



# CANCER NUTRITION CONSORTIUM™

Nutritional Guidance & Support

NEWSLETTER | **Issue No. 1**  
RESEARCH, RESOURCES, & RECIPES

CancerNutrition.org

## BRINGING TOGETHER RESOURCES IN HEALTH CARE, NUTRITION, & CULINARY ARTS

As a physician, I found on a frequent basis that I was seeing patients undergoing chemotherapy and radiation therapy who were having great difficulty eating—staying nourished and hydrated. They were coming to me because nutritional advice was not a focus of their oncologists. In searching for information themselves, they frequently encountered unreliable or untrustworthy information.

Concern for my patients and the realization that this story was not unique to my practice led to the formation of the Cancer Nutrition Consortium (CNC). Our mission is to bring together resources in health care, nutrition and culinary arts to raise awareness about patient nutritional needs with the result of bettering the quality of life for those undergoing cancer treatment.

We began by assembling a team of experts from medical institutions including Dana Farber, Brigham and Women's, Johns Hopkins, Duke University, Cedars Sinai, Mayo Clinic, Yale University, University of Chicago, NYU Langone Perlmutter, and Roswell Park. With them,

we created a clinical research study to learn how cancer treatment affects a patient's food intake and preferences so as to guide the development of dietary interventions. The study explored nutritional needs and preferences for taste and smell, which can be problematic for patients undergoing chemotherapy and radiation.

We took the results of our initial study and developed hundreds of delicious recipes to meet patients' nutritional needs. Cancer patients, family members and caregivers can access these recipes on the consortium's website (CancerNutrition.org)—and prepare meals at home for themselves and their loved ones.

We look forward to any feedback you may have.

Bruce Moskowitz, MD  
**FOUNDER**

## ACHIEVE OPTIMAL HEALTH DURING CANCER TREATMENT

The Cancer Nutrition Consortium recognizes the importance of food and nutrition to positive medical outcomes of cancer treatment. Our recipes and recommendations incorporate a wide range of insights. Key among them is that these dishes can be created at home, making it easier for patients to achieve optimal health during cancer treatment by providing nourishing and great-tasting meals and protein shakes.

Based upon a nutrition and taste research study conducted at several leading U.S. cancer centers, we took the expert advice of renowned nutritionists and asked the best chefs in the nation to develop hundreds of recipes to

meet patients' nutritional needs—while always remaining focused on making great-tasting food. We trust that these foods will sustain you.

We are continually undertaking new research on nutrition and taste to guide our efforts. We look forward to what the future holds.

Peter L. White  
**EXECUTIVE CHAIRMAN**

# Sugar

## MYTHS & TRUTHS

Mae Reilly, MS, RD, LDN | Senior Nutritionist  
Dana Farber Cancer Institute

“Does sugar feed cancer?” is one of the most frequent questions I receive as an oncology dietitian. While researchers continue to investigate the relationship between sugar intake and cancer, it remains a source of uncertainty and fear for many cancer patients and their caregivers. Let’s take a look at some information about the connection between sugar and cancer and steps you can take to support your overall health.

Sugar comes in many different forms, but the simplest form is a single molecule called glucose. All cells, including cancer cells, use glucose as their primary fuel. Glucose comes from any food that contains carbohydrates including healthful foods like vegetables, fruits, whole grains and dairy. Glucose also comes from refined carbohydrates and added sugars like white breads, pasta, sweets and sweetened beverages.

The idea that sugar, or glucose, could fuel the growth of cancer cells can lead some people to unnecessarily avoid all carbohydrate-containing foods. This approach assumes that if cancer cells need glucose, then cutting it out of one’s diet will stop cancer from growing. Unfortunately, it’s not that simple. All of our healthy cells need glucose to function, and there is no way for our bodies to let healthy cells have the glucose they need, but not give it to the cancer cells. Without adequate carbohydrate intake from foods we eat, our bodies will make glucose from other sources, including protein and fat. Glucose is that critical for our cells to survive and function properly. Not consuming sufficient carbohydrates can lead to the breakdown of protein stores in our body, which can contribute to muscle loss and possibly malnutrition. Following a restricted diet with very low amounts of carbohydrates can also cause unintentional weight loss. This can impact the ability to tolerate cancer treatment. Restricting carbohydrates also eliminates foods that are good sources of fiber, vitamins, minerals and immune supporting phytonutrients.

To date, there are no randomized controlled trials showing sugar causes cancer. There is, however, an indirect link between sugar and cancer. Eating a lot of high sugar foods

such as cakes, cookies, and sweetened beverages can contribute to excess caloric intake. This may lead to weight gain and excess body fat. Research has shown that being overweight or obese increases the risk of 13 types of cancers including colorectal, postmenopausal breast, ovarian, and pancreatic cancer.

While it is not necessary to completely avoid sugar, reducing added sugars and consuming nutrient-dense, high fiber carbohydrates may be most effective.

## 6 STEPS to

SUPPORT YOUR OVERALL HEALTH  
& MAINTAIN A HEALTHY WEIGHT

- ➔ **CHOOSE WHOLE GRAINS** like whole wheat bread, pasta, brown rice, or quinoa over refined grains like white bread, pasta and rice.
- ➔ **LIMIT ADDED SUGARS.** The American Heart Association recommends women should have no more than six teaspoons of sugar per day (24 grams) and men should have no more than nine teaspoons of sugar per day (36 grams).
- ➔ **CONSUME A DIET RICH IN VEGETABLES & FRUIT** which contain fiber, vitamins, minerals and immune supporting phytonutrients. Choose whole fruit over fruit juices and dried fruit.
- ➔ **INCLUDE A LEAN PROTEIN SOURCE** with each meal and snack like skinless poultry, fish, eggs, low fat dairy, tofu, beans, nuts or seeds.
- ➔ **BALANCE YOUR PLATE.** Make 50 percent of your plate high fiber vegetables and fruit. Twenty-five percent of your plate should be protein-rich foods and the other 25 percent should be whole grain carbohydrates or starchy vegetables such as peas, corn or potatoes.
- ➔ **STAY WELL HYDRATED.** Limit sugary beverages such as juice and soda.



## BENEFITS OF

# Exercise

Nancy Campbell, MS | Exercise Physiologist  
Dana Farber Cancer Institute

There are many benefits to exercising both during and after cancer treatment. In 2009 the American College of Sports Medicine published their recommendations that all cancer survivors should strive to avoid inactivity. Since then, more research has continued to emphasize this point and show potential reductions in cancer recurrence. Also, evidence suggests that exercise can have a beneficial impact on body weight, overall fitness, muscle strength, flexibility and quality of life, as well as on symptoms such as pain and fatigue.

### 1 START LOW & GO SLOW

Before you start exercising, you should check in with your medical team to make sure they don't have any concerns. Once they have given you clearance, it is important to start slowly. As you are starting to establish a routine, I recommend finishing your routine knowing you could have done a little bit more. Set yourself up for success and make your activity enjoyable and not exhausting. Fatigue is one of the most common and frustrating side effects of treatment and exercise is one of the most helpful ways to help you have more energy. It seems counterintuitive, but even a short walk around your house or to the end of the driveway and back can help take the edge off the fatigue. As you get stronger, you may find that breaking up your exercise into two or three 10-minute bouts over the course of the day is helpful.

### 2 SET GOALS & KEEP TRACK

There are so many ways to keep track of your progress with exercise. Maybe it's a calendar on your refrigerator or an activity tracker that you wear and monitor your exercise on a website or phone app. The main goal of tracking is to keep you aware of how much activity you are getting and remind you of the importance. Focusing on the consistency piece, instead of the duration or intensity will help your body get adjusted to incorporating

activity into your lifestyle. As your body is recovering from treatment, you want to avoid doing a big bout of activity that leaves you exhausted and unable to exercise again a day or two later. Listening to your body will make it easier to progress and get stronger.

Many survivors find it helpful to set a daily or weekly exercise goal to keep them on track. Make sure that your goal is S.M.A.R.T; Specific, Measurable, Attainable, Relevant and Time-bound. For example, instead of "I will exercise more" saying "I will walk on Monday, Wednesday and Friday morning from 10 to 10:20 am." Setting goals like this will help with accountability and focusing on small changes to help reach your wellness goals.

### 3 DECREASE SEDENTARY TIME

Exercise should also be more than an event in your day; the goal is to stay as active as possible throughout your day. Look for creative ways to add more movement into your day. Many of the activity trackers on the market will buzz when you have been inactive for more than an hour. You could also set a reminder in your computer to get up every hour or download an app that will buzz and remind you to move. As few as 250 steps an hour, or 2-3 minutes of walking can help with fatigue and the harmful effects of being sedentary. Try parking further away when you are running errands, taking the stairs or getting off the bus one stop earlier and walking.


### 4 LOOK FOR RESOURCES

All the positive research around exercise and cancer has led to the design of many different programs to help survivors stay active. For example, many of the YMCAs across the country offer the Livestrong exercise program, which is specifically designed for cancer survivors. It is a free 12-week program that incorporates cardiovascular exercise, strength training and stretching. You could also look into programs at your local hospital or wellness center to see if they have movement classes that are designed for survivors. If you are struggling with side effects from treatment like neuropathy, it may be beneficial to meet with a physical or occupational therapist to help with modifications. Many hospitals are now researching exercise and have clinical trials that you may be eligible for to help you get started or stay motivated. You can find trials by visiting [MyClinicalTrialLocator.com](http://MyClinicalTrialLocator.com) or [ClinicalTrials.gov](http://ClinicalTrials.gov) and entering "exercise and survivors" in the search box.

### 5 RESPECT YOUR BODY

Be kind to your body as you are undergoing or recovering from treatment and starting to exercise. I always say, 10% of something is better than 100% of nothing.





SERVINGS: 6  
PREP TIME: 10min  
COOK TIME: 60min

**PER SERVING**

CALORIES: 235  
SATURATED FAT: 9.5g  
SODIUM: 460mg  
CARBOHYDRATES: 6g  
DIETARY FIBER: 1g  
PROTEIN: 17g  
CHOLESTEROL: 49mg

Certified Master Chef Ron DeSantis

## Balsamic & Rosemary Glazed Pork Tenderloin with Roasted Roots

### INGREDIENTS

1 1/2 lbs RAINBOW CARROTS, CUT LENGTHWISE  
1 each FENNEL BULB, CUT INTO 6THS OR 8THS  
2 tbsp EXTRA VIRGIN OLIVE OIL  
1 tsp KOSHER SALT  
1/4 tsp FENNEL SEED  
1/4 tsp CORIANDER SEED  
1/8 tsp CUMIN SEED  
1 pinch BLACK PEPPER  
1/4 cup EXTRA VIRGIN OLIVE OIL  
3 tbsp BALSAMIC VINEGAR  
1 each GARLIC BULB, PEELED  
2 sprigs FRESH ROSEMARY  
2 each PORK TENDERLOINS

### DIRECTIONS

Heat a **roasting pan** in 425°F oven for 5 minutes. Add 2 tbsp extra virgin olive oil along with the carrots, fennel, and seeds. Season with salt and roast for 30 minutes without stirring.

In **blender** purée 1/4 cup extra virgin olive oil, balsamic vinegar, garlic cloves, and fresh rosemary until smooth.

Season with salt and pepper.

Heat a heavy **sauté pan** and spray with vegetable oil. Season pork tenderloins with salt and pepper. Brown pork on all sides in sauté pan-3 minutes per side. Remove from heat and coat with balsamic purée.

Stir vegetables in roasting pan. Place pork into pan, reduce heat to 350°F and roast for 15-20 minutes or until pork is done.

Slice pork tenderloin and serve with roasted roots.

SERVINGS: 4  
PREP TIME: 10min  
COOK TIME: 30min

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**PER SERVING**

CALORIES: 254  
SATURATED FAT: 3g  
SODIUM: 460mg  
POTASSIUM: 685mg  
CARBOHYDRATES: 17g  
DIETARY FIBER: 4g  
PROTEIN: 8g



Chef Jim Warner  
Ohio State University Wexner Medical Center

## Roasted Pumpkin Soup

### INGREDIENTS

**2 tbsp** EXTRA VIRGIN OLIVE OIL  
**1/2 cup** ONION DICED  
**1/4 cup** CELERY DICED  
**1/4 cup** CARROTS DICED  
**1 stick** CINNAMON **OR 1 tsp** GROUND CINNAMON  
**1/2 tsp** GROUND CORIANDER (OPTIONAL)  
**1 1/2 cups** ROASTED PUMPKIN PURÉED  
**1/2 cup** HALF AND HALF  
**1/2 cup** LIGHT COCONUT MILK  
**2 tbsp** SOY SAUCE LOW SODIUM  
**1 tbsp** FRESH GINGER MINCED FINELY  
**1/2 cup** PLAIN GREEK YOGURT  
**2 tbsp** TOASTED PUMPKIN SEEDS (OPTIONAL)

### DIRECTIONS

Heat olive oil in a **saucepan** over medium heat until hot. Add the onion, celery, carrot, ginger and cinnamon. Sauté until soft (but not brown), about 10 minutes.

Add chicken broth and coriander and bring to a boil.

Simmer for several minutes.

Stir in the puréed pumpkin until smooth.

Simmer gently to let the flavors meld, about 10 minutes.

If using a cinnamon stick, remove from soup and discard.

Purée the soup with an **immersion blender** until smooth.

Add half and half, coconut milk and soy sauce and stir until completely incorporated. Adjust seasoning with salt and pepper.

For the garnish, top with Greek yogurt and roasted pumpkin seeds.



## Our Research Initiatives

### The Impact of Cancer Treatment on the Diets & Food Preferences of Patients Receiving Outpatient Treatment

PUBLISHED 2015 - *NUTRITION AND CANCER*, 67(2), 339-353, 2015

Kisha I. Coa | Joel B. Epstein | David Ettinger | Aminah Jatoi |  
Kathy McManus | Mary E. Platek | Wendy Price | Meghan Stewart |  
Theodoros N. Teknos | Bruce Moskowitz

**ABSTRACT:** Patients undergoing cancer treatment experience a multitude of symptoms that can influence their ability to complete treatment as well as their quality of life during and after treatment. This cross-sectional study sought to describe the dietary changes experienced by cancer patients and to identify associations between these changes and common treatment symptoms. A convenience sample of 1199 cancer patients aged 18 years and older undergoing active treatment were recruited from 7 cancer centers to complete a self-administered paper-and-pencil survey. Descriptive analyses were conducted to estimate prevalence of dietary changes and Chi-squared tests were used to examine associations between dietary changes and health outcomes.

Approximately 40% of patients reported a decreased appetite since beginning treatment, and 67.2% of patients reported at least 1 chemosensory alteration. Increased taste sensitivities were more common than decreased taste sensitivities, with increased sensitivity to metallic being the most common taste sensitivity (18.6%). Patients also had increased sensitivities to certain smells including cleaning solutions (23.4%), perfume (22.4%), and food cooking (11.4%). Patients reported a wide range of food preferences and aversions. Patients who had less energy or lost weight since beginning treatment were more likely than others to report treatment-related dietary changes.

### Nutrition Related Issues & Dietary Challenges among Older Adult Cancer Patients

SUBMITTED NOV. 2017 - *JOURNAL OF NUTRITION & FOOD SCIENCES*

Kisha I. Coa | Joel B. Epstein | Kathy McManus | Bruce Moskowitz

**ABSTRACT:** To describe the impact of cancer treatment on the dietary behaviors and food preferences of older adult cancer patients and explore associations between these dietary changes and common cancer symptoms. Eight hundred cancer patients age 55 years of age and older undergoing cancer treatment completed a self-administered questionnaire. Descriptive statistics were conducted to examine associations between dietary changes and age groups (categorized as 55-64 years old, 65-74 years old, and 75 years old and older), and multivariable logistic regression was used to assess associations between dietary changes and health outcomes. The majority of participants experienced at least one cancer symptom, with fatigue and poor appetite being most commonly reported. About half of respondents reported no change in appetite or thirst, but those who did were: (1) more likely to report a decrease in appetite rather than an increase in it, and (2) more likely to report an increase in thirst rather than a decrease. Most of the patterns were consistent across age groups, but the oldest age group (75+) was less likely to report eating less frequently, and less likely to report certain increased taste and smell sensitivities. Characterizing the nutritional needs of older adult cancer patients is the first step in being able to address their needs. Future research is needed to evaluate potential strategies to address nutritional concerns, and to better understand the unique needs of specific subgroups of older adult cancer patients at high risk of experiencing dietary changes (e.g., those with head and neck cancer).

### Taste Changes, Oral Status & Eating Interest in Head and Neck and Breast Cancer Patients Treated with Chemotherapy: Clinical Taste/Flavor Evaluation

STARTING DEC. 2017 - CEDARS-SINAI MEDICAL CENTER, LOS ANGELES

Principal Investigator: Joel B. Epstein, MD

**ABSTRACT:** The perception of flavor is frequently altered in cancer patients, impacting quality of life and affecting dietary intake, with potential metabolic and nutritional effects. While taste/flavor changes are very common during active cancer care, they persist in large numbers of cancer survivors affecting quality of life beyond active cancer treatment. The CNC is planning a broad survey of taste function and nutritional outcomes, which provides an opportunity to add a subsite study of measures of taste and flavor and impact of oral function upon nutrition, leveraging the planned survey with clinical testing.

We propose a pilot study in both head and neck and breast cancer patients to assess taste/flavor change due to cancer therapy, employing chemosensory testing and patient report of taste change. Significant advances have occurred in the study of taste biology, but there has been very limited study in oncology. We propose objective testing, along with patient reported outcomes, to further investigate taste function. We will complete nutrition assessment for correlation with taste measures. The goal is to provide pilot data for subsequent grant applications to assess the natural history of taste change over time, and to define a testing protocol to facilitate progress in prevention and management of taste/flavor change in cancer patients during therapy and throughout survivorship to guide product development.

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