Lecture 12

Cancer

HEAL 101: Health and Lifestyle
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Objectives

- Define cancer and discuss how it develops
- Discuss the causes of cancer
- Describe the different types of cancer
- Explain the importance of self exams, medical exams, and symptoms of cancer
- Discuss ways of preventing cancer and the implications of behavioral risks
- Discuss cancer detection and treatment

An Overview of Cancer

- Cancer: group of diseases characterized by uncontrolled growth and spread of abnormal cells
- In 2008:
  - 1,437,180 Americans were diagnosed with cancer
  - 565,650 Americans died of cancer
  - #2 cause of death
- Nearly 4 in 10 will be alive five years after diagnosis
- Some cancers have a more positive prognosis today compared with a few decades ago

An Overview of Cancer

- New growth or neoplasm may form a clumping cells called a tumor
- Biopsy – a microscopic examination of cell development to determine if a tumor is malignant
- Malignant tumors may spread to other organs – known as metastasis
New Cancer Cases and Deaths

Some Americans at greater risk than others
Blacks more likely to develop cancer than any other racial or ethnic group
Cancer incidence and mortality rates for some groups, such as Hispanics, and Asian American and Pacific Islander are lower than white or black Americans
Rate differences may be due to diet, exercise patterns, or other culturally influenced behaviors
Genetics may be a factor too

Variations in Rates

<table>
<thead>
<tr>
<th>Cancer Incidence and Mortality Patterns</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>Estimated New Cases</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>Female</td>
<td></td>
</tr>
<tr>
<td>Non-Hodgkin’s lymphoma</td>
<td>29,330 (6%)</td>
<td>29,330 (6%)</td>
</tr>
<tr>
<td>Melanoma of the skin</td>
<td>24,380 (2%)</td>
<td>24,380 (2%)</td>
</tr>
<tr>
<td>Breast</td>
<td>181,320 (24%)</td>
<td>181,320 (24%)</td>
</tr>
<tr>
<td>Colon &amp; rectum</td>
<td>72,300 (11%)</td>
<td>72,300 (11%)</td>
</tr>
<tr>
<td>Prostate</td>
<td>94,000 (13%)</td>
<td>94,000 (13%)</td>
</tr>
<tr>
<td>Leukemia</td>
<td>10,300 (2%)</td>
<td>10,300 (2%)</td>
</tr>
<tr>
<td>Bladder</td>
<td>17,900 (3%)</td>
<td>17,900 (3%)</td>
</tr>
<tr>
<td>Lung &amp; bronchus</td>
<td>98,100 (14%)</td>
<td>98,100 (14%)</td>
</tr>
<tr>
<td>Non-Hodgkin’s lymphoma</td>
<td>12,300 (4%)</td>
<td>12,300 (4%)</td>
</tr>
<tr>
<td>Melanoma of the skin</td>
<td>24,380 (2%)</td>
<td>24,380 (2%)</td>
</tr>
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</tr>
</tbody>
</table>

*Excludes basal and squamous cell skin cancers and in situ carcinomas except urinary bladder. Percentages may not total 100% due to rounding.

What Causes Cancer?

Caused by both internal and external factors
Cellular change/mutation theories
Carcinogens are cancer causing agents like radiation, chemicals, hormones, drugs, toxins (tar in cigarettes)
Oncogene theory suspects there are cancer causing genes that under certain conditions genes grow out of control
Factors Contributing to Cancer

- Diet
- Sedentary lifestyle
- Obesity
- Viral infections
- Tobacco use
- Excessive consumption of alcohol
- Occupational exposures
- Genetic predispositions
- Stress and other lifestyle factors

Risks for Cancer

Preventing Cancer through Diet and Lifestyle

<table>
<thead>
<tr>
<th>TYPE</th>
<th>DECREASES RISK</th>
<th>INCREASES RISK</th>
<th>PREVENTABLE BY DIET</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lung</td>
<td>Vegetables, fruits</td>
<td>Smoking; some occupations</td>
<td>33–50%</td>
</tr>
<tr>
<td>Stomach</td>
<td>Vegetables, fruits</td>
<td>Salt, salted foods</td>
<td>66–75%</td>
</tr>
<tr>
<td>Breast</td>
<td>Vegetables, fruits</td>
<td>Obesity, alcohol</td>
<td>55–59%</td>
</tr>
<tr>
<td>Colon/rectum</td>
<td>Vegetables, physical activity</td>
<td>Meat, alcohol, smoking</td>
<td>66–75%</td>
</tr>
<tr>
<td>Mouth/throat</td>
<td>Vegetables, physical activity</td>
<td>Salt, alcohol, smoking</td>
<td>33–50%</td>
</tr>
<tr>
<td>Liver</td>
<td>Vegetables</td>
<td>Alcohol, contaminated food</td>
<td>33–66%</td>
</tr>
<tr>
<td>Cervix</td>
<td>Vegetables, fruits</td>
<td>Smoking</td>
<td>10–20%</td>
</tr>
<tr>
<td>Esophagus</td>
<td>Vegetables, fruits</td>
<td>Deficient diet, smoking alcohol</td>
<td>50–75%</td>
</tr>
<tr>
<td>Prostate</td>
<td>Vegetables</td>
<td>Meat or meat fat, dairy fat</td>
<td>10–20%</td>
</tr>
<tr>
<td>Bladder</td>
<td>Vegetables, fruits</td>
<td>Smoking, coffee</td>
<td>10–20%</td>
</tr>
</tbody>
</table>

Lung Cancer

- Rates have dropped for males during past decade, but increased for females and black males
- Leading cancer killer for both men and women
- Symptoms of lung cancer: persistent cough, blood streaked sputum, chest pain, recurrent attacks of pneumonia or bronchitis
- Treatment: surgery, radiation therapy and chemotherapy
- Prevention: 90% of all lung cancers could be avoided if people didn’t smoke

Table 16.1 Preventing Cancer through Diet and Lifestyle

Sources: World Cancer Research Fund, American Institute for Cancer Research.
Breast Cancer

- 1 in 8 women will develop breast cancer in her lifetime
- Observable indicators in mammograms; persistent breast changes such as a lump in breast or surrounding lymph node
- Thickening; swelling, dimpling, skin irritation, distortion, retraction or scaliness of the nipple, nipple discharge, pain or tenderness

Breast Self-Examination

How to Examine Your Breasts

- Do you know that 95% of breast cancers are discovered first by women themselves? And that the earlier the breast cancer is detected, the better the chance of a complete cure? Of course, most lumps or changes are not cancer. But you can safeguard your health by making routine checks of your breasts. It’s a simple self-examination. Only you can tell when something is wrong. Use your mirror to look carefully at your breast. Take another look the next day. If you see or feel anything that you think is a change, see your doctor. It may not be cancer — it may be a sign of early breast cancer.

How to Feel for Changes

Step 1
- Sit down and use a pillow or folded bath towel under your left shoulder. Then lean your left arm down over your head. (Habitually you can lean your head down over your hand. [From now on you will be feeling for a lump or thickening in your breasts.]

Step 2
- Imagine that your breast is divided into quarters.

Step 3
- With fingers of your right hand held flat, press your fingers lightly, using small circular motions to feel the upper outer quadrant of your left breast. Start at your breasts, work toward the nipple. Also examine the area around the nipple. Now do the same for the lower inner portion of your breast.

Step 4
- Feel your armpit area to your side and under your left arm for swelling.

Step 5
- With your arm still down, feel the upper outer part of your breast, starting with your fingers at the edge of the breastbone and moving down and away from the chest. Repeat the same steps for your right breast.

Step 6
- Now examine the other side the same way.

Risks Factors for Breast Cancer

- Family history
- Long menstrual history
- Obesity after menopause
- Recent use of oral contraceptives or postmenopausal use of estrogen/progestin
- Never having children
- Higher education and socioeconomic status

Treatment for Breast Cancer

- Drugs
  - Tamoxifen and raloxifene
- Lumpectomy
- Radical mastectomy
- Combinations of radiation and chemotherapy

Lumpectomy
- Performed when tumor is in one quadrant of breast. Prognosis for cure is as good as less than 50 percent. Only lump itself is removed. Some lymph nodes are also removed normal tissues in surrounding area.

Simple mastectomy
- Removal of breast and underlying tissues. Prognosis for full recovery better than 80 percent.

Modified radical mastectomy
- Removal of breast and lymph nodes in in removed arm lymph nodes. Prognosis for full recovery somewhat dependent on level of spread.

Radical mastectomy
- Removal of breast, lymph nodes, plural meso, all fat and underlying tissues. Prognosis for full recovery may be as low as 20 percent dependent on level of spread.
Colon and Rectal Cancers

- Early screening is key to survival – 90% of colorectal cancers are preventable
- Prognosis is good if cancer caught in early stages
- Persons over age 40, overweight, or have a family history or personal history of polyps or inflammatory bowel are at increased risk

Colon and Rectal Cancers

- Colorectal screenings are recommended for those over age 50
  - Fecal occult blood tests (FOBT)
  - Digital rectal exam
  - Flexible sigmoidoscopy
  - Barium enema
  - Colonoscopy
- Reduce risk by: regular exercise, diet with lots of fruits and vegetables, healthy weight, moderation in alcohol

Prostate Cancer

- Most common type of cancer in males after skin cancer
- Second leading cause of cancer death after lung cancer
- PSA – prostate specific antigen blood test detects early cancers - questioned recently due to slow growth rate of this cancer
- Digital Rectal Exam also used to screen for cancer
- Black men have twice the rate of prostate cancer as white men
- Men should be screened with PSA by age 50 - Black men should be screened earlier
Skin Cancer

- Skin cancer is most common form of cancer in U.S.
- Most are basal or squamous cell skin cancers
- Malignant melanomas are least common but are the deadliest form of skin cancer
  - Melanoma is the most frequent cancer in women 25-29
  - 10 times higher in whites than blacks

Who is At Risk For Skin Cancer?

- Fair skin, blond, red, or light brown hair, grey, blue or green eyes, northern European extraction
- Always burn before tanning
- Burn easily and peel readily
- Spend lots of time outdoors
- Previous treatment for skin cancer, history of melanoma
- Work outdoors in high altitudes or close to equator
- Use low SPF or no sunscreen

Skin Cancer: What to Look For?

- Spots, scaly patches on face, ears, neck, arms, hands, legs as warty bumps
- Melanoma – simple ABCD rules
  - Asymmetry – one half of mole does not match other half
  - Border irregularity – edges are uneven, notched or scalloped
  - Color – not uniform - melanoma may vary in color from tan to deeper brown, reddish black, black or bluish black
  - Diameter – greater than 6 millimeters (size of a pea)

ABCD Rule

- Asymmetry
- Border Irregularity
- Color not Uniform
- Diameter > 6mm
Treatment for Skin Cancer

- Surgery is used in 90% of all cases
- Radiation therapy, electodesiccation (destruction by heat) and cryosurgery (destruction by freezing) are common treatments
- Melanoma – surgical removal of regional lymph nodes, radiation or chemotherapy

Testicular Cancer

- One of the most common types of solid tumors found in young adult males (age 17-34 at greatest risk)
- Rates are 5x higher for white males compared to black males
- Painless enlargement of testicle or thickening of tissue may be first sign/symptom
- Dull, dragging sensation often reported
- Regular self testicular exam a must for all males

Testicular Self-Exam

- After a warm shower, support each testicle with one hand and examine it with the other.
- Gently roll each testicle between the thumb and fingers.
- Feel for firm masses, lumps, or nodules in the testicle. In cancer, these lumps often are painless.
Ovarian Cancer

- Symptoms: enlargement of abdomen, vague digestive disturbances, fatigue, pain during intercourse, unexplained weight loss, unexplained changes in bowel or bladder habits, urinary frequency, and incontinence
- Highest rates in women over age 70, women who haven’t borne children
- Prevention – diet may play a role – saturated fats pose greater risk
- Pelvic exams important – women over 40 every year

Cervical and Endometrial Cancer

- Pap test help in diagnosing cervical cancer
- Risk factors: early age of intercourse, multiple sex partners, cigarette smoking, sexually transmitted diseases (herpes and human papilloma virus), history of infertility, failure to ovulate
- Cervical cancer prevention via Gardasil vaccine
  - Protects against 4 types of HPV which cause 70% of cervical cancer cases

### Table 16.5
Five-Year Relative Survival Rates by Stage at Diagnosis*

<table>
<thead>
<tr>
<th>SITE</th>
<th>ALL STAGES</th>
<th>LOCAL</th>
<th>REGIONAL</th>
<th>DISTANT</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>%</td>
<td>%</td>
<td>%</td>
<td>%</td>
</tr>
<tr>
<td>Breast (female)</td>
<td>89</td>
<td>96</td>
<td>75</td>
<td>21</td>
</tr>
<tr>
<td>Cervix (uterus)</td>
<td>70</td>
<td>92</td>
<td>49</td>
<td>15</td>
</tr>
<tr>
<td>Colon and rectum</td>
<td>61</td>
<td>90</td>
<td>64</td>
<td>8</td>
</tr>
<tr>
<td>Endometrium (uterus)</td>
<td>81</td>
<td>96</td>
<td>63</td>
<td>26</td>
</tr>
<tr>
<td>Esophagus</td>
<td>14</td>
<td>27</td>
<td>15</td>
<td>2</td>
</tr>
<tr>
<td>Kidney</td>
<td>62</td>
<td>88</td>
<td>61</td>
<td>9</td>
</tr>
<tr>
<td>Larynx</td>
<td>69</td>
<td>83</td>
<td>50</td>
<td>38</td>
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<tr>
<td>Liver</td>
<td>15</td>
<td>48</td>
<td>21</td>
<td>3</td>
</tr>
<tr>
<td>Lung</td>
<td>89</td>
<td>96</td>
<td>61</td>
<td>12</td>
</tr>
<tr>
<td>Melanoma</td>
<td>56</td>
<td>82</td>
<td>46</td>
<td>21</td>
</tr>
<tr>
<td>Ovarian</td>
<td>52</td>
<td>95</td>
<td>81</td>
<td>29</td>
</tr>
<tr>
<td>Pancreas</td>
<td>4</td>
<td>17</td>
<td>7</td>
<td>2</td>
</tr>
<tr>
<td>Prostate</td>
<td>98</td>
<td>100</td>
<td>–**</td>
<td>34</td>
</tr>
<tr>
<td>Stomach</td>
<td>59</td>
<td>58</td>
<td>22</td>
<td>2</td>
</tr>
<tr>
<td>Testis</td>
<td>59</td>
<td>99</td>
<td>94</td>
<td>76</td>
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<tr>
<td>Thyroid</td>
<td>99</td>
<td>99</td>
<td>94</td>
<td>42</td>
</tr>
<tr>
<td>Urinary bladder</td>
<td>81</td>
<td>94</td>
<td>48</td>
<td>6</td>
</tr>
</tbody>
</table>

*Adjusted to normal life expectancy. This chart is based on cases diagnosed from 1992–1997, followed through 1997.
*Rate for local stage represents local and regional stages combined.
Source: NCI Surveillance, Epidemiology, and End Results Program. 1998. (c) 2002, American Cancer Society, Inc.

### Cancer’s Seven Warning Signals

1. Changes in bowel or bladder habits
2. A sore that does not heal
3. Unusual bleeding or discharge
4. Thickening or lump in breast or elsewhere
5. Indigestion or difficulty in swallowing
6. Obvious change in a wart or mole
7. Nagging cough or hoarseness

If you have a warning signal, see your doctor.