Bladder Cancer: Diet

What We Know

› In the United States and other developed countries, cancer is second only to heart disease as a leading cause of mortality. Bladder cancer is a neoplasm that originates in the urinary bladder. Although bladder cancer is usually diagnosed early enough to allow for effective treatment, it has a high recurrence rate and survivors must undergo continued medical surveillance with follow-up testing for years after treatment completion. Treatment is dependent on the stage of the cancer as well as the age and health of the patient. Treatment options for bladder cancer include chemotherapy, radiation therapy, immunotherapy, and surgery\(^{4,12,18,20}\)

› Risk factors for bladder cancer\(^{4,8,12,18,19,20}\)
  - Diet and lifestyle contribute to many cases of cancer in humans. It has been speculated that 10–70% of cancer-related deaths might be preventable by alterations in diet. Diet-related risk factors associated with increased risk of developing bladder cancer include the following:
    - Overweight and obese individuals are at greater risk for cancer. High fat intake is a risk factor for excessive weight gain and is associated with an increased incidence of cancer
    - Individuals who consume drinking water containing high levels of nitrate are at increased risk for developing bladder cancer\(^8\)
  - Individuals who smoke cigarettes, cigars, or pipes are at increased risk of developing bladder cancer
  - Individuals with diabetes who take the anti-diabetes medication pioglitazone (Actos) or medications that contain pioglitazone (e.g., metformin [Actoplus Met], glimepiride [Duetact]) for longer than one year are at increased risk of developing bladder cancer\(^{19}\)
  - Persons over the age of 40 are more likely to develop bladder cancer than persons who are younger than 40
  - White men develop bladder cancer more often than women and more often than men of other races/ethnicities

› Dietary and lifestyle recommendations for the prevention of bladder cancer\(^{4,9,11,12,14,19,20}\)
  - In general, the best recommendation for a diet focused on cancer prevention is to eat a high-fiber diet that includes a wide variety of fruits, vegetables, lean proteins, and unsaturated fats
  - Balance calorie intake and physical activity to achieve or maintain a healthy body weight

› To calculate BMI, divide body weight (kilograms) by height (meters squared); or multiply 703 by weight (pounds) and divide by height (inches squared)
  - Underweight: < 18.5; normal: 18.5–24.9; overweight: 25–29.9; obese: > 30
  - In patients over 65 years of age, evidence suggests that a slightly higher BMI (25–27) may help prevent bone deterioration and is associated with a lower risk of mortality
  - In some cases, body composition testing (e.g., dual-energy X-ray absorptiometry scan, skin calipers) may be necessary\(^2\)
• Consume a diet rich in vegetables and fruits
  – Eating a variety of deeply colored fruits and vegetables (e.g., spinach, carrots, berries) should be emphasized
  – Drinking fruit juice should not be encouraged because it does not provide the fiber of whole fruit and has a higher calorie content per serving
• Choose whole-grain, high-fiber foods
  – Research results show that high intake of cereal fiber from whole grains is associated with a lower risk for all-cause mortality
  – At least half of the grains consumed should be whole grains
• Minimize intake of beverages and foods that contain added sugar
• Consume fish, especially oily fish, at least twice a week
  – Fish is a source of the unsaturated fat omega-3, which has many health benefits, including reduced risk for cancer
• Limit intake of saturated fat and trans fat
  – Replace animal fats with unsaturated fats from plants
  – Choose lean meats
  – Choose dairy products that are fat-free (also called skim), 1% fat, and low-fat
• For those who consume alcohol, do so in moderation
  – It is recommended that men limit alcohol consumption to 2 drinks/day and women limit consumption to 1 drink/day, preferably to be consumed with meals
    - 1 drink = 12 oz of beer, 4 oz of wine, or 1½ oz of 80-proof liquor
• Engage in regular physical activity for at least 30 minutes, 5 times per week
• Do not smoke
  › Signs and symptoms of bladder cancer
    • Signs and symptoms of bladder cancer include the following:
      – Blood in the urine
      – Urinary frequency
      – Painful urination
      – Back or pelvic pain
  › Treatment of bladder cancer
    • Treatment is dependent on the stage of the cancer as well as the age and health of the patient, and can involve surgery, immunologic therapy, chemotherapy, and/or radiation therapy
    • Although there has been speculation regarding the effect of diet therapy on the progression of an existing cancer, drastic dietary changes such as high doses of vitamins or large quantities of fruits and vegetables are not usually recommended therapeutically. In some cases, high nutrient doses can interfere with chemotherapy treatment
    • Diet does, however, play a role in the management of symptoms and side effects
      – Patients receiving radiation therapy or chemotherapy experience a variety of symptoms (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 cause decreased appetite and decreased effectiveness of treatment. These symptoms and adverse effects are worsened by the increased energy needs and alterations in metabolism caused by cancer
      – Adequate calorie and nutrient intake is important for resolving fever and infection, but intake can be challenging for many patients with cancer. It is estimated that malnutrition affects up to 80% of patients with cancer of the gastrointestinal tract. Malnutrition is responsible for 20–40% of all cancer-related deaths, so all patients with cancer should be considered at risk for inadequate calorie and nutrient intake
      – Signs and symptoms of malnutrition include the following:
        - 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 and/or joint pain
        - Constipation and/or diarrhea
- Headaches
- Night blindness
- Weak muscles
- Poor reflexes

- Vitamin and mineral deficiencies are observed in cancer patients
- Vitamins A, D, and B₆ deficiencies are common in many patients with cancer
- Deficiencies of vitamins B₁, B₂, and K as well as niacin, folic acid, and thiamine can result from chemotherapy
- Vitamin C deficiency occurs in some patients with advanced cancer and can predict shorter survival
- Iron deficiency can result from lack of iron in the diet, malabsorption, or chronic bleeding
- Fluid and electrolyte imbalances such as hypercalcemia, hyperphosphatemia, and hyper- or hypokalemia are common side effects of cancer

- Nutritional interventions can be initiated for patients who have cancer and malnutrition
- In most cases, oral intake of nutritional support is preferable to tube feedings
- Oral nutrition intervention can increase nutritional intake and may improve quality of life in malnourished patients
- Eating small, frequent meals and snacks is often easier to manage if mild anorexia is present
- Consuming high-calorie, high-protein foods (e.g., nuts, nut butters, avocados, olive oil, chicken, fish) is recommended in addition to calorie-dense snacks (e.g., milkshakes, peanut butter, pudding). Dry milk powder can be added to creamed soups and shakes to increase the caloric and protein content
- Protein supplements such as Sustacal (Nestle Health Science), Ensure (Abbott Nutrition), can be recommended for patients who are unable to consume enough calories; some patients do not tolerate these supplements and it is important to monitor patients receiving supplements for diarrhea
- Bland foods can be more palatable if the patient has strong food aversions
- Cool or frozen foods (e.g., popsicles, ice cream, frozen fruit) are numbing, which can be helpful for patients with mouth pain; cool or frozen acidic foods such as lemons or oranges should be avoided
- Tube feedings such as enteral feedings and total parenteral nutrition (TPN) should be considered only under the following conditions:
  - Patient is unable to eat for a long period of time, possibly due to a mechanical difficulty (e.g., inability to chew or swallow; gastrointestinal impairment)
  - Patient has experienced weight loss secondary to an inability to eat
  - There is adequate professional support to monitor administration of the nutrition therapy and prevent complications
  - The cancer is expected to respond to treatment and the patient would benefit from tube feedings as a method of preventing further nutritional deterioration

Recent research findings on bladder cancer and diet

- Results of several studies have noted potential benefits from increased intake of fruits and vegetables for the prevention of endometrial, breast, lung, colorectal, and bladder cancers. Researchers report that high intake of cruciferous vegetables (e.g., broccoli, cabbage, Brussels sprouts) may be protective against bladder cancer. Consumption of certain nutrients such as folate, B vitamins, and retinol has been associated with reduced risk of developing bladder cancer.
- The Mediterranean diet is a plant-forward dietary pattern that favors high intake of fruits, vegetables, legumes, nuts, seeds, olive oil, and fish. It is low in sugar, refined carbohydrates, and animal fats. Studies on this diet pattern suggest it may decrease the risk of bladder cancer. In a case control study with 690 bladder cancer cases and 665 control patients, high adherence to the Mediterranean diet was associated with 35% reduced risk of bladder cancer compared to low adherence to the diet.
- Studies on coffee consumption and bladder cancer have had mixed results, with some suggesting increased risk in male smokers. However, authors of a meta-analysis of 16 studies with 2,122,816 participants and 11,848 bladder cancer cases found no association between coffee consumption and bladder cancer risk.
- In a study on the effects of nitrate from diet and drinking water, researchers analyzed data from 34,708 postmenopausal women over a period of 21 years. They determined that those with longer term exposure (≥4 years) to nitrate from water, but not diet, had an increased risk of bladder cancer. Nitrate is a common drinking water contaminant that occurs in agricultural areas from chemical nitrogen-containing fertilizers, as well as manure and human waste.
- Malnutrition is a serious and challenging by-product of cancer that is not resolved by increasing nutrient intake. Many of the nutrient deficiencies are the result of physiologic malfunctions in metabolism secondary to the destructive force of cancer. Research results show that weight loss in patients with cancer is associated with poor clinical outcomes. Nutrition
interventions can improve clinical outcomes and may have beneficial effects on quality of life (e.g., improved emotional functioning, appetite, and overall well-being)\(^{(1,5,13,15,18)}\)

**What We Can Do**

- Educate yourself about bladder cancer and diet so you can accurately assess your patients’ personal characteristics and health education needs; share this information with your colleagues
- Emphasize the importance of reporting any health-related changes to the treating clinician as soon as possible to prevent worsening health status
- Assess your patients and their family members for knowledge deficits about the prescribed treatment regimen, and emphasize the importance of strict treatment regimen adherence and continued medical surveillance to monitor health status

**Coding Matrix**

References are rated using the following codes, listed 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 |
| GI | 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, presentation |

**References**


