1. **DURATION OF ROTATION:** One (1) block/four (4) weeks.

2. **ELIGIBILITY:** PL-2, or 3

3. **POSITION:** One resident per month.

4. **FACILITIES USED:**
   - Pediatric Hematology/Oncology Clinic, WRNMMC; 4th Floor America Building (Building 19)

5. **TEACHING STAFF:**
   a. Col Tom Newton MD  
      Chief, Pediatrics, WRNMMC  
      Staff, Pediatric Hematology/Oncology, WRNMMC
   b. LTC Dina Parekh MD  
      Chief, Pediatric Hematology/Oncology Service, WRNMMC  
      Staff, Pediatric Hematology/Oncology, WRNMMC
   c. COL(ret) Kip R. Hartman, MD  
      Staff, Pediatric Hematology/Oncology, WRNMMC
   d. COL Ken Lieuw MD PhD  
      Staff, Pediatric Hematology/Oncology, WRNNMC
   e. LtCol Allen Stering MD  
      Staff, Pediatric Hematology/Oncology, WRNMMC  
      Associate Program Director, PHO Fellowship
   f. Col(ret) Gary Crouch MD  
      Associate Professor and Vice Chair, Department of Pediatrics, USUHS  
      Staff, Pediatric Hematology/Oncology, WRNNMC
   g. COL Anne Warwick MD MPH  
      Associate Professor, Department of Pediatrics, USUHS  
      Director, Pediatric Hematology/Oncology Fellowship Program  
      Staff, Pediatric Hematology/Oncology, WRNMMC
   h. Col Wanda Salzer MD  
      Director, CDMRP, Fort Detrick, MD  
      Staff, Pediatric Hematology/Oncology, WRNMMC

6. **GENERAL GOALS & OBJECTIVES:**

The Pediatric Hematology/oncology rotation is intended to familiarize pediatric residents with common problems in hematology, oncology, and coagulation they may encounter during their medical careers. They are expected to become familiar with, and competent in, the management of common anemias and coagulation disorders. They should be able to perform an initial evaluation as well as stabilize a child with a suspected malignancy. The residents should become familiar with basic oncology drugs and their common side effects.

7. **COMPETENCY-BASED GOALS AND OBJECTIVES:**

   Goal 1: **MEDICAL KNOWLEDGE**
Normal Versus Abnormal (Hematology/Oncology). Understand how to determine the difference between normal and pathologic states related to the hematologic and lymphatic systems.

Objectives:
   a. Discuss the changes that occur over time in the hematologic indices in the normal child (e.g., hemoglobin, hematocrit, MCV, etc.).

Conditions Generally Referred (Hematology/Oncology). Understand how to diagnose and initiate management of hematologic/oncologic disorders which generally need referral.

Objectives:
   a. Discuss the differential diagnosis and clinical presentation of these conditions:
      1. Anemia (exclusive of common iron deficiency or transient erythropenia)
      2. Abnormal bruising or bleeding (inherited and acquired)
      3. Major complications of inherited bleeding disorders
      4. Hemoglobinopathies (sickle cell and other sickling disorders), including severe pain crisis, fever, stroke, sequestration, and aplastic crises
      5. Urgent conditions in children under treatment for cancer, including fever while on chemotherapy, chicken pox exposure or illness, bleeding
      6. Neutropenia
      7. Thrombocytopenia
      8. An abdominal mass
      9. Increased intracranial pressure due to a suspected brain tumor
      10. Conditions that may predispose to malignancy (e.g., neurofibromatosis, Beckwith-Wiedeman syndrome, retinoblastoma, and familial cancer)

Common Malignancies. Understand the presentation, pathophysiology, and prognosis of important malignancies in children and adolescents.

Objectives:
   a. Identify the presenting complaints, principles of current therapy, prognosis, and long term complications due to the disease or therapy for these conditions:
      1. Leukemia (ALL, AML)
      2. Brain tumor
      3. Hodgkin’s and Non-Hodgkin’s lymphoma
      4. Neuroblastoma
      5. Wilms tumor
   b. For these common pediatric signs and symptoms, describe clinical findings that would warrant screening for malignancy:
      1. Adenopathy
      2. Headache
      3. Limb pain
      4. Hepatomegaly and/or splenomegaly
      5. Persistent fever and malaise
      6. Seizures
      7. Weight loss
   c. Describe common acute side effects of commonly used chemotherapeutic drugs (e.g., cyclophosphamide, vincristine, doxorubicin, and methotrexate).
   d. Describe common late complications of childhood cancer treatment that may present in childhood or adolescents (e.g., learning disabilities, endocrine suppression, second cancers).

Iron Disorders. Understand the appropriate methods of diagnosis and management of a child with disorders relating to iron.
MCHL-PHO
SUBJECT: Pediatric Hematology/Oncology Rotation

Objectives:
   a. Describe the normal requirements, absorption, and metabolism of iron from birth through adolescence.
   b. Describe and use appropriately laboratory tests to screen for, treat, and follow the therapy of iron deficiency.

Blood Products. Understand indications and complications related to the use of blood products.

Objectives:
   a. List the appropriate indications and potential risks of various blood products (red blood cell products, platelet concentrates, coagulation factors).
   b. Be aware of alternatives to blood transfusions, e.g., erythropoietin and other cytokines.
   c. Discuss the reasons for leukofiltration and/or irradiation of blood products.

Goal 2: PATIENT CARE

Demonstrate a family-centered, compassionate, effective, and age appropriate approach toward the evaluation and management of children referred to the pediatric hematology/oncology service.

Common Conditions Not Referred (Hematology/Oncology). Understand how to diagnose and manage hematological disorders which generally do not need referral.

Objectives:
   a. Recognize, evaluate, and manage without referral these conditions:
      1. Iron deficiency
      2. Thalassemia trait
      3. Transient erythropenia of infancy or childhood
      4. Minor, common reactions to blood transfusions
      5. Sickle cell trait

Conditions Generally Referred (Hematology/Oncology). Understand how to diagnose and initiate management of hematologic/oncologic disorders which generally need referral.

Objectives:
   a. Diagnose, provide initial evaluation and management, and provide appropriate referral of the child presenting with these conditions:
      1. Anemia (exclusive of common iron deficiency or transient erythropenia)
      2. Abnormal bruising or bleeding (inherited and acquired)
      3. Major complications of inherited bleeding disorders
      4. Hemoglobinopathies (sickle cell and other sickling disorders), including severe pain crisis, fever, stroke, sequestration, and aplastic crises
      5. Urgent conditions in children under treatment for cancer, including fever while on chemotherapy, chicken pox exposure or illness, bleeding
      6. Neutropenia
      7. Thrombocytopenia
      8. An abdominal mass
      9. A mediastinal mass
      10. Conditions that might predispose to malignancy (e.g., neurofibromatosis, Beckwith-Wiedeman syndrome, retinoblastoma, and familial cancer)

Iron Disorders. Understand the appropriate methods of diagnosis and management of a child with disorders relating to iron.
MCHL-PHO
SUBJECT: Pediatric Hematology/Oncology Rotation

Objectives:
   a. Identify the features of iron deficiency including anemia.
   b. Manage iron deficiency appropriately (e.g., dietary management, replacement therapy, parent education, and follow-up).

Prevention (Hematology/Oncology). Understand the pediatrician's role in the prevention of hematologic/oncologic disorders.

Objectives:
   a. Provide dietary counseling to parents about the prevention of iron deficiency.
   b. Counsel patients who have a sickle hemoglobinopathy about the importance of antibiotic prophylaxis and urgency of evaluation for fever.

Goal 3: INTERPERSONAL SKILLS AND COMMUNICATION

Demonstrate effective communication skills with families and patients referred to the pediatric hematology-oncology service. Demonstrate effective communication skills during interactions with nurses and other doctors involved in the care of each patient. Maintain comprehensive and concise written consultations and notes on each patient seen.

Goal 4: PROFESSIONALISM

Demonstrate a commitment to patient care and learning by timeliness, responsibility for patients seen on the service, and sensitivity to cultural diversity.

Goal 5: PRACTICE BASED LEARNING AND IMPROVEMENT

Demonstrate the ability to use the medical literature effectively and cogently in order to evaluate pediatric hematology and oncology conditions and/or symptoms, as well as to modify management plans appropriately based upon the information obtained from the literature. Demonstrate receptiveness to feedback provided during the rotation with appropriate modification of behavior to improve performance.

Goal 6: SYSTEMS-BASED PRACTICE

Demonstrate understanding of cost issues related to pediatric hematology-oncology imaging studies, lab tests, medications and hospitalizations. Demonstrate understanding of health care prevention and maintenance related to pediatric hematology and oncology disease.

8. INSTRUCTIONAL PLAN:

The house officer will be given reading assignments on topics related to the individual objectives outlined above. The majority of these topics will be covered in brief didactic sessions that will include “unknown” patient scenarios, smears of peripheral blood and bone marrow aspirate/biopsies, physical and radiographic features via photographs, and live patients.

9. REFERENCES:

   a. Residents will have access to the Pediatric Hematology-Oncology Clinic reference text collection.

10. RESIDENT RESPONSIBILITIES:
MCHL-PHO
SUBJECT: Pediatric Hematology/Oncology Rotation

The house officers will be responsible for the initial evaluation of outpatient consults, and selected established patients in the pediatric hematology/oncology clinic. They are expected to obtain pertinent history, perform complete physical examinations, and obtain appropriate laboratory/imaging information. They will then present their findings as well as their interpretations of the available data to include a differential diagnosis and treatment plan.

The house officer will be responsible for reading the assigned material, and to discuss the illustrative cases with the clinic staff. The reading material and corresponding cases will be divided into four weekly blocks:

a. Anemias
b. Neutrophil disorders and Thrombocytopenias
c. Coagulation problems
d. Common oncologic disorders

11. METHOD OF EVALUATION:

The resident’s proficiency in physical diagnosis, laboratory interpretation, and knowledge will be evaluated during patient encounters in clinic and during case discussions. A formal, prepared case discussion using primary literary sources will also be assessed. Pre and post-tests will be used for learning. During the didactic sessions the residents will be asked to describe the physical diagnosis and interpret lab data relevant to the material being covered. Verbal feedback will be given mid-rotation, and a formal written evaluation will be completed at the end of the rotation. Observations regarding the resident’s professionalism, interpersonal skills and communication, and patient care will be obtained from the pediatric hematology-oncology staff, fellows, and nurses.

POC for overall coordination of rotation is LTC Dina Parekh MD.

LTC Dina S Parekh, MD
Chief, Pediatric Hematology/Oncology Service

Concur:

Thomas Newton, Col, USAF, MC,
Chief, Department of Pediatrics

Greg Gorman, CDR, MC, USN
Pediatric Residency Program Director
National Capital Consortium