV. SYLLABUS

1. Course of Study:

a. A wide coverage of Basic Sciences like Anatomy, Physiology, Biochemistry, Pathology, Microbiology, Pharmacology, and Immunology pertaining to the cardiovascular and respiratory systems and the chest and its contents;

b. A thorough knowledge, theoretical as well as practical of the various investigative procedures – invasive and non-invasive — including biochemical, radiological and ultra-sonographic investigations, radioisotope scanning and dynamic function studies such as pulmonary function tests, cardiac catheterization and oesophageal manometry.

c. A detailed theoretical knowledge as well as practical experience – both clinical and surgical exposure in paediatric and adult cardiac surgery, surgery on arch and great vessels and peripheral arteries and general thoracic surgery including surgery of the chest wall, diaphragm, oesophagus, mediastinum, trachea, lungs and pleura.

   Besides the conventional cardiac procedures, a knowledge of the following topics is also essential: Cardiac and Lung transplantation, management of LV failure, arrhythmia surgery, Ventricular Assist devices, Exrracorporeal Membrane oxygenation, Artificial heart, minimally invasive procedures, Video assisted Thoracoscopic cardiac procedures and catheter based procedures as TAVI etc. Knowledge about the various types of valves. Details of the cardiopulmonary perfusion. Candidates should also be well versed with the following Thoracic surgical procedures besides the conventional as Video assisted thoracoscopic procedures (VATS), bronchoscopy and Virtual bronchoscopy, EBUS, Transbronchial biopsy, Mediastinoscopy should also be the part of the curriculum.

   Candidates should also have knowledge and practical exposure to the following Vascular surgical procedures as surgery for the peripheral arterial disease, surgery on diseased aorta and various endovascular procedures, knowledge of Debranching and Hybrid procedures. This should also include diseases of the venous system.

d. A broad knowledge of Cardiology, Respiratory Medicine and other medical problems relating to cardiovascular and-thoracic surgery as well as Computer Application.

2. Quantum of Training:

a. The quantum of training shall be sufficient so that at the end of the training period, a candidate will be able to:
   - Identify the problems in a given patient, and arrive at a provisional diagnosis based on the history and the clinical examination.
   - Interpret the results of investigations.
   - Recognize what special procedures operations, pertaining to cardiovascular-thoracic surgery could be offered to the patient and he/she can perform,
   - Perform the necessary special procedures / operations.
   - Take care of any Emergency / complication following the special procedure / operation and,
   - Refer to an appropriate centre for the diagnostic tests and treatment, which could not be carried out by him / her.

b. In order to achieve the above objectives, a candidate shall be apportioned graded responsibility in patient-care leading to at least six months' period of de facto independence under de jure supervision, similar to Chief Residency in United States of America.

c. A candidate at the end of the training period must have acquired:
   - Full command over broncho-oesophagoscopy, mediastinoscopy, biopsy technique, bronchography, non-invasive vascular studies, angiography and drainage procedures.
   - Posting in the Cath-Lab and to get acquainted to the procedures.
   - Capability in conducting cardiopulmonary bypass;
   - Competence in the intensive care management of patients with cardiae, vascular and thoracic surgical problems, and
   - Confidence in the operating room by performing under supervision as well as independently, a minimum number of operations as stipulated hereunder.

d. Nature of Operations: *Number of operations performed

	Assisted by faculty	Independently (under de jure Supervision)
Bronchoscopies	20	50
Oher endoscopies	10	5
Lung resections.	7	3
General thoracic operations	3	2

(other than lung resections)		
Operations on oesophagus/Diaphragm	3	-
Closed heart operations	5	3
Open heart operations	12	5
Vascular operations	5	2
Intercostal drainages	5	15
Minimum Total	70	80

e. (*The number of operations under each category is subject to revision from time to time; and, if there are compelling reasons, the Board of Examiners can condone deviations from these stipulated minimum numbers).

- A candidate shall be required to spend four weeks in the Department of Cardiology which includes a minimum of 2 weeks of posting in the Cath-lab, two weeks in the Department of chest diseases and six weeks as an Exchange Visitor at one or two other reputed centers within the country.
- A duly certified report regarding the satisfactory completion of this part of the training program which includes the intramural and extramural postings of the candidates shall be submitted to the National Board of Examinations for its approval. Provided that if there are compelling reasons then the Board can condone deviations from these stipulations and the candidate may then be permitted to take the final examination.
- A candidate shall be required to either prepare a dissertation and / or to publish or personally present at conferences of National level or higher, at least two papers.
- Candidates who are writing a Dissertation it is a must to submit the protocol well in time to NBE after the ethical clearance from their Institute Ethical Committee for approval to NBE. Once the approval from the NBE Board is received, the candidate can start their study and submit the final dissertation well in advance 3 months prior to the final examination for clearance and approval to appear for the exam.
- Note: The studies for the dissertation should be prospective studies. Only under circumstances as during the Covid-19 pandemic a retrospective study may be permitted.
- Besides, he/she must have attended at least a Zonal/ National/ International conferences and one workshop/CME programme during his/her training period. These presentations / participations should also be mentioned in the Log book.

- Three copies of the dissertation or three copies each of the two papers, duly certified, shall be submitted by the candidate to the National Board of Examinations 3 months prior to commencement of his/her Final Examination (Part-II), for onward transmission to the Examiner for their evaluation.
- Only for candidates, whole dissertation or the fill texts of the two published / personally presented papers have been approved by the appointed examiners, will be permitted to take the Final Examinations (Part 1 and Part II)
- Log Book: A candidate shall maintain a Log Book of the special procedures / operations assisted and performed by him/her during the training period and its authenticity shall be certified by the concerned postgraduate teacher Head of the Department / Senior Consultant.
- The log book should also take into account the presentations and attendance in the Department seminars / lectures. Presentations of cases and with short discussion held. Presentations made in the Journal club.
- The log book maintained during the training period by the candidate shall be made available to the Board of Examiners for their perusal at the time of his/her appearing at the Final Examinations (Part II).

3. Operating Work Load:

a. The minimum number of major operations performed per year by the Department admitting up to 2 Postgraduate students in a year shall be as follows.

Cardiac operations:	200 (Including at least 180 Open-heart Procedures and 20 Closed heart operations)
General thoracic operations:	30
Vascular operations:	20

The above cited number shall proportionately be more depending on whether the department admits 3 or 4 students per year.

V. LOG BOOK

RECORD OF TRAININGS

1. Name of Trainee

2. Name of Hospital/institution

3. Place

4. Specialty

5. Name of Supervising Specialist

6. Name of Medical /Director /Superintendent

Date: _____ Signature of Supervising Specialist

Name (Block Letters):

Passport Photograph

Permanent Address:

Date of Birth:

Fathers Name & Address:

Education:

Speciment Signature

MBBS

Name of College	Date of joining	Date of passing	No. of attempts	Prizes

House job

Subject	Date of joining	Date of leaving	Period

Primary Diplomate od N.B.

Subject	Date of Passing	No. of Attempts

Final Diplomate of N.B.

Subject	Date of joining

Checklist / Performance of the candidate:

CHECKLIST - I

Model Check List for Evaluation of Teaching Skill during the presentation at the Seminar.

S.No.		Poor 0	Below Average 1	Average 2	Good 3	Very Good 4
1.	Communication of the purpose of the talk					
2.	Evokes audience interest in the subject					
3.	The introduction					
4.	The sequence of ideas					
5.	The use of practical examples and /or illustrations					
6.	Speaking style (enjoyable, monotonous, etc., specify)					
7.	Summary of the main points at the end					
8.	Ask questions					
9.	Answer questions asked by the audience					
10.	Rapport of speaker with his audience					
11.	Effectiveness of the talk					
12.	Uses of AV aids appropriately					

CHECKLIST – II

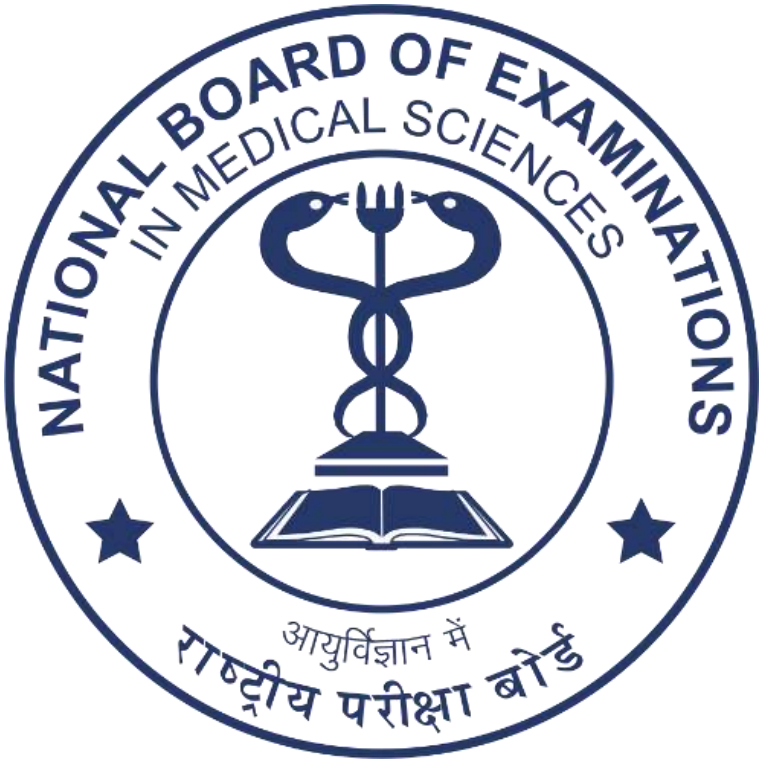
Model check list for Dissertation / Project Work Presentations

S.No.	Points to be considered	Poor 0	Below Average 1	Average 2	Good 3	Very Good 4
1.	Interest shown in selecting topic					
2.	Appropriate review					
3.	Discussion with guide and other faculty					
4.	Quality of protocol					
5.	Preparation of proforma					
	Total score					

Overall Assessment of the student by the clinical/operative and ICU work:

S.No.	Points to be considered	Poor 0	Below Average 1	Average 2	Good 3	Very Good 4	Excellent 5
1.	Attendance						
2.	Punctuality						
3.	Interaction with colleagues and support staff						
4.	Maintenance of case records						
5.	Topic Presentation						
6.	Time sense						
7.	Knowledge						
8.	Rapport with patient						
9.	Overall quality of work						
	Total Score						

The Log book should be duly signed by the HOD and be submitted at the time of the practical examinations and be endorsed by the examiners.



आयुर्विज्ञान में राष्ट्रीय परीक्षा बोर्ड

स्वास्थ्य एवं परिवार कल्याण मंत्रालय, भारत सरकार

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