Nutrition for Patients with Cancer or HIV/AIDS

Chapter 22
Nutrition for Patients with Cancer or HIV/AIDS

- Cancer and HIV/AIDS can cause devastating weight loss and malnutrition.
- Nutrition therapy
  - Cannot effect a cure for either disease
  - Has the potential to maximize the effectiveness of drug therapy
  - Can alleviate the side effects of the disease and its treatments
  - Can improve overall quality of life
Cancer

- Second leading cause of death in the United States
- Group name for more than 100 different diseases characterized by the uncontrolled growth of cells
Cancer—(cont.)

- Relationship between nutrition and cancer is multifaceted.
  - Nutrition may play a role in cancer prevention.
  - Nutrient intake or utilization can be impaired from the local effects of tumors.
  - Nutrient utilization can be altered from tumor-induced changes in metabolism.
  - Nutrient intake, absorption, or need can be impacted by cancer treatments.
Cancer—(cont.)

- Nutrition therapy during the course of cancer treatment may improve tolerance to treatment, enhance immune function, aid in recovery, and maximize quality of life.
  - Palliative nutrition for terminally ill patients with cancer may improve quality of life and enhance well-being.
Cancer—(cont.)

• Nutrition in cancer prevention and promotion
  

  o Maintain a healthy weight.
  o Be physically active.
  o Eat a mostly plant-based diet.

  ❏ Overall eating pattern to reduce the risk of cancer
American Institute for Cancer Research
Recommendations for Cancer Prevention

• Be as lean as possible without becoming underweight.
• Be physically active for at least 30 minutes every day.
• Avoid sugary drinks and limit consumption of energy-dense foods, particularly processed foods that are high in added sugar, low in fiber, or high in fat.
• Eat more of a variety of vegetables, fruits, whole grains, and legumes such as beans.
• Limit consumption of red meats, such as beef, pork, and lamb, and avoid processed meats.
American Institute for Cancer Research
Recommendations for Cancer Prevention—
(cont.)

- If consumed at all, limit alcohol to two drinks per day for men and one drink per day for women.
- Limit consumption of foods high in salt.
- Do not use supplements to protect against cancer.
American Institute for Cancer Research
Recommendations for Cancer Prevention—(cont.)

- Exclusive breastfeeding for up to 6 months is recommended.
- Cancer survivors should follow these guidelines after treatment is completed.
- Do not smoke or chew tobacco.
Question

- What is one of the strongest links to cancer risk?
  a. Genetics
  b. Diet
  c. Body weight
  d. Occupation
Answer

c. Body weight

Rationale: Some of the strongest links to cancer risk are excess body weight and physical inactivity.
Cancer—(cont.)

- Some of the strongest links to cancer risk are excess body weight and physical inactivity.
  - Higher body fat is a cause of cancer of the esophagus, colon/rectum, postmenopausal breast, endometrium, and kidney.
  - Evidence that colorectal cancer is caused by abdominal obesity is also convincing.
Cancer—(cont.)

- Mechanisms by which fat may increase cancer risk
  - Increasing hormones that promote cancer cell growth
  - Promoting insulin resistance and hyperinsulinism, which increase the risk of certain cancers
  - Promoting low levels of chronic inflammation which can promote cancer cell growth and development
Cancer—(cont.)

- Physical activity on its own appears to protect against colon cancer and probably postmenopausal breast and endometrial cancers.
Cancer—(cont.)

- The impact of cancer on nutrition
  - Cancer impacts nutrition through local effects caused by the tumor and by altering metabolism.
    - Weight loss is an indicator of poor prognosis in people with cancer.
Cancer—(cont.)

- **Local tumor effects**
  - Occur when the tumor impinges on surrounding tissue.
  - Effects vary with the site and size of the tumor.
  - Most likely to impact nutrition when the GI tract is involved.
  - GI obstruction can cause anorexia, dysphagia, early satiety, nausea, vomiting, pain, or diarrhea, leading to weight loss and malnutrition.
Cancer—(cont.)

- **Metabolic changes**
  - Tumors can induce changes in metabolism that alter the body’s use of fuels and promote loss of lean body mass and weight.
  - Metabolic alterations may include glucose intolerance and insulin resistance, increased energy expenditure, increased body protein turnover, reduced muscle protein synthesis, and accelerated fat breakdown.
Cancer—(cont.)

- Changes in metabolism can also be attributed to the body’s response to cancer.
  - Anorexia
    - Common symptom in people with cancer
    - May be intermittent or continuous
Potential Causes of Anorexia

- Pain
- Depression/anxiety
- Early satiety
- Fatigue
- Nausea and vomiting
- Cancer treatments may contribute to anorexia by causing taste alterations, loss of taste, sore mouth, dry mouth, thick saliva, esophagitis, and fatigue.
Cancer—(cont.)

- The impact of cancer on nutrition—(cont.)
  - Cachexia
    - Progressive wasting syndrome
    - Preferential loss of lean body mass and weight loss
    - Etiology of cancer cachexia is not completely understood.
    - Estimated to be present in 80% of cancer deaths
Cancer—(cont.)

- Cachexia—(cont.)
  - Hard to reverse
  - Nutrition therapy
    - Aimed at preserving lean muscle mass and fat stores
    - Improves quality of life
    - Does not guarantee increased length of survival
Question

- Metabolic alterations in the body can occur as effects of tumors. What can these metabolic alterations include?
  a. Decreased energy expenditure
  b. Increased muscle protein synthesis
  c. Decelerated fat breakdown
  d. Insulin resistance
Rationale: Metabolic alterations may include glucose intolerance and insulin resistance, increased energy expenditure, increased body protein turnover, reduced muscle protein synthesis, and accelerated fat breakdown.
Cancer—(cont.)

Treatment

- Includes surgery, chemotherapy, radiation, immunotherapy, hemopoietic (Hematopoietic stem cells (HSCs) or hemocytoblasts are the stem cells that give rise to all the other blood cells through the process of haematopoiesis. They are derived from mesoderm and located in the red bone marrow, which is contained in the core of most bones.) and stem cell transplantation, or a combination of therapies
  - Nutritional deterioration related to localized or systemic side effects
  - Nutritional therapy used as an adjuvant
Cancer—(cont.)

• The impact of cancer treatments—(cont.)

  – Surgery
    o Often the primary treatment for cancer
    o Malnourished patients prior to surgery are at higher risk of morbidity and mortality.
    o Postsurgical nutritional requirements
    o Increased need for protein, calories, vitamin C, B vitamins, and iron to replenish losses and promote healing
Cancer—(cont.)

The impact of cancer treatments—(cont.)

- Chemical therapy
  - Chemotherapy drugs damage the reproductive ability of both malignant and normal cells.
  - Cyclic administration of multiple drugs is given in maximum tolerated doses.
  - Side effects vary with the type of drug or combination of drugs used, dose, rate of excretion, duration of treatment, and individual tolerance.
  - Side effects are systemic.
Most Commonly Experienced Nutrition-Related Side Effects

- Anorexia
- Nausea and vomiting
- Taste alterations
- Sore mouth or throat
- Diarrhea
- Early satiety
- Constipation
Cancer—(cont.)

- The impact of cancer treatments—(cont.)
  - Radiation
    - Radiation injures all rapidly dividing cells; it is most lethal for the poorly differentiated and rapidly proliferating cells of cancer tissue.
    - Normal tissue appears to recover more quickly from radiation damage than does cancerous tissue.
Cancer—(cont.)

The impact of cancer treatments—(cont.)

- Radiation—(cont.)
  - Type and intensity of radiation side effects depend on type of radiation used, the site, the volume of tissue irradiated, the dose of radiation, the duration of therapy, and individual tolerance.
  - Patients most at risk for nutrition-related side effects are those who have cancers of the head and neck, lungs, esophagus, cervix, uterus, colon, rectum, and pancreas.
Cancer—(cont.)

- The impact of cancer treatments—(cont.)
  - Radiation—(cont.)
    - Side effects usually develop around the second or third week of treatment.
    - Side effects usually diminish 2 or 3 weeks after radiation therapy is completed.
    - Managing side effects helps improve intake and quality of life.
Cancer—(cont.)

- **Immunotherapy**
  - Seeks to enhance the body’s immune system to help control cancer
  - Most common side effects include fever, which increases protein and calorie requirements, nausea, vomiting, diarrhea, and fatigue.
  - Symptoms can cause weight loss and malnutrition.
Cancer—(cont.)

- Hemopoietic and peripheral blood stem cell transplantation
  - Preceded by high-dose chemotherapy
  - Possibly total-body irradiation to suppress immune function and destroy cancer cells
  - Nutritional side effects caused by high-dose chemotherapy, total-body irradiation, and immunosuppressant medications, which are given before and after the procedure
  - Total parenteral nutrition (TPN) may be needed for 1 to 2 months after bone marrow transplantation.
Cancer—(cont.)

- When an oral diet resumes, a liquid diet restricted in lactose, fiber, and fat is given to minimize malabsorption and improve tolerance.

- Neutropenia leaves the patient susceptible to infection.
High-protein, high-calorie, high-calcium diet is needed.

- Nutrition therapy during cancer treatment
  - Focus is to prevent weight loss (even in overweight patients), maintain lean body mass, and prevent unintentional weight gain in certain groups of people, such as women treated for breast cancer.
Cancer—(cont.)

- Nutrition therapy during cancer treatment
  - Course of treatment
    - May be aggressive or palliative
    - May include surgery, chemotherapy, radiation, or a combination of treatments
    - Effect on nutritional status and intake may be mild or dramatic.
Cancer—(cont.)

• Nutrient needs
  - Calorie and protein
    - Adjusted to meet the individual needs
    - Patients may experience
      - A decreased threshold for urea
      - An increased threshold for sucrose
Cancer—(cont.)

- Enteral and parenteral nutrition support
  - Oral diet is preferred whenever possible.
  - Candidate for nutrition support if one or more of the following criteria are met:
    - Weight of less than 80% of ideal
    - Malabsorption of nutrients related to disease
    - Fistulas or draining abscesses
    - Inability to eat or drink for more than 5 days
    - Moderate or high nutritional risk
    - Client or caregiver demonstrates competency in nutrition support for discharge planning.
Cancer—(cont.)

- Enteral nutrition is not routinely used on well-nourished patients.
  - Chemoradiation to the head or neck
    - Prevent dehydration
    - Mucositis
    - Individualized and should be limited to malnourished patients with a functional GI tract who are unable to consume an adequate intake of nutrients orally
Cancer—(cont.)

- Parenteral nutrition can be a lifesaving therapy.
  - No improvement in nutritional parameters
  - Increase in complications, especially infections
  - Appropriate for patients who are unable to tolerate oral or enteral feedings for more than 7 to 10 days
Cancer—(cont.)

- Palliative nutrition therapy
  - For clients with terminal cancer who are not being aggressively treated
  - Goals of providing comfort and relieving side effects
  - Client’s requests and preferences are more important than the nutritional quality of the diet.
Question

What makes a patient a candidate for parenteral nutrition support?

a. Weight of less than 75% of ideal
b. Chemoradiation to the head or neck
c. Minimum improvement in nutritional parameters
d. Deceased infection rate
Answer

b. Chemoradiation to the head or neck

Rationale: A notable exception is the routine use of enteral nutrition for patients undergoing chemoradiation to the head or neck. In this population, enteral nutrition has been shown to prevent dehydration and treatment interruptions resulting from an impaired oral intake related to mucositis.
Nutrition and Immunodeficiency

- **HIV-associated weight loss and wasting**
  - Historically, severe malnutrition and weight loss were common.
  - Weight loss and wasting remain common problems.
  - They occur in people successfully treated with antiretroviral therapy (ART).
  - HIV-associated wasting, an AIDS-defining condition (ADC), is defined by the CDC as unintentional weight loss of more than 10% of baseline weight plus either diarrhea, fever, or weakness for 30 days or more in the absence of a concurrent illness.
Nutrition and Immunodeficiency—(cont.)

- HIV-associated weight loss and wasting—(cont.)
  - “Wasting” is not specific as to the type of weight lost.
  - Lipodystrophy
  - Weight loss is a stronger predictor of death than loss of lean body mass.
  - Baseline BMI is important.
  - Etiology of HIV-associated wasting is multifactorial.
Nutrition and Immunodeficiency—(cont.)

- HIV-associated weight loss and wasting—(cont.)
  - Impaired intake
    - May be related to diet itself, GI symptoms, or malabsorption and GI dysfunction
  - Changes in metabolism
    - Viral load and ART have been found to independently increase resting energy expenditure.
    - Opportunistic infections
Nutrition and Immunodeficiency—(cont.)

• **Nutrition therapy**
  - Begins with an individualized assessment
  - An individualized plan of care is designed that takes into account the client’s socioeconomic, cultural, and ethnic background.
  - Impaired intake and altered metabolism may be at least partially responsible.
Nutrition and Immunodeficiency—(cont.)

- Nutrition therapy—(cont.)
  - Impaired intake
    - Impaired intake among PLHA may be related to diet itself, GI symptoms, or malabsorption and GI dysfunction.
  - Changes in metabolism
    - Nutrient needs of PLHA differ from those of noninfected people, even before the onset of symptoms.
Nutrition and Immunodeficiency—(cont.)

- Nutrition therapy—(cont.)
  - Calories
    - WHO recommends calorie intakes increase by 10% for asymptomatic clients so that body weight can be maintained.
    - When HIV is symptomatic, calorie needs are estimated to increase by 20% to 30% above normal.
Nutrition and Immunodeficiency—(cont.)

- Nutrition therapy—(cont.)
  - Calories—(cont.)
    - Calorie recommendations from HIV Research of the Nutrition Infection Unit at Tufts University School of Medicine are as follows:
      - 37 to 45 cal/kg if the client’s weight is stable and there are no secondary infections
      - 45 cal/kg if the client has an opportunistic infection
      - 55 cal/kg if the client is losing weight
Nutrition and Immunodeficiency—(cont.)

- **Nutrition therapy—(cont.)**
  - **Protein**
    - Protein intake of 1.2 to 2.0 g/kg is frequently recommended.
    - Rule-of-thumb guideline of 100 to 150 g/day for men and 80 to 100 g/day for women
  - **Fat**
  - **Vitamins and minerals**
    - Observational studies suggest that low blood levels and inadequate intakes of some vitamins and minerals are associated with faster HIV disease progression and mortality.
Nutrition and Immunodeficiency—(cont.)

- **Nutrition therapy—(cont.)**
  - Enteral and parenteral nutrition support
  - Same guidelines for use apply in HIV as in other populations, with extra attention to ensure sanitary conditions
  - Parenteral nutrition is reserved for clients whose GI tract is nonfunctional.
Nutrition and Immunodeficiency—(cont.)

• Nutrition therapy—(cont.)
  – Alleviate symptoms
    o May experience problems with appetite and intake similar to those of cancer clients
  – Metabolic alterations of lipodystrophy
    o Not life threatening
    o Nutrition therapy and exercise may help reverse some changes in body shape.
Nutrition and Immunodeficiency—(cont.)

• Nutrition therapy—(cont.)
  – Metabolic alterations of lipodystrophy—(cont.)
    o Mediterranean diet
    o Resistance exercise

• Food–drug interactions
  – Maximum effectiveness of drug therapy depends on compliance with the medication schedule and food restrictions.
Nutrition and Immunodeficiency—(cont.)

- **Food safety**
  - Steps should be taken to reduce the risk of foodborne illness.
Question

• Is the following statement true or false?

The weight recommendations from the HIV Research of the Nutrition Infection Unit at Tufts University School of Medicine are for 45 cal/kg if the client has an opportunistic infection.
Answer

True.

Rationale: HIV Research of the Nutrition Infection Unit at Tufts University School of Medicine are as follows:

• 37 to 45 cal/kg if the client’s weight is stable and there are no secondary infections
• 45 cal/kg if the client has an opportunistic infection
• 55 cal/kg if the client is losing weight