Cancer

Objectives:

1. Discuss the development of cancer and its relationship to the immune system and carcinogens.

2. Contrast benign and malignant tumors.

3. Discuss the methods used in classifying cancers.

4. Discuss the four treatment modalities and the goals of treatment.

5. Review the management of lung, breast, ovarian, colon, and prostate cancers.

Readings:


2. Browse the National Cancer Institute’s Cancer Topics Home Page, http://cancernet.nci.nih.gov/cancertopics for information geared to both patients and health professionals.


Please use the following outline, along with the readings, to fulfill the course objectives.

Cancer
Group of over 200 diseases characterized by unregulated growth of cells

- estimated 30% Americans now living will experience cancer at some point

-To the public, the word cancer is viewed as being synonymous with death, disfigurement, and dependency

- Cancer 2nd most common cause of death (heart disease most common)

NED
No Evidence of Disease
-term substituted for “cured”

A. 2 Major Cell Dysfunctions

1. Defective cellular differentiation
   - Protooncogene
     genetic lock that keeps cell in its mature, functioning state
   - Oncogenes
     tumor-inducing agents

2. Defective Cellular Proliferation
   - normally state of dynamic equilibrium
   - divide indiscriminately & haphazardly

B. Development of Cancer

1. Initiation
   - Carcinogen – agents capable of producing cellular alterations
   - Genetics

2. Promotion
   - promotors
3. Progression

C. Tumors
   1. benign
      a. well/partially differentiated cells
      b. encapsulated
      c. metastasis absent
      d. rarely recurrent
      e. slight vascularity
      f. expansive mode of growth
      g. cell characteristics: fairly normal, similar to parent cell
   2. malignant
      a. poorly differentiated
      b. rarely encapsulated
      c. metastasis frequent
      d. moderate to marked vascularity
      e. mode of growth: invasive and expansive
      f. cells abnormal, become more unlike parent cell

D. Role of the Immune System
   1. Immunologic surveillance
      -lymphocytes continually check cell surface antigens and detect and
        destroy cells with abnormal or altered antigenic determinants
   2. Cytotoxic T-cells capable of killing tumor cells
      -production of lymphokines
      -stimulates T cells, Natural Killer Cells, B cells, and macrophages
   3. Immunosuppressed/Immunocompromised = higher incidence of cancer
      -person who receives high doses of immunosuppressive drugs has an 80-100 fold increased of developing cancer - primarily epithelial or lymphoid
      -there is an increased risk for the young (immune system immature) and
        the old (? immunologic surveillance system less effective)

E. Oncofetal Antigens
   1. found on the surfaces of cancer cells and also normally found in fetal
evelopment
      -CEA (carcinoembryonic antigen)
      -AFP (alpha-fetal protein)
      -CA 125
-CA 19-9
-Fetal Sulfated Glycopeptide
-Pregnancy-specific beta 1 glycoprotein
-HCG (human chorionic gonadotropin)
-POA (pancreatic oncofetal antigen)

Can be used in tumor detection (screening) and during treatment in determining response or progression of disease.

F. Classification of Cancers
   1. Anatomic Site
      a. Carcinomas - originate from embryonal ectoderm (skin & glands) and endoderm (mucus membrane linings of respiratory tract, GI tract, and GU tract)

      b. Sarcomas - originate from embryonal mesoderm (connective tissue, muscle, bone, fat)

      c. Lymphomas & Leukemias - originate from the hematopoietic system

   2. Histologic analysis
      a. Grades 1-4

   3. Extent of disease
      a. clinical staging

   4. TNM Classification System
      a. T = tumor size
      b. N = degree of regional spread to lymph nodes
      c. M = presence or absence of metastasis

G. Prevention & Detection of Cancer
   -reduce exposure to carcinogens
   -balanced diet
   -regular exercise
   -adequate rest
   -screening
   -reduce stressors
   -relaxation
   -7 warning signs
   -self exam
-seek medical care

H. Treatment
  1. Goals:
     - Cure
     - Control
     - Palliative

I. 4 Modalities
  1. Surgery
  2. Radiation Therapy
  3. Chemotherapy
  4. Biologic Response Modifiers