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## NUTRITION GUIDE FOR CANCER PATIENTS ON CHEMOTHERAPY TREATMENT



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## To the Patient and Family

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This booklet discusses eating for good nutrition throughout cancer therapy. Nutritional problems associated with cancer and cancer treatment are presented, along with tips to help minimize these eating difficulties. If you have any questions about the information in this booklet, please ask your health care team and dietician.

## Before the Cancer Treatment

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Even before your treatment has not yet begun, start eating as well as you can right away. Make sure your diet includes plenty of calories and protein. Good nutrition before starting chemotherapy will help you:

- Build extra strength for healing
- Prevent body tissue from breaking down
- Keep up your weight and your body's store of nutrients
- Fight off infection
- Cope with higher doses of cancer treatment

## Chemotherapy and its effects on nutrition

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Chemotherapy (also called chemo) is a type of cancer treatment that uses drugs to destroy cancer cells. Chemotherapy works by stopping or slowing the growth of cancer cells, which grow and divide quickly. But it can also harm healthy cells that divide quickly, such as those that line your mouth and intestines or cause your hair to grow. Damage to healthy cells may cause side effects. Often, side effects get better or go away after chemotherapy is over.

Some of the more common side effects of chemotherapy that can affect your nutrition are:

- Loss of appetite (anorexia)
- Sore mouth or throat
- Dry mouth
- Dental and gum problems
- Changes in taste or smell
- Nausea
- Vomiting
- Diarrhea
- Constipation
- Feeling very tired all the time (fatigue) due to anemia
- Reduced Immunity and increased risk of food-borne infections
- Depression

Cancer and chemotherapy treatment may affect taste, smell, appetite, and the ability to eat enough food or absorb the nutrients from food.

You might – or might not – have any of these side effects. Although many patients tolerate therapy well and experience few or no side effects, malnutrition is still a common entity that affects quality of life and survival for many persons with cancer. Many factors determine whether you'll have side effects and how bad they'll be. These factors include the type of cancer you have, the part of the body affected, the type and length of treatment, and the dose of treatment.

Many side effects can be controlled, and most go away over time after treatment ends.

## Importance of nutrition during the chemotherapy period

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Nutrition is important for your body to function at its best. With a healthy diet and good nutrition status, you'll go into treatment with reserves to help keep up your strength, prevent body tissue from breaking down, rebuild tissue, and maintain your defenses against infection. People who eat well are better able to cope with side effects of treatment. And you may even be able to handle higher doses of certain drugs. In fact, some cancer treatments work better in people who are well-nourished and are getting enough calories and protein.

To maintain or improve nutritional status, all barriers associated with oral intake should be aggressively addressed. Modifications in diet and eating habits may be necessary during treatment to reduce or eliminate the side effects of therapy. Weight maintenance is strongly recommended during therapy, with weight gain or loss being recommended based on the individual's nutritional status. Calorie and protein requirements may increase during treatment.

### Eat well

Try these tips:

- Don't be afraid to try new foods. Some things you may have never liked before, may taste good during treatment.
- Choose different plant-based foods. Try eating beans and peas instead of meat at a few meals each week.
- Try to eat at least 2½ cups of fruits and vegetables a day, including citrus fruits and dark-green and deep-yellow vegetables. Colorful vegetables and fruits and plant based foods contain many natural health-promoting substances.
- Limit high-fat foods, especially those from animal sources. Choose lower-fat milk and dairy products. Reduce the amount of fat in your meals by choosing a lower-fat cooking method like baking or broiling.

- Try to stay at a healthy weight, and stay physically active. Small weight changes during treatment are normal.
- Limit the amount of salt-cured, smoked, processed, and pickled foods you eat.

### Snack frequently as needed

During cancer treatment your body often needs extra calories and protein to help you maintain your weight and heal as quickly as possible. If you're losing weight, snacks can help you meet those needs, keep up your strength and energy level, and help you feel better. During treatment you may have to rely on snacks that are less healthy sources of calories to meet your needs. Keep in mind that this is just for a short while – once side effects go away you can return to a healthier diet. Try these tips to make it easier to add snacks to your daily routine:

- Eat small snacks throughout the day.
- Keep a variety of protein-rich snacks on hand that are easy to prepare and eat. These include yogurt, cereal and milk, half a sandwich, a bowl of hearty soup, and cheese and crackers.
- Avoid snacks that may make any treatment-related side effects worse. If you have diarrhea, for example, avoid popcorn and raw fruits and vegetables. If you have a sore throat, do not eat dry, coarse snacks or acidic foods.
- If you're able to eat normally and maintain your weight without snacks, then don't include them in order to prevent excess weight gain.

**Quick and easy snack ideas:** hot or cold cereal, cookies, crackers, nuts, seeds, and nut butters, dips made with cheese, beans, yogurt, or peanut butter, puddings, custards, sandwiches such as egg, grilled cheese, or peanut butter, soups, etc.

### Tips to get more calories and protein

- Eat several small snacks throughout the day, rather than 3 large meals.
- Eat your favorite foods at any time of the day. For instance, eat breakfast foods for dinner if they appeal to you.
- Eat every few hours. Don't wait until you feel hungry.
- Eat your biggest meal when you feel hungriest. For example, if you are most hungry in the morning, make breakfast your biggest meal.
- Try to eat high-calorie, high-protein foods at each meal and snack.
- Exercise lightly or take a walk before meals to increase your appetite.
- Drink high-calorie, high-protein beverages like milk shakes and canned liquid supplements.

- Drink most of your fluids between meals instead of with meals. Drinking fluid with meals can make you feel too full.
- Try homemade or commercially prepared nutrition bars and puddings.

### High Protein Foods

#### Milk products

- Eat cheese on toast or with crackers.
- Add grated cheese to baked potatoes, vegetables, soups, noodles, meat, and fruit.
- Use milk in place of water for hot cereal and soups.
- Include cream or cheese sauces on vegetables and pasta.
- Add powdered milk to cream soups, mashed potatoes, puddings, and casseroles.
- Add Greek yogurt, powdered whey protein, or cottage cheese to favorite fruits or blended smoothies.

#### Eggs

- Keep hard-cooked eggs in the refrigerator. Chop and add to salads, casseroles, soups, and vegetables. Make a quick egg salad.
- All eggs should be well-cooked to avoid the risk of harmful bacteria.
- Pasteurized egg substitute is a low-fat alternative to regular eggs.

#### Meats, poultry, and fish

- Add cooked meats to soups, casseroles, salads, and omelets.
- Mix diced or flaked cooked meat with sour cream and spices to make dip.

#### Beans, legumes, nuts, and seeds

- Sprinkle seeds or nuts on desserts like fruit, ice cream, pudding, and custard.
- Also serve on vegetables, salads, and pasta.
- Spread peanut or almond butter on toast and fruit or blend in a milk shake.



## Don't forget about physical activity

Physical activity has many benefits. It helps you maintain muscle mass, strength, stamina, and bone strength. It can help reduce depression, stress, fatigue, nausea, and constipation. It can also improve your appetite. So, if you don't already exercise, talk to your doctor about aiming for at least 150 minutes of moderate activity, like walking, each week. If your doctor approves, start small (maybe 5 to 10 minutes each day) and as you are able, work up to the goal of 150 minutes a week. Listen to your body, and rest when you need to.

## Chemotherapy nutrition-related side-effects and ways to manage them

Side effects of chemotherapy treatment may vary from person to person, depending on the type, length, and dose of treatments as well as the type of cancer being treated. This section offers practical suggestions for managing the common symptoms affecting nutrition intake.

### 1. Appetite Changes

Chemotherapy can cause appetite changes. You may lose your appetite because of nausea (feeling like you are going to throw up), mouth and throat problems that make it painful to eat, or drugs that cause you to lose your taste for food. The changes can also come from feeling depressed or tired. Appetite loss may last for a day, a few weeks, or even months. It is important to eat well, even when you have no appetite. This means eating and drinking foods that have plenty of protein, vitamins, and calories. Eating well helps your body fight infection and repair tissues that are damaged by chemotherapy. Not eating well can lead to weight loss, weakness, and fatigue. Some cancer treatments cause weight gain or an increase in your appetite. Be sure to ask your doctor, nurse, or dietician what types of appetite changes you might expect and how to manage them.

#### Suggestions for appetite improvement include the following:

- Plan a daily menu in advance.
- Eat small, frequent, high-calorie meals (every 2 hours).
- Arrange for help in preparing meals.
- Fortify your meals with foods that are rich in calories and nutrients. Try adding nonfat dry milk, wheat germ, nut butter, avocado (slices or purée) or ground meat to soups, hot cereals, casseroles or other dishes. Prepare and store small portions of favorite foods.
- Snack between meals.
- Seek foods that appeal to the sense of smell.
- Be creative with desserts.
- Experiment with different foods.
- Perform frequent mouth care to relieve symptoms and decrease aftertastes.

### 2. Alterations of taste and smell

Alterations in taste can be related to unknown effects of cancer, chemotherapy treatment, dental problems, mucositis and infection (thrush), or medications. People undergoing chemotherapy frequently report changes in their sense of taste, specifically a bitter taste sensation during administration of the cytotoxic drugs.

Taste dysfunction can result in food avoidance, inducing weight loss and anorexia, all of which can have significant consequences on patients' quality of life. Simply changing the types of foods eaten as well as adding additional spices or flavorings to foods may help. Citrus may be tolerated well if no mouth sores or mucositis is present. Rinsing the mouth before eating may help improve the taste of food.

While undergoing cancer therapy, you develop sudden dislikes for certain foods. Your sense of taste may return partially or completely, but it may be a year after therapy ends before their sense of taste is normal again.

#### Suggestions for helping cancer patients manage taste changes include the following:

- Choose and prepare foods that look and smell good to you. Foods may taste better if served cold or at room temperature.
- Frozen fruits such as melon balls, grapes or orange wedges that are moist and naturally tart and sweet may be appealing.
- If red meat tastes different, try chicken, turkey, fish, tofu, beans, eggs or dairy products that don't have a strong odor.
- Marinate meats in juice, barbecue sauce, Italian dressing or other flavorful liquid you find appetizing
- Be flexible. Eat meals when hungry rather than at set mealtimes.
- Use plastic utensils if foods taste metallic. Use plastic forks and spoons. Some types of chemo give you a metal taste in your mouth. Eating with plastic can help decrease the metal taste. Cooking in glass pots and pans can also help.
- Adding small amounts of sugar, honey or maple syrup to some foods can help decrease salty, bitter or unpleasant tastes.
- Tart foods and beverages such as lime - or lemonade or lemon yogurt may be appealing. (Do not eat these foods if your mouth is sore.) Use sugar-free lemon drops, gum, or mints when experiencing a metallic or bitter taste in the mouth.

### 3. Dryness of Mouth / Thick Saliva

During chemotherapy, a number of medications may induce dryness of mouth. Dry mouth may affect speech, taste sensation, ability to swallow, and use of oral prostheses. There is also an increased risk of cavities and periodontal disease because less saliva is produced to cleanse the teeth and gums.

A primary method of coping with dry mouth is to drink plenty of liquids and eat moist foods with extra sauces, gravies, butter, or margarine. In addition, hard candy, frozen desserts such as frozen grapes, chewing gum, flavored ice pops, and ice chips may be helpful. Oral care is very important to help prevent infections.

#### Suggestions for lessening or alleviating dry mouth include the following:

- Avoid salty foods.
- If your mouth is not sore, try tart foods and beverages, such as lemonade, in small amounts, which may help your mouth produce more saliva.
- Suck on ice cubes or ice chips
- Suck on lemon-flavored, sugar-free candies, frozen grapes or sugarless popsicles or chew sugarless gum to help stimulate saliva.
- Eat foods moistened with broth, gravy, sauces and salad dressings. Moist foods, including soups, are easier to swallow.
- Avoid alcohol. This includes avoiding commercial mouthwash, which may contain alcohol, because it will dry your mouth.
- Keep your lips moist with lip balms.
- Try using a cool mist humidifier at night and while napping
- Perform oral hygiene at least 4 times per day Brush and rinse dentures after each meal.
- Keep water handy at all times to moisten the mouth.
- If you see small, white patches in your mouth, tell your physician. This may be evidence of an infection that may require special attention.

### 4. Sore Mouth

Sore mouth, can occur when cells inside the mouth, which grow and divide rapidly, are damaged by chemotherapy treatment. By carefully choosing foods and by taking good care of their mouths, you can usually make eating easier. Individuals who have mouth sores, or tender gums should eat foods that are soft, easy to chew and swallow, and nonirritating. Some conditions may require processing foods in a blender. Irritants may include acidic, spicy, salty, and coarse-textured foods.

#### Suggestions for people with cancer who are experiencing sore mouth include the following:

- Eat soft foods that are easy to chew and swallow, including bananas and other soft fruits, applesauce, peach, pear, and apricot nectars, watermelon, cottage cheese, mashed potatoes, macaroni and cheese, custards, puddings, gelatin, milkshakes, scrambled eggs, oatmeal or other cooked cereals, pureed or mashed vegetables such as peas and carrots; and pureed meats.
- Avoid foods that irritate the mouth, including citrus fruits and juices such as orange, grapefruit, or tangerine, spicy or salty foods, and rough, coarse, or dry foods, including raw vegetables, granola, toast, and crackers.
- Cook foods until soft and tender.
- Cut foods into small pieces.
- Use a straw to drink liquids. Eat foods cold or at room temperature; hot and warm foods can irritate a tender mouth.
- Practice good mouth care, which is very important because of the absence of the antimicrobial effects of saliva.
- Increase the fluid content of foods by adding gravy, broth, or sauces.
- Supplement meals with high-calorie, high-protein drinks.
- Numb the mouth with ice chips or flavored ice pops.

#### Foods to try if your mouth, tongue or throat is sore

- bananas, applesauce, watermelon, canned fruits
- peach, pear and apricot nectars
- puréed or mashed vegetables such as mashed potatoes and mashed sweet potatoes
- oatmeal or other cooked cereal
- cottage cheese, yogurt, milkshakes
- custards, puddings, gelatin
- macaroni and cheese, scrambled eggs, ground meats

#### Foods to avoid

- citrus fruits or juices such as grapefruit, orange, lemon and lime
- spicy or salty foods
- pickled or vinegary foods
- tomato-based foods such as chili, salsa, spaghetti sauce and pizza
- rough, coarse or dry foods
- hot spices, such as pepper, chili powder, nutmeg, cloves, curry and horseradish

## 5. Nausea

Nausea can affect the amount and types of food eaten during treatment. Eating before treatment is important, as well as finding foods that do not trigger nausea. Frequent triggers for nausea include spicy foods, greasy foods, or foods that have strong odors. Once again, frequent eating, and slowly sipping on fluids throughout the day may help.

### Additional eating suggestions include the following:

- Eat dry foods such as crackers, breadsticks, or toast, throughout the day.
- Sit up or recline with a raised head for 1 hour after eating.
- Eat bland, soft, easy-to-digest foods rather than heavy meals.
- Avoid eating in a room that has cooking odors or is overly warm, keep the living space comfortable but well ventilated.
- Choose cold plates or eat foods at room temperature; hot dishes produce more odors that can aggravate nausea.
- Eat sitting upright. Avoid lying flat for about an hour after eating. If you need to rest after eating, recline with your head elevated.
- Rinse out the mouth before and after eating.
- Suck on hard candies such as peppermints or lemon drops if the mouth has a bad taste.
- If the smell of food cooking or cooling nauseates you, ask others to cook your meals for you.

### Foods to try if you have nausea

- toast, saltine crackers, dry cereal or breadsticks
- clear liquids, such as water, broth, cranberry juice and flat soda
- candied dried ginger
- ice chips
- hot cereal, such as oatmeal
- skinless chicken (not fried)
- yogurt, sherbet, sorbet and popsicles, canned peaches, pears, fruit cocktail

### Foods to avoid

- fatty, greasy, fried or spicy foods
- candy, cake and rich desserts
- foods with strong odors

## 6. Diarrhea

Chemotherapy can cause diarrhea because it harms healthy cells that line your large and small intestines. It may also speed up your bowels. Diarrhea can also be caused by infections or drugs used for chemotherapy. Avoiding diarrhea requires the intake of additional oral fluids and electrolytes. Broth, soups, sports drinks, bananas, and canned fruits may be helpful for the replenishment of electrolytes. Diarrhea may worsen with greasy foods, hot or cold liquids, or caffeine. Fibrous foods-especially dried beans and cruciferous vegetables-may contribute to frequent stools.

### Additional suggestions include the following:

- Drink plenty of mild, clear, non-carbonated liquids during the day. Drink liquids at room temperature. This may be easier to take than very hot or cold drinks.
- Eat small, frequent meals and snacks during the day.
- Avoid greasy, fried, spicy, or very sweet foods.
- Limit milk or milk products to 2 cups a day. Yogurt and buttermilk are OK.
- Avoid drinks and foods that cause gas, like carbonated drinks, gas-forming vegetables, and chewing gum. Allow carbonated drinks to become slightly “flat” before drinking by pouring them into a glass and letting them sit at least 10 minutes.
- Drink and eat high-sodium (salt) foods like broths, soups, sports drinks, crackers, and pretzels.
- Drink and eat high-potassium foods like fruit juices and nectars, sports drinks, potatoes, and bananas.
- Increase soluble-fiber foods like applesauce, bananas, canned peaches and pears, potatoes, oats or oatmeal, and sweet potatoes.
- Drink at least 1 cup of liquid after each loose bowel movement. Try water, sports drinks, or bouillon.
- Limit the use of sugar-free candies or gum made with sugar alcohol (sorbitol).
- Drink at least 1 cup of liquid after each loose bowel movement.

### Foods to try if you have diarrhea

- low-fiber foods like white rice, noodles, white bread and mashed potatoes
- soft, cooked or puréed vegetables soft, canned or cooked fruit without skins, such as bananas and applesauce
- skinless turkey or chicken, lean ground beef, cooked fish and thoroughly cooked eggs

### Foods to avoid: The following foods may worsen diarrhea

- foods and beverages that cause gas such as beans, onions, carbonated drinks and chewing gum
- high-fiber foods including vegetables such as broccoli, cauliflower, corn, beans, cabbage or peas
- large amounts of milk and dairy products
- raw vegetables and fruits, nuts, dried fruits
- greasy, fatty, fried, very sweet or very spicy foods

## 7. Reduced Immunity

Cancer and its treatment can weaken your body's immune system by affecting the blood cells that protect us against disease and germs. As a result, your body can't fight infection, foreign substances, and disease as well as a healthy person's body can. During your treatment for cancer, there will be times when your body won't be able to protect itself very well. While your immune system is recovering, you may be told to try to avoid exposure to possible infection-causing germs.

### Food handling tips for prevent infections related to weak immune system include the following:

- Wash your hands with warm, soapy water for 20 seconds before and after preparing food and before eating.
- Refrigerate foods at or below °40 F.
- Keep hot foods hot (warmer than °140 F) and cold foods cold (cooler than °40 F).
- Thaw meat, fish, or poultry in the microwave or refrigerator in a dish to catch drips. Do not thaw at room temperature.
- Use defrosted foods right away, and do not refreeze them.
- Put perishable foods in the refrigerator within 2 hours of buying or preparing them.
- Egg dishes and cream- and mayonnaise-based foods should not be left unrefrigerated for more than an hour.
- Wash fruits and vegetables well under running water before peeling or cutting. Do not use soaps, detergents, chlorine bleach solutions, or commercial produce rinses. Using a clean vegetable scrubber, scrub produce that has a thick, rough skin or rind (melons, potatoes, bananas, etc.) or any produce that has dirt on it.
- Do not eat raw vegetables / vegetable sprouts.
- Throw away fruits and vegetables that are slimy or moldy.
- Do not buy produce that has been cut at the grocery store (like melon or cabbage).
- Wash tops of canned foods with soap and water before opening.
- Check expiration dates on food and do not buy or use if the food is out of date.
- Avoid old, moldy, or damaged fruits and vegetables.
- Avoid tofu in open bins or containers.
- Cook all meat, poultry, and fish thoroughly; avoid raw eggs or raw fish.
- Use caution when eating out—avoid salad bars and buffets. Do not eat deli foods. In the bakery, avoid unrefrigerated cream- and custard containing desserts and pastries.
- Do not eat foods that are bought from self-serve or bulk containers.
- Do not eat yogurt and ice cream products from soft-serve machines.
- Do not eat free food samples.

- Limit exposure to large groups of people and people who have infections.
- Wash hands frequently to prevent the spread of bacteria.
- Ask that food be prepared fresh in fast-food restaurants.
- Ask for single-serving condiment packages, and avoid self-serve bulk condiment containers.
- Do not eat from high-risk food sources, including salad bars, buffets and sidewalk vendors.
- Ask if fruit juices are pasteurized. Avoid “fresh-squeezed” juices in restaurants.



## 8. Hydration and dehydration

Adequate hydration is critically important for health maintenance. Hydration status can become compromised with prolonged disease or treatment-related diarrhea and/or episodes of nausea and vomiting. Acute and chronic pain can also adversely affect the appetite and hence the desire to eat and drink. Fatigue, an all-too-common complaint of people with cancer, can be one of the first signs of dehydration.

### Some suggestions to promote adequate hydration include the following:

- Drink 8 to 12 cups of liquids a day; take a water bottle whenever leaving home. It is important to drink even if not thirsty, as the thirst sensation is not a good indicator of fluid needs.
- Add food to the diet that contains a significant portion of fluid, such as soup, flavored ice pops, flavored ices, and gelatins.
- Limit consumption of caffeine-containing products, including colas and other caffeinated sodas, coffee, and tea (both hot and cold), these foods may not be as nourishing as non-caffeinated beverages.
- Drink most liquids after and/or between meals to increase overall consumption of both liquids and solids.



## 9. Constipation

Constipation is defined as fewer than three bowel movements per week. It is a very common problem among individuals with cancer and may result from lack of adequate fluids or dehydration, lack of fiber in the diet, physical inactivity or immobility, anticancer therapies such as chemotherapy, and medications used in the treatment of side effects of anticancer therapy such as anti-emetics and opioids.

An effective bowel regimen should be in place before the problem of constipation occurs. Preventive measures should be common practice, and special attention should be paid to the possibility of constipation as a side effect of certain therapies.

### Suggestions include the following:

- Eat more fiber-containing foods on a regular basis. The recommended fiber intake is 25 to 35 grams per day. Fiber should be gradually added to the diet, and adequate fluids must be consumed at the same time.
- Drink 8 to 10 cups of fluid each day, beverages such as water, prune juice and warm juices, decaffeinated teas, and lemonade can be particularly helpful.
- Take walks and exercise regularly (proper footwear is important).

## Nutrition after treatment ends

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Most eating-related side effects of cancer treatments go away after treatment ends. Sometimes side effects like poor appetite, dry mouth, change in taste or smell, trouble swallowing, or weight changes last for some time. If this happens to you, talk to your cancer care team and work out a plan to deal with the problem.

For more information regarding your diet, contact your dietician. For appointments call +97143786666.