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# Athletes, Cancer and Nutrition Considerations for Improving Immune Function

By Christine Turpin, RD, LDN, CSCS

NATA Liaison to the Academy of Nutrition and Dietetics

Many of us have a client, family member or friend who has battled that beast of a disease—cancer. Due to the prevalence of this disease, the odds are good that a patient battling a form of cancer will cross your professional path. Although the rate of patients diagnosed with cancer seems to be on the rise, the survival rate is improving. It is estimated that by Jan. 1, 2024, the population of cancer survivors will increase to almost 19 million.<sup>1</sup>

As the lead contact to an athlete's sports medicine team, athletic trainers should be aware of the role nutrition plays throughout treatment of and recovery from cancer. An athlete battling cancer and going through treatment will have a weakened immune system and is less able to protect the body from disease and germs. Waging a successful war against cancer requires maximizing the immune system, the network of organ, tissues, circulation cells and secreted molecules that resist and defeat infections.<sup>2</sup> Athletes' schedules are packed with classes, study

hall, practice and strength and conditioning sessions. The physical demands of a student athlete with a healthy immune system cause an abundant amount of wear and tear on the body, so imagine the hardship when a student athlete is faced with disease. As an AT, you should understand your athlete's needs during the recovery process and know how to discuss common issues with your athlete's registered dietitian (RD). Working together, ATs and RDs can play a vital part in managing coordinated care for any athlete battling cancer, addressing issues such as nausea, swallowing difficulties, proper nutrient consumption, problems with supplements, exercise and food safety.

Susan O'Malley, a clinical dietitian at Baltimore Washington Medical Center in Maryland, consults with cancer patients daily and uses the latest research to help patients meet their individual nutrition needs. As a two-time survivor of pancreatic cancer, she also uses her personal experience to make nutritional recommendations. The following are important topic areas for the sports

medicine team to consider when working with a patient who is currently in treatment or recovering from cancer.

## Gastrointestinal Distress

For meals and snacks, planning and preparation are vital to achieving nutritional success. An athlete undergoing chemotherapy and radiation may experience any combination of negative treatment effects, and O'Malley confirms that these can include "weight loss, nausea, vomiting, diarrhea, taste/smell changes, infections to the mucosal linings of the mouth, depression, lack of appetite and fatigue" during the prescribed course of treatment. All these side effects add additional challenges to proper fueling. "When patients are not eating because they are nauseous, I work with their physician to find an anti-nausea medication that works best for them," O'Malley said. "Once the nausea is under control, it's easier for the patient to tolerate food."

Another example of a practical approach to fueling is planning a more liquid to soft diet with the patient to meet their continued

nutritional needs after the cancer treatment has altered taste buds and caused irritation to the esophagus. This could make it easier for the athlete to physically consume adequate calories and nutrients.

While the caloric needs for athletes seem to rise high enough, often exponentially at certain times of year such as preseason or two-a-days, one's energy demands often increase further during a state of disease. Athletes should compose balanced plates with a variety of nutrient-dense foods that include whole grains for energy, lean proteins for building and maintaining muscle tissue, fruits, vegetables and healthy fats to protect the immune system and low-fat dairy for strong and healthy bones.

For patients undergoing surgery, chemotherapy and radiation, food choices often depend on their tolerance. While it is optimal to consume "healthy" foods, adequate caloric intake is crucial to avoid weight loss during cancer treatment and keep up with the physical demands of the athletes' sport. O'Malley recalled a client receiving chemotherapy and radiation for breast cancer who found the only appealing food to be a piece fried chicken and a piece of blueberry pie. Although that combination of food may not be ideal for high athletic performance, nutrition care should aim for positive energy balance and adequate protein to preserve or rebuild lean body mass.<sup>3</sup> Low levels of lean body mass, especially as part of sarcopenic obesity, is associated with poor health outcomes.<sup>3</sup> Solid foods are often unappealing, however, liquid calories (such as Boost, Ensure and Carnation Instant Breakfast) can provide good-quality calories. High-calorie homemade smoothies, full of a variety of food sources and nutrients, can help meet nutrition needs. ATs can use the sports RD as a resource to help guide an athlete toward foods that minimize side effects, prevent and resolve nutrient deficiencies and avoid nutrition-related side effects.

### Swallowing Issues

During cancer treatment and recovery, every patient's needs are unique. Symptoms and side effects can vary. In general, athlete-patients should focus on eating whole grains, lean proteins, fruits and vegetables, low-fat dairy and healthy fats. If a patient has mouth irritation, it may be painful to eat, and with radiation treatment to the mouth and neck, swallowing foods can be difficult. O'Malley suggests focusing on low-fiber foods such

as white breads, white pasta and white rice, which are easier for the stomach to break down. To limit fiber in fruits and vegetables, have your athlete eat canned fruits and overcooked vegetables as the cooking process breaks down the fiber in produce and makes it easier for the patient to swallow. These low-fiber complex carbohydrates can still deliver energy stores (or muscle glycogen), which is essential for an athlete's working muscles. ATs have a great window of opportunity during treatment to speak with their athletes about their food and fluid intake. The ability to identify any red flags related to nutrition concerns can be of great assistance during collaborations with the RD.

### Phytonutrients

Phytonutrients are the bioactive non-nutrient compounds in fruit, vegetables, grains and other plant foods that have been linked to reductions in the risk of major chronic diseases.<sup>4</sup> Plant-based foods such as fruit, vegetables and whole grains, which contain significant amounts of bioactive phytochemicals, may provide desirable health benefits beyond basic nutrition to reduce the risk of chronic diseases.<sup>4</sup> Help your athletes "eat the rainbow" and get a lot of color in their eating plan. It is important that your athletes understand that every color in their food signifies a different nutrient. Remember, the bolder the color, the more dense the nutrients composition in the food. Consuming varied and bright colors in foods will go a long way toward keeping their immune systems healthy.

### Supplements

Your athletes want to be on the cutting edge and will do anything to be on the top of their game, including taking nutritional supplements. However, there may be a great risk associated with considering nutritional supplementation—loss of eligibility from a positive drug test. The NCAA has a strict list of banned, permissible and impermissible substances at [www.ncaa.org/health-and-safety/policy/2014-15-ncaa-banned-drugs](http://www.ncaa.org/health-and-safety/policy/2014-15-ncaa-banned-drugs). Collegiate athletes often place themselves at risk by consuming supplements without consulting their sports medicine team. ATs can use this opportunity to refer athletes to a sports RD who can assist with the evaluation of any nutritional and/or

herbal supplements for legality, safety, quality and efficacy.<sup>8</sup> The RD can also monitor use of appropriate supplementation for health, safety and performance.<sup>10</sup>

Overall, there are mixed reviews about whether supplements are safe for cancer patients. Evidence suggests some supplements can interfere with chemotherapy and radiation.<sup>9, 10, 11, 12, 13</sup> "You don't want to encourage the growth of cancer cells," O'Malley said. "Talk with your physician and RD to find out which supplements might be best for you."

Ideally, nutrients should be consumed from whole foods in place of supplements. Supplements should be provided only for those with diagnosed deficiencies and should not exceed Dietary Reference Intake recommendations, unless prescribed. In addition, vitamin and mineral supplementation needs to be individualized. The disease, surgery, radiation and chemotherapy treatments may prevent supplements from being filtered through the system and cause toxicity. The "more is better approach" does not apply to nutritional supplementation. For example, excessive intake of antioxidant supplements may impede exercise adaptations to training.<sup>14</sup>

Instead, athletes should focus on creating a sound eating plan with a wide selection of a variety of foods from each food group. Eating the same foods day after day and eliminating food groups will only rob the athlete of essential nutrients for health and performance. The AT and the RD can team up and educate the athletes about the proper incorporation of antioxidants through foods, and the RD can assist the athlete with an appropriate calorie level for their fueling plan specific to their sport. Remember, the health, safety and eligibility of the student athlete will never be compromised by consuming whole foods.

### Staying Active

Following treatment, the symptoms of cancer can result from the progression of the illness or from the side effects of the treatment itself. Among all modalities, staying active has been shown to have the most benefits.<sup>18</sup> Each exercise program



should be tailored to the needs of the patient and advanced as tolerated under medical supervision.

While adequate sleep and rest are important, research strongly supports engaging in physical activity to reduce cancer-related fatigue, and it's one of the few evidence-based treatments currently available.<sup>3</sup> According to the *British Journal of Cancer* and the World Confederation of Physical Therapy, studies have noted a significant link between low physical activity and increased death from cancer. Studies have noted that moderate exercise reduces the rate of death by 34 percent and improves the survival rate by 33 percent.<sup>15</sup> In contrast, people who adapted the lifestyle of resting between treatments and not engaging in physical activity showed declines of as much as 25 percent in aerobic capacity during treatment.<sup>18</sup>

Studies have also shown that during cancer treatment, physical activity can improve upper and lower body strength and reduce fatigue.<sup>16</sup> According to the new roundtable statement from the American College of Sports Medicine, cancer survivors—including those currently undergoing treatment—can experience a multitude of benefits from exercise.<sup>5</sup>

"Exercise helped me keep my emotions in check during treatment, even if it was just a walk around the block," said O'Malley, adding she practiced yoga during her recovery and it was a big part of her healing process.

### Food Safety

According to the Center for Disease Control and Prevention, each year roughly one in six Americans (or 48 million people) get sick, 128,000 are hospitalized and 3,000 die of foodborne diseases.<sup>6</sup> A weakened immune system resulting from cancer treatments will place your athlete at a heightened risk for contracting a foodborne illness. ATs can educate the athlete in keeping safe in the kitchen while living with other roommates. The following are some simple tips:

- Handling, preparing and eating foods with good techniques can help athletes fight off disease. Wash hands, surfaces, the skins of fruits and vegetables and the lids of unopened lids and jars.
- Avoid cross contamination and don't touch foods after handling raw meat, seafood or eggs without washing hands first.

- Cook foods to the right temperature and use a food thermometer to check the internal temperature of foods.
- Store foods at or below 40 degrees within two hours after preparation. Bacteria grow more rapidly at temperatures between 40-140 degrees.<sup>7</sup>

Visit [www.homefoodsafety.org/about](http://www.homefoodsafety.org/about) for downloads and app instructions for food safety tips.

### It Takes a Team.

Working together, RDs and ATs make a great team and can achieve great success in assisting an athlete with the management of his/her unique nutrition needs during cancer treatment. With emphasis on preserving and heightening one's immune system, all athletes faced with a cancer diagnosis are up against much improved odds for a successful recovery. Simple practices for warding off infections such as eating adequate calories, consuming phytonutrients, maintaining their exercise regime and practicing good food safety are all important areas for the RD and AT "team" to reinforce to their athletes.

All ATs can find an RD in their local area through SCAN—the Sports, Cardiovascular and Wellness Nutrition Group—a dietetic practice group of the Academy of Nutrition and Dietetics. Use the following link [www.scandpg.org/search-rd](http://www.scandpg.org/search-rd) to find a SCAN RD. An RD and certified specialist in sports dietetics is an invaluable asset to any sports medicine team or athletics program. Using Evidence-Based Practice, registered and certified sports dietitians are the nutrition experts who focus on individual nutrition therapy and/or group nutrition education for performance and optimal health. Consider reaching out to the sports RDs in your area and use their expertise as part of your sports medicine team. §

*About the author: Christine Turpin, RD, LDN, CSCS, ACSM-HFS, is a licensed and registered dietitian specializing in sports nutrition. She is the owner of Nourish 2 Perform LLC, a nutrition consulting company located in the Annapolis-Baltimore region of Maryland. Her primary clients include Towson University, Stevenson University and Chiro 1st Chiropractic and Physical Therapy.*

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