

Board of Studies Meeting

2.3. Program - Post Doctoral Certificate Course (PDCC) in Pediatric Hematology:


Duration - 1 year




Program Objectives- The objective of this training program is to train medical postgraduate students (Pediatrics speciality) in pediatric hematology. They will acquire the knowledge and skills in diagnosis and management of hematological disorders occurring during infancy, childhood, and adolescence. They shall also have the intellectual and technical capabilities to setup and run pediatric hematology units in different academic and non-academic institutions and contribute to the growth of field of pediatric hematology


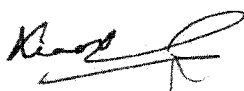

Program Outcome-

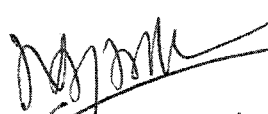
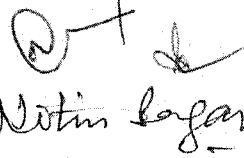
The Pediatric Hematology Program intends to train physician scientists, with the following attributes:

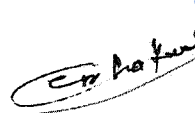




- 1) Develop skills in the diagnosis and management of disease to provide comprehensive, compassionate care for children and adolescents
- 2) Gains adequate basic and applied knowledge to deliver optimal treatment for children suffering from hematological and disorders (Benign & Malignant)
- 3) Interpret laboratory data and synthesize laboratory and clinical data to provide a rational management plan for children with hematological disorders.
- 4) Carry out all necessary diagnostic and therapeutic procedures as required for the care of children with hematological and malignant disorders
- 5) To be able to prepare and perform protocol-based therapies.
- 6) Understand the special requirements of pediatric population and counsel for the prevention of disease states.
- 7) Ensure better patient care and address their special needs like nutrition, growth & development monitoring, psychological support, etc.
- 8) Counsel parents and relatives of the patient with empathy and compassion
- 9) Design and execute research projects


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Courses Offered in the Program

Course I - **Basic Pediatric Hematology**

Course Objective - The course at providing an in-depth knowledge of the basics of hematology, neonatal hematology and disorders of neonatal state. It will also aid in understanding the differences in adult and pediatric physiology, and developmental hemostasis. It will focus on the anatomy and physiology of newborns and infants.

Course Outcome -

At the end of the training, the students would have acquired the following attributes -

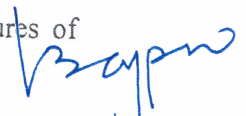
1. Students will have gained fundamental knowledge of the physiology, haemostasis, and basics of pediatric Hematology, Oncology and BMT.
2. Understand the pathogenetic mechanisms of the different hematological disorders
3. Development of clinical skills in Pediatric Hematology, Oncology and BMT patients.
4. Development of skills in interpreting basic laboratory tests pertinent to Pediatric Hematology, Oncology and BMT
5. The candidate will gain information on the different disorders like congenital or inherited anemia, thrombocytopenias, and leukemia/lymphomas, particularly seen in childhood and develop an approach to work up pediatric patients for hematological disorders.

Course II - Applied & Recent Advances related to Pediatric Hematology

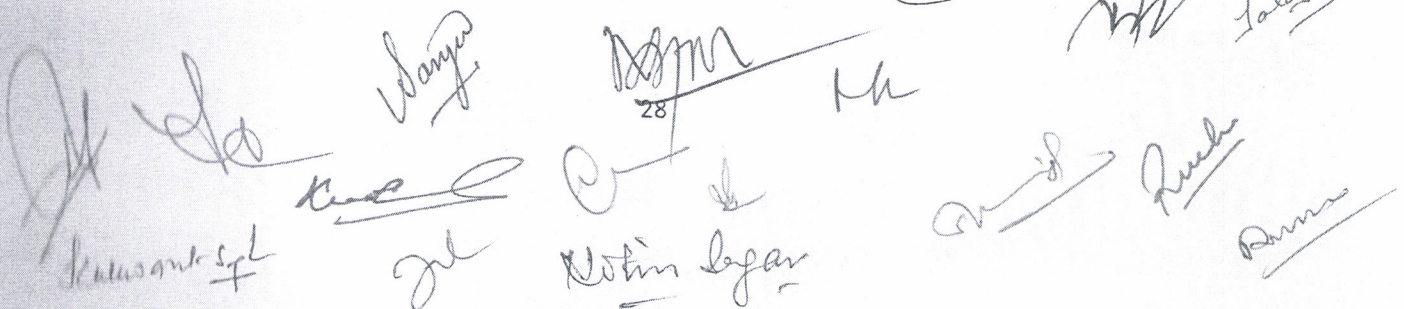
Course Objective - The course will focus on imparting students the skills to evaluate pediatric patients suffering from different hematological disorders. They will develop diagnostic skills and learn to interpret various clinical and laboratory findings to provide the best patient care services. They will learn to counsel patients, and develop the rationale, principles and, procedures of Hematopoietic stem cell transplant.

Course outcome -

The students would have acquired the following knowledge and skills -



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1. 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.
2. The candidates will learn the management of various Hematological disorders (Benign & malignant) of childhood, and their early diagnosis as well as the interpretation of various tests and procedures for optimal outcome.
3. Development of skills in preparing clinical presentations, discussions of cases, and case reports
4. Develop well-rounded, empathetic clinicians with the skills to successfully communicate and give counsel to patients and families.
5. Provide academic pediatricians the research training and experience to develop careers as physician-scientists.
6. Impart the skills necessary to become lifelong learners, teachers, and leaders who can work effectively with team members.
7. They would perform specialized diagnostic and therapeutic procedures like bone marrow aspiration and trephine biopsy, FNAC, true cut biopsy, use and care of central venous access, lumbar puncture, pleurocentesis, pericardiocentesis, peritonocentesis, stem cell harvest (PBSC and bone marrow) etc. wherever indicated and learn the use and maintenance of various equipment used for patient care.
8. Learn the use and maintenance of various equipment used for patient care.
9. Independently dispense outdoor patient care service and discuss cases with faculty concerned for guidance.
10. The students will get an opportunity to work in Subspecialty clinics like thalassemia and hemophilia clinics that have special needs.
11. Day Care Centre work duties will enable the candidate to give chemotherapies, blood transfusions, and care of central venous lines conducting routine procedures.
12. The candidate will have acquired the knowledge of the stem cell procurement process, 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, methods in which transplant recipients are conditioned, the


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Needs: Local : Pink, National : Orange, Regional: light blue, International : green

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rationale for the specific transplant conditioning regimen and design of the conditioning regimen.

13. The candidate would be introduced to research methodologies and would be expected to complete an independent research project under the supervision and guidance of the faculty.

Detailed Course Curriculum -

I. History

- Pediatric Hematology in Historical Perspective

II. Neonatal Hematology

- The Neonatal Erythrocyte and Its Disorders
- Immune Hemolytic Disease
- Disorders of Bilirubin Metabolism
- Developmental Hemostasis: Relevance to Newborns and Infants

III. Bone Marrow Failure

- The Anatomy and Physiology of Hematopoiesis
- Acquired Aplastic Anemia
- Inherited Bone Marrow Failure Syndromes
- Principles of Bone Marrow and Stem Cell Transplantation

IV. Disorders of Erythrocyte Production

- A Diagnostic Approach to the Anemic Patient
- Megaloblastic Anemia
- Disorders of Iron Metabolism and Sideroblastic Anemia
- The Porphyrrias

V. Hemolytic Anemias

- Autoimmune Hemolytic Anemia
- Disorders of the Erythrocyte Membrane
- Pyruvate Kinase Deficiency and Disorders of Glycolysis
- Glucose-6-Phosphate Dehydrogenase Deficiency and Hemolytic Anemia

VI. Disorders of Hemoglobin

- Hemoglobins: Normal and Abnormal

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- **Sickle Cell Disease**
- The Thalassemias and Thalassemia syndromes

VII. The Phagocyte System

- The Phagocyte System and Disorders of Granulopoiesis and Granulocyte Function

VIII. The Immune System

- **Cell-Mediated and Humoral Immunity and the Regulation of Immune Responses**
- **Primary Immunodeficiency Diseases**

IX. Storage Diseases

- Storage Diseases of the Reticuloendothelial System
- Role of Stem cell transplantation

X. Hemostasis

- Blood Platelets and the Vessel Wall
- Blood Coagulation
- The Molecular Basis of Fibrinolysis
- Clinical and Laboratory Approach to the Patient with Bleeding
- Inherited Platelet Disorders
- Hemophilia and von Willebrand Disease
- Rare Hereditary Coagulation Factor Abnormalities
- Inherited Disorders of Thrombosis and Fibrinolysis
- Acquired Platelet Defects
- Acquired Disorders of Hemostasis

XI. Supportive Therapy

- Psychologic Aspects of Leukemia and Hematologic Disorders
- Infectious Complications in children with Hematologic Disorders
- Transfusion: indications, safety, blood components/ apheresis, transfusion reactions

XII. Hematologic Manifestations of Systemic Diseases

- Hematologic Manifestations of Systemic Diseases
- Special issues in Children of the Developing World
- Approach to hepatosplenomegaly in infant/ child

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XIII. MANAGEMENT OF COMMON CANCERS OF CHILDHOOD (HEMATOLOGICAL)

- Acute lymphoblastic leukemia
- Acute Myelogenous Leukemia
- Chronic Leukemias of Childhood
- Myeloproliferative and Myelodysplastic Disorders
- Hodgkin lymphoma
- Malignant Non-Hodgkin Lymphomas in Children
- Lymphoproliferative Disorders and Malignancies Related to Immunodeficiencies
- The Histiocytoses

XIV. SUPPORTIVE CARE OF CHILDREN WITH CANCER

- Oncologic Emergencies
- Hematologic Supportive Care for Children with Cancer
- Infectious Complications in Pediatric Cancer Patients
- Nutritional Supportive Care
- Symptom Management in Supportive Care
- Nursing Support of the Child with Cancer
- Rehabilitation of the Child with Cancer
- Psychiatric and Psychosocial Support for the Child and Family
- The Other Side of the Bed: What Caregivers Can Learn from Listening to Patients and Their Families
- Ethical Considerations in Pediatric Oncology

Posting Rotation

S No.	Posting	Duration (mo)
1	Acute Leukemia ward	06
2	Thalassemia/Hemophilia ward	03
3	The bone marrow transplant unit	01



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Posting in allied fields

1.	Lab hematology	02
2.	Medical Genetics	15 days
3.	Transfusion Medicine	15 days

Method for Computing Course Outcome

Course I - Basic Pediatric Hematology

Assessment of the student will be done base on the following academic activities.

1. Seminar presentation
2. Journal Club
3. Micro-teaching
4. Case discussion during academic hours
5. Case presentation and Discussion during ward rounds

Course II - Applied Pediatric Hematology

1. Seminar presentation
2. Journal Club
3. Micro-teaching

Method for Computing Program Outcome

The assessment of the fellow will be done base on

- A. Log Book:** Every candidate shall maintain a work dairy and record his/ her participation in the training programs conducted by the department such as journal reviews, seminars, etc. Special mention should be made of the presentations and procedures performed by the candidate. The student's monthly performance will be recorded by the faculty of the department/laboratory where he / she has worked. The logbook shall be scrutinized and certified by the Head of the Department and presented in the university examination.

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B. Research:

- iii. Participate in ongoing Departmental projects/plan a new study
- iv. Original paper published/presented in national Conference

Amant Lal *Netim Lagay* *Harsh* *Manoj* *Ravi* *Ram*

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Method for computing program outcome;

The summative assessment examination shall be done in two components

A. Theory examination: will comprise of two papers of 100 marks each and representing the two courses included in the program. The passing percentage will be 50%.

Theory -

Total marks - 200

S No.	Papers	Max. Marks
1	Basic Pediatric Hematology	100
2	Applied & recent advances related to Pediatric Hematology	100
Total Marks		200

B. Practical -

Total marks - 300

S No.	Exercise	Max. Marks
1	Clinical Competence Long Clinical Cases (01) Marks 80 Short cases (02) Marks 70 (35+35)	150
2	Practical Skin Laboratory Spots (05) 25 marks Microscopy Slides (05) 25 marks Clinical Ward Rounds 50 marks	100
3	Viva - Voce	50
Total Marks		300

Marks required passing the examination: The candidate should obtain a minimum of 50% separately in theory, clinical and laboratory examination. Viva will be added to the theory.

In addition to the above mentioned formal examination, each student will be evaluated for the competence obtained in the six areas listed below on day to day basis:

- o. **Patient care:** about appropriate and effective for management of health problems and health promotion. Compassionate in patient care
- p. **Medical Knowledge:** about established and developing clinical and cognate (eg. Epidemiological and socio-behavioral) sciences and its application to patient care.
- q. **Practise based learning and improvement.** That involves investigations evaluation of their own patient care.

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- r. **Interpersonal and communication skills:** that result in effective communication and information exchange with patients, their families and other health care givers.
- s. **Professionalism:** as manifested through a commitment to carrying out professional responsibilities and adherence to ethical principles.
- t. **System-based practise:**
- u. as manifested by actions that demonstrate an awareness and responsiveness to the larger context and system of health care.

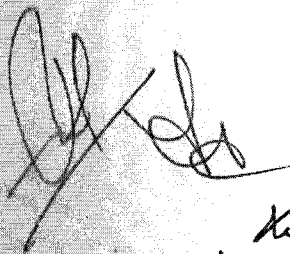
Revision in the Syllabus:

The following topics have been included in the curriculum.

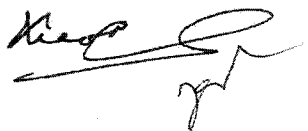
1. Principles of gene therapy in conditions such as sickle cell disease and hemophilia
2. Revised classification of Hematolymphoid malignancies
3. Recent advances in immunotherapy of hematological malignancies
4. Application of flowcytometry in diagnosis of non-malignant hematological disorders
5. Newer drugs in management of patients with congenital bleeding disorders
6. Developmental and psychological issues in childhood cancer survivors.



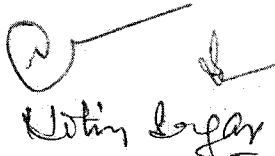
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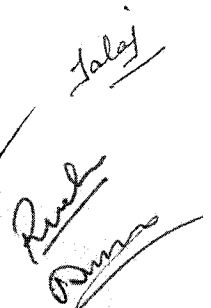
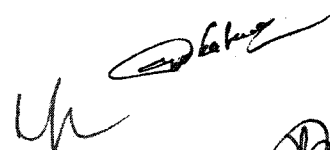
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