

Guidelines
for
Competency Based Training Programme
in
DNB- OPHTHALMOLOGY



NATIONAL BOARD OF EXAMINATIONS

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PROGRAMME GOAL

- The purpose of this program is to standardize Ophthalmology teaching at Post Graduate level so that it will achieve uniformity in postgraduate teaching, and create competent ophthalmic surgeons with appropriate expertise.
- Adequate current knowledge of the subject with sufficient diagnostic and surgical skills.
- Good knowledge of blindness control program to help eradicate blindness from our country.

PROGRAMME OBJECTIVES

A candidate upon successfully qualifying in the DNB (Ophthalmology) examination shall be able to:

- Offer to the community the current quality of 'standard of care' in ophthalmic diagnosis as well as therapeutics (medical or surgical) in most of the common and easily managed situations at the all levels of health services.
- Periodically self assess his or her performance, keep abreast with ongoing advances in the field, and apply the same in his/her practice.
- Apply research and epidemiological methods during his/her practice. The candidate shall be able to present or publish work done by him/her.
- Contribute as an individual / group towards the fulfillment of national objectives with regard to prevention of blindness.
- Effectively communicate with patients and relatives so as to educate them sufficiently and give them the full benefit of informed consent for treatment, and ensure compliance.
- Acquire the basic skills of teaching medical and paramedical professionals.

OVERALL OBJECTIVES:

The clinical postgraduate training program is intended at developing in the student a blend of qualities of a clinical specialist, a teacher, a researcher and a surgeon. A postgraduate should possess the following qualities, knowledge and skills:

Basic Sciences: Resident should possess basic knowledge of the structure, function and development of the human body as related to ophthalmology, and of the factors which may disturb these, the mechanisms of such disturbances, and the disorders of structure and function which may result.

Clinical Knowledge: Resident should be able to practice and handle most day to day ophthalmic problems independently, should recognize the limitations of his clinical knowledge and know when to seek further help.

Environment and Health: Resident should understand the effect of environment on health and be familiar with the epidemiology and common diseases in the field of ophthalmology. He/she should be able to integrate the preventive and promotive methods with the curative and rehabilitative measures in the treatment of disease.

Community Ophthalmology: Resident should be able to integrate the preventive and promotive methods with the curative and rehabilitative measures in the treatment of ophthalmic disease. He should be familiar with common eye problems occurring in communities and be able to deal with them effectively. The student should be able to organize and conduct survey in rural, urban and industrial communities and special group population.

Recent Advances: Resident should be familiar with the current developments in Ophthalmic Sciences.

Teaching: Resident should be able to plan educational programs in ophthalmology in association with senior colleagues, and be familiar with modern methods of teaching and evaluation.

Research: Resident should be able to identify a problem for research of a clinical experimental nature, clearly state the objective, plan a rational approach to its solution, execute it, and critically evaluate the data in the light of existing knowledge.

Scientific Method: Resident should know that conclusions should be reached by logical deduction; he/she should be able to assess evidence both as to its reliability and its relevance.

Medico-legal aspects: Resident should have basic knowledge of medico legal aspects of medicine.

ELIGIBILITY CRITERIA FOR ADMISSIONS TO THE PROGRAMME

(A) DNB Ophthalmology 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 **Ophthalmology** seats purely on merit cum choice basis.
2. Admission to 3 years post MBBS DNB **Ophthalmology** 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) Ophthalmology Course:

1. Any medical graduate with MBBS qualification who has successfully completed **DOMS** (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) **Ophthalmology** seats purely on merit cum choice basis.
2. Admission to 2 years post diploma DNB **Ophthalmology** 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:

1. Case presentations & discussion- once a week
2. Seminar – Once a week
3. Journal club- Once a week
4. Grand round presentation (by rotation departments and subspecialties)- once a week
5. Faculty lecture teaching- once a month
6. Clinical Audit-Once a Month
7. 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

I. The Basic Sciences:

- Orbital and ocular anatomy
 1. Gross anatomy
 2. Histology
 3. Embryology
- Ocular Physiology
- Ocular Pathology
- Ocular Biochemistry-Biochemistry applicable to ocular function

- Ocular Microbiology-Specific microbiology applicable to the eye
- Immunology with particular reference to ocular immunology.
- Ocular Pharmacology
- Genetics

II Optics

- Basic physics of optics
- Applied ophthalmic optics
- Applied optics including optical devices
- Disorders of Refraction
- Low Vision Aids

III. Clinical Ophthalmology

- Disorders of the lids
- Disorders of the lacrimal system
- Disorders of the Conjunctiva
- Disorders of the Sclera
- Disorders of the Cornea
- Disorders of the Uveal Tract
- Disorders of the Lens
- Disorders of the Vitreo Retina
- Disorders of the Optic Nerve & Visual Pathway
- Disorders of the Orbit
- Glaucoma
- Neuro ophthalmology
- Pediatric ophthalmology
- Ocular involvement in systemic disease
- Immune ocular disorders
- Strabismus & Amblyopia
- Community Ophthalmology

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

1. Basic medical science:

- Attain understanding of the structure and function of the eye and its parts in health and disease including Anatomy, Physiology, Genetics, Biochemistry, Microbiology, Pharmacology etc. and its relevance to ophthalmology
- Attain understanding and application of knowledge of CNS and other systems of body which influence or control the structure and function of the eye.
- Attain understanding of, and develop competence in, executing common general laboratory procedures employed in diagnosis and research in Ophthalmology.

2. Clinical Ophthalmology:

The student will be given adequate opportunity to work, on the basis of graded responsibilities, in outpatients, in patient, and operation theaters (on a rotational basis). Thus, from the day of entry to the completion of the training program, the student shall be able to:

- Acquire scientific and rational approach to the diagnosis of ophthalmic cases.
- Acquire understanding of, and develop inquisitiveness to investigate, cause and effect of diseases.
- Manage and treat all types of ophthalmic cases
- Competently handle all ophthalmic medical and surgical emergencies
- Competently handle and execute safely all routine surgical procedures on lens, glaucoma, lid, sac, adnexa, retina and extra ocular muscles etc.
- Be familiar with micro-surgery and special surgical techniques
- Demonstrate knowledge of the pharmacological aspects (including toxicity) of drugs used in ophthalmic practice, and of drugs commonly used in general diseases that affect the eyes.
- To understand the principles, perform observe all routine and special ophthalmic investigations for example, Slit lamp examination Gonioscopy, Perimetry, Tonometry, Dark room procedures, Electrophysiological Tests (ERG, EOG, VER), OCT, etc.

3. Refraction:

- Acquire competence in assessment of refractive errors and prescription of glasses for all types of refraction problems.

- Acquire basic knowledge of manufacture and fitting of glasses and competence in judging the accuracy and defects of the dispensed glasses.

4. Medical and Surgical Management

- To demonstrate the knowledge of the pharmacology (including toxic) aspects of drugs used in ophthalmic practice and drugs commonly used in general diseases affecting the eyes.
- To exhibit competence in medical management of ophthalmic cases.
- To competently handle and execute safely common surgical procedures on lens, glaucoma, lid, sac, adnexa, ocular surface including conjunctiva, cornea and sclera and extraocular muscle, etc.
- To competently handle all ophthalmic medical and surgical emergencies.

5. Ophthalmic sub-specialties:

The student will be given an opportunity to work on a rotational basis in various special clinics of sub-specialties of ophthalmology. The student shall be able to:

- Examine, diagnose and demonstrate understanding of management of the problems of neuroophthalmology, and refer appropriate cases to neurology and neuro-surgery.
- Examine, diagnose and demonstrate understanding of management of (medical and surgical) complicated problems in the field of (a) lens, (b) uvea, (c) ocular surface including conjunctiva cornea and sclera including transplant (d) vitreo retina (e) pediatric ophthalmology and squint (f) eyelid orbital and lacrimal diseases of the eye (g) glaucoma (h) plastic surgery of eye (i) genetic problems in ophthalmology, (j) principles of refractive surgery.
- To demonstrate understanding of the manufacture, and competence in prescribing and dispensing of contact lenses, low visual aids, and ocular prosthesis

6. Ophthalmic pathological/microbiological/biochemical sciences:

The student should be able to interpret the relevant pathological / microbiological / biochemical data, and correlate with clinical data.

7. Imaging Techniques in Ophthalmology

X-Rays, USG, CT scan MRI, etc.

8. Community Ophthalmology:

- Postgraduate students may be able to assist or carry out eye camps; community and school surveys.
- They may be given an opportunity to participate in surveys, and to be a part of rehabilitation teams.
- They shall be able to guide rehabilitation workers in the organization and training of the blind in the art of daily living, and in the vocational training of the blind, leading to their gainful employment.

9. Should be able to identify systemic emergencies of acute nature and carry out an effective emergency management

10. Research:

The student shall be able to:

- Recognize a research problem.
- State the objectives in terms of what is expected to be achieved in the end.
- Plan a rational approach, with appropriate controls, with full awareness of the statistical validity of the size of the material.
- Spell out the methodology and carry out most of the technical procedures required for the study.
- Accurately, systematically and objectively record results and observations made.
- Analyze the data with the aid of appropriate statistical analysis.
- Interpret the observations in the light of existing knowledge, and highlight in what ways the study has advanced the existing knowledge on the subject and what further remains to be done.
- Resident should be encouraged to write at least one scientific paper of National / International Standards from the material of this thesis.
- Resident should have knowledge of ethical issues involved in research and publication.

11. Teaching

- To write Symposia / Seminars and critically discuss them
- To methodically summarize internationally published articles according to prescribed instructions and critically evaluate and discuss each selected article
- To discuss symposia and journals with his colleague and guide his juniors in the groups
- To present cases at clinical conferences, discuss them with his colleagues and guide his juniors in groups in evaluation & discussion of these cases.

LEARNING METHODS

A. Theoretical methods:

1. Lectures, demonstrations: Didactic teaching in clinical, applied, and pre-clinical, Paraclinical, and allied sciences (like forensic medicine, radiology, microbiology, pharmacology, pathology, biochemistry, biostatistics etc). These may be imparted by the members of the staff in respective disciplines or by clinicians themselves.

2. Seminars: seminars should be conducted regularly. The topics selected should be repeated once in 3 years so as to cover as wide a range of topics as possible. Seminars could be individual presentations or a continuum (large topic), with many students participating.

3. Journal Clubs: The selected articles from the journals should be reviewed by the resident and these shall be presented by the student under the following headings, 1) Aim 2) Methods 3) Observations 4) Discussion and 5) Conclusions.

4. Case Discussion:

I. Bedside discussion, outpatient teaching, clinical case discussion should form part of a department's schedule. This could range from 1-2 hours.

Clinical case presentations of the resident should be evaluated as per Annexure I.

II. Case presentation at other in-hospital multidisciplinary forums should be encouraged.

III. Webinars and e-learning methods incorporated in the teaching program of residents

B. Clinical Ophthalmology:

The training should be given in wards, out-patients department, specialty clinics and operation theatres.

1. Out Patients: For the first six months of the training program, students may be attached to a faculty member to be able to pick up methods of history taking and ocular examination in ophthalmic practice. During this period the student may also be oriented to the common ophthalmic problems. After 6 months, the student may work independently, where resident receives new and old cases including refractions and prescribes for them. The students are attached to a senior resident and faculty member whom they can consult in case of difficulty.

2. Wards: Each student may be allotted beds in the in-patient section depending upon the total bed capacity and the number of the postgraduate students. The whole concept is to provide the student with an increasing opportunity to work with increasing responsibility according to seniority. A detailed history and case record is to be maintained by the resident.

3. Specialty clinics: The student must rotate in the various subspecialty clinics run by the department.

The **following practical skills** shall be acquired:

A. Examination techniques along with interpretation

1. Slit lamp Examination

Diffuse Examination / Focal Examination / Retrolumination-direct & indirect / Sclerotic scatter / Specular reflection / Staining modalities and interpretation

2. Fundus evaluation

- i. Direct & Indirect ophthalmoscopy with fundus drawing
- ii. 3-mirror, 78-D/90-D/60-D Examination

B Basic Investigations along with their interpretation

i. Tonometry

- Applanation / Indentation / Non contact tonometry

ii. Gonioscopy- grading of the angle

iii. Tear/ Lacrimal function test

- Staining- fluorescein, Rose Bengal / Schirmer's tests/ Break up time / Syringing / Dacrocystography

iv Corneal Evaluation

- Corneal scraping and cauterization
- Smear preparation and interpretation (Gram's stain/KOH)

- Keratometry- performance & interpretation
- Corneal topography and Scheimpflug principle
- Pachymetry

v Colour Vision Evaluation

- Ishihara pseudoisochromatic plates / Farnsworth Munsell 100 hue test

vi Refraction

- Retinoscopy- streak/ Priestley Smith
- Use of Jackson's cross-cylinder
- Subjective and objective refraction
- Prescription of glasses

vii Diagnosis & Assessment of squint

- Ocular position and motility examination
- Synaptophore usage
- Lees / Hess screen usage
- Diplopia charting
- Assessment of strabismus - cover tests/ prism bars/ synaptophore
- Amblyopia diagnosis and treatment
- Assessment of convergence, accommodation, stereopsis, suppression

viii Exophthalmometry

- Usage of Hertel's Exophthalmometry- proptosis measurement

ix Contact lenses:

- Fitting and assessment of RGP and soft lenses
- Subjective verification of over refraction
- Common complications arising from contact lens use
- Educating the patient regarding CL usage, and of complications

x Low Vision Aids

- Knowledge of basic optical devices available and relative advantages and disadvantages of each.
- The basics of fitting, with knowledge of availability & cost

xi Community Ophthalmology

- Ability to organize institutional screening
- Ability to organize peripheral eye screening camps
- Knowledge and ability to execute guidelines of National programme for prevention of Blindness.
- Eye checkup Camps

C) Essential investigative skills: the postgraduate student should be able to perform / interpret the following tests:

- Fundus Photography
- Fluorescein angiography
- Ophthalmic ultrasound: A-scan /B-scan
- Automated perimetry for glaucoma and neurological lesions
- OCT and basic knowledge of UBM
- ERG, EOG, VER
- Specular Microscopy
- New modalities of glaucoma investigation
- Radiological tests

1. X rays
2. Localization of ocular and intra orbital Foreign Bodies
3. Interpretation of – CT scan / MRI

4. Operations: The resident shall be provided with an opportunity to perform operations, both extra-ocular and intra-ocular, with the assistance of the senior residents and / or under the direct supervision of a faculty member. Resident shall be provided with an opportunity to learn special and complicated operations by assisting the Senior Residents or the Senior Surgeon, in these operations. Resident shall be responsible for the post-operative care of these cases. It is desirable that the student be able to perform independently/under guidance various surgeries; the thrust areas include cataract, glaucoma, squint, lacrimal sac, entropion and enucleation / evisceration.

To provide surgical training, a phased program may be chalked out. In the first phase the student is given training in wet lab. He is also exposed to regional anaesthetic block, preparations of cases for operation, and premedication.

In the next phase, the student shall assist the operating surgeon during the operation. In the third phase, the student operates independently assisted by senior resident, or a faculty member.

The resident surgery should be evaluated by available tools like OSCAR, CEX

a) Minor surgical procedures: the student must know and be able to perform independently:

1. Conjunctival and corneal foreign body removal on the slit lamp
2. Pterygium excision with recent techniques
3. Suture removal- skin / conjunctival/ corneal / corneoscleral
4. Subconjunctival injection
5. Posterior Sub-Tenon's injections
6. Repair of corneal / corneo – scleral perforations
7. Chalazion incision and curettage
8. Biopsy of small lid tumors
9. Tarsorrhaphy

b) Major surgical Procedures:

I) the student must know and be able to perform independently:

Ocular Anesthesia

- a) Peribulbar / Retrobulbar anesthesia
- b) Facial nerve blocks- O'Brien / Atkinson/ Van lint & modifications
- c) Frontal nerve blocks
- d) Infra orbital nerve blocks
- e) Blocks for sac surgery

II) The student must be able to perform independently / under supervision / assist and deal with complications arising from the following surgeries:

Lid Surgery

- Tarsorrhaphy
- Ectropion & entropion (simple procedures)
- Lid repair following trauma – including lid margin tears
- Epilation, electroepilation

Destructive procedures

- Evisceration with or without implant
- Enucleation with or without implant
- Enucleation for eye donation
- Cyclocryotherapy

Sac surgery

- Dacryocystectomy / Dacryocystorhinostomy
- Probing for congenital obstruction of nasolacrimal duct

Strabismus surgery

- Recession and resection procedures on the horizontal recti

III) The student shall be well conversant with use of Operating microscope and must be able to perform the following surgeries competently using the microscope:

Cataract surgery

- Standard ECCE with IOL implantation
- Small incision Cataract surgery with IOL implantation
- Resident should have performed under guidance / assisted the following
- Secondary AC or PC IOL implantation
- Phacoemulsification

Vitreous Surgery

- Intra-vitreous and intra-cameral (anterior chamber) injection techniques and dosages, particularly for endophthalmitis management.
- The student should know the basis of anterior vitrectomy in the management of cataract surgery complications.

IV) The student should have preferably assisted in the following microscopic surgeries

1. Keratoplasty

- Therapeutic and optical

2. Glaucoma surgery

- Trabeculectomy
- Pharmacological modulation of trabeculectomy

V) The student should have assisted in the following laser procedures:

- Yag Capsulotomy
- Laser iridotomy
- Focal and panretinal photocoagulation

VI) The student should have assisted/ have knowledge of Kerato-refractive procedures.

C. Ocular Histopathology:

The student shall have basic knowledge of gross and microscopic features of various ocular pathologic conditions, to assist them in confirmation of clinical diagnosis, and help in management.

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

1. The proposed study must be approved by the institutional ethics committee and the protocol of thesis should have been approved by NBE.
2. The thesis should be restricted to the size of 80 pages (maximum). This includes the text, figures, references, annexures, and certificates etc. It should be printed on both sides of the paper; and every page has to be numbered. Do not leave any page blank. To achieve this, following points may be kept in view:
 - a. The thesis should be typed in 1.5 space using Times New Roman/Arial/ Garamond size 12 font, 1” margins should be left on all four sides. Major sections viz., Introduction, Review of Literature, Aim & Objectives, Material and Methods, Results, Discussion, References, and Appendices should start from a new page. Study proforma (Case record form), informed consent form, and patient information sheet may be printed in single space.
 - b. Only contemporary and relevant literature may be reviewed. Restrict the introduction to 2 pages, Review of literature to 10-12 pages, and Discussion to 8-10 pages.

- c. The techniques may not be described in detail unless any modification/innovations of the standard techniques are used and reference(s) may be given.
 - d. Illustrative material may be restricted. It should be printed on paper only. There is no need to paste photographs separately.
3. Since most of the difficulties faced by the residents relate to the work in clinical subject or clinically-oriented laboratory subjects, the following steps are suggested:
 - a. The number of cases should be such that adequate material, judged from the hospital attendance/records, will be available and the candidate will be able to collect case material within the period of data collection, i.e., around 6-12 months so that he/she is in a position to complete the work within the stipulated time.
 - b. The aim and objectives of the study should be well defined.
 - c. As far as possible, only clinical/laboratory data of investigations of patients or such other material easily accessible in the existing facilities should be used for the study.
 - d. Technical assistance, wherever necessary, may be provided by the department concerned. The resident of one specialty taking up some problem related to some other specialty should have some basic knowledge about the subject and he/she should be able to perform the investigations independently, wherever some specialized laboratory investigations are required a co-guide may be co-opted from the concerned investigative department, the quantum of laboratory work to be carried out by the candidate should be decided by the guide & co-guide by mutual consultation.
4. The clinical residents are not ordinarily expected to undertake experimental work or clinical work involving new techniques, not hitherto perfected OR the use of chemicals or radioisotopes not readily available. They should; however, be free to enlarge the scope of their studies or undertake experimental work on their own initiative but all such studies should be feasible within the existing facilities.
5. The DNB residents should be able to freely use the surgical pathology/autopsy data if it is restricted to diagnosis only, if however, detailed historic data are required the resident will have to study the cases himself with the help of the guide/co-guide. The same will apply in case of clinical data.
6. Statistical methods used for analysis should be described specifically for each objective, and name of the statistical program used mentioned.

General Layout of a DNB Thesis:

- **Title-** A good title should be brief, clear, and focus on the central theme of the topic; it should avoid abbreviations. The Title should effectively summarize the proposed research and should contain the PICO elements.
- **Introduction-** It should be focused on the research question and should be directly relevant to the objectives of your study.
- **Review of Literature** - The Review should include a description of the most relevant and recent studies published on the subject.
- **Aim and Objectives** - The 'Aim' refers to what would be broadly achieved by this study or how this study would address a bigger question / issue. The 'Objectives' of the research stem from the research question formulated and should at least include participants, intervention, evaluation, design.
- **Material and Methods-** This section should include the following 10 elements: Study setting (area), Study duration; Study design (descriptive, case-control, cohort, diagnostic accuracy, experimental (randomized/non-randomized)); Study sample (inclusion/exclusion criteria, method of selection), Intervention, if any, Data collection, Outcome measures (primary and secondary), Sample size, Data management and Statistical analysis, and Ethical issues (Ethical clearance, Informed consent, trial registration).
- **Results-** Results should be organized in readily identifiable sections having correct analysis of data and presented in appropriate charts, tables, graphs and diagram etc.
- **Discussion**—It should start by summarizing the results for primary and secondary objectives in text form (without giving data). This should be followed by a comparison of your results on the outcome variables (both primary and secondary) with those of earlier research studies.
- **Summary and Conclusion-** This should be a précis of the findings of the thesis, arranged in four paragraphs: (a) background and objectives; (b) methods; (c) results; and (d) conclusions. The conclusions should strictly pertain to the findings of the thesis and not outside its domain.
- **References-** Relevant References should be cited in the text of the protocol (in superscripts).
- **Appendices** -The tools used for data collection such as questionnaire, interview schedules, observation checklists, informed consent form (ICF),

and participant information sheet (PIS) should be attached as appendices. Do not attach the master chart.

Thesis Protocol Submission to NBE

1. DNB candidates are required to submit their thesis protocol within 90 days of their joining DNB training.
2. Enclosures to be submitted along with protocol submission form:
 - a) Form for Thesis Protocol Submission properly filled.
 - b) Thesis Protocol duly signed.
 - c) Approval letter of institutional Ethical committee. *(Mandatory, non receivable of any one is liable for rejection)*

Thesis Submission to NBE

1. As per NBE norms, writing a thesis is essential for all DNB candidates towards partial fulfillment of eligibility for award of DNB degree.
2. DNB candidates are required to submit the thesis before the cut-off date which shall be 30th June of the same year for candidates appearing for their scheduled December final theory examination. Similarly, candidates who are appearing in their scheduled June DNB final examination shall be required to submit their thesis by 31st December of preceding year.
3. Candidates who fail to submit their thesis by the prescribed cutoff date shall NOT be allowed to appear in DNB final examination.
4. Fee to be submitted for assessment (In INR): 3500/-
5. Fee can be deposited ONLY through pay-in-slip/challan at any of the Indian bank branch across India. The challan can be downloaded from NBE website www.natboard.edu.in
6. Thesis should be bound and the front cover page should be printed in the standard format. A bound thesis should be accompanied with:
 - a. A Synopsis of thesis.
 - b. Form for submission of thesis, duly completed
 - c. NBE copy of challan (in original) towards payment of fee as may be applicable.
 - d. Soft copy of thesis in a CD duly labeled.
 - e. Copy of letter of registration with NBE.
7. A declaration of thesis work being bonafide in nature and done by the candidate himself/herself at the institute of DNB training need to be submitted bound with thesis. It must be signed by the candidate himself/herself, the thesis guide and head of the institution, failing which thesis shall not be considered.

***The detailed guidelines and forms for submission of Thesis
Protocol & Thesis are available at
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 .

1. Personal profile of the candidate
2. Educational qualification/Professional data
3. Record of case histories
4. Procedures learnt
5. Record of case Demonstration/Presentations
6. Every candidate, at the time of practical examination, will be required to produce performance record (log book) containing details of the work done by him/her during the entire period of training as per requirements of the log book. It should be duly certified by the supervisor as work done by the candidate and countersigned by the administrative Head of the Institution.
7. In the absence of production of log book, the result will not be declared.

Leave Rules

1. DNB/FNB Trainees are entitled to avail leave during the course of DNB/FNB training as per the Leave Rules prescribed by NBE.
2. A DNB/FNB Trainees can avail a maximum of 30 days of leave in a year excluding regular duty off/ Gazetted holidays as per hospital/institute calendar/policy. This leave shall be processed at the institutional level.
3. Any kind of study leave is not permissible to DNB/FNB Trainees.
4. 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/FNB training program may be clubbed together with prior approval of NBE.
5. Unauthorized absence from DNB/FNB training for more than 7 days may lead to cancellation of registration and discontinuation of the DNB/FNB training and rejoining shall not be permitted.
6. Any Leave availed by the candidate other than the eligible leave (30 days per year) shall lead to extension of DNB /FNB training. The training institute has to forward such requests to NBE along with the leave records of the candidate since his/her joining and supporting documents (if any) through the Head of the Institute with their recommendation/comments. NBE shall consider such requests on merit provided the seat is not carried over and compromise with training of existing trainees in the Department.
7. Any extension of DNB/FNB training beyond the scheduled completion date of training is permissible only under extra-ordinary circumstances with prior approval of NBE. Such extension is neither automatic nor shall be granted as a matter of routine.
8. DNB/FNB trainees are required to complete their training by a prescribed cutoff date (as per information bulletin of Exit exam) for being eligible to DNB/FNB Exit examination.
9. The eligibility for DNB/FNB Final Examination shall be determined strictly in accordance with the criteria prescribed in the respective information bulletin.
10. Candidates join on or after 2018 can avail Maternity / Paternity leave, as per the Central or State Government policies, whichever is applicable to DNB/FNB training institute.

11. DNB/FNB trainees are eligible for stipend either during the leave period or extension of training period as per the policies of DNB/FNB training institute and prevailing rules.

EXAMINATION

FORMATIVE ASSESSMENT

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

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

The scheme includes:-

Part I:- Conduction of theory examination

Part-II :- Feedback session on the theory performance

Part-III :- Work place based clinical assessment

Scheme of Formative assessment

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

The performance of the resident during the training period should be monitored throughout the course and duly recorded in the log books as evidence of the ability and daily work of the student

1. Personal attributes:

- **Behavior and Emotional Stability:** Dependable, disciplined, dedicated, stable in emergency situations, shows positive approach.
- **Motivation and Initiative:** Takes on responsibility, innovative, enterprising, does not shirk duties or leave any work pending.

- **Honesty and Integrity:** Truthful, admits mistakes, does not cook up information, has ethical conduct, exhibits good moral values, loyal to the institution.
- **Interpersonal Skills and Leadership Quality:** Has compassionate attitude towards patients and attendants, gets on well with colleagues and paramedical staff, is respectful to seniors, has good communication skills.

2. Clinical Work:

- **Availability:** Punctual, available continuously on duty, responds promptly on calls and takes proper permission for leave.
- **Diligence:** Dedicated, hardworking, does not shirk duties, leaves no work pending, does not sit idle, competent in clinical case work up and management.
- **Academic ability:** Intelligent, shows sound knowledge and skills, participates adequately in academic activities, and performs well in oral presentation and departmental tests.
- **Clinical Performance:** Proficient in clinical presentations and case discussion during rounds and OPD work up. Preparing Documents of the case history/examination and progress notes in the file (daily notes, round discussion, investigations and management) Skill of performing bed side procedures and handling emergencies.

3. Academic Activity: Performance during presentation at Journal club/ Seminar/ Case discussion/Stat meeting and other academic sessions. Proficiency in skills as mentioned in job responsibilities.

FINAL EXAMINATION

The summative assessment of competence will be done in the form of DNB Final Examination leading to the award of the degree of Diplomate of National Board in Ophthalmology. 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

1. The theory examination comprises of **Four** papers, maximum marks 100 each.
2. There are 10 short notes of 10 marks each, in each of the papers. The number of short notes and their respective marks weightage may vary in some subjects/some papers.
3. Maximum time permitted is 3 hours.
4. Candidate must score at least 50% in the aggregate of **Four** papers to qualify the theory examination.

5. Candidates who have qualified the theory examination are permitted to take up the practical examination.
6. The paper wise distribution of the Theory Examination shall be as follows:

Paper I: Basic Sciences related to Ophthalmology

Paper II: Clinical Ophthalmology

Paper III: Principles and Practice of Surgery of Eye and related topics

Paper IV: Recent Advances in Ophthalmology

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

- Clinical Ophthalmology – Kanski J J
- Parson's Diseases of the Eye – Sihota and Tandon
- Anatomy of the eye and orbit: Eugene Wolff
- Clinical anatomy of the eye: Richard S Snell
- Adler's Physiology of the Eye: Francis H Adler
- Biochemistry of the eye: Elaine R. Berman
- Ocular Pathology: A Text and Atlas: Yanoff M & Fine BS
- Ophthalmic Pathology: An Atlas and Textbook: Zimmerman LE
- Ocular pharmacology: William H Havener
- Ocular Immunology: Gilbert Smolin
- Duke Elder's Practice of refraction: Sir Stewart Duke-Elder
- Clinical optics: A. R. Elkington, Helena J. Frank, Michael J. Greaney
- Paediatric Ophthalmology and strabismus: Kenneth W Wright
- Binocular vision and ocular motility: Gunter K von Noorden
- Diagnosis and Management of Ocular Motility Disorders: Mein J, Trimble R.
- Shields' textbook of glaucoma : Bruce M Shields
- Becker-Shaffer's Diagnosis and Therapy of the Glaucomas
- Uveitis: a clinical approach to diagnosis and management : Ronald E Smith, Robert A Nozik
- Uveitis: fundamentals and clinical practice: Robert B. Nussenblatt and Alan G. Palestine
- Vitreous Microsurgery: Steve Charles
- Ultrasound of the eye and orbit: Sandra F Byrne and Ronald L. Green
- Clinical neuroophthalmology: Walsh & Hoyt
- Diagnosis and management of intraocular tumors: Jerry A Shields
- Diseases of the orbit: a multidisciplinary approach: Jack Rootman
- Diseases of the orbit: Frederick A. Jakobiec and Ira S Jones
- Diagnosis and management of orbital tumors: Jerry A. Shields
- Grayson's diseases of the Cornea
- Smolin and Thoft's The Cornea: scientific foundations and clinical practice
- Stallard's Eye Surgery
- Ophthalmic Surgery: Principal and Practice. George L. Spaeth
- Cataract Surgery and its Complications. Normal S. Jaffe
- Principal and Practice of Ophthalmology. G. A. Peymen
- Basic and Clinical Science Course. American Academy of Ophthalmology
- Principles and Practice of Ophthalmology by FA Jakobiec.
- Retina by Stephen J. Ryan
- Basic & Advances Biostatistics – Manju Pandey
- Oxford Handbook of Medical Biostatistics

JOURNALS

- Indian Journal of Ophthalmology
- American Journal of Ophthalmology
- Ophthalmology
- Archives of Ophthalmology
- Survey of ophthalmology
- International Ophthalmology Clinics
- British Journal of Ophthalmology
- Cornea
- Retina
- Journal of Cataract and Refractive Surgery
- Ophthalmic Surgery, Imaging and Lasers

WEB RESOURCES

1. International Council of Ophthalmology (ICO): www.icoph.org
 - a. ICO Center for Ophthalmic Educators: educators.icoph.org
 - b. ICO Examinations: www.icoexams.org/
 - c. ICO International Fellowships: www.icoph.org/refocusing_education/fellowships.html
 - d. ICO Foundation: www.icofoundation.org/
2. American Academy of Ophthalmology: <http://www.aao.org>
3. American Academy of Ophthalmology Education Resource Center: <http://www.aao.org/education/index.cfm>
4. American Board of Ophthalmology: <http://www.abop.org>
5. Digital Journal of Ophthalmology: <http://www.djo.harvard.edu>
6. Eye Search: <http://www.eyesearch.com>
7. Eye Atlas - Online Atlas of Ophthalmology: <http://www.eyeatlas.com>
8. Eye Cancer Network: <http://eyecancer.com>
9. Eye Library.Org: <http://www.eyelibrary.org>
10. Eye Text.Net: <http://www.eyetext.net>
