Nutrition and Cancer

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Objectives

1. Discuss current knowledge regarding nutritional prevention of cancer
2. Discuss goals for the cancer patient
3. Explain how cancer treatment affects nutritional needs
4. Review ways to cope with the nutritional problems that develop during cancer
5. Outline the role of the nurse in nutritional counseling for cancer treatment

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American Cancer Society Guidelines on Nutrition and Physical Activity for Cancer Prevention

A. Maintain a healthy weight throughout life.
1. Balance calorie intake with physical activity.
2. Avoid excessive weight gain throughout life.
3. Achieve and maintain a healthy weight if currently overweight or obese.
B. Eat a varied diet with emphasis on vegetables, fruit and fiber (plant based)

1. Choose foods and drinks in amounts that help achieve and maintain a healthy weight.
2. Eat 5 or more servings of a variety of vegetables and fruits each day.
3. Choose whole grains over processed (refined) grains.
4. Limit intake of processed and red meats.

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C. Minimize total fat intake
D. Limit consumption of salt-cured, nitrite preserved, and char-broiled foods (mainly meats)
E. Avoid energy-dense foods and sugary drinks
F. Avoid Alcoholic beverages and tobacco
G. Increase physical activity

- **Adults:** Engage in at least 30 minutes of moderate to vigorous physical activity, above usual activities, on 5 or more days of the week; 45 to 60 minutes of intentional physical activity are preferable.

- **Children and adolescents:** Engage in at least 60 minutes per day of moderate to vigorous physical activity at least 5 days per week.

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Diet and physical activity factors that affect risks for selected cancers

Bladder cancer

- The major risk factors for bladder cancer are **tobacco smoking** and being exposed to certain **industrial chemicals**.

- Some research suggests that **drinking more fluids** and **eating more vegetables** may lower the risk of bladder cancer.

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Breast cancer:

Factors that may **raise** breast cancer risk:

- Both **increased body weight** and **weight gain during adulthood** are linked with a **higher** risk of breast cancer after menopause.

- **Alcohol** also **increases risk** to some extent, especially in women whose intake of **folate is low**

Factors that may **lower** breast cancer risk:

- Moderate to vigorous **physical activity**

- **Greatly lowering fat**, although a recent major study found that this effect may be very small.

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Colorectal cancer

Some studies show a lower risk of colon cancer among those who are moderately active on a regular basis, and more vigorous activity may even further reduce the risk of colon cancer.

Obesity raises the risk of colon cancer in both men and women, but the link seems to be stronger in men.

Diets high in vegetables and fruits have been linked with lower risk, and

Diets high in processed meats and/or red meats have been linked with a higher risk of colon cancer.
Several studies have found that:

√ calcium,
√ vitamin D, or
√ a combination of the two

may help protect against colorectal cancer.

But because of the possible increased risk of prostate cancer with high calcium intake, it may be wise for men to limit their daily calcium intake to less than 1,500 mg per day until further studies are done.
The best advice to reduce the risk of colon cancer is to:

1. Increase the intensity and duration of physical activity.
2. Limit intake of processed and red meats.
3. Get the recommended levels of calcium.
4. Eat more vegetables and fruits.
5. Avoid obesity.
6. Avoid excess alcohol.
Endometrial cancer

- There is strong evidence of a link between obesity and endometrial cancer.
- Studies have also suggested lower endometrial cancer risk with high physical activity levels.
- Vegetable and fiber intake may lower risk, whereas red meat, saturated fat, and animal fat may increase risk.
- At this time, the best advice to reduce the risk of endometrial cancer is to:
  1. Maintain a healthy weight through diet and regular physical activity, and to
  2. Eat a plant-based diet rich in vegetables, whole grains, and beans.

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Other cancers linked to dietary habits include:

- Stomach cancer
- **Prostate cancer** (linked to high intake of dairy products and calcium)
- **Pancreatic cancer**
- **Mouth, throat, and esophagus cancers** - link to smoking
- **Lung cancer** - link to smoking (Using high-dose beta-carotene and/or vitamin A supplements has increased (not decreased) lung cancer risk among smokers)
- Following the general guidelines mentioned earlier reduces the overall risk

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Cancer cachexia

- Definition:
  A form of malnutrition and emaciation

- Characteristics:
  1. anorexia
  2. early satiety
  3. weight loss
  4. anemia
  5. weakness
  6. muscle wasting
Reasons for cancer cachexia

1. Altered sense of taste
2. Lack of energy
3. Feeling of fullness
4. Nausea and vomiting
5. Food aversions
6. Altered metabolism
7. Malabsorption of nutrients
The Pathways Contributing to Cancer Cachexia

- Anorexia
- Mechanical Factors
- Decreased Nutrient Intake
  - Abnormal Losses
  - Decreased Nutrient Assimilation
    - Treatment-Related Factors
    - CANCER CACHEXIA
      - Host/Tumor Competition
      - Abnormal Metabolic Pathways

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Types of Cancer Therapy

- Cancer is usually treated by:
  - Surgery
  - Radiation
  - Chemotherapy, or a combination

- Each of these treatments could affect the nutritional status of the patient
<table>
<thead>
<tr>
<th>AREA OF TREATMENT</th>
<th>SHORT-TERM EFFECTS</th>
<th>LONG-TERM EFFECTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Head and neck</td>
<td>Irritation of mouth, tongue, esophagus</td>
<td>Dry mouth</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Tooth decay</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Stricture of esophagus</td>
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<tr>
<td></td>
<td></td>
<td>Inability to taste</td>
</tr>
<tr>
<td>Abdomen</td>
<td>Irritation of stomach</td>
<td>Some of these symptoms may continue in some patients</td>
</tr>
<tr>
<td></td>
<td>Diarrhea</td>
<td></td>
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<tr>
<td></td>
<td>Milk intolerance</td>
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</tr>
<tr>
<td></td>
<td>Nausea and vomiting</td>
<td></td>
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<tr>
<td>Spine—upper areas</td>
<td>Irritation of stomach and esophagus</td>
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<td>Spine—lower areas</td>
<td>Diarrhea</td>
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<tr>
<td>Pelvis</td>
<td>Diarrhea</td>
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<td></td>
<td>Malabsorption</td>
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<tr>
<td>AREA OF CANCER</td>
<td>SURGICAL PROCEDURES</td>
<td>POSSIBLE NUTRITIONAL PROBLEMS</td>
</tr>
<tr>
<td>-------------------</td>
<td>----------------------------------------------------------</td>
<td>---------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Head, neck, tongue</td>
<td>Removal of all or part of the tongue (glossectomy)</td>
<td>Makes chewing and swallowing difficult</td>
</tr>
<tr>
<td>Jaw</td>
<td>Removal of lower jaw bone</td>
<td>Requires tube feeding</td>
</tr>
<tr>
<td>Esophagus</td>
<td>Removal (esophagectomy) with reconstruction using muscle from the intestine</td>
<td>Food can leak into the lungs or the new esophagus can narrow</td>
</tr>
<tr>
<td>Stomach</td>
<td>Removal (gastrectomy)</td>
<td>Food can travel to the intestines too quickly or hypoglycemia can develop</td>
</tr>
<tr>
<td>Small intestine</td>
<td>Opening created to outside the body (jejunostomy or iliostomy)</td>
<td>Poor absorption of nutrients, vitamin B₁₂ deficiency, electrolyte imbalance, scars, intestinal blockage</td>
</tr>
<tr>
<td>Digestive organs</td>
<td>Removal of pancreas</td>
<td>Poor absorption of nutrients, diabetes</td>
</tr>
<tr>
<td>Large intestine</td>
<td>Removal (colectomy) with or without an opening created outside the body (colostomy)</td>
<td>Poor absorption of nutrients and water</td>
</tr>
</tbody>
</table>
CHEMOTHERAPY-INDUCED SIDE EFFECTS

Irritation and inflammation of the mouth
Irritation and inflammation of the tongue
Irritation and inflammation of the throat
Diarrhea
Constipation
Nausea
Vomiting
Taste changes
Appetite changes (increased, decreased)
Weight changes (increased, decreased)
Milk intolerance
Food aversions
Nutritional goals

1. Prevent weight loss (short-term)
2. Achieve and maintain normal weight (long-term)
3. Replace nutritional losses
4. Provide adequate kilocalories, protein, vitamins and minerals
5. Maintain or improve functional capacity and quality of life
This is achieved by three components:

- Assessment
- Intervention
- Teaching
Intervention

a) Providing adequate nutrients to meet the individual needs for maintenance and building of tissues

b) Providing comfort and alleviation nutritional problems associated with cancer therapy

c) Using appropriate nutrition support method
Teaching

a) Encourage a high-energy and high-protein intake and explain how

b) Suggest ways to cope with side effects of therapy

c) Encourage keeping weight records

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Box 13-1  Common Nutritional Problems and Dietary Suggestions for Individuals with Cancer

Nausea and Vomiting
**Diet:** Liquids and soft foods served cold: juices, carbonated beverages, gelatin, fruits; dry, bland foods: toast, crackers, plain bagels; tart foods and fluids: lemonade; serve small amounts frequently

**Supplements:*** Glucose oligosaccharides, clear liquids such as Resource Fruit Drink (Novartis)

**Suggestions:** Keep environment cool, well ventilated, free of cooking odors; dry starchy foods (crackers, toast) before rising can help prevent vomiting; liquids should be sipped slowly; distraction, imagery, and relaxation techniques may help; premedicate with antiemetics if appropriate; plan the medication schedule so that drugs with high emetic potential are not given close to mealtime, if possible; avoid serving favorite foods during nausea to reduce the risk of developing aversions to them; avoid coaxing or pressure to increase intake

**Problem foods:** Hot foods, fatty foods, foods with strong odors, spicy foods

Anorexia

**Diet:** Regular foods served attractively, with variety in texture and color; small, frequent feedings

**Supplements:** Glucose oligosaccharides and other modular products; complete liquid supplements (allow the individual to taste several and select the one[s] preferred); milk powder added to liquid milk, cereals, mashed potatoes (if lactose tolerance not a problem); Lipomul (Upjohn); tube feedings if necessary

**Suggestions:** Avoid offering beverages until individual has finished eating, since fluids can be filling; encourage physical activity; children may eat more if they are involved in food preparation or if foods are decorated (e.g., with decorating candies and chocolate chips) or formed in interesting shapes (e.g., sandwiches cut with cookie cutters)

**Problem foods:** Large meals can overwhelm the person and suppress appetite
Box 13-1  Common Nutritional Problems and Dietary Suggestions for Individuals with Cancer—cont’d

Mucositis (Stomatitis, Esophagitis)

**Diet:** Nonabrasive, soft foods served cold or at room
temperature: sherbet, canned or soft, fresh, low-acid fruits,
fruit ices, popsicles, custard, gelatin, ice cream, yogurt,
cottage cheese, puddings, canned or cooked vegetables,
egg whites, sandwiches, cooked cereals (warm, not hot)

**Supplements:** Glucose oligosaccharides, complete liquid
supplements

**Suggestions:** Rinse mouth often with saline, plain water,
sodium bicarbonate solution (1 tsp baking soda/500 ml
water), or hydrogen peroxide diluted to 1/8 strength;
viscous lidocaine provides topical analgesia; but the
patient must be careful in eating after using it because
numbed tissues may inadvertently be bitten or burned by
hot foods or beverages

**Problem foods:** Acidic fruits and juices such as citrus
(evaluate vitamin C intake when citrus fruits are avoided);
salty or spicy foods; hard or abrasive foods such as chips,
pretzels, nuts, seeds; foods served hot

**Dysphagia**

**Diet:** Emphasize foods that form a semisolid bolus in the
mouth (e.g., macaroni and cheese)

**Supplements:** Carbohydrate or protein modules added to
foods, thickened liquid supplements (see Suggestions);
pudding-type supplements such as Ensure pudding (Ross)
or Sustacal pudding (Mead Johnson)

**Suggestions:** Thicken liquids with dry infant cereals,
mashed potatoes, potato flakes, or cornstarch; use gravies
and sauces to moisten meats and vegetables; if dysphagia
is severe, consider tube feedings

**Problem foods:** Thin liquids such as water, tea, coffee; foods
that are not uniform in consistency such as stews; dry
foods such as overcooked meats, hard rolls, nuts; foods
that stick to the palate, such as peanut butter and white
bread; slippery foods such as gelatin
Box 13-1  Common Nutritional Problems and Dietary Suggestions for Individuals with Cancer—cont’d

Xerostomia (Reduced Saliva Production)
Diet: Regular, moist foods: casseroles, gravies, sauces; encourage fluids, including popsicles, fruit ices, sherbet, gelatin, soups
Suggestions: Use good oral hygiene because dental caries is common when saliva production is insufficient to buffer acids produced by mouth bacteria; rinse mouth often with saline or mouthwash; use sugar-free candies and gum between meals to promote saliva flow; use artificial saliva if problem is severe
Problem foods: Breads, dry foods, sweet sticky foods, sugars in gum or candy

Hypogeusia (“Mouth Blindness”)
Diet: Regular foods with strong flavors or seasonings and interesting textures
Supplements: Complete liquid supplements with added flavors if necessary
Problem foods: Bland foods

Dysgeusia (Altered Taste)
Diet: Regular foods; use trial and error to determine the most suitable foods
Supplements: Fruit-flavored supplements, glucose oligosaccharides
Problem foods: Coffee, chocolate, red meats, others (varies with the individual)

Diarrhea
Diet: Low-lactose, low-fat; increase fluids; emphasize starches
Supplements: Glucose oligosaccharides, lactose-free liquid supplements
Problem foods: Milk, cream soups, ice cream, fatty or fried foods
Box 13-1  Common Nutritional Problems and Dietary Suggestions for Individuals with Cancer—cont’d

Constipation
Diet: High-fiber; at least 50 ml fluid per kg/day
Supplements: Bran, 2 tbsp/day

Neutropenia with Potential for Infection
Diet: Regular
Suggestions: Cook eggs, meats, poultry, and fish well; thoroughly wash fruits and vegetables to be eaten raw (after bone marrow transplant and in severe neutropenia, it is sometimes necessary to avoid raw foods altogether); avoid cross-contamination (e.g., carefully clean cutting boards used for trimming raw meat before using them to prepare raw vegetables); refrigerate cooked foods immediately after the meal; discard any leftovers within 3 days†
Supplements: Glucose oligosaccharides, canned supplements
Problem foods: Raw or undercooked eggs, meats, poultry, fish, shellfish (e.g., rare meats, sushi, homemade mayonnaise, raw oysters, key lime pie, and “royal” icing or other decorative icings and glazes unless they are known not to contain raw eggs)
Role of the nurse in nutritional counseling for cancer treatment

1. Help the patient cope with eating difficulties that may arise
2. Establish a good relationship with the patient to facilitate nutrition guidance
3. Help patient to select best times for eating
4. Encourage patient to take advantage of the good days

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5. **Provide pleasant dining atmosphere when hospitalized**

6. **Advice patient wisely about nutritional needs in the home setting and how to promote comfort as long as possible**