

Guidelines
for
Competency Based Training Programme
in
FNB- Pediatrics Hemato Oncology



NATIONAL BOARD OF EXAMINATIONS

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INTRODUCTION

The discipline of Pediatric Hematology/Oncology has continued to expand in both the clinical and basic science arenas over the last several decades. Discoveries of dominant oncogenes, tumor suppressor genes, gene transfer technology and hematopoietic growth factors have opened new areas of clinical and basic research, as well as provided new potential therapies for patients. Both the demonstrated improvement in care for pediatric patients with hematologic-oncologic disorders as well as the scientific excitement generated through research directed toward understanding of these disorders ensures that the discipline of Pediatric Hematology/Oncology will continue to be an exciting part of pediatric medicine and science in the future.

The field of Pediatric Hematology-Oncology encompasses a broad array of disorders of children and adolescents with Primary immunodeficiency disorders, solid tumors, hematological cancers and non-malignant disorders of the blood and blood-forming tissues. The intent of the Pediatric Hematology-Oncology fellowship Program is to train physician scientists, with the following attributes:

- 1) Skill in the prevention, diagnosis and management of disease so as to provide comprehensive, compassionate care for children and adolescents
- 2) Ability to contribute to the progress of the field through research
- 3) Ability to understand and interpret the research of others, and to integrate that understanding into their own practice
- 4) Excellence in teaching of medical students, residents and colleagues

Pediatric Hematology-Oncology Fellowship Training Program provides trainees with the necessary knowledge, skills, experience and mentorship to develop into independent physician-scientists or clinical/ translational investigators who will lead the field forward.

PROGRAMME GOAL

The main goals of Pediatric Hemato Oncology fellowship are

- Provide the clinical experience and educational opportunities necessary to build a solid foundation of medical knowledge, critical thinking abilities, literature review, diagnostic acumen and technical skills.
- Develop well-rounded, empathetic clinicians with the skills to successfully communicate and give counsel to patients and families.
- Provide academic pediatricians the research training and experience to develop careers as physician-scientists.
- Impart the skills necessary to become lifelong learners, teachers, and leaders who can work effectively with team members.
- Teach professionalism via mentorship with emphasis on the critical roles of personal ethics, responsibility, respect, compassion, communication and self-awareness.

PROGRAMME OBJECTIVES

- Acquisition of a fundamental knowledge base in Pediatric Hematology, Oncology and BMT
- Development of clinical skills in Pediatric Hematology, Oncology and BMT
- Development of skills in interpreting basic laboratory tests pertinent to Pediatric Hematology, Oncology and BMT
- Development of skills in preparing clinical presentations, discussions of cases, and case reports
- Development of skills in process improvement
- Initiation of research interests

ELIGIBILITY CRITERIA FOR ADMISSIONS TO THE PROGRAMME

(A) FNB Pediatric Hemato-Oncology Course:

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

Duration of Course: 2 Years

Every candidate admitted to the training programme shall pursue a regular course of study (on whole time basis) in the concerned recognized institution under the guidance of recognized post graduate teacher for assigned period of the course.

TEACHING AND TRAINING ACTIVITIES

The fundamental components of the teaching programme should include:

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

HEMATOLOGY

- Physiology of Hemostasis and Hematopoiesis
 - Classification & Diagnosis of Anemia during Childhood
 - Anemia During the Neonatal Period
 - Erythroblastosis Fetalis
 - Iron-Deficiency Anemia
 - Megaloblastic Anemia
 - Hematologic Manifestations of Systemic Illness
 - Bone Marrow Failure syndromes including Acquired Marrow failure
 - Hemolytic Anemia due to Membrane & Enzyme Defects
 - Hemoglobinopathies.... Sickle Cell Disease/ Thalassemia
 - Extracorporeal Hemolytic Disease (AIHA etc)
 - Polycythemia
 - Disorders of White Blood Cell
 - Disorders of Platelets
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- Hemostatic Disorders
 - Thrombotic Disorders
 - Lymphadenopathy and Splenomegaly
 - Porphyrias
 - Diagnostic Methodologies in Pediatric Hematology
 - Various National Health Programme in Anemia

Transfusion medicine

Indications for transfusion of various components

Methods of preparation of components

Cryopreservation of Stem Cells

Transfusion Reactions

Transfusion Transmitted Diseases

ONCOLOGY

Main Objective: To understand the epidemiology, molecular and cellular biology of various tumors.

- Chemotherapy

Main objective: To know the mechanism of action, indications, toxicities and management of chemotherapeutic agents used in patients with malignancies.

A. Principles of chemotherapy

1. Principles of combination chemotherapy
2. Principles of drug resistance
3. Specific agents

- Immunologic Abnormalities

Main Objective: To know the management of infections in immuno compromised patients.

A. Bacterial Prophylaxis

B. Fungal Prophylaxis

C. Viral Prophylaxis

D. Treatment of infection in immunocompromised patients

E. Early Warning Signs of Cancer in Children/ Models for Early Diagnosis

F. Procedures in Pediatric Oncology: Practical Guidelines

- Cancer

Etio-pathogenesis of cancer

A. Epidemiology of cancer

1. Age-related incidence
2. Race-related incidence
3. Genetic factors
4. Chemical-related factors
5. Environmental factors
6. Immunologic factors

B. Tumor molecular and cellular biology factors

C. Oncogenesis and cell growth regulation factors

- Lymphoproliferative Disorders
- Myelodysplastic Syndromes
- Myeloproliferative Disorders
- Leukemias
- Histiocytosis Syndromes
- Hodgkin's Disease
- Non-Hodgkin Lymphoma
- Central Nervous System Malignancies
- Neuroblastoma
- Wilms' Tumor
- Rhabdomyosarcoma & Other Soft Tissue Sarcomas
- Malignant Bone Tumors and Osteosarcoma
- Retinoblastoma
- Germ Cell Tumors
- Primary Hepatic Tumors
- Gonadal/ Germ cell tumors
- Rare Tumors
- Tumors in adolescents and young adult
- HLH
- Hematopoietic Stem Cell Transplantation

Rationale, principles, procedures of Hematopoietic stem cell transplant

- A. Oncological, hematological, Immunological, metabolic and autoimmune diseases which are correctable with transplant procedure
- B. Rationale for transplant for a given disease or disease status, such as for high-risk malignant disease
- C. Urgency of the workup of a patient with diagnosis of severe aplastic anemia, and the identification of a suitable histocompatible sibling donor so that transplant procedure can be undertaken as soon as possible, before multiple transfusions are given
- D. Pre-transplant evaluation process (to evaluate organ function) to determine the suitability of an individual patient to undergo transplant procedure
- E. Methods in which transplant recipients are conditioned for the transplant procedure, as well as rationale for the specific transplant conditioning regimen and design of the conditioning regimen
- F. Sources of hematopoietic stem/progenitor cells available for the procedure of stem cell transplant, as well as the rationale for the selection of a particular source of stem cell product
- G. Process of acquisition and procurement of stem cells, as well as the rationale and the procedures utilized for the processing of the stem cells prior to transplant procedure
- H. Immunosuppressive therapy for the prevention of graft versus host disease, graft rejection the mode of administration of these agents, as well as their respective benefits and side effects
- I. Acute, delayed and chronic complications associated with the transplant procedure and management of these complications, i.e. acute and chronic GvHD, veno-occlusive disease, immunodeficiency, infections, bleeding complications, acute organ failure, delayed organ dysfunctions including growth and development, endocrine functions, and effect on neurocognitive function
- J. Management of patients undergoing hematopoietic stem cell transplant and immunocompromised patients hematological and immunological recovery, prevention of management of graft versus host disease, effects of chronic GVHD and other late effects of procedure of transplantation. Clinical and

histopathological changes with GVHD and use of drugs and procedures appropriate for the treatment of CGvHD.

- K. Implementation of all the guideline for the care of immunocompromised patients including limiting environmental exposures to micro organisms by proper isolation measures, maintenance of the patients in proper air handled environment, and administration of prophylactic antimicrobial therapy.
 - L. The knowledge of Stem cell procurement process, which includes the evaluation of the patient for suitability for the procedure, consenting process for the procedure, collection of the product (Bone Marrow harvest under general anesthesia or collection of the peripheral blood stem cells by apheresis procedure) and evaluation of the product collected
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- Gene Therapy
 - Monoclonal Antibodies in Pediatric Hematology and Oncology
 - Biological Response Modifiers
 - Management of Oncologic Emergencies
 - Supportive Care of Patients with Cancer
 - Nutritional Assessment and Intervention
 - Palliative and Supportive Care
 - Evaluation, Investigations & Management of Late Effects of Childhood Cancer
 - Psycho-Social Aspects of Managing Oncologic Patients
 - Childhood Cancer in Low-Income and Middle-Income Countries in the Twenty-First Century
 - Cancer Registries and the Descriptive Epidemiology of Pediatric Cancer in Low-and Middle-Income Countries
 - The Role of International Organizations on Collaboration for Global Pediatric Cancer Control
 - The Role of Twinning Programs and Telemedicine in Pediatric Oncology
 - Paediatric Radiotherapy
 - Central Venous Catheters
 - Management of Fever in the Child with Cancer
 - Acute Pain Management in the Inpatient Setting

- Palliative Care
- Chemotherapy Basics
- Guide to Procedures
- Treatment of Chemotherapy Extravasations
- **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

A) Clinical Hematology – Oncology

1) Leukemias: Acute and chronic leukemias

Clinical evaluation, diagnostic confirmation by morphology, immunophenotyping, special stains, cytogenetics and electron microscopy. The trainee must be familiar with the principles of leukemia management and the various protocols available. He/She should be familiar with the statistical tools used to evaluate therapy protocols, survival curves etc. He/she should also be familiar with the pharmacology of antimitotic drugs and their toxicity and well versed in the supportive management of patients with all types of leukemia.

2) Myeloproliferative disorders

Classification, systemic diagnostic evaluation of erythrocytosis, including polycythemia vera; interpretation of blood volume studies; with radionuclides, familiarity with current management strategies of MPD including the use of interferon.

3) Lymphoma

Classification of lymphomas, principles of staging and management of different types of lymphomas. The trainee must be familiar with the principles of lymphoma management and the various protocols available.

4) Miscellaneous disorders like Histiocytosis, Splenic disorders and systemic diseases affecting the haemopoietic system, etc.

5) Chemotherapy

Various chemotherapy related protocols, practical training in giving the chemotherapy; recognition and management of complications related to chemotherapy. The trainee must be familiar with the principles of hematooncology management and the various protocols available.

6) Transfusion Medicine :

A) Blood component preparation and their clinical use Collection of blood, correct techniques of venepuncture, plastic systems, anticoagulants and additives, and their effect of storage stability, centrifugation, preparation of platelets, fresh frozen plasma and cryoprecipitate, storage of components, principles of fractionation. Quality control. A thorough understanding of the clinical indications for proper use of specific blood components.

B) Diagnosis & Management of Transfusion related complications

Febrile transfusion reactions- laboratory investigations, diagnosis, management and prevention. Diagnosis and management of hemolytic transfusion reactions. Infections transmitted by transfusion, physical and clinical complications of transfusion.

C) Cell separation principles

The trainee must be able to perform cell separation and apheresis. Principles of cell separators; continuous versus intermittent flow techniques, replacement fluids for plasmapheresis, current status and indications in various diseases should be known and understood.

D) Techniques of leuco-depletion

Problems related to white cells in donor blood and techniques of removal. Principles of filter design and use.

E) Irradiation of blood and components

Biology of irradiation of blood and components, transfusion graft versus host disease (GVHD) Indications for irradiation of blood and protocols. Use of equipment.

F) Management of alloimmunization in relation to transfusion Techniques for prevention of alloimmunization, role of ultraviolet radiation and photosensitizers, management of patients with red cell and platelet alloantibodies.

Practical Laboratory Training

1) General Hematology

- Proper use and care of common instruments such as light microscope, centrifuge, water baths, freezers, weighing balance, etc.
- Blood collection samples – venepuncture and finger prick methods of sample collection, types of anticoagulants, containers and the effects of delay in processing and storage.
- Determination of peripheral blood counts (Hemoglobin, Hematocrit, Total WBC and platelets) manually and calculation of red cell indices.
- Use of automated blood cell counters including principles and practice.
- Interpretation of peripheral blood counts and abnormal flags.
- Preparation of blood films and, staining of peripheral blood films and cytospin slides with Romanowsky and other dyes.
- Review of normal and abnormal blood films with emphasis on morphology of red cells, white cells and platelets.
- Performance of WBC differential counts; subjective assessment of platelet counts and diagnostic interpretation of abnormal counts.
- Preparation and staining of thick and thin blood films for malarial parasites.
- Measurement and significance of ESR and plasma viscosity
- Supravital staining of reticulocytes, counting of reticulocytes.
- Performance of bone marrow aspiration; trephine needle biopsy, splenic aspiration.

- Preparation of smears of bone marrow aspirates and biopsy (touch) imprints.
- Staining and diagnostic evaluation of bone marrow aspirates.

2) Cytochemistry

Performance of the following staining procedures, Sudan Black, Myeloperoxidase, specific and non specific esterases, acid phosphatase. PAS and 'Iron Staining'.

3) Cytogenetics

Familiarisation with cytogenetics, understanding the principles of cytogenetics and appreciating the relevance and significance of chromosomes in diagnostic hematology, interpreting the results of chromosome preparation of hemopoietic cells.

4) Flow Cytometry

A working knowledge of the principle and practice of flowcytometry and interpretation of the clinical significance of common leukocyte immunophenotypes.

Histocompatibility laboratory, Stem Cell processing Laboratory and Clinical immunology Laboratory experience

5) Teaching scheme :

Total periods and periods allotted to each topic

Didactic lectures: These will be held once a week and will be delivered either by a faculty member or by a specialist in the area from hemato-oncology and allied disciplines.

Seminars and journal clubs: Seminars and journal clubs will be held once a week.

Candidates are required to present 1 seminar and 2 journal clubs per month.

Therapeutic case and problem discussions: This will be held every week and each

student is expected to present every week after the first 3 months. Experts from related specialties will be present for these discussions.

Patient care, teaching and research: It is expected that the fellowship candidates will contribute to patient care in the hematology department in all aspects i.e. management of indoor patients, OPDs, emergencies, as well as the laboratory work up of the patients. They are also required to give lectures on selected topics to the postgraduate medical students of Pediatrics.

Project work and paper publication: Each fellowship candidate will be required to undertake a research project on a topic decided after consultation with the guide. This topic will require to be approved by the institutional ethics committee. The project work will be submitted in the form of a thesis at the end of 10 months of the fellowship. It will undergo evaluation by 3 independent experts from within the institution, who will then grade it. This project will also be written up for publication and sent to a suitable journal before completion of the fellowship. Award of the certificate of fellowship is subject to successful completion of the project, approval of the thesis by experts and submission to a peer-reviewed journal.

Attending conferences: The candidate will attend the Annual conference of the Pediatric Hematology Oncology Chapter or any other similar conference and present a paper (oral)/ poster on the work carried out during the fellowship tenure. Candidates will also be encouraged to participate in other related, CMEs etc. organized in the city.

Schedule for Postings

- Inpatient hematology and oncology
- Outpatient hematology and oncology

- Hematology rotation (including transfusion medicine, hematopathology, special coagulation)
- Bone marrow transplant
- Radiation Oncology
- Research Exploration

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. FNB Trainees are entitled to leave during the course of FNB training as per the Leave Rules prescribed by NBE.
2. A FNB 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 FNB 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 FNB 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 FNB candidates are entitled for paternity leave of maximum of one week during the entire period of FNB training.
 5. No kind of study leave is permissible to FNB candidates. However, candidates may be allowed an academic leave as under across the entire duration of training program to attend the conferences/CMEs/Academic programs/Examination purposes.

DNB COURSE	NO. OF ACADEMIC LEAVE
DNB 3 years Course (Broad & Super Specialty)	14 Days
DNB 2 years Course (Post Diploma)	10 Days
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 FNB 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 FNB course.
8. Any extension of FNB 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 FNB training for more than 7 days may lead to cancellation of registration and discontinuation of the FNB training and rejoining shall not be permitted.

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 FNB training and have to be sent to NBE.
- c. The medical treatment should be taken from the institute/ hospital where the candidate is undergoing FNB training. Any deviation from this shall be supported with valid grounds and documentation.
- 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 FNB 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 FNB 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 FNB training. It is

clarified that prior approval of NBE is necessary for availing any such leave.

- b. The eligibility for FNB EXIT Examination shall be determined strictly in accordance with the criteria prescribed in the respective information bulletin.

EXAMINATION

FORMATIVE ASSESSMENT

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

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

The scheme includes:-

Part I:- Conduction of theory examination

Part-II:- Feedback session on the theory performance

Part-III :- Work place based clinical assessment

Scheme of Formative assessment

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

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

1. Personal attributes:

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

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

2. Clinical Work:

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

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

FELLOWSHIP EXIT EXAMINATION

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

Theory Examination:

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

Practical Examination:

- 1. Maximum marks : 300**
 - 2. Comprises of Clinical Examination and viva**
- The candidate has to score a minimum of 50% marks in aggregate i.e., 200 out of total 400 marks (Theory & Practical) with at least 50% marks in theory examination to qualify in the Fellowship Exit Exam.
 - The Theory and Practical of Fellowship Exit Examination shall be conducted at the same examination centre of the concerned specialty.

Declaration of FNB Results

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

RECOMMENDED TEXT BOOKS AND JOURNALS

Textbooks & Reference Books

- William's Haematology [Beutler, Lichtman, Coller & Kipps]
- Wintrobe's Clinical Haematology [Lee, Boggs, Bithell, Foerster, Athens, Lukins]
- Haematology-Basic Principles & Practice [Hoffman, Benz, Shattil, Furie, Cohen & Silberstein]
- Blood – [Jandl]
- Practical Haematology [Dacie & Lewis]
- Thalassaemia Syndromes – [Weatherall & Clegg]
- Haemostasis & Thrombosis – Basic Principle & Clinical Practice (Coleman, Hirsch, Marder & Salzman)
- Blood Banking (Mollison)
- Modern Blood banking & transfusion Practices (Denese M Hannening)
- Bone Marrow Transplantation, (Forman, Blume & Thomas)
- The molecular basis of Blood Diseases (Stamatoyannopoulos, Neinhuis, Leder & Majerus)
- Paediatric Haematology by (Nathan & Oskie)
- Lanzkowsky's Manual of Pediatric Hematology and Oncology
- Textbook Of Pediatric Hematology & Hemato-Oncology Paperback – 2016 by Lokeshwar
- Pediatric Hematology/Oncology Secrets Paperback – 31 Aug 2001 by Weiner
- Rudolph's Textbook of Pediatrics, 21st Edition, McGraw-Hill 2003
- Nelson Textbook of Pediatrics. 17th Edition Saunders 2004
- Pizzo and Poplack Principles and Practice of Pediatric Oncology. Fourth Edition.
- Lippincott 2002
- Nathan and Oski's Hematology of Infancy and Childhood. Sixth Edition. Saunders 2003

Journals

- Blood
- British J. Hematology
- Seminars in Haematology
- Haematology & Oncology clinics
- Transfusion
- Indian J. Hematology & Blood Transfusion
- Hemostasis & Thrombosis
- Bone Marrow Transplantation
- Lancet
- New England Journal of Medicine
- Iranian journal of pediatric hematology oncology |
- Journal of Pediatric Hematology/Oncology
- Pediatric Oncology |
- The Japanese Journal of Pediatric Hematology / Oncology