Themes for Oncology Section

1. Epidemiology
2. Etiology
3. Pathology
4. Manifestations
5. Treatment

ONCOLOGY SECTION

Educational Goals

1. Epidemiology
   - pattern of cancer
   - hypothesis generation

ONCOLOGY SECTION

Educational Goals

2. Etiology
   - genetic model
   - hereditary factors
   - carcinogens

ONCOLOGY SECTION
Educational Goals

3. Pathology
   - morphology of benign and malignant neoplasms
   - mechanism of metastases
   - effects on organ function

ONCOLOGY SECTION
Educational Goals

4. Manifestations
   - anatomy
   - physiology
   - pathology

ONCOLOGY SECTION
Educational Goals

5. Treatment
   - surgery
   - radiation therapy
   - medical therapy

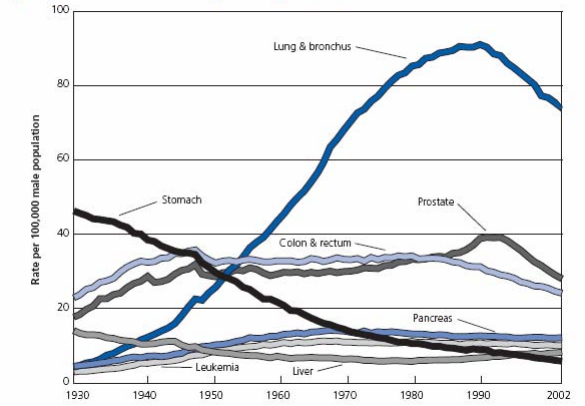
ONCOLOGY SECTION
Educational Goals

5. Treatment
   - medical therapy – pharmacology
     - classes agents
     - mechanisms action
     - effects
     - toxicity

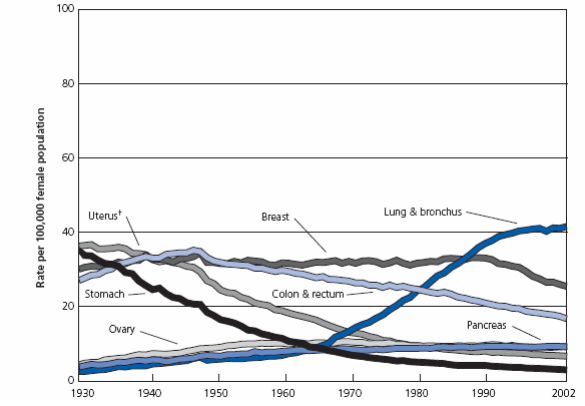
EPIDEMIOLOGY

Cause	No. Cases	No. Deaths
Lung	174,000	162,000
Breast	213,000	41,000
Colon	145,000	55,000
Prostate	235,000	27,000

Age-Adjusted Cancer Death Rates,* Males by Site, US, 1930-2002



Age-Adjusted Cancer Death Rates,* Females by Site, US, 1930-2002



INTERNATIONAL VARIATION IN CANCER INCIDENCE

	Japan	U.S.
Gastric	High	Low
Breast	Low	High
Colon	Low	High

2. ETIOLOGY

Cancer is a genetic disorder

Genetic abnormalities can be:

a. Hereditary

b. Acquired

2. ETIOLOGY

Cancer is a genetic disorder

Inherited genetic abnormalities

i. 5q deletion – FAP – colon cancer

ii. Mutations in BRCA1 and BRCA2

- breast, ovarian cancer

iii. Spell checking genes

- colon cancer

2. ETIOLOGY

Cancer is a genetic disorder

Environmental carcinogens

i. Chemicals

ii. Radiation

iii. Infectious agents

3. PATHOLOGY

4. MANIFESTATIONS

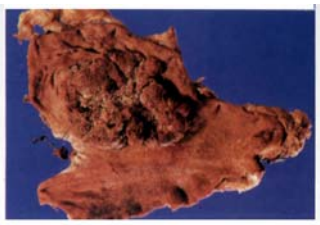
i. Growth of malignant cells at primary site

ii. Metastatic spread of tumor cells

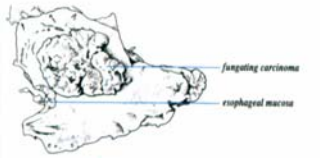
iii. Remote or paraneoplastic effects

Growth at Primary Site

Growth at Primary Site



Adenocarcinoma (fungating type). This specimen, opened along the greater curvature of the stomach, exhibits a large, fungating tumor occupying the lesser curvature.



4. MANIFESTATIONS

Metastatic Spread of Cancer Cells

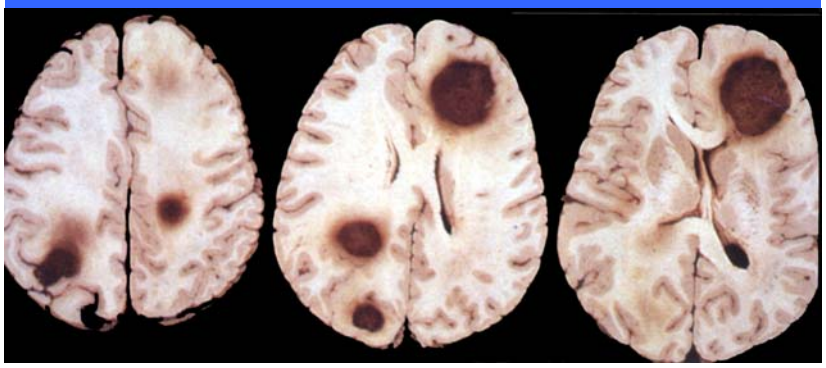
i. Direct extension into adjacent tissues
ii. Lymphatic routes
iii. Hematogenous

4. MANIFESTATIONS

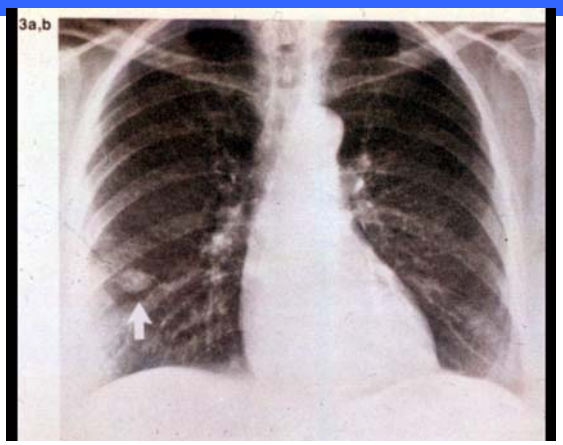
Hematogenous Dissemination

i. Brain
ii. Lungs
iii. Liver
iv. Skeleton

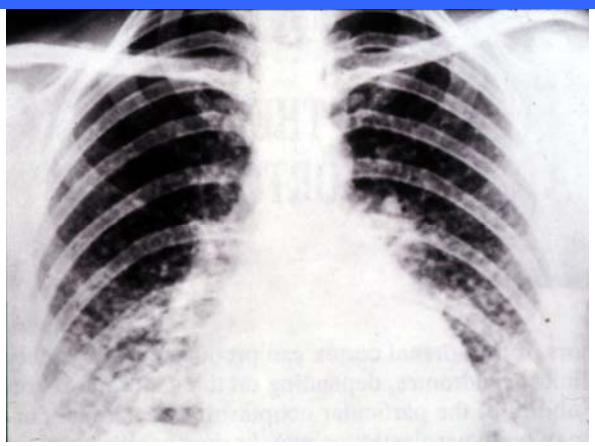
Brain Metastases



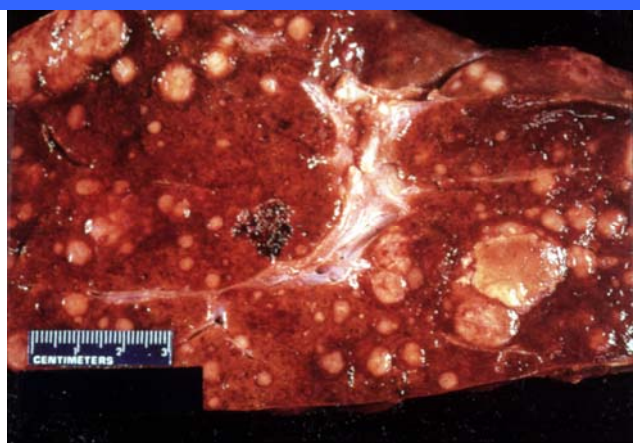
Lung Metastasis - Single



Lung Metastases - Multiple



Liver Metastases



Skeletal Metastasis - Lytic

Skeletal Metastasis-Vertebra

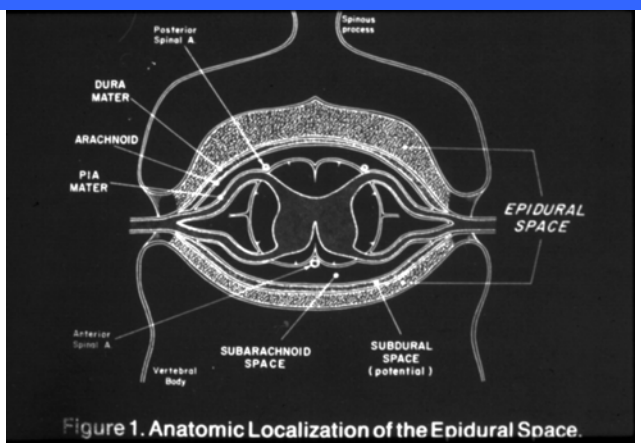
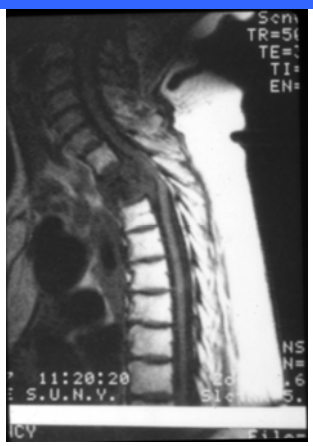
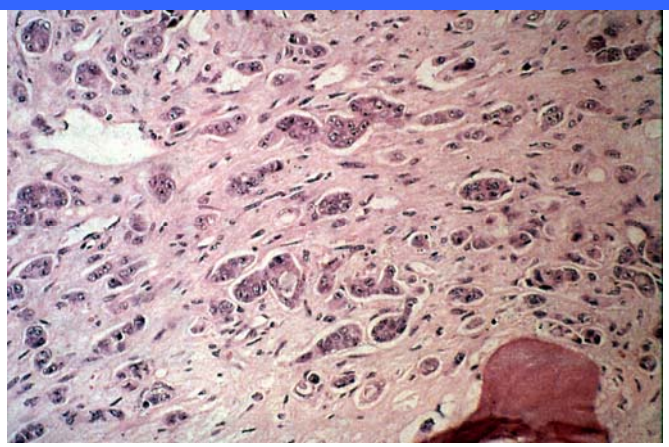


Figure 1. Anatomic Localization of the Epidural Space.

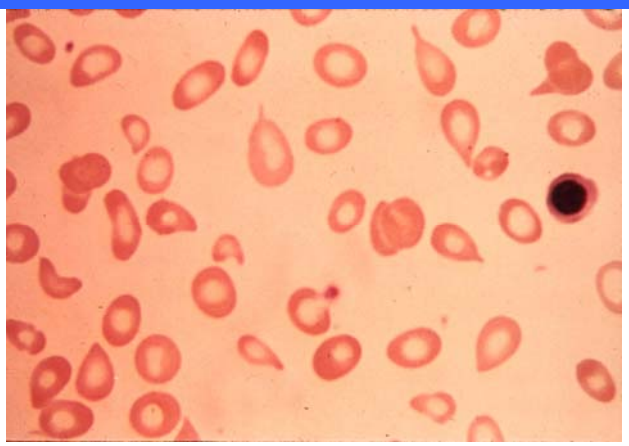
Spinal Cord Compression



Bone Marrow Metastasis



Myelophthistic Anemia



4. MANIFESTATIONS

Paraneoplastic or Remote Effects

i. Anorexia/Cachexia syndrome

- Interleukins
- Cachectin/Tumor necrosis factor

ii. Anemia

- Anemia chronic disease

4. MANIFESTATIONS

Paraneoplastic or Remote Effects

iii. Neurological abnormalities

- Peripheral neuropathies
- Cerebellar atrophy
  - Small cell lung cancer
- Eaton Lambert syndrome
  - Small cell lung cancer

4. MANIFESTATIONS

Paraneoplastic or Remote Effects

iv. Endocrinological abnormalities

- Hypercalcemia
  - PTHrP
    – Parathyroid hormone related protein
- Cushing's syndrome
  - ACTH – small cell lung cancer
- Syndrome inappropriate ADH
  - Small cell lung cancer

5. TREATMENT

i. Surgery

ii. Radiation therapy

iii. Pharmaceuticals

	Surgery	Radiation	Drugs
Advantages	Removes gross tumor rapidly	Effective against tumor masses, especially microscopic	Systemic Distribution
Disadvantages	No effect on distant metastases	No effect on distant metastases	Often non-specific effects, damage normal cells
	Leaves microscopic cancer deposits	Large tumor masses may not be effectively treated	Large tumor masses may contain resistant tumor cells
	Functional and cosmetic limits on extent of resection	Damage to normal tissues within radiation treatment field	Drug delivery limited to some tissues (e.g. blood-brain