

What We Know

- ▶ Cancer refers to over 100 types of malignant neoplastic diseases that have the ability to grow uncontrollably and metastasize throughout the body. The two major types of cancer are sarcoma, which develops from connective tissue (e.g., muscle and bone), and carcinoma, which is found in epithelial tissue (e.g., lung, breast, prostate, colon). Sarcoma is more prevalent in young persons and carcinoma is more common in older adults^(2, 8, 9)
- In the United States, cancer is second only to heart disease as a cause of mortality. Of those cancer-related deaths, it has been speculated that 10–70% may be preventable by dietary alterations. In general, the most highly recommended diet for cancer prevention is a high-fiber diet that includes a wide variety of fruits, vegetables, and lean proteins and is low in saturated fats. Regular intake of fruits and vegetables may be protective against oral, esophageal, stomach, and colorectal cancers. Higher fruit and vegetable consumption is also beneficial because it is usually associated with higher fiber and lower fat intake and lower body weight, all of which contribute to cancer prevention. Overweight and obese individuals are at a greater risk for cancer of the breast, colon, endometrium, gallbladder, esophagus, pancreas, and kidney
- Many individuals want to begin eating a neutropenic (i.e., raw whole foods) diet when diagnosed with cancer. Results of recent studies on neutropenic diets do not show symptom improvement, prevention of infection, or increased survival. While there is speculation regarding the effect of diet therapy on the progression of cancer, drastic dietary changes (e.g., ingesting high doses of vitamins or large quantities of fruits and vegetables) are not usually recommended therapeutically. In some cases, high nutrient doses interfere with chemotherapy treatment. Diet does, however, play a role in the management of symptoms and adverse treatment effects. Patients receiving radiation or chemotherapy experience a variety of manifestations (e.g., alteration in taste, nausea, abdominal discomfort) that can negatively affect appetite and dietary intake. Anxiety and depression are common in patients with cancer and can lead to decreased appetite and decreased effectiveness of treatment at a time when the patient has increased energy needs and alterations in metabolism inflicted by cancer. Adequate calorie and nutrient intake is imperative for reducing risk for fever and infection. It is estimated that malnutrition affects up to 80% of patients with certain cancers, including cancer of the head and neck, gastrointestinal tract cancer, and pancreatic cancer. Malnutrition is considered the cause of 20–40% of all cancer-related deaths. All patients with cancer should be considered at risk for inadequate calorie and nutrient intake
- ▶ Signs and symptoms of malnutrition^(6, 8, 9)
 - Significant weight loss
 - Listless or apathetic demeanor and/or confusion
 - Fatigue
 - Dry, brittle hair and nails
 - Skin that is pale, pigmented, bruised, or has petechiae or cheilosis
 - Spleen or liver enlargement
 - Bone/joint pain
 - Constipation and/or diarrhea
 - Headaches
 - Night blindness
 - Weak musculature
 - Poor reflexes
- ▶ Vitamin and mineral deficiencies observed in patients with cancer^(8, 9)
 - Deficiency in vitamins A, D, and B₆ are common in many patients with cancer
 - Deficiencies of vitamins B₁, B₂, and K and niacin, folic acid, and thiamine can result from chemotherapy

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Author

Cherie Marcel, BS

Reviewers

Darlene A. Strayer, RN, MBA
Cinahl Information Systems
Glendale, California

Nursing Executive Practice Council
Glendale Adventist Medical Center
Glendale, California

Editor

Diane Pravikoff, RN, PhD, FAAN
Cinahl Information Systems

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- In some cases, vitamin C deficiency occurs in patients with advanced cancer and increases risk for shorter survival time
- Iron deficiency can result from lack of iron in the diet, malabsorption, or chronic bleeding
- Fluid and electrolyte imbalances (e.g., hypercalcemia, hyperphosphatemia, hyper- or hypokalemia) are common in patients with cancer
- ▶ Risk factors for malnutrition secondary to cancer or its treatment^(8, 9)
 - All patients with cancer should be considered at risk for malnutrition, particularly those with the following risk factors:
 - Anorexia-cachexia syndrome, which is characterized by progressive wasting and loss of skeletal muscle and adipose tissue
 - Receiving radiation or chemotherapy
 - Anxiety or depression
 - Dementia or confusion
 - Nausea, vomiting, diarrhea, or other abdominal conditions
 - Fever
 - Infection or inflammation
 - Oral lesions
 - Alterations in taste
 - Difficulty chewing, opening the mouth, or swallowing; pain in the oral cavity
 - Poor socioeconomic status
- ▶ Nutritional interventions^(7, 9)
 - In most cases, oral nutritional support is preferable to tube feedings
 - Dietary counseling for the patient and his/her family is imperative and has been shown to improve the patient's nutritional status, decrease morbidity, and improve quality of life
 - Small frequent meals and snacks are often easier for a patient with mild anorexia to manage
 - Foods high in calories and protein (e.g., cheese, whole milk, chicken, fish) are recommended along with calorie-dense snacks (e.g., milkshakes, peanut butter, pudding)
 - ▶ Dry milk powder can be added to creamed soups and milkshakes to increase the calorie and protein content
 - Protein supplements such as Sustacal (Mead Johnson), Ensure (Ross), or Citrotein (Sandoz) can be recommended for patients who have difficulty consuming enough calories; some patients do not tolerate protein supplements and close monitoring (e.g., for diarrhea) is important
 - Bland foods can be more palatable if the patient has strong food aversions
 - Cold or frozen foods (e.g., popsicles, ice cream, frozen fruit) are numbing, which can be helpful for patients who have oral pain; acidic cold or frozen foods (e.g., lemon popsicles, frozen orange slices) should be avoided
 - Tube feedings (e.g., enteral feedings, total parenteral nutrition [TPN]) should be considered for patients only under the following conditions:
 - Patient is unable to eat for a long period of time (e.g., due to inability to chew or swallow or gastrointestinal impairment)
 - Patient has experienced weight loss secondary to an inability to eat
 - There is adequate clinical support to monitor the nutrition therapy to reduce risk for complications
 - The cancer is expected to respond to treatment and the patient would benefit from tube feedings to prevent worsening nutritional deterioration
- ▶ Additional interventions that can improve nutrition⁽⁹⁾
 - Topical analgesics can help to reduce oral pain
 - Using baking soda in place of toothpaste can reduce pain from oral lesions
 - Avoiding strong mouthwashes is important because their use can irritate oral mucosa
 - Use small plates for small meals
- ▶ Recent research findings on cancer and malnutrition^(1, 3, 4, 5)
 - Malnutrition is a serious and challenging by-product of cancer that is not solved by simply increasing nutrient intake. Many of the nutrient deficiencies are the result of physiologic malfunctions in metabolism secondary to cancer. Research results show that weight loss in patients with is associated with poor clinical outcomes. However, the direct causality of increased morbidity and mortality in patients with cancer has not been established. A systematic review and meta-analysis of 13 studies involving 1414 participants was conducted to determine if oral nutritional interventions in malnourished patients with cancer improved clinical outcomes. Researchers determined that although nutritional interventions had some beneficial effects on quality of life (e.g., improving emotional functioning, appetite, and sense of well-being), there appeared to be no effect on mortality. The reasons behind this finding are unclear. More research is needed to understand the complexity of malnutrition in patients with cancer and what the best nutritional intervention strategies should be for each type of cancer^(1, 3, 4, 5)

What We Can Do

- ▶ Become knowledgeable about malnutrition and interventions in patients with cancer so you can accurately assess your patients' personal characteristics and health education needs; share this information with your colleagues
- ▶ Emphasize the importance of reporting health- and nutrition-related changes to the treating clinician as soon as possible to prevent complications
- ▶ Assess the patient and family members for knowledge deficits about the prescribed treatment regimen and dietary recommendations; emphasize the importance of strict adherence to the prescribed treatment regimen and continued medical surveillance to monitor health status

Coding Matrix

References are rated in order of strength:

- M** Published meta-analysis
- SR** Published systematic or integrative literature review
- RCT** Published research (randomized controlled trial)
- R** Published research (**not** randomized controlled trial)
- C** Case histories, case studies
- G** Published guidelines
- RV** Published review of the literature
- RU** Published research utilization report
- QI** Published quality improvement report
- L** Legislation
- PGR** Published government report
- PFR** Published funded report
- PP** Policies, procedures, protocols
- X** Practice exemplars, stories, opinions
- GI** General or background information/texts/reports
- U** Unpublished research, reviews, poster presentations or other such materials
- CP** Conference proceedings, abstracts, presentations

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