

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

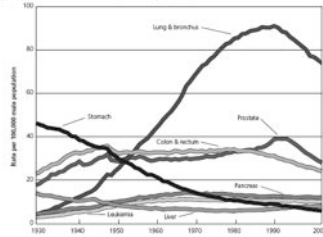
### 5. Treatment

- medical therapy – pharmacology
- classes agents
- mechanisms action
- effects
- toxicity

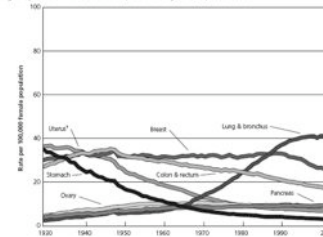
## EPIDEMIOLOGY

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

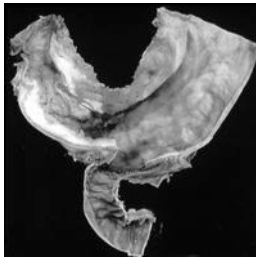
- i. Chemicals
- ii. Radiation
- iii. Infectious agents

## 3. PATHOLOGY

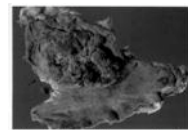
## 4. MANIFESTATIONS

- 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 (glandular type). This specimen, opened along the greater curvature of the stomach, exhibits a large, fungating tumor involving the lesser curvature.*



#### 4. MANIFESTATIONS

##### Metastatic Spread of Cancer Cells

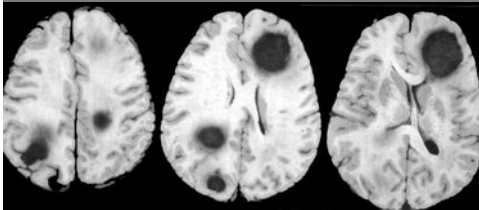
- i. Direct extension into adjacent tissues
- ii. Lymphatic routes
- iii. Hematogenous

#### 4. MANIFESTATIONS

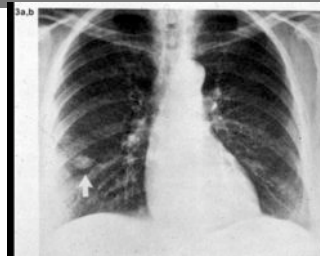
##### Hematogenous Dissemination

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

#### Brain Metastases



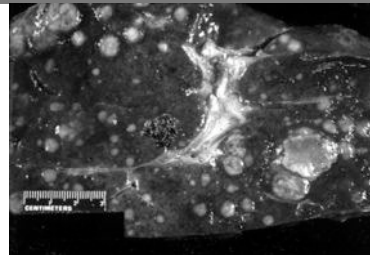
#### Lung Metastasis - Single



#### Lung Metastases - Multiple



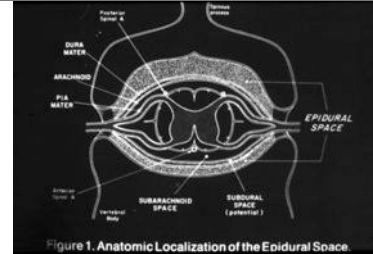
#### Liver Metastases



### Skeletal Metastasis - Lytic



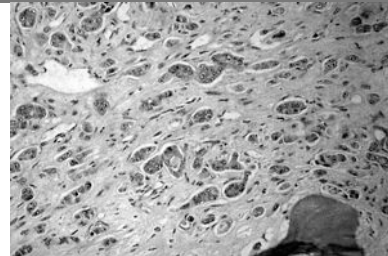
### Skeletal Metastasis-Vertebra



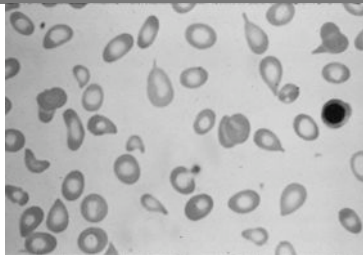
### Spinal Cord Compression



### 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)