

HEMATOLOGY ONCOLOGY GOALS AND OBJECTIVES

Faculty:

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Goal:

1. Understand how to determine the difference between normal and pathologic states related to the hematologic and lymphatic systems.
2. Understand how to diagnose and manage hematological disorders which generally do not need referral.
3. Understand how to diagnose and initiate management of hematological/oncological disorders which generally need referral.
4. Understand the presentation, pathophysiology, and prognosis of important malignancies in children and adolescents.
5. Understand the appropriate methods of diagnosis and management of a child with disorders relating to iron.
6. Understand indications and complications related to the use of blood products.
7. Understand the pediatrician's role in the prevention of hematologic/oncologic disorders.

Learning Objectives and Curriculum Content:

1. Identify the changes that occur over time in the hematologic indices in the normal child (e.g., hemoglobin, hematocrit, MCV, etc.)
2. Recognize, evaluate, and manage without referral these conditions:
 - a. Iron deficiency
 - b. Thalassemia trait
 - c. Transient erythropenia of infancy or childhood
 - d. Minor, common reactions to blood transfusions
 - e. Sickle cell trait
 - f. Uncomplicated Henoch Schonien Purpura
3. Recognize the differential diagnosis, provide initial evaluation and management, and provide appropriate referral of the child presenting with these conditions.
 - a. Anemia (exclusive of common iron deficiency of transient erythropenia)
 - b. Abnormal bruising or bleeding (inherited and acquired)
 - c. Major complications of inherited bleeding disorders
 - d. Hemoglobinopathies (sickle cell and other sickling disorders), including severe pain crisis, fever, stroke, sequestration, and aplastic crises
 - e. Urgent conditions in children under treatment for cancer, including fever while on chemotherapy, chicken pox exposure or illness, bleeding
 - f. Neutropenia
 - g. Thrombocytopenia
 - h. An abdominal mass
 - i. A mediastinal mass
 - j. Conditions that might predispose to malignancy (e.g., neurofibromatosis, Bloom's

syndrome, retinoblastoma, and familial cancer)

4. Identify the presenting complaints, principles of current therapy, prognosis, and long term complications due to the disease or therapy for these conditions:
 - a. Leukemia (ALL< AML)
 - b. Brain tumor
 - c. Hodgkin's Non-Hodgkin's lymphoma
 - d. Neuroblastoma
 - e. Wilm's Tumor
 - f. Soft tissue sarcomas
 - g. Bone tumors (Osteosarcoma and Ewing's sarcoma)
 - h. Retinoblastoma
 - i. Langerhans cell histiocytosis
5. For these common pediatric signs and symptoms, describe clinical findings that would warrant screening for malignancy:
 - a. Adenopathy
 - b. Headache
 - c. Limb pain
 - d. Hepatomegaly and/or splenomegaly
 - e. Persistent fever and malaise
 - f. Seizures
 - g. Weight loss
6. Describe common acute side effects of commonly used chemotherapeutic drugs (e.g., cyclophosphamide, vincristine, doxorubicin, and methotrexate).
7. Describe common late complications of childhood cancer treatment that may present in childhood or adolescents (e.g., learning disabilities, endocrine suppression, second cancers).
8. Describe the normal requirements, absorption, and metabolism of iron from birth through adolescence.
9. Identify the features of iron deficiency including anemia.
10. Describe and use appropriately laboratory tests to screen for, treat, and follow the therapy of iron deficiency.
11. Manage iron deficiency appropriately (e.g., dietary management, replacement therapy, parent education, and follow-up).
12. List the appropriate indications and potential risks of various blood products (red blood cell products, platelet concentrates, coagulation factors).
13. Be aware of alternatives to blood transfusions, e.g., erythropoietin and other cytokines.
14. Discuss the reasons for leukofiltration and/or irradiation of blood products.
15. Provide dietary counseling to parents about the prevention of iron deficiency.
16. Counsel patients who have a sickle hemoglobinopathy about the importance of antibiotic prophylaxis and urgency of evaluation for fever.

Skills Acquisition:

1. Technical skills:

- a. start an intravenous line
- b. lumbar puncture
- c. bone marrow aspiration

2. Laboratory skills:

- a. Blood smear: be able to distinguish abnormalities of red blood cell, white blood cell morphology and assess platelet number. The following abnormalities should be identified: hypochromasia, polychromasia, spherocytes, schistocytes, sickle cells, atypical lymphocytes and blast cells
- b. Describe the clinical importance of Coombs' test, osmotic fragility, serum ferritin, free erythrocyte protoporphyrin, serum iron and TIBC, fibrin degradation products, fibrinogen, hemoglobin electrophoresis, hemoglobin A and F levels, PT, PTT, bleeding time, individual factor assays and mixed PT, PTT.

Reading Materials:

Recommended readings (available at LSUMC, Children's Hospital, departmental libraries and oncology floor):

- a. Hematology of Infancy and Childhood. Nathan and Oski.
- b. Blood Diseases of Infancy and Childhood. Miller.
- c. Malignant Disease of Infancy and Childhood and Adolescence. Altman and Schwartz.
- d. Hematologic Problems in the Newborn. Oski and Naiman.
- e. Principles and Practice of Pediatric Oncology. Pizzo, Poplack.
- f. Nelson's Textbook of Pediatrics. Saunders.
- g. Relevant Pediatric Clinics of North America. Saunders.
- h. Division resource packet.

Rotation Requirements:

- 1. Residents will see all new referrals in clinic and consults on the floor.
- 2. Teaching will take place in the outpatient setting.
- 3. Residents will be required to attend daily didactic sessions. Topics will be scheduled in advance to allow assigned reading and to be certain all objectives are met.
- 4. Residents are required to attend formal lectures, discussions, case presentations, slide reviews and tumor board.
- 5. Residents will be encouraged to work up a case report or get involved in a research project.
- 6. Inpatient responsibilities will be limited to new and educationally interesting patients and consults.