

Breast Cancer and Nutrition in Survivorship

According to the WCRF/AICR (World Cancer Research Fund/American Institute for Cancer Research), breast cancer is the 2nd most common cancer among all people worldwide, and it is the most common cancer diagnosis among women worldwide.

In addition to your medical providers' recommendation and instruction, combining nutrition and lifestyle changes can help lower your risk of breast cancer progression and recurrence. What you can do in your part, is to be proactive in your own care, to come up with a plan that would help you achieve lifelong healthy changes by following a well-balanced plant-based diet, increasing physical activity, and maintaining a healthy weight to lower your risk of cancer progression or recurrence.

Key Changes in Your Diet and Lifestyle That Would Make a Difference

The following table provides some highlights as a jump start on how you can achieve your dietary goals by following a healthful well-balanced plant-based diet to optimize your overall well-being.

Food Group	Tips
Vegetables	<ul style="list-style-type: none">• Aim to fill ½ of your plate with a variety of colorful non-starchy vegetables, including carotenoid rich food such as cruciferous vegetables, tomato, bell peppers
Fruits	<ul style="list-style-type: none">• Aim to have 2-3 servings of whole fruit everyday• Limit fruit juices to 4 oz per day if you choose to consume
Starches	<ul style="list-style-type: none">• Choose whole grains such as brown rice, quinoa, whole-grain bread and pasta, oatmeal, or tuber vegetables more often.• Try to replace your refined grains such as white rice, white bread, refined and sweetened cereals with these wholesome foods!
Protein	<ul style="list-style-type: none">• Choose plant-based protein, such as beans and lentils, tofu, nuts and seeds more often. They are great sources of dietary protein and fiber• When choosing animal protein, choose leaner protein sources such as chicken without skin, fish, and seafood• Limit red meat to no more than 12-18 oz cooked per week. Choose leaner cuts if able• Limit consuming food that is prepared with high heat cooking such as grilling and barbequing• Limit deep fried foods• Avoid processed meat such as luncheon meats, bacon, and sausages
Dairy	<ul style="list-style-type: none">• Choose low fat or nonfat dairy over full fat versions• You may consider some other calcium and Vitamin D fortified dairy alternatives such as soy milk, nut milk, oat milk, pea protein milk if you prefer• Aim to meet your daily goals of 800-1200 mg calcium and 1000-2000 IU vitamin D

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Food Group	Tips
Dietary Fat	<ul style="list-style-type: none"> • Choose healthy fat such as nuts and seeds, olive oil, and avocado more often, and consume in moderation • On a weekly basis, include 2 servings of omega-3 fatty acid rich foods. <i>*One serving can be 3.5 oz of oily fish like salmon, trout, mackerel, herring and tuna.</i> <i>*One serving can also be 1 tablespoon of flax seed or 14 walnut halves.</i> • Limit the use of saturated fat which is found in a higher percentage in red meat and animal products, as well as in tropical oil such as coconut and palm oil • Avoid trans fat
Fast food and sugar-sweetened drinks	<ul style="list-style-type: none"> • Avoid these foods as much as you can, as these foods provide you with little nutrients but lots of calories and added sugar
Hydration	<ul style="list-style-type: none"> • Keep yourself well hydrated with 8-10 eight-oz glasses of non-caffeinated and non-alcoholic fluid a day • Water is the best!
Physical Activity	<ul style="list-style-type: none"> • Walk more and sit less. Try to be physically active as much as you can, to your tolerance! • Start moving, make a plan, keep going and keep at it • As able, you may consider a combination of the following: <ul style="list-style-type: none"> ⇒ Balance and flexibility, such as yoga, Pilates, stretches ⇒ Aerobic activity, such as brisk walking and others ⇒ Weight bearing exercise, such as weightlifting and resistance training

Bottom line:

- Try to eat a rainbow of color of food that would help you optimize your consumption of a variety of cancer fighting nutrients including phytochemicals and antioxidants. These nutrients are found in abundance in fruits, vegetables, and whole grain. These foods should be the base of your daily diet.
- Choose wholesome, minimally processed foods more often. Avoid highly processed foods especially processed meat and prepackaged processed foods.
- Stay active and maintain a healthy weight.

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Foods You Should Choose More Often

Fiber

Natural fiber from fruit, vegetables, legumes and whole grain would bind with some cancer-causing substances, toxins and hormones that can help speed up the elimination of these substances from your body, which in turn may help slow down breast cancer progression and reduce the chances of recurrence.

When including bread, cereal, rice, and other starchy foods in your diet, choose the ones that are more wholesome (less refined) which would provide you with more fiber and micronutrients.

Aim to consume 30-35 grams of fiber from grains, cereals, legumes, fruits and vegetables every day.

Some helpful tips to help reach your daily dietary fiber goal:

- Choose breads and cereals with 3 grams or more fiber per serving. One serving of breads and cereals can be 1 slice of whole grain bread, and 1/3 cup of brown rice or quinoa.
- Include whole grains such as: sprouted wheat, oats, barley, quinoa and amaranth, brown rice, whole wheat bread and pasta, or tuber vegetables in your diet more often.
- Try to replace your refined grains such as white rice, white bread, refined and sweetened cereals with these wholesome foods!
- Beans and legumes are a good source of fiber and low-fat protein, as well as essential micronutrients. Including these foods in your diet can help reach your daily fiber and protein goals.
- Fill ½ of your plate with a rainbow of color of non-starchy vegetables such as dark leafy green vegetables (such as kale), cruciferous vegetables (such as broccoli), tomato, and all other colorful vegetable
- To avoid abdominal discomfort and constipation while including more fiber in your diet, be sure to drink plenty of fluids and gradually increase your fiber intake.
- Include 2-3 servings of fruits in your daily diet such as apple, berries, citrus fruits, mango, pear, pomegranate, or what is in season.
- Consider including 1-3 tbsp of ground flaxseed to your diet for added fiber as well as lignans. Adding flax seed meal in your oatmeal or smoothies may be a good start!
- If you have not consumed this much fiber in the past, increase your intake gradually to build up tolerance

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Phytochemical and Antioxidants

Phytochemicals and antioxidants are found in abundance in plant-based foods. These nutrients have been found to be helpful in fighting cancer!

Vitamins A, C, E, Selenium, lycopene, and beta-carotene are some well-known antioxidants that are found in most fruit and vegetables. These antioxidants can help prevent and repair oxidative damage in body cells. By including these antioxidants into your diet by consuming a variety of fruit and vegetables, nuts and seeds, wholegrains and vegetable oils daily in your diet, you can optimize your intake of these nutrients to help fight cancer!

Phytochemicals are plant chemicals that contribute to the color, taste, and smell of the food. They can be found in fruits, vegetables, legumes, nuts, seeds, whole grains, fungi, herbs, and spices. Research on phytochemicals is ongoing, but so far, the scientific evidence shows promising benefits for these cancer fighting nutrients.

In addition, more often use of natural herbs and spices such as turmeric, garlic, ginger, onions, chives, leeks, scallions, and shallots in your cooking, instead of salt, to flavor your dishes, can help maximize the consumption of these cancer fighting phytochemicals (e.g. Adiallyl Sulfids and Curcumin), while reducing your salt intake. After all, the best way you can maximize your intake of these nutrients is by trying to include a rainbow of color of foods in your daily diet!

Furthermore, current research supports that moderation consumption of green tea up to 2 to 3 cups a day may provide general health benefits as well as cancer protection, as long as you can tolerate the mild caffeine content in this beverage.

Best ways to include these good antioxidants and phytochemicals to your daily routine is by consuming WHOLE FOOD instead of supplement, which whole food consumption is considered safe, and helps you to get the most out of it. For those who are not able to consume adequate nutritional intake from their diets due to some side effects from the treatments or the ill-feelings from the diagnosis, a basic daily multivitamin supplement that would provide close to RDA (Recommended Dietary Allowance) / DRI (Dietary Reference Intakes) amount is considered safe. This may help fill the gap temporarily If you are unable to get adequate nutrients from your food intake.

The following tables show some examples of the antioxidants and phytochemicals with their food sources that you can try to incorporate them more into your daily diet.

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Antioxidants	Food Sources
Vitamin A	Citrus fruits, tomatoes, green peppers, broccoli, dark green vegetables, berries, cantaloupe, mangos, papaya, guava, raw cabbage, potatoes
Vitamin E	Wheat germ, nuts, seeds, whole grains, green leafy vegetables, avocado, vegetable oil, fish-liver oil
Beta Carotene	Dark orange, red, yellow and green vegetables. Carrots, squash, broccoli, sweet potatoes, tomatoes, kale, collard greens, parsley, spinach, cantaloupe, peaches, apricots, pink grapefruit, oranges
Selenium	Brazil nuts, brewer's yeast, fish, shellfish, red meat, grains, eggs, chicken, and garlic. Vegetables can also be a good source if grown in selenium rich soil
Zinc	Barley, wheat, oysters, crab, beef, lamb, chicken, turkey
Omega-3 FA	Salmon, trout, tuna, walnuts, flaxseed
Flavonoids	Tomato, lemon, lime, pomegranate, chocolate, soy bean, oranges, apples, onions, grapefruit, carrots, blueberries
Quercetin	Green cabbage, spinach, cranberries, kale, pears, grapes, apples, onions, garlic, white grapefruit
Alpha Lipoic Acid	Spinach, liver, brewer's yeast
N acetyl cysteine	Lean chicken breast, lentils, oatmeal, eggs, low-fat yogurt, sunflower seeds, swiss cheese

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Phytochemicals	Food Sources
Allicin	Onions, garlic
Anthocyanin	Red and blue fruits (raspberries, blueberries, purple grapes, plums, etc.) and vegetables such as eggplant skin, red cabbage
Capsaicin	Chili peppers
Catechins	Apple, grapes, pomegranates, raspberries, red wine, tea, dark chocolate
Curcumin	Ginger, turmeric
Indoles & Isothiocyanates	Broccoli, cabbage, kale, cauliflower, brussels sprouts
Isoflavones	Soy bean, tofu, soy milk
Labiatae	Rosemary, sage, oregano, thyme
Lignans	Flaxseed and whole grain products
Lutein	Kale, spinach, collard greens, Swiss chard, Romaine lettuce, broccoli, Brussels sprouts, kiwi
Lycopene	Tomato, ketchup, tomato sauce, sundried tomatoes, guava, watermelon, red grapefruit
Monoterpenes	Citrus fruits, mint, sage, cherries, cranberries
Phenolics	Citrus fruit, fruit juices, legumes
Resveratrol	Red and purple grape skin

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Omega-3 Fats

These healthy fats play an important role in the formation of cell membranes and hormone-like substances. They also help strengthen your nervous system, regulate your body's immune and inflammatory responses. These healthy fats may also play a huge role in the anti-inflammatory process in your body, thus inhibiting cancer cell growth.

Consider including 2 servings omega-3 rich foods to your diet on a weekly basis. One serving of omega-3 rich foods can be 3.5 oz of salmon, Atlantic herring, trout or mackerel; or 1 tablespoon of flax seed or 14 walnut halves.

Foods to Limit

Refined Carbohydrates

Some studies find that postmenopausal women with high level of fasting blood sugar had a slightly greater risk of cancer progression and recurrence, compared with those who have normal fasting blood sugar or did not have diabetes. It is speculated that the constant surge of insulin and associated insulin-related hormone (e.g. Insulin-like growth factor) may contribute to promoting cancer growth. Limit refined carbohydrates consumption may help stabilize the blood sugar levels in your body, which in turn would help slow down cancer growth. In addition, refined carbohydrates and added sugar as commonly found in most processed foods, may provide more calories, but fewer nutrients to nourish your body.

Consider:

- Limit refined carbohydrate such as white flour, white pasta, white rice, sugary baked foods, and desserts with added sugar
- Limit sugar sweetened beverages, and other concentrated sweets, such as candy, and cookies.
- Read food labels: Avoid processed foods with ingredients such as corn syrup, high fructose corn syrup, sugar, brown sugar, and cane sugar especially if they are listed in the first 4-6 ingredients on the ingredients list. These foods are generally high in refined carbohydrates.

Saturated Fat

This kind of fat is usually found in foods from animal sources (meat, whole milk dairy products, butter, cheese, and eggs) as well as tropical oil (such as coconut and palm oil). Excessive intake of this kind of fat will promote the inflammatory process in your body, thus promoting cancer growth. High consumption of this type of fat is also associated with other chronic conditions such as heart disease. Therefore, consumption of saturated fat should be minimized.

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Red Meat / Processed Meat

Studies have shown that red meat and processed meat consumption is associated with increased risk of cancer formation. Consider:

- Red meat: consume as little as possible. If you choose to consume, limit red meat to no more than 12 oz per week including beef, pork, and lamb. Choose leaner cuts.
- Processed meat: best to avoid altogether. Some examples of processed meat are bacon, sausage, luncheon meats, and hot dogs.

Way of cooking matters! Limit consuming food that is prepared with high heat cooking such as grilling and barbequing. These kinds of cooking methods can produce char on your foods, which may promote cancer growth.

Trans Fats

Trans-fat can promote some inflammatory responses in the body that would lead to cell damages, eventually to the development and progression of cancer. Some examples of Trans-fat are hydrogenated fat and partially hydrogenated fat that are commonly found in margarine and fried foods, and some processed foods such as crackers, cereals, cookies, and other baked goods. Read the food labels before your purchase.

Salt / Sodium

Some studies have found that high salt intake may increase risk of cancer progression and the development of other chronic health conditions, such as high blood pressure, and cardiovascular disease.

To help lower your risk of cancer progression or recurrence, and the risk of developing other chronic health problems, here are some tips to help lower your consumption of added salt:

- Use fresh fruit, vegetables, and protein food more often
- Reading food labels and choose one without salt or other sodium source in the ingredient list. Such as choosing 100% natural nut butter rather than the one with added salt and sugar, or frozen vegetables rather than canned vegetables.
- Try to use more natural herbs and spices such as garlic, and turmeric to season and enhance the flavor of your food instead of using salt.
- When dining out, ask that no salt be added to your meal. Keep take out and fast food to an occasional treat.

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Tips for Fat in Your Diet

Excessive fat consumption has been associated with breast cancer progression/recurrence. High fat consumption, as well as weight gain because of excessive caloric intake from fat consumptions, may stimulate the inflammatory process in a body, that would promote cancer growth.

Consider:

- Include healthy fats in your diet: such as cold-water fish, ground flaxseeds, nuts and seeds, avocados, olives, and olive oil, in moderation.
- Avoid foods that contain hydrogenated or partially hydrogenated fat as listed in the ingredients list.
- Limit animal fat and whole milk dairy products. Choose low-fat or non-fat milk, yogurt, cheese, and cottage cheese.
- Avoid fried food.

Bone Health and Vitamin D

Adequate intake of calcium and vitamin D is important to maintain bone health, especially in post-menopausal women. In addition, adequate vitamin D intake may be associated with improved survival, and decreased risk of cancer recurrence.

Calcium goal: 1000-1200 mg. Some of the calcium rich foods are:

- Low fat / non-fat milk or yogurt, calcium fortified dairy alternative (1 cup provide ~300 mg calcium)
- Cheese (1 oz ~200 mg)
- Dark leafy green vegetables (1/2 cup provide ~70-125 mg calcium)
- Edamame (1/2 cup ~130 mg)
- White beans (1/2 cup ~100 mg)

Vitamin D goal: 1000-2000 IU. Some of the Vit D rich sources are:

- Direct sunlight of 10-15 min daily
- Vit D fortified dairy alternatives (~100 IU, read the food label)
- Oily fish (3 oz halibut ~510 IU, 3 oz salmon ~360 IU)
- Ready-to-eat cereal fortified with vit D (~40-50 IU, read the food label)
- Eggs (1 whole egg ~26 IU)

You may consider calcium and Vit D supplements if you find your dietary intake inadequate to meet your goals.

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Soy

Soy contains various healthful nutrients such as protein, fiber, calcium, and several B vitamins. It is also a good source of antioxidants and isoflavones.

Consuming moderate amounts of natural soy products such as edamame, tofu, tempeh, unsweetened soymilk, and soy nuts is considered safe along with a low-fat diet that includes plenty of fruit and vegetables. However, processed soy products, such as soy sausage, should be limited as they are processed foods after all.

Individuals with Estrogen Receptor Positive breast cancer can still safely include natural soy products in their diet in moderation if limiting these foods to 1-3 servings per day as whole food consumption.

One serving can be:

- 1 cup unsweetened calcium fortified soymilk
- 1/2 cup cooked soybeans or tofu
- 1/3 cup edamame
- 1 oz. soy nuts

Organic

According to the AICR, there have been no studies to confirm that organic produce is better at preventing cancer or cancer recurrence than non-organic produce. However, it might be beneficial to choose organic on produce that are likely contaminated by pesticides if your food budget allows. Below is the 2021 “dirty dozen” and “clean 15” list per the Environmental work group, a shopper’s guide to pesticides in produce (<https://www.ewg.org/>). This list is updated frequently based on the results of field samples. You may choose your food options, based on your food budget, and your own preference, according to the current list.

Dirty Dozen

Apples, bell and hot peppers, celery, cherries, kale / collard and mustard greens, grapes, nectarines, peaches, pears, spinach, strawberries, tomatoes

Clean Fifteen

Asparagus, avocados, broccoli, cabbage, cantaloupe, cauliflower, eggplant, honeydew melon, kiwi, mushrooms, onions, papaya, pineapple, sweet corn, sweet peas (frozen)

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Coffee/Caffeine

Relationship between caffeine consumption and breast cancer is uncertain.

However, having one to two 8-oz cups of caffeinated drinks per day is generally considered safe if caffeine containing food does not trigger any discomfort such as acid reflux or affecting your sleep.

Another healthy option to replace your “joe” in the morning is a cup of green tea. Research has shown that green tea can provide your body with some antioxidants that can help fight cancer and reduce the risk of cancer progression!

Alcohol

Many studies support the fact that even low-level consumption of alcohol can increase the risk of developing and progression of breast cancer, especially in postmenopausal women and women at risk of developing hormone sensitive breast cancer.

It is therefore recommended that women with a history of breast cancer to limit to 1 drink per day, or best, not to drink alcohol at all.

Smoking

Multiple studies support the fact that smoking and exposure to passive smoking increase the risk of breast cancer development. Quit if you smoke.

Additional Lifestyle Factors

Physical Activity

Research indicates that women who engage in regular physical activity have a reduced risk of breast cancer compared to women who are less active. Physical activity after the diagnosis of breast cancer may also reduce the risk of death from the disease. Women diagnosed with hormone receptor positive breast cancer appear to get greater benefit from regular physical activity.

Regular physical activity may play a role in cancer prevention as it improves insulin sensitivity and help with weight management. You may consider a combination of aerobic activity as well as weight bearing/resistance exercise.

Aerobic activity, such as brisk walking, helps keep building a stronger heart and blood circulating system.

Weight bearing exercise, like weight-lifting exercise against gravity, can help strengthen your bone and help reduce the risk of developing osteoporosis along with adequate calcium and Vit D intake.

Always check with your doctor first to determine what levels of physical activity you can safely engage!

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Healthy Weight

Goal: Try to achieve a healthy weight geared toward Body Mass Index (BMI) of 20 – 25.

Overweight and obesity has a strong association with an increased risk of breast cancer development and progression especially in postmenopausal women. There is a strong link between overweight and obesity at the time of breast cancer diagnosis, weight gain after the diagnosis, and recurrence of breast cancer.

Obesity is also associated with many other health problems such as diabetes and heart disease. By achieving and maintaining a healthy weight, women can reduce their risk of developing breast cancer and cancer recurrence, as well as these chronic health problems.

Fasting

There are increasing evidence to support there is health benefit with longer nighttime fasting. Study shows people with history of breast cancer who fasted more than 13 hours at night had decreased rates of breast cancer recurrence, compare with those who fasted for less than 13 hours per night.

Stress

Stress and anxiety go together with any medical condition including a cancer diagnosis. Many times, these natural responses may result with a lower quality of life. There are many techniques and ways to manage your stress such as exercise, adequate sleep schedule, support group, schedule daily relaxing time, or simply, do things you enjoy. Choose the one that feels right to you and be consistent. Utilizing mindfulness, relaxation technique that works for you. Consult with your provider if you feel you need more help. The Health Education Departments in Kaiser Permanente also offer lots of classes and resources to help you manage your emotional well-being.

After the completion of your treatment and recovery, it might be a great opportunity for you to connect with one of our nutritionists to discuss your plans on moving forward by engaging in some healthier life-long style changes to reduce the risk of cancer recurrence. Please contact our Health Education department at **415-833-3450** for a follow up appointment to help navigate your pathway to personalize your goals and plan. We are here for you!

Updated by Eunice Y. Wong, MS RD CDCES on 11/2021