Causes of cancer

- Heredity
  - Cancer is not inherited, but one can inherit a predisposition for cancer
  - Certain alleles have been linked to cancer
    - Individuals who inherit those alleles at a greater risk
    - Ex:BRCA1, BRCA2 and p53

Causes of cancer

- Radiation
- Organic chemicals
- Pollutants
- Viruses

Types of cancer

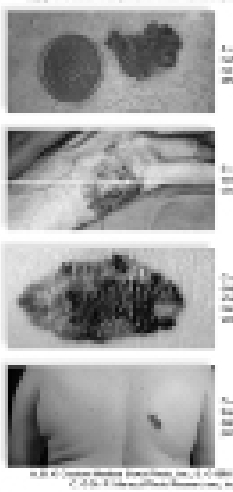
- Oncology – study of cancer
  - Carcinomas: cancers of the epithelial tissue
  - Adenocarcinomas: cancers of glandular epithelial cells
  - Sarcomas: cancers of muscle and connective tissues
  - Leukemias: cancers of the blood
  - Lymphoma: cancers of lymphatic tissues

Seven warning signs of cancer

- Change in bowel or bladder habits
- A sore that does not heal
- Unusual bleeding or discharge
- Thickening or lump in breast or elsewhere
- Indigestion or difficulty in swallowing
- Obvious change in wart or mole
- Nagging cough or hoarseness

Detecting skin cancer

- A – asymmetry
- B – border is irregular
- C – color varies from one area to another
- D – diameter is larger than 6mm



Testing for cancer

- Genetic testing can determine if an individual has inherited genetic mutations to a proto-onco gene or TSG
  - Much the same as knowing family medical history
- Tumor marker tests – blood tests for tumor antigens/antibodies
  - Ex: CEA (carcinoembryonic antigen) antigen can be detected in someone with colon cancer
  - Ex: PSA (prostate-specific antigen) test for prostate cancer

Traditional treatments

- Surgery
  - Removal of cancerous tissue
- Radiation therapy
  - X-rays or gamma rays are administered with a laser beam
  - Causes breaks in DNA too large to repair
- Chemotherapy
  - Drugs that inhibit DNA replication or disrupt mitotic spindle formation

Disadvantages to traditional therapies

- Kills good cells too!
- This explains common side effects:
  - Hair loss
  - Nausea
  - Fatigue

Future therapies

- Anti-angiogenesis
  - Administer anti-angiogenesis factors to inhibit blood vessel growth and essentially starve out the cancer
- p53 gene therapy
  - retrovirus is injected into the body to deliver the healing p53 gene to cancer cells
    - Once the p53 gene is expressed, it will trigger apoptosis of the cancer cells
  - in clinical trials