



Children's Hospital



University of Missouri – Columbia
Department of Child Health
Division of Hematology/Oncology
Rotation Overview

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Introduction

The rotation in Child Health – Hematology/Oncology at the University of Missouri – Columbia School of Medicine is designed to provide a similar clinical experience for first year residents and students alike. During their rotation in the Division of Hematology/Oncology, residents and students work very closely with the faculty and staff. The rotation is both inpatient and outpatient-based, giving residents/medical students a more encompassing clinical experience. Residents and students participate in the care of established hematology and oncology inpatients and outpatients, and may be asked to assist with inpatient and outpatient consultations. Special electives in hematopathology or blood banking can also be arranged under the supervision of faculty members.

Overview

At the end of the rotation, residents and students alike will be able to identify, diagnose and treat most of the hematology/oncology problems that they will encounter in their practice. Many of these goals will be accomplished during the rotation by review of commonly encountered hematological and oncological problems.

Basic knowledge of the etiology and pathogenesis of common disorders, as well as some uncommon conditions that illustrate essential elements of disease pathophysiology, is essential and is reviewed in detail with the faculty.

Residents will receive a National Institutes of Health book on the management of sickle cell disease and will have access to divisional copies of other relevant textbooks in hematology/oncology. They actively participate in informal discussions, telemedicine conferences, weekly divisional meeting, tumor board and other relevant seminars.

Much of the learning is case based and takes place in the office, in the clinic and at the bedside. Interesting cases will serve as the basis to direct their reading during the rotation. At the beginning of the rotation, several important topics will be chosen by the attending for special emphasis. Informal sessions will be given by the faculty. In addition, the resident/student will be asked to review a particular subject for subsequent presentation in for members of the division during each week of the rotation.

Throughout the rotation, residents and students will have access to members of the faculty, who specialize in all areas of hematology and oncology, with the exception of bone marrow transplantation. Thus, residents and students receive broad exposure to all areas of pediatric hematology/oncology through attendance at ambulatory clinics, select case discussions of the day's patients and short didactic sessions.

Residents are expected to provide care for the inpatients on the service and both residents and students see consultations referred by other services in the Children's Hospital or referring physicians in the community. Typically the resident or student reviews the case, elicits a focused history, examines the patient and then presents their findings, differential diagnosis and plan to the inpatient Attending Physician. S/he may also review the literature for interesting consults, and writes the consult note, co-signed by the Attending

Physician.

Residents are highly encouraged to observe and, under supervision of the faculty, perform some invasive procedures (lumbar puncture, bone marrow aspirate and biopsy). Residents and students are also encouraged to accompany the attending physician for review of peripheral blood morphology in the hematology laboratory.

Residents and medical students are also encouraged to participate in the sickle cell outreach clinic in Sikeston, MO, which is held once every quarter. Please inquire for more details.

GOALS and OBJECTIVES:

Patient Care:

Goal: Provide family-centered patient care that is development- and age-appropriate, compassionate, and effective for the treatment of health problems and the promotion of health.

Objectives:

- Obtain accurate and appropriate medical information for each patient.
- Use a logical and appropriate clinical approach to the care of patients presenting for specialty care, applying principles of evidence-based decision-making and problem-solving.
- Describe general indications for subspecialty procedures and interpret results for families.
- See Medical Knowledge section below for further details.

Medical Knowledge:

Goal: Must consistently demonstrate proficiency in obtaining knowledge through reading of the literature, clinical discussions and weekly didactic discussions with the hematology/oncology faculty.

Objectives:

- Distinguish normal from pathologic states of the hematologic and lymphatic systems.
 - Describe the changes that occur over time in the hematologic indices of the normal infant and child (e.g., hemoglobin, hematocrit, MCV).

- Explain the findings on clinical history and examination that suggest a hematologic or oncologic disease that requires further evaluation and treatment
- Interpret clinical and laboratory tests to identify hematologic or oncologic disease (HPD, including indices and blood smear review, reticulocyte count, ESR, PT/PTT, hemoglobin electrophoresis, iron, iron binding capacity, ferritin, transferrin, uric acid, LDH, electrolytes, renal function, urinalysis)
- Evaluate, treat and/or refer patients with presenting signs and symptoms that may indicate a hematologic or oncologic disease process.
 - Develop a strategy to determine if the following presenting signs and symptoms are caused by a hematology/oncology disease process and determine if the patient needs treatment or referral:
 - Fatigue/malaise
 - Fever
 - Bruising/bleeding
 - Headache
 - Limp pain/limp
 - Seizure
 - Lymphadenopathy
 - Hepatomegaly and/or splenomegaly
 - Weight loss
 - Abdominal pain
 - Vomiting
 - Dizziness and gait disturbances
 - Nevi
- Diagnose and initiate management of patients with hematological or oncological disorders that generally need referrals

- Identify, explain and initially manage and seek consultation or refer the following hematology/oncology conditions:
 - Anemia (exclusive of common iron deficiency or transient erythropenia of childhood)
 - Abnormal bruising or bleeding (inherited and acquired)
 - Inherited bleeding disorders
 - Hemoglobinopathies (sickle cell disease), including severe pain crisis, fever, stroke, splenic sequestration and aplastic crisis
 - Urgent conditions in children under treatment for cancer, including fever and neutropenia, chicken pox exposure or illness, bleeding
 - Neutropenia
 - Thrombocytopenia, including ITP
 - Abdominal masses
 - Mediastinal masses
 - Lytic bone lesions
 - Suspected or confirmed CNS tumor
 - Conditions that might predispose to malignancy (e.g., neurofibromatosis, Bloom syndrome, Downs syndrome (transient myeloproliferative disorder), McCune Albright, familial cancer syndromes)
 - Coagulation disorders
- Discuss the presentation, pathophysiology and prognosis of important malignancies in children and adolescents
 - Summarize the common ages, presenting signs and symptoms, diagnostic procedures, principles of current therapy, prognosis and long-term complications (due to disease or treatment) for the following malignancies and conditions:
 - Leukemia (ALL, AML)
 - Brain tumors

- Hodgkin's and Non-Hodgkin's lymphoma
 - Neuroblastoma
 - Wilm's tumor
 - Soft tissue sarcomas (rhabdomyosarcomas)
 - Bone tumors (Ewing's sarcoma and osteosarcoma)
 - Retinoblastoma
 - Langerhans' cell histiocytosis
- Compare and contrast the common acute side effects of frequently used chemotherapeutic drugs, including: cyclophosphamide, cytarabine, vincristine, anthracycline compounds, methotrexate and prednisone.
- Be familiar with adjunctive medications that increase patients' tolerance of chemotherapy, e.g. erythropoietin, granulocyte colony stimulating factors
- Discuss the common late complications of childhood cancer treatment that may present in childhood or adolescence. These include: learning disabilities, endocrine suppression and second cancers.
- Discuss the appropriate methods of diagnosis and management of a patient with iron disorders.
 - Describe the normal requirements, absorption and metabolism of iron from birth through adolescence.
 - Identify the common causes and features of iron deficiency in all age groups and compare and contrast with anemia caused by chronic inflammation.
 - Describe the diagnosis and treatment of iron deficiency and discuss the follow up necessary to assure success in treatment.
 - Develop a treatment and education plan for managing iron deficiency, to include dietary management, replacement therapy, parent education and follow up.
- Understand indications for and complications related to the use of blood products.

- Explain the appropriate indications for and potential risks of various blood products (e.g., red blood cell products, platelet concentrates and coagulation factors).
- Describe alternatives to blood transfusions. These should include: erythropoietin, G-CSF.
- Describe the indications for leukofiltration, irradiation of blood products and use of CMV negative blood products.
- Summarize the signs and symptoms of a transfusion reaction. Develop an effective treatment plan to manage a transfusion reaction.
- Understand the general pediatrician's role in the diagnosis and management of patients with sickle cell disease.
 - Explain the findings on clinical history, examination and laboratory tests (including newborn screening) that suggest a diagnosis of sickle cell disease.
 - Compare and contrast the different sickle cell syndromes, including presentation, treatment and complications. These syndromes include sickle cell anemia, hemoglobin SC, and hemoglobin S beta thalassemia.
 - Discuss the common complications seen in a child with sickle cell disease. These include: hemolysis, hand-foot syndrome, anemia, aplastic crises, bone infarction, stroke, skin ulcers, pain episodes, priapism, sepsis and infections, cholelithiasis, chest syndrome, retinopathy, renal failure, and sequestration crises.
 - Outline the management of a patient who presents with a sickle crisis. These should include discussion and proper use of IV fluids, analgesics, antibiotics, oxygen, blood transfusion and indications for hydroxyurea and stem cell transplant.
 - Develop a preventive care plan for a patient with sickle cell disease, including use of folate, prophylactic antibiotics, immunizations, prompt evaluation of febrile episodes and stroke screening.
- Provide skillful medical care and empathic support to the terminally ill child and his/her family.
 - Discuss principles in the medical management of the terminally ill child and demonstrate an understanding of the goals of treatment, including involving parents in the decision-making processes, redirection of goals of

care, symptomatic management of pain, respiratory distress and nutrition, hospice care, 'do not attempt to resuscitate (DNAR) orders and termination of life support, use of bioethics committees in difficult decision-making situations.

- Discuss the principles of counseling parents regarding treatment options for terminally ill children, including the integration of relevant cultural and religious or spiritual values.
- Describe stages of the normal grieving process.
- Discuss the development capabilities of children at different ages regarding their understanding of death and dying and their manifestations of grief.
- Understand one's personal response and feelings when dealing with death and dying, including personal belief and religious/spiritual belief systems related to disease and management of the dying child and the need to share feelings with others during times of stress or death.

Practice-Based Learning and Improvement:

Goals: Demonstrate knowledge, skills and attitudes needed for continuous self-assessment, using scientific methods and evidence to investigate, evaluate, and improve one's patient care practice. In addition, residents at all levels should seek to be involved in palliative care or end-of-life care for children with terminal illnesses and their families.

Objectives:

- Consistently review the hematology/oncology literature using paper, computer and web-based resources.
- Consistently evaluate individual performance, identify gaps in knowledge, and target learning to fill these gaps.
- Consistently demonstrate learning from error.
- Work well with other learners to enhance the common knowledge.
- Provide, request, and accept feedback about performance.
- Facilitate the learning of students, junior residents, and other health care professionals
- Participate in informal discussions, telemedicine conferences/tumor board and other relevant seminars.
- Prepare an informal presentation on a particular subject of interest in hematology/oncology for members of the division each week of the rotation.

Interpersonal Skills and Communication:

Goals: Demonstrate interpersonal and communication skills that result in information exchange and partnering with patients, their families and professional associates. They must be able to approach the patients and families in a patient-centered manner.

Objectives:

- Create and sustain a therapeutic and ethically sound relationship with patients and their families.
- Use effective listening skills (nonverbal, explanatory, and questioning) to elicit and provide information during the medical interview.
- Understand and explain issues of confidentiality, disclosure, and consent.
- Use consultants appropriately and communicate effectively with them in a timely fashion.
- Maintain accurate and timely medical records.
- Provide follow up to patients about laboratory and radiologic studies.

Professionalism:

Goal: Understand and demonstrate a commitment to carrying out professional responsibilities, adherence to ethical principles, and sensitivity to a diverse patient population.

Objectives:

- Consistently act in the best interest of patients.
- Consistently demonstrate a caring and respectful demeanor when interacting with patients and families.
- Maintain patient/family confidentiality.
- Provide effective patient education, including reassurance, for conditions common to this subspecialty
- Communicate effectively with primary care and other physicians, other health professionals, and health-related agencies to create and sustain information exchange and teamwork for patient care.
- Demonstrate sensitivity to and respect for differences in race, ethnicity, culture, socioeconomic status, educational attainment, age, gender, sexual preference, and disability.
- Apply fundamental bioethical principles to the provision of care.
- Be conscientious, punctual, reliable, and dressed in an appropriate and professional manner.
- Follow hospital procedures for acknowledging, reporting, and correcting errors.
- Discuss errors honestly with families, when appropriate.

Systems-based Practice:

Goals: Understand how to practice high-quality health care and advocate for patients within the context of the health care system. They should be able to work effectively with a multi-disciplinary team of providers to aid in the best outcomes possible.

Objectives:

- Consistently advocate for patients and families and help them navigate the healthcare system by assisting them in making appointments, scheduling studies in a timely manner, and calling other providers to communicate about the patient, when necessary.
- Describe billing and coding procedures and their supporting documentation.
- Appropriately refer and follow-up patients when necessary.
- Demonstrate appropriate communication and collaboration with subspecialty consultants and ancillary staff.

Schedule Overview

| Monday | Tuesday | Wednesday | Thursday | Friday |
|---|--|------------------------------------|--|---|
| 0815 – Divisional Meeting 7W-12M AM – Heme/Onc general clinic | AM – Sickle cell clinic AM – Heme/Onc general clinic | AM – Heme/Onc general clinic | AM – Heme/Onc general clinic | 10am – Resident/student presentations 7W-12M No scheduled clinic |
| PM – Heme/Onc general clinic | PM – Heme/Onc general clinic Comprehensive Hemophilia clinic (2 nd Tuesday of month) | PM – Heme/Onc general clinic | PM – Sickle cell clinic PM – Heme/Onc general clinic 2pm – SLCH teleconference | |

Recommended Reading:

It is recommended that the student/resident read the Hematology and Oncology sections in one of the two major textbooks in pediatrics (Rudolph or Nelson). Also, a compilation of the major literature in pediatric hematology/oncology is available on the Child Health intranet site; first click on the hematology/oncology tab, then the shared documents tab. A copy of this entire document can also be found on the intranet site.

1. The Management of Sickle cell disease, Fourth Edition, National Institutes of Health, NHLBI, 2002
2. Rudolph's Textbook of Pediatrics, 21st Edition, McGraw-Hill 2003
3. Nelson Textbook of Pediatrics. 17th Edition, Saunders 2004
4. Pizzo and Poplack Principles and Practice of Pediatric Oncology. Fifth Edition. Lippincott 2005
5. Nathan and Oski's Hematology of Infancy and Childhood. Sixth Edition. Saunders 2003

Personnel:

Faculty

Dr. Barbara Gruner, Assistant Professor, Interim Division Chief

Dr. Nasrollah Hakami, Professor Emeritus

Dr. LaJuan Chambers, Assistant Professor

Nurses

Kim Ebersol, RN, CPNP – Oncology

Lisa Holm, RN – Hemophilia/Thrombosis/ITP

Elizabeth Nelson, RN – Sickle cell/general hematology

Staff

Monica Loar – Divisional Secretary

Mihaela Popescu – Clinical Research Associate

Wayne Richards, LCSW – Social Worker

Kathleen Deidrick, Ph. D. – Psychologist

LeAnn Reeder, CCLS – Child Life

Terry Hessenkemper – CBCU Nurse

Debbie Huffington – CBCU Nurse

Robbie Leubbering – CBCU receptionist