Pediatric Hematology-Oncology Fellowship Training Program

The Children’s Hospital at Montefiore
Albert Einstein College of Medicine-Montefiore Medical Center

SUMMARY…………………………………………………….Page 2

PROGRAM GOALS AND OBJECTIVES…………..Page 3

CLINICAL EXPERIENCES………………………………Page 4

PROGRAM ORGANIZATION…………………………Page 5

TEACHING RESOURCES……………………………Page 6

CORE CURRICULUM………………………………....Page 7

RELATIONSHIP TO OTHER PROGRAMS…………Page 8

FACULTY………………………………………………..Page 9
SUMMARY

The Children’s Hospital at Montefiore (CHAM) is one of the most technologically advanced hospitals for children in the world. Staffed by the nationally renowned faculty of the Albert Einstein College of Medicine, our pediatric specialists and caregivers are ranked among the best in the nation. Along with our outstanding medical care, CHAM’s unique integration of architecture, technology, education and inspiration is designed to engage children in a voyage of discovery and learning that can last a lifetime.

From family centered care that focuses on the whole child, to the bedside computers that can transport them to NASA’s space station and beyond, we’ve created a hospital that brings healing, education and new possibilities to children – a model for children’s hospitals in the 21st century.

Despite a population that approximates that of Philadelphia, the Bronx has only one comprehensive tertiary care hospital for the estimated 400,000 children in its service area. The Children’s Hospital at Montefiore is the only medical center in the area that provides the multi-disciplinary care needed for children with cancer and complex blood disorders. In addition to providing state-of-the-art care, The Children’s Hospital at Montefiore offers unique expertise in caring for a diverse socio-economic patient population.

Our three-year training program is certified by the ACGME and is part of The Albert Einstein College of Medicine Pediatric Residency Training Program. The Albert Einstein Cancer Center was among the first cancer centers to be funded by the National Cancer Institute in 1972, and the Section of Pediatric Hematology-Oncology participates in the Cancer Center’s activities and research as well as the Children’s Oncology Group. The AECOM Comprehensive Sickle Cell Center is the only Comprehensive Sickle Cell Center in the tri-state area, providing research and clinical opportunities to our trainees.

Combining a dynamic children’s hospital, a highly-respected medical school, a broad-based patient population, a dedicated and diverse faculty with the support of an NCI Cancer Center and a National Institute of Health Comprehensive Sickle Cell Program, The Section of Pediatric Hematology-Oncology Fellowship Training Program offers its trainees the variety of clinical, academic, basic science and clinical research opportunities needed to serve as a platform for an outstanding career in our field.
PROGRAM GOALS AND OBJECTIVES

The principal goal of this program is to train fellows to become excellent and independent pediatric hematologists-oncologists, prepared for an academic career incorporating clinical care, research, and education.

The Section of Pediatric Hematology and Oncology at The Children’s Hospital at Montefiore (CHAM) has undergone a period of marked expansion. The enhanced clinical program improves the care and quality of life of children being treated for cancer and blood disorders and optimizes our Fellowship Training Program. These changes include recruitment of new faculty, the development of a dedicated inpatient hematology-oncology unit, enhanced ambulatory care services, and the development of a bone marrow transplantation program.

Our Section Chief, Richard Gorlick, MD, was recruited to The Children’s Hospital at Montefiore from Memorial Sloan-Kettering Cancer Center in the Spring of 2004. In addition to his clinical expertise in cancer care, Dr. Gorlick is a national leader in basic science and clinical research in pediatric cancer. He is active and well known in the Children’s Oncology Group where he chaired the Young Investigator Committee, leads the Bone Tumor Resource Laboratory and is involved in clinical trial design.

Dr. Catherine Driscoll was recruited from the Children’s National Medical Center and joined us at CHAM this academic year as the Director of Pediatric Hematology. Dr. Driscoll is well known for her research and clinical work on sickle cell disease. In the New York City region, the only designated Comprehensive Sickle Cell Center is the Albert Einstein College of Medicine/Montefiore Medical Center. With Dr. Driscoll’s arrival, additional programmatic development in the areas of hemophilia, platelet disorders and thrombosis are anticipated.

Dr. Adam Levy was recruited from NYU Medical Center to serve as the Director of the Fellowship Training Program. A former chief resident and chief fellow, Dr. Levy has a strong interest in medical education and has been acknowledged for outstanding teaching throughout his career. The training program has been revitalized and restructured to foster academic as well as clinical development of our trainees.
CLINICAL EXPERIENCES

Patients are followed from birth to young adulthood in the new Children’s Hospital at Montefiore (CHAM). CHAM is situated in an urban community and has an ethnically, culturally and socio-economically diverse patient population. CHAM provides the community with primary care clinics, multiple subspecialty clinics, and a capable emergency department. CHAM is the major tertiary care facility in the borough. As a result, there is the opportunity to see and diagnose patients with a wide variety of illnesses at all stages. Patients followed by the division include about 350-400 pediatric patients with malignancies, about 300 with hemoglobinopathies, and many others.

There is a Pediatric Day Hospital where patients are seen for chemotherapy, transfusions, infusions and procedures. The majority of our chemotherapy infusions take place in the Day Hospital in the ambulatory setting allowing our patients to be at home as much as possible. Fellows perform procedures including bone marrow aspirations, bone marrow biopsies, and lumbar punctures with administration of intrathecal chemotherapy. Procedures are performed with an attending anesthesiologist to ensure patient comfort.

Outpatient clinic sessions are held daily with an average of 20 patients seen per session. All patients are seen at the same site providing centralized care and the opportunity for the physician’s to interact with consulting and referring services.

Throughout the training period the attending staff is always available for supervision and guidance. Early in the fellowship period this supervision is quite close but it decreases as the trainee develops experience and confidence, so that in the third year the fellow is acting as a junior attending. Support staff includes certified pediatric oncology nurses, pediatric nurse practitioners, two full-time social workers, child life workers, pediatric laboratory technicians, and pediatric phlebotomists.

The fellow is on “first call” for nights and weekends every third week. During times when another fellow is on vacation (two months per year) the call may be every other week. Because of the excellent quality of the pediatric house staff, almost all “after hours” issues can be handled by telephone. Fellows are only responsible for calls regarding inpatients and patients in the Emergency Department.

After the first year of training, fellows may elect to spend one week as the physician for a camp for children with cancer located about two hours from New York City. Dr. Gorlick is the Medical Director of the camp and faculty, nurses and trainees have found the experience to be quite valuable and enjoyable.
**PROGRAM ORGANIZATION**

**Year 1**
The first year of the Fellowship Training Program includes 9 months of inpatient service at which time the first year fellow is responsible for the daily management of inpatient hematology and oncology patients as well as hematology consultations from the broader inpatient pediatric population. The fellow’s active participation for each patient will include a daily review of problems, daily physical exam, daily review of laboratory results and medications, review of imaging studies, review of other physical assessments, and formulation of a daily treatment plan. The fellow will round at least once daily with the general pediatrics house staff and play an active role in clinical teaching. The fellow will be closely supervised by a full-time member of the Pediatric Hematology-Oncology faculty. The inpatient team is comprised of one attending physician, a fellow, and four general pediatrics house officers.

Clinical exposure will include patients with a wide variety of hematologic-oncologic problems including, but not limited to:

<table>
<thead>
<tr>
<th>Leukemias</th>
<th>Hemolytic Anemias</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lymphomas</td>
<td>Disorders of red blood cells</td>
</tr>
<tr>
<td>Brain and Spinal Cord Tumors</td>
<td>Nutritional anemias</td>
</tr>
<tr>
<td>Sarcomas</td>
<td>Platelets disorders</td>
</tr>
<tr>
<td>Embryonal Tumors</td>
<td>Coagulopathies</td>
</tr>
<tr>
<td>Neuroblastoma</td>
<td>Hematologic disorders of the newborn</td>
</tr>
<tr>
<td>Wilms’ Tumor</td>
<td>Transfusion medicine</td>
</tr>
<tr>
<td>Rare tumors</td>
<td>Immunodeficiencies</td>
</tr>
<tr>
<td>Bone Marrow Failure Syndromes</td>
<td>Stem cell transplantation</td>
</tr>
<tr>
<td>Hemoglobinopathies</td>
<td>(including stem cell harvest)</td>
</tr>
</tbody>
</table>

Four weeks of the first training year are reserved for electives during which time the fellow is exposed to disciplines related to the practice or field of pediatric hematology-oncology. Appropriate electives include, but are not limited to:

- Radiation Oncology
- Blood Bank
- Oncologic Surgery
- Clinical Hematology Laboratory
- Radiology
- Hematopathology/Cytogenetics

Four weeks are reserved for vacation for each year
PROGRAM ORGANIZATION

Year 2 and 3
The second and third year are designed for protected research time, and as such, the second and third year fellows will not be responsible for inpatient clinical management during weekdays. Each fellow will be responsible to be “on call” from home on a rotating basis to respond to questions from the general pediatric house staff on weekday nights and to round in the hospital with an attending physician on weekends and holidays.

Fellows in the second and third year will have a weekly continuity clinic where they will see both hematology and oncology patients under the supervision of an attending physician.

The Hematology-Oncology fellow is the "first line" consultant to the pediatric house officers on the inpatient and emergency room services for any problems or questions that they have. There are always informal “bedside” consultations brought to the attention of the team by junior house staff, and the fellows are constantly assuming a role as teachers, done with appropriate supervision by the faculty. Fellows also become more responsible for teaching at clinical conferences and didactic sessions as they gain experience. During the second and third years they give some of the pediatric teaching conferences.

Each fellow leads 3-4 Protocol Review sessions per year for the section and rotating house staff. Each fellow actively participates is traditional journal club on the departmental level as well as a clinical journal club within the section.
TEACHING RESOURCES

A double-headed microscope is available in the clinic, as well as a multi-head microscope to expand our teaching and conference capabilities. Blood counts and smears are available and can be reviewed while the patient is still in the clinic. All bone marrows and spinal fluid cytospin preparations are reviewed with the fellows, as well as peripheral blood smears when indicated. The division maintains a large collection of teaching slides, both laboratory slides and kodachromes, which are available for review.

The Montefiore Medical Center (MMC) library includes a large selection of journals, books and computer resources. Word processing and statistical software are free and fully available for house staff including fellows. Free remote access to Medline is available as well as online journals through The Albert Einstein College of Medicine (AECOM).

The Department of Pediatrics and the Section of Pediatric Hematology-Oncology also maintain a large selection of reference books and periodicals that are available 24 hours a day. The AECOM medical library is, located on the east campus 15 minutes away by car or shuttle bus, has extensive resources and is open and available daily until midnight.

The Section of pediatric hematology - oncology has its own computers, available to the fellows 24 hours a day, with access to laboratory results, radiographic images, the internet, e-mail, COG protocols, NCI/PDQ, several graphics programs, and databases. A scanner for teaching or presentations is available.

The Department provides support for each fellow to attend one national conference each year.
CORE CURRICULUM

Tumor Board
Regular Tumor Board meetings are a requirement for the fellowship program and necessary to optimize patient care. Tumor Board meets weekly and participants include the Pediatric Hematology-Oncology faculty, fellows, nurse practitioners, data managers as well as faculty from Radiology, Pathology, Surgery, Radiation Oncology, Nuclear Medicine, and other disciplines.

Journal Club
Traditional Journal Club
As part of the Fellowship Research series within the Department of Pediatrics, fellows from all sections are required to participate in a monthly traditional Journal Club (i.e. in depth review and critical analysis of an original research article from the literature).

Clinical Journal Club
The purpose of the Clinical Journal Club is to be knowledgeable about current, major advances in the clinical practice of pediatric hematology/oncology. Since it is difficult to review all the journals where important new information is likely to be published, the intent of this journal club is to cover the scope of clinically important publications from a variety of journals. Rather than discuss a specific article at length, we focus on highlighting new issues as they appear in the literature. Discussions for each article are brief: a short description of the study, critical analysis of methods, results, and should the conclusions of the study change our practice. This occurs monthly within the Section of Pediatric Hematology-Oncology.

Protocol Review
Protocol reviews are an outstanding opportunity to discuss the details of a clinical trial in greater depth. Protocol reviews are monthly sessions lead by a fellow with the support of a faculty member. The presenting fellow provides a background discussion of the disease and a brief history of previous treatment plans. Recent literature and other studies regarding the disease are included. A detailed description of the objectives and design of the clinical trial are discussed along with critical analysis of the study.

Bone Marrow Slide Review
Despite the increasing reliance on flow cytometry and sophisticated studies, competent morphological review of bone marrow aspirates remains an important skill for clinical hematologists/oncologists. A monthly slide review session for the fellows is lead by a faculty member.
Palliative Care Sessions
It is a requirement of the ACGME that the training program monitor fellows’ stress and provide counseling and psychological support services when needed. Some programs take a proactive approach by including psychosocial sessions as part of the curriculum. These sessions can be open forums for fellows to discuss their concerns and stresses, but they can also be structured to discuss salient psychosocial issues important to clinical care (e.g. the day one talk, how to talk to a child with serious illness, relating to families of sick children, etc.)

Fellows’ Research Conferences
As part of the Fellowship Research Series within the Department of Pediatrics, fellows from all sections are required to participate in didactic sessions on research methodology. The Research Series also allows each fellow to present the progress of his/her research projects. In addition to these Department level meetings, each 2nd and 3rd year fellow will present a review of her/his research project to the section yearly.

Lecture Series
In addition to the above sessions, a core lecture series is vital to ensure that basic topics in Pediatric Hematology-Oncology are reviewed for the fellows. Weekly lectures are given by an attending within the section and from other faculty as appropriate. The range of topics covers the spectrum of Pediatric Hematology-Oncology with emphasis drawing on the interests and expertise of faculty within the Section as well as The Children’s Hospital and AECOM.
RELATIONSHIP TO OTHER PROGRAMS

We are fortunate to be a vital program within a thriving children’s hospital. The pediatric hematology-oncology service interacts extensively with the pediatric house staff, attending staff, medical students, and other pediatric subspecialty services. There are frequent clinical conferences at which patients are discussed with the participation of the involved subspecialty services. There are daily inpatient pediatric radiology rounds at which all x-ray studies of the previous day are reviewed. Many patients require coordination of care with other subspecialty services including GI and nutrition, infectious disease, genetics, immunology, pulmonology, cardiology, neurology, nephrology, surgery, neurosurgery, endocrinology, and psychiatry. There is interaction with the pediatric critical care service and the anesthesia service in relation to painful procedures for which sedation is provided. There is a Pain Service that is available for inpatients that have particular problems with severe pain. Other services, such as radiation oncology and pathology, are always available for consultation and discussion.

There is a monthly hematopathology conference at which bone marrow aspirations and biopsies, as well as immunophenotyping, and lymph node biopsies of patients who were evaluated during the preceding month are reviewed. The Department of Pediatrics strongly supports and funds interdivisional research projects.

Our Palliative and Complementary Care Program is lead by Dr. Karen Moody and it is actively involved in patient evaluation and care throughout the patient’s treatment. Home visits are made for patients to ensure their needs are met and to provide oversight regarding home care. Fellows are encouraged to participate in the home visits of our patients.

Strong emphasis is placed on psychosocial issues that affect the lives of children and adolescents with serious illnesses and their families. Weekly behavior rounds are held on both the children’s and adolescent units to discuss psychosocial issues, and hematology-oncology social service rounds are held weekly. In addition, MMC has a strong ethics department that is associated with the world-renowned Hastings Institute and includes an ethicist and a lawyer who specializes in ethical issues. This team is represented on the Institutional Review Board for the Protection of Human Subjects and is available for consultations and discussions relating to ethical issues including families who refuse therapy, life support in controversial cases, treatment of children with severe mental retardation, and other such situations.

Pediatric Grand Rounds, which are held weekly, cover a wide range of subjects in general pediatrics and all subspecialties. In addition, there are daily general pediatric teaching conferences that the fellows are
invited to attend and a weekly “Professors’ Rounds” at which faculty members from all subspecialties
discuss interesting patients and their work-up and differential diagnosis starting with the patient’s initial
historical information.

The Section interacts with the hematology and oncology divisions of the Department of Medicine in
several ways. Both divisions have weekly grand rounds which may be attended by the pediatric fellows
and cover topics including hemoglobin structure and function, iron metabolism, red cell membranes,
coagulation, the phagocytic system, splenic function, cell kinetics, immunology and
immunophenotyping, the characteristics of malignant cells, molecular genetics, cytogenetics, and many
other subjects. There are also regular lymphoma conferences and bone marrow transplantation
conferences, at which both adult and pediatric patients are presented. There is a weekly conference of
the Sickle Cell Center which does not directly see children, but which interacts closely with pediatric
hematology-oncology and there is a joint transition program for older adolescents.
FACULTY

Richard Gorlick, MD: Section Chief, Pediatric Hematology-Oncology
Dr. Gorlick directs a research laboratory devoted to studying drug resistance and therapeutic target identification for sarcomas, leukemias and other pediatric malignancies. Areas of particular interest include the pathogenesis of osteosarcoma, antifolate resistance and therapeutic inhibitors of signal transduction. Dr. Gorlick’s clinical focus is bone and soft tissue sarcomas that occur in children, adolescents and young adults.

Catherine Driscoll, MD: Director of Pediatric Hematology
Dr. Driscoll’s research interests focus on determining the genetic modifiers of sickle cell disease (SCD). Efforts to define these genetic modifiers will focus on collaborations with laboratories with expertise in sickle transgenic mouse models in a study of expression microarrays and identification of candidate genes for stroke risk and post-stroke brain injury in the sickle cell mouse model.

Moshe Bell, MD
Dr. Bell is involved in studies of novel imaging techniques, and novel applications of established imaging techniques, in pediatric oncology patients. He is also involved in the study of several novel therapeutic approaches for pediatric oncology patients. Dr. Bell’s clinical focus is the treatment of pediatric solid tumors including sarcomas, Wilms’ tumor and neuroblastoma. Dr. Bell is involved in pediatric housestaff education.

Paul Jubinsky, MD, PhD
Dr. Jubinsky devotes seventy percent of his time and effort to laboratory research. He has discovered a novel mitochondrial protein involved in GM-CSF signal transduction, which he has named Magma. He is presently studying the function of M magma in mitochondria, in malignancies and in hypoxia. Dr. Jubinsky is also characterizing a human macrophage disorder by studying monocytes from a patient with recurrent infections. Studies are focused on determining the underlying defect genetic defect. Dr. Jubinsky is the principal investigator of a multicenter supportive care study in oncology patients. He is also involved in the development of a protocol for the treatment and study of histiocytosis.

E. Anders Kolb, MD
Dr. Kolb directs a research laboratory devoted to the preclinical testing of new agents and treatment approaches for pediatric oncology. The laboratory tests new treatment combinations and is interested in developing new model drug testing systems. Dr. Kolb clinically is interested in bone marrow transplantation and the treatment of patients with hematologic malignancies including leukemia and lymphoma. Dr. Kolb has established a pediatric bone marrow transplantation unit.
Adam Levy, MD
Dr. Levy's clinical interests focus on brain tumors. He has a strong interest in medical education and is the director of the pediatric hematology-oncology fellowship training program. Dr. Levy is The Children's Hospital's principal investigator for the Children's Oncology Group, an NCI-sponsored cooperative group. Dr. Levy also directs the outpatient pediatric hematology-oncology day hospital activities.

Karen Moody, MD
Dr. Moody’s current research interests include studying the patterns of utilization and the benefits derived from complementary care modalities in pediatric oncology. Dr. Moody is interested in improving patient end of life care and will direct outreach services at partnered facilities. Dr. Moody in addition to clinical interests in palliative care has broad interests in general hematology and general oncology.

Thomas Moulton, MD
Dr. Moulton is working on the development of a protocol for the treatment and study of desmoplastic small round cell tumors. Dr. Moulton clinically focuses on pediatric sickle cell disease, general hematology and general oncology.

Eva Radel, MD
Dr. Radel is the former Section Chief and continues to play an active role within the Section. Dr. Radel is involved in the clinical care of patients with a broad variety of hematologic and oncologic disorders. She will be establishing a long-term follow up clinic for cancer survivors.