What Is Cancer?

- Cancer = abnormal, uncontrolled cellular growth
- Benign versus malignant tumors
  - Malignant tumor = cancerous and capable of spreading; neoplasm
  - Benign tumor = noncancerous and nonspreading
- 1.3 million cases of cancer per year; 550,000 deaths

Percentage of All Cancer Deaths Linked to Risk Factors

How Cancer Spreads: Metastasis

- Metastasis = spread of cancer cells from one part of the body to another
  - Blood vessels
  - Lymphatic system
  - Secondary tumors or metastases
- Carcinogen = any substance that causes cancer

Tumor Development

Cancer Cases and Deaths
Common Cancers: Lung Cancer
- Leading cause of cancer death
- Chief risk factor = smoking
- ETS causes about 3000 lung cancer deaths per year
- Symptoms = persistent cough, chest pain
- Treatment = combination of surgery, radiation, chemotherapy
- Survival rate = 15% after five years

Common Cancers: Colon and Rectal Cancer
- Second leading cause of cancer death
- Risk factors
  - Age
  - Preexisting polyps
  - Heredity
  - Inactivity and obesity
  - Diets high in red meat, smoked foods, simple sugars
  - Excessive alcohol consumption
  - Smoking
- Symptoms
  - Bleeding from the rectum
  - Change in bowel habits
- Testing
  - Stool blood test
  - Sigmoidoscopy or colonoscopy
- Treatment
  - Surgery is primary method of treatment

Common Cancers: Breast Cancer
- Most common cancer in women and second to lung cancer in the number of cancer deaths among women
- Causes/risk factors
  - Heredity
  - Long-term exposure to high blood levels of estrogen
    - Early onset of menstruation
    - Late onset of menopause
    - No children or first child after age 30
    - Obesity
    - Current use of HRT
    - Alcohol use
    - Inactivity
    - Diet low in vegetables and fiber
**Common Cancers: Breast Cancer**
- Early detection
  - Mammography (low-dose X ray) after age 40
  - Clinical breast exam
  - Breast awareness and self-examinations
- Diagnosis
  - Ultrasonography = imaging method using high-pitched sound
  - Biopsy = removal and examination of a small piece of body tissue
- Treatment
  - Surgery (lumpectomy, mastectomy)
  - Chemotherapy or radiation, social support

**Common Cancers: Prostate Cancer**
- Most common cancer in men and second to lung cancer in the number of cancer deaths among men
- Risk factors
  - Age
  - African American ethnicity
  - Heredity
  - Lifestyle factors
    - Diets high in calories, dairy products, and animal fat and low in plant foods
    - Obesity and inactivity
    - History of STDs
- Detection and diagnosis
  - Rectal exam
  - PSA (prostate-specific antigen) blood test
  - Ultrasound
  - Biopsy
- Treatment
  - Surgery
  - Radioactive seeds
  - Survival rate = 98% at 5 years

**Cancers of the Female Reproductive Tract**
- **Cervical cancer**
  - Linked to infection with HPV (genital warts)
  - Detected with the Pap test = scraping of cells from the cervix for examination
  - Abnormal cells are monitored over time; if they progress toward malignancy, they are removed
- **Uterine or endometrial Cancer**
  - Risk factors similar to those for breast cancer
  - Usually detected by pelvic examination
  - Treatment = surgery, possibly combined with radiation and chemotherapy
  - Survival rate = 96% at 5 years
- **Ovarian cancer**
  - Risk factors similar to breast and endometrial cancer
    - Anything that lowers the lifetime number of ovulation cycles reduces risk
    - Usually has no symptoms and is difficult to detect
    - Treatment = surgery
    - Survival rate is low due to late detection
  - Other female reproductive tract cancers
    - Clear cell cancer of vagina or cervix is more common among daughters of women who took DES during pregnancy
Skin Cancers

- Most common type of cancer when cases of the highly curable forms are included
- Primary risk factor is exposure to ultraviolet (UV) radiation
  - UVA = longer wavelength; damages connective tissue, leads to premature aging of the skin, causes skin cancer
  - UVB = shorter wavelength; causes sunburn, damages eyes and immune system, causes skin cancer

Skin Cancers

- Basal cell carcinoma = cancer of the deepest layers of the skin
- Squamous cell carcinoma = cancer of the surface layers of the skin
- Melanoma = a malignant tumor of the skin that arises from pigmented cells, usually a mole; the most dangerous form of skin cancer

ABCD Test for Melanoma

- Asymmetry: some half don’t match the other
- Border: is the edge的安全，不规则的 or a clear, defined border?
- Color: is the color uniform, or does it vary in different shades, tints, or tones?
- Diameter: is the growth larger or smaller than a pencil eraser?

Preventing Skin Cancer

- Wear long-sleeved shirts, long pants, hats
- Use a broad-spectrum sunscreen with a high SPF (30+)
- Apply sunscreen 30 minutes before sun exposure, 15–30 minutes after exposure begins, and frequently after that; apply extra if you are using DEET
- Avoid sun exposure between 10 AM and 4 PM
- Check UV index
- Avoid tanning salons

UV Index

The index predicts UV levels as follows:

<table>
<thead>
<tr>
<th>Index Number</th>
<th>Exposure Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>0–2</td>
<td>Minimal</td>
</tr>
<tr>
<td>3–4</td>
<td>Low</td>
</tr>
<tr>
<td>5–6</td>
<td>Moderate</td>
</tr>
<tr>
<td>7–9</td>
<td>High</td>
</tr>
<tr>
<td>10+</td>
<td>Very High</td>
</tr>
</tbody>
</table>

- It is particularly important to take precautions when exposure levels are expected to be moderate or above.

Common Cancers

- Oral cancer
  - Key risk factors are tobacco use (including spit tobacco) and consumption of alcohol
  - Easy to detect but difficult to treat
- Testicular cancer
  - Rare overall, but most common cancer in men age 20–35 years
  - Can be detected with self-examination
Other Cancers

- Pancreatic cancer = very deadly form of cancer
- Bladder cancer
- Kidney cancer
- Brain cancer
- Leukemia = cancer of white blood cells
- Lymphoma = cancer that begins in the lymph nodes

The Causes of Cancer: Role of DNA

- DNA basics
  - DNA = deoxyribonucleic acid, a chemical substance that carries genetic information
  - Chromosome = threadlike body in a cell nucleus that contains molecules of DNA
  - Gene = section of chromosome that contains the instructions for making a particular protein

The Causes of Cancer

- Dietary factors
  - Dietary fat and meat
  - Alcohol
  - Fruits and vegetables
    - Carotenoids
    - Antioxidants
    - Phytochemicals

Dietary Guidelines for Cancer Prevention

- Eat a varied plant-based diet
- Eat 5–9 servings of fruits and vegetables each day
  - Cruciferous vegetables
  - Citrus fruits and berries
  - Dark-green leafy vegetables
  - Dark-yellow, orange, or red fruits or vegetables
  - Eat high-fiber foods
- Limit consumption of meat and total fat; favor monounsaturated and omega-3 polyunsaturated fats
- Limit consumption of charred, blackened, cured, and smoked meat and fish
- Be moderate in consumption of alcohol

SOURCE: National Cancer Institute
The Causes of Cancer

- Inactivity and obesity
- Carcinogens in the environment
  - Ingested chemicals
  - Environmental and industrial pollution
  - Radiation
  - Microorganisms

Preventing Cancer

- Avoid tobacco
- Control diet and weight
- Exercise regularly
- Protect skin from sun
- Avoid environmental and occupational carcinogens
- Be aware of warning signs, and get recommended screening tests

Seven Major Warning Signs of Cancer

1. Change in bowel or bladder habits.
2. A sore that does not heal.
3. Unusual bleeding or discharge.
4. Change in a wart or mole.
5. Nodules or thickening.
6. Indigestion or difficulty in swallowing.
7. Obvious change in a wart or mole.

Preventing Cancer

**Do's**
- Eat a variety of plant-based diets that is high in fiber-rich foods such as legumes and whole grains.
- Eat 5-9 servings of fruits and vegetables every day, focusing foods from the following categories: Citrus fruits, Berries, Dark green leafy vegetables, Dark chocolates, melons or apricots and eggplants.
- Be physically active
- Maintain a healthy weight
- Practice safe sex to avoid HIV infection
- Protect your skin from the sun with appropriate clothing and sunscreen
- Perform regular self-exams

**Dont's**
- Don't smoke tobacco in any form: Cigarettes,卷烟, cigars, pipes, and other tobacco products.
- Avoid recreational environmental tobacco smoke
- Limit consumption of fatty meats and fried foods or processed fats.
- Avoid exposure to radiation and radon.
- Limit consumption of salt.
- Drink alcohol in measured levels, and limit consumption of sugary and artificial sweetened drinks and beer.
- Avoid occupational exposure to carcinogens.