

## **Hematology-Oncology Curriculum**

### **Goal**

Hematology relates to the care of patients with disorders of the blood, bone marrow, and lymphatic systems, including anemias, hematologic malignancies and other clonal processes, and congenital and acquired disorders of hemostasis, coagulation, and thrombosis.

Medical oncology is the diagnosis and management of benign and malignant neoplasms.

Rotation on the medical ward services and in general medicine, hematology and oncology clinics will provide training for the resident to develop a wide range of competencies necessary for the clinical diagnosis and management of common hematologic and oncologic disorders. He or she should be able to (1) detect abnormal physical, laboratory and radiologic findings relating to the lymphohematopoietic system, (2) assess the need for bone marrow aspirate and biopsy and lymph node biopsy, (3) understand the initial evaluation and management of disorders of the hemostatic and clotting system, (4) identify patients at risk for malignancy and counsel them regarding risk reduction and screening, (5) investigate clinical syndromes suggestive of underlying malignancy, (6) identify neoplasms with a potential for cure and appropriately refer patients to obtain such care, (7) participate in the diagnostic evaluation, treatment, follow-up care and palliative care of patients with cancer, and (8) develop competence in the management of hematologic and oncologic emergencies.

Depending on the availability of a hematologist or oncologist in the primary care setting, the range of competencies expected for a general internist may vary. For example, depending on the resident's practice goals, he or she may desire competence in bone marrow biopsy or thyroid fine needle aspirate and administration of certain chemotherapies in consultation with a hematologist or oncologist. In any case, as patients often have multiple comorbidities not managed by the subspecialist, the resident should feel comfortable with the general management of patients diagnosed with and undergoing treatment for hematologic and oncologic diseases.

### **Objectives**

#### **Patient Care**

- I. Provide patient care that is compassionate, appropriate and effective for the prevention and treatment of hematologic and oncologic disorders.

#### **Medical Knowledge**

- I. Develop the knowledge and skills to obtain an appropriate history for patients with complaints concerning for hematologic or oncologic disorders, including information on genetic, environmental, lifestyle and life events that may impact patient risk for developing hematologic or oncologic disorders.
- II. Develop the knowledge and skills for performing and interpreting physical exam findings on patients with suspected hematologic or oncologic disease, including

lymph node exam, palpation of tumor masses, and assessment of physical signs that may help characterize the etiology, location, extent and /or severity of hematologic and oncologic disease.

- III. Develop an approach to patients presenting the following symptoms or signs:
- a. anemia
  - b. ascites
  - c. bleeding, bruising or petechiae
  - d. bowel obstruction
  - e. cough or hoarseness
  - f. family history of anemia or bleeding disorder
  - g. family history of cancer
  - h. fatigue
  - i. hemoptysis
  - j. lymphadenopathy
  - k. neutropenia
  - l. splenomegaly
  - m. pleural or peritoneal effusion of unknown cause
  - n. recurrent infections
  - o. sensory polyneuropathy
  - p. soft tissue mass
  - q. superior vena cava syndrome
  - r. thrombocytopenia
  - s. thrombosis, venous or arterial
  - t. unintentional weight loss
- IV. Recognize symptoms and signs, differential diagnosis and management of the following disease processes:
- a. anemia, including iron deficiency, megaloblastic anemia (B12 and folate deficiency), anemia of chronic disease, hemolytic anemia, and sickle cell anemia.
  - b. acute and chronic leukemia (lymphocytic and myelogenous)
  - c. antiphospholipid antibody syndrome
  - d. coagulopathies (liver disease, DIC, TTP)
  - e. chronic myeloproliferative disorders (polycythemia vera, myelofibrosis, essential thrombocythemia)
  - f. lymphoma (Hodgkin's and non-Hodgkin's)
  - g. multiple myeloma
  - h. myelodysplastic disorders
  - i. neutropenia
  - ii. leukopenia
  - j. thrombocytopenia
  - k. breast cancer
  - l. cancer of unknown primary
  - m. CNS tumors
  - n. endocrine cancers

- o. gastrointestinal tumors, including esophageal, stomach, pancreatic, hepatobiliary, small and large bowel, rectal and anal
  - p. genitourinary tumors, including renal, ureteral, bladder, prostate, urethral and penile and germ cell neoplasms
  - q. head and neck cancers
  - r. lung and pleural cancers
  - s. sarcomas
  - t. skin cancers and precancers
  - u. paraneoplastic syndromes
- V. Become familiar with the epidemiology of cancer and carcinogenesis.
- VI. Understand general principles of cancer management, including:
- a. chemotherapy management, including indications, adverse effects and drug interactions of common chemotherapies
  - b. management of immunosuppressed patients
  - c. management of hematologic and oncologic emergencies including blast crisis, SVC obstruction, spinal cord compression, CNS metastasis, visceral organ obstruction, and metabolic emergencies
  - d. principles of radiation therapy
  - e. issues related to the initial assessment of patients for bone marrow transplant and initial management of patients with a history of transplant
  - f. pain management
  - g. management of antiemetics, laxatives, nutrition and psychosocial support in cancer patients
- VII. Understand the indications and procedure for transfusion of blood and blood products.
- a. Become familiar with the use of iron and erythropoietin therapy.
- VIII. Develop competence in the management of prophylactic and therapeutic anticoagulation.
- IX. Understand appropriate use, interpretation and limitations of the following diagnostic studies:
- a. complete blood count with indices and peripheral smear
  - b. chemistries
  - c. iron studies
  - d. B12 and folate levels
  - e. stool guaiac
  - f. PSA
  - g. serum and urine electrophoresis
  - h. hemoglobin electrophoresis
  - i. clotting assay, including factor levels and mixing studies
  - j. bone marrow aspirate, biopsy, special stains, cytogenetics, and immunophenotyping

- k. serologic tumor markers
  - l. DNA content and molecular markers of tumor tissue
  - m. estrogen and progesterone receptors
  - n. cytology
  - o. chromosome analysis-peripheral blood and bone marrow
  - p. Schilling test
  - q. lymph node biopsy and lymphoid cell immunophenotype
  - r. imaging studies, including ultrasound, CT, MRI and nuclear studies for cancer screening; assessment of adenopathy, splenomegaly and red cell mass; cancer staging; follow-up and assessment of complications
  - s. radiologic, sonographic, and nuclear studies to assess adenop
- X. Develop competence in the following procedures:
- a. therapeutic phlebotomy
  - b. bone marrow aspiration and core biopsy (optional)
  - c. fine needle aspiration of thyroid and breast (optional)

### **Practice-Based Learning and Improvement**

- I. Utilize multidisciplinary approach to manage patients with cancer, involving surgeons, social workers, psychologists, psychiatrists, nurses, and pharmacists.
- II. Be able to access clinical practice guidelines to help improve patient care.
  - a. Plasma exchange – **Error! Bookmark not defined.**
  - b. Cancer pain - <http://www.painresearch.utah.edu/cancerpain/guidelineF.html>
- III. Research specific clinical questions arising from patient care for best evidence-based practice.
- IV. Review patient care errors with attention to changes in systems to prevent recurrence.
- V. Utilize information technology to enhance patient education.

### **Interpersonal and Communication Skills**

- I. Communicate effectively with patients and families in a compassionate, culturally sensitive and patient-centered manner to improve understanding and compliance.
- II. Understand the impact of terminal disease on patient and family.
- III. Develop skills to counsel patients on cancer screening risks and benefits and to appropriately refer patients for genetic counseling.
- IV. Ensure charting is legible, thoughtful, complete and timely to facilitate communication within the health care team.

### **Professionalism**

- I. Understand impact of gender, age, culture, religion, and socioeconomic status on patient compliance with therapy.
- II. Understand how to inform patients regarding the natural history of their disease and the risks and benefits of therapeutic interventions to obtain informed consent for

- procedures and treatments.
- III. Develop a respectful, compassionate approach to addressing code status and hospice in patients with cancer and patients receiving palliative care.
  - IV. Respect patient confidentiality, particularly with respect to genetic disease.
  - V. Provide meaningful feedback to colleagues and students regarding performance and behavior.

### **Systems-Based Practice**

- I. Understand and utilize community resources for home care when appropriate.
- II. Ensure patient access to the multidisciplinary team including the social worker, nurse, pharmacist, therapist and billing coordinator to provide optimal care.
- III. Apply evidence-based, cost-conscious strategies to prevention, diagnosis and disease management.
- IV. Understand the factors involved in the determination of eligibility for transplant.
- V. Develop skills in identifying opportunities for quality improvement, risk management and cost-effectiveness within a practice.

### **Teaching Methods**

- I. Attending supervision of resident activities in patient care
- II. Teaching rounds
- III. Individual rounds with the hematologist and oncologist, pathologist and radiologist to review specific cases.
  - Review Cottage Hospital Lab teaching slides with attending hematologist to become familiar with normal versus abnormal
  - Review hematology atlas cases on-line via American Society of Hematology website - [www.ashteachingcases.org/](http://www.ashteachingcases.org/)
- III. Conferences
  - Morning report
  - Noon conference
  - Tumor Board
- IV. Recommended reading

### **Resident Evaluation**

- I. Attending feedback to residents on strengths and weaknesses throughout the rotation
- II. Attending written evaluation of residents at the end of the rotation
- III. Mini-CEX bedside evaluation tool

### **Resources**

*Harrison's Principles of Internal Medicine*, 15<sup>th</sup> ed. McGraw Hill, 2001.

*Cecil Textbook of Medicine*, 21<sup>st</sup> ed. Saunders, 2000.

*Hillman and Ault's Hematology in Clinical Practice*, 3<sup>rd</sup> ed. McGraw Hill, 2001.

*Cancer Management: A Multidisciplinary Approach: Medical, Surgical and Radiation Oncology*, 7<sup>th</sup> ed. F.A. Davis Company, 2003.

### *MKSAP*

#### On-line Resources

- UptoDate
- MDConsult
- Stanford Hematology Oncology Toolkit - <http://lane.stanford.edu/toolkits/oncology.html>
- American Society of Hematology - <http://www.hematology.org/education/>
- Practice guidelines
  - Plasma exchange - <http://www.wramc.amedd.army.mil/departments/medicine/Nephrology/education/Lectures/TPEGuid98GR/>
  - Cancer pain - <http://www.painresearch.utah.edu/cancerpain/guidelineF.html>

Residents should review *Annals of Internal Medicine* for recent Updates in Hematology and Oncology sections as well as ACP journal club for pertinent articles.