

Cancer Association of South Africa (CANSA)



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Nutritional Guidelines for Individuals Undergoing Cancer Treatment

Introduction

Eating a balanced diet is vital for good health and wellbeing. Food provides one's body with the energy, protein, essential fats, vitamins and minerals to live, grow and function properly. Every individual needs a wide variety of different foods to provide the right amounts of nutrients for good health. Enjoyment of a healthy diet can also be one of the great cultural pleasures of life.

[Picture Credit: Balanced Diet]



The major causes of death, illness and disability in which diet and nutrition play an important role include coronary heart disease, stroke, hypertension, atherosclerosis, obesity, some forms of cancer, Type 2 diabetes, osteoporosis, dental caries, gall bladder disease, dementia and nutritional anaemias.

(National Health and Medical Research Council).

Benefits of Various Nutrients

A nutrient is a component in foods that an organism uses to survive and grow. Macronutrients provide the bulk energy one's metabolic system needs to function while micronutrients provide the necessary cofactors for metabolism to be carried out. Both types of nutrients can be acquired from the environment. Micronutrients are used to build and repair tissues and to regulate body processes while macronutrients are converted to, and used for, energy.

Organic nutrients consist of carbohydrates, fats, proteins (or their building blocks, amino acids), and vitamins. Inorganic chemical compounds such as dietary minerals, water (H₂O), and oxygen may also be considered nutrients. A nutrient is considered essential if it must be obtained from an external source either because the organism cannot synthesise it or because insufficient quantities are produced.

Protein – The building blocks of protein are amino acids. Protein is an important component of every cell in the body. One's body uses protein to build and repair tissues. One also

uses protein to make enzymes, hormones, and other body chemicals. Protein is an important building block of bones, muscles, cartilage, skin, and blood.

Fats – Fats plays an important role in nutrition. Fats and oils are made of fatty acids and serve as a rich source of energy for the body. The body breaks down fats and uses them to store energy, insulate body tissues, and transport some types of vitamins through the blood. When considering the effects of fats on one's body, it is better to choose monounsaturated and polyunsaturated fats more often than saturated fats or trans fats.

Monounsaturated fats are found mainly in vegetable oils like canola, olive, peanut and soya.

- *Polyunsaturated fats* are found mainly in vegetable oils like sunflower, corn flaxseed. They are also the main fats found in seafood.
- *Saturated fats* are mainly found in animal sources like meat and poultry, whole or reduced-fat milk, cheese, and butter. Some vegetables like coconut, palm kernel oil, and palm oil are saturated. Saturated fats can raise cholesterol and increase one's risk for heart disease and some cancers. Less than 10% of one's kilojoules should come from saturated fats.
- *Trans-fatty acids* are formed when vegetable oils are processed into solids, such as margarine or shortening. Sources of trans fats include snack foods and baked goods made with partially hydrogenated vegetable oil or vegetable shortening. Trans fats can raise bad cholesterol and lower good cholesterol.

Carbohydrates - Carbohydrates are the first to get blamed when someone gains weight. Weight watchers think of reducing rice, wheat, beans or legumes wherever he/she thinks of reducing weight. However it is necessary to understand that not all carbohydrates are bad. In fact, if chosen carefully, carbohydrates can give one many health benefits other than just controlling weight and, therefore, carbohydrates have a rightful place in any diet.

The carbohydrates can be divided mainly in three groups:

- *Sugar* - The simplest form of carbohydrates, sugar occurs in natural form in many foods starting from milk, milk derivatives, fruits and vegetables. Sugar may be available in three forms, lactose, fructose, and sucrose obtained from milk, table sugar, and fruits respectively. Sugar provides the energy required for one's daily activities.
- *Starch* - Sugar unit bonded together is starch. Naturally occurring starch can be found in rice, beans, peas and other grains.
- *Fibre* - Like starch, the fibre is also made of bonded sugar. Fibrous foods help in quick digestion of food. Fibre occurs in some vegetables, whole grains, peas and dry beans, bran, soya beans, etc.

Water – One's body is made up of approximately 60% water, give or take. Here are some evidence-based health benefits of drinking sufficient potable water. Water helps to maximise physical performance. If one does not stay hydrated, physical performance can suffer. Hydration has a major effect on energy levels and brain function. One's brain is strongly influenced by hydration status. Studies show that even mild dehydration (1-3% of body weight) can impair many aspects of brain function. Drinking water helps relieve constipation. Constipation is a common problem, characterised by infrequent bowel movements and difficulty in passing stool. Other functions of water in the body include digestion, absorption,

circulation, creation of saliva, transportation of nutrients, and maintenance of body temperature.

Vitamins and Minerals - Eating plenty of fruits and vegetables helps to add minerals and vitamins to one's diet. One's body requires essential minerals and vitamins for every process and function. These nutrients work in symphony to grow, heal, repair and maintain one's body's cells, organs, systems and skeleton.

Antioxidants - Antioxidants protect the body from damage caused by harmful molecules called free radicals. Many experts believe this damage is a factor in the development of blood vessel disease (atherosclerosis), cancer, and other conditions.

Phytonutrients - Phytonutrients (also referred to as phytochemicals) are compounds found in plants. They serve various functions in plants, helping to protect the plant's vitality. For example, some phytonutrients protect the plant from UV radiation while others protect it from insect attack. Not only do phytonutrients award benefit to the plants but they also provide benefits to those who enjoy plant food. That is because they have health-promoting properties including antioxidant, anti-inflammatory, and liver-health-promoting activities.

Herbs – herbs have been used to treat disease for hundreds of years, with mixed results. Herbs are found in many products, like pills, liquid extracts, teas, and ointments. Many of these products are harmless and safe to use, however, others can cause harmful side effects. Some may even interfere with proven cancer treatments, including chemotherapy, radiation therapy, and recovery from surgery. If interested in using products containing herbs, talk about it with the treating oncologist first.

(Wikipedia; WebMD; American Cancer Society; Med-Health/Net; Authority Nutrition; Healthy Eating.SFGate; WHFoods).

Nutrition and a Cancer Diagnosis

Nutrition is a process in which food is taken in and used by the body for growth, to keep the body healthy, and to replace tissue. Good nutrition is important for good health. Eating the right kinds of foods before, during, and after cancer treatment can help the patient feel better and stay stronger. A healthy diet includes eating and drinking enough of the foods and liquids that have the important nutrients (vitamins, minerals, protein, carbohydrates, fat, and water) the body needs.

When the body does not get, or cannot absorb, the nutrients needed for health, it causes a condition called malnutrition or malnourishment.

A brief summary about nutrition in adults diagnosed with cancer:

- Good nutrition is important for cancer patients
- Healthy eating habits are important during cancer treatment
- Cancer can change the way the body uses food
- Cancer and cancer treatments may affect nutrition
- Anorexia (loss of appetite) and cancer cachexia (progressive weight loss, anorexia, and persistent erosion of host body cell mass in response to a malignant growth) are common causes of malnutrition in cancer patients

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- It is important to treat weight loss caused by cancer and its treatment

Good nutrition is especially important if one has been diagnosed with cancer because both the illness and its treatments can change the way one eats. Cancer and cancer treatments can also affect the way one's body tolerates certain foods and uses nutrients.

The nutrient needs of people with cancer vary from person to person. Eating well while being treated for cancer might help one:

- Feel better
- Keep up one's strength and energy
- Maintain one's weight and one's body's store of nutrients
- Better tolerate treatment-related side effects
- Lower one's risk of infection
- Heal and recover faster

Eating well means eating a variety of foods to get the nutrients your body needs to fight cancer. These nutrients include protein, carbohydrates, fat, water, vitamins, and minerals. (National Cancer Institute; American Cancer Society).

Common Side Effects of Cancer Treatment

When one's cancer is first diagnosed, the doctor will discuss plans around a treatment plan.

This may include:

- Surgery
- radiation therapy
- chemotherapy
- hormone therapy
- biologic therapy (immunotherapy)
- a combination of treatments

All of these treatments kill cancer cells. But in the process, healthy cells are damaged, too. This damage is what causes cancer treatment side effects. Some of the more common side effects that can affect eating are:

- Loss of appetite (anorexia)
- Sore mouth or throat
- Dry mouth
- Dental and gum problems
- Changes in taste or smell
- Nausea
- Vomiting
- Diarrhoea
- Constipation
- Feeling very tired all the time (fatigue)
- Depression

One might – or might not – have any of these side effects. Many factors determine whether one will have side effects and how bad they will be. These factors include the type of cancer

one has, the part of the body that is affected, the type and length of treatment, and the dose of the treatment.
(American Cancer Society).

Food Safety Tips

These food safety tips are especially important for people undergoing and recovering from cancer treatment:

- Wash hands frequently. Use plenty of soap and warm, running water for at least twenty seconds. Use hand sanitiser for cleaning hands when soap and water are not available
- Wash or sanitise hands:
 - After using the toilet
 - Before eating
 - Before and after each step of food preparation
 - After handling garbage
 - After touching pets
 - After sweeping the floor or wiping down the counters
- Keep cutting boards, countertops, and utensils thoroughly cleaned
- Change, launder, and discard sponges and dish towels often
- Keep raw meat, poultry, seafood, and eggs away from ready-to-eat foods
- Always use separate cutting boards for raw meat, poultry, and fish
- Cook food thoroughly at proper temperatures. Use a food thermometer to make sure foods are safely cooked
- Properly wrap and refrigerate foods promptly
- Refrigerate or freeze leftover foods within one hour to limit growth of bacteria
- Thaw frozen meat and poultry in the refrigerator, microwave, or cold water. Do not leave it out on the kitchen counter
- Pay attention to food product expiration dates. If in doubt, throw it out

(American Institute for Cancer Research).

Things To Do Before Cancer Treatment Commences

Eating well before cancer treatment begins may help to increase your energy. It can also improve your sleeping patterns. To prepare yourself and your home for your nutritional needs during cancer therapy, consider the following suggestions:

- Stock the refrigerator with plenty of your favourite foods so that you will not have to shop as often.
- Make sure these are foods you can eat when you are not feeling well.
- Cook large portions of your favourite dishes in advance and freeze them in meal-sized portions.
- To save your energy, buy foods that are easy to prepare. Examples are nut butters, pudding, frozen dinners, soup, canned fish or chicken, cheese, and eggs.
- Ask family and friends to help you cook and shop.
- Talk to a registered dietitian about meal planning, grocery shopping, and reducing side effects of treatment, such as nausea and diarrhoea.
- Talk to your healthcare provider or registered dietitian about whether you should take multivitamin, minerals or supplements

By planning ahead, you will have foods on hand that you like to eat. This will benefit you later. You will have good things to choose from in your kitchen, even if you do not feel well enough to prepare an elaborate meal. You may also come to think differently about your weight. If you have been concerned in the past about weight gain, your focus will likely change to eating enough to keep your weight constant.

Before treatment begins, cancer itself can cause problems that may result in eating problems or weight loss. It is not uncommon to have lactose intolerance (intolerance to milk sugar), nausea, vomiting, poor digestion, or a feeling of early fullness, sleepiness, and forgetfulness even before treatment for cancer.
(University of Rochester Medical Center).

Nutrition During Cancer Treatment

Cancer treatment can place a lot of nutritional demand on one's body. It is important to try to consistently consume a healthy diet and to drink nourishing beverages. The main nutritional goals during this time are to maintain a healthy weight and eat healthy foods that supply one's body with kilojoules and nutrients for energy, repair, recovery, and healing. A healthful eating pattern includes plenty of vegetables and fruit, moderate amounts of whole grains, and plant protein sources like nuts, beans, lentils, tofu, and tempeh, along with modest portions of fish, poultry, lean meats, and non-fat or low-fat dairy foods.

Careful food choices will help support one's immune system's fight against cancer. The foods one chooses to eat during active cancer treatment will vary according to any side effects one may be experiencing. Overall, one should try to make food choices that provide enough kilojoules, protein, and nutrients such as vitamins and minerals, and fluids. Kilojoules will help one maintain one's weight. Protein will help one rebuild tissues that cancer treatment may harm. Nutrients and fluids are essential for one's body's functioning.

The following suggestions may be helpful if one is having difficulty eating or is suffering from a loss of appetite during cancer treatment:

Loss of appetite – this is common in people with cancer and can lead to weight loss and undernutrition (malnutrition). Poor nutrition can slow the body's ability to heal. Severe malnutrition can interfere with proper functioning of the heart, liver, kidneys, and immune system.

Try these ideas for improving your appetite and maintaining calorie and protein intake during cancer treatment:

- Eat five or six smaller meals per day
- Eat food at room temperature
- Eat the largest meal when hungriest
- Avoid spicy foods or foods with strong odours
- Start with high-protein foods while one's appetite is strongest
- Keep favourite high-kilojoule foods and beverages within easy reach
- Eat high-protein and high-kilojoule foods (including snacks)
- Keep snacks, such as nut butters, crackers, nuts, granola bars, or dried fruit on hand
- Avoid foods low in kilojoules and protein, and avoid empty kilojoules (such as sugar sweetened and fizzy drinks)

- To avoid nausea and improve one's appetite, do not drink liquids with meals
- Try to eat when feeling the at one's best, no matter what time of day
- Try high-kilojoule, high-protein drinks when one does not feel like eating
- Add extra kilojoules and protein to food using foods, such as butter, milk powder, honey, or brown sugar
- Take medicines with high-kilojoule fluids
- Try to be as physically active as can be to help stimulate appetite
- Enlist the help of loved ones and caregivers to help with purchasing and preparing food
- Ask to talk with a registered dietitian for personalised help
- Try to increase appetite through light exercise or appetite stimulants
- In certain situations, one's treating physician may prescribe a medication to help improve appetite

Nausea and vomiting – this can be caused by chemotherapy or from radiation therapy to the stomach, abdomen, or brain. Being nauseated or vomiting because of cancer treatment can make it difficult for a person to eat and drink.

Try these ideas for managing nausea and vomiting:

- Eat small amounts of food more often
- Small portions of meals and snacks are often more easy to tolerate than large
- Eating foods and sipping on clear liquids at room temperature or cooler may be easier to tolerate
- Avoid high-fat, greasy, spicy, or overly sweet foods
- Avoid foods with strong odours
- Sip on beverages between meals rather than with meals
- Eat sitting up and keep head raised for about an hour after eating
- For vomiting, avoid eating or drinking until vomiting is controlled - then try sipping on small amounts of clear liquids such as cranberry juice or broth. Nibbling on plain foods such as pretzels or crackers may also help
- Take anti-nausea medicine as prescribed. If it is not controlling symptoms, contact a healthcare professional that prescribed the anti-nausea medicine, and let him or her know what is happening

Evaluate if you are feeling indigestion or reflux versus nausea. Discuss your symptoms with your healthcare professional as treatment options for each condition vary

Fatigue - Fatigue is the most common side effect for those diagnosed with cancer. It can be related to the cancer itself or can be one of the effects of cancer treatment. Eating regularly and being as physically active as possible may help to relieve fatigue and enhance one's mood.

Try these ideas for managing fatigue:

- Temporarily rely on ready-to-eat foods like frozen dinners, fruits, and vegetables
- Prepare food when you feel your best and freeze leftovers in meal-size portions
- Try to drink plenty of fluids. Being dehydrated can make fatigue worse. Aim not to ever get thirsty unless advised to restrict fluids for another medical condition. Hydrating fluids include water, clear juices, broth, or weak tea

- Accept help with meals from friends and family members
- Check for delivery services like Meals on Wheels

Diarrhoea - Diarrhoea can be caused by the cancer itself, certain chemotherapy agents and medicines, or because of radiation therapy to the abdomen and pelvis. Diarrhoea is having frequent and loose watery stools.

Try these ideas for managing diarrhoea:

- Drink sufficient liquids such as potable water, clear juices, broth, weak tea, or oral rehydration solutions (available over-the counter at most pharmacies)
- Eat small amounts of soft, bland foods.
- Consider a diet that consists of water soluble fibre containing foods such as bananas, white rice, applesauce, and white toast
- Decrease intake of high fibre foods during this time. These include foods containing nuts and seeds, raw vegetables and fruits, and whole grain breads and cereals
- Eat small amounts of food throughout the day rather than fewer large meals
- Take anti-diarrhoea medicine as prescribed. If the medicine is not controlling the diarrhoea, contact the healthcare professional that prescribed the medicine

Constipation - Constipation can be a symptom of the cancer itself or it can be caused by medicines used to treat cancer or manage pain. Constipation is when bowels do not move regularly and when stools become hard and difficult to pass.

Try these ideas for managing constipation:

- Drink more healthy beverages to help keep the digestive system moving, especially water, prune juice, warm juices, decaffeinated teas or coffee, and hot lemonade
- Increase intake of high fibre foods such as whole grains, fresh and cooked vegetables, fresh and dried fruits, and foods containing peels, nuts, and seeds
- Work with the healthcare team to set up an individualised bowel regimen. This programme may include stool softeners and gentle, non-habit forming laxatives which can be taken on prescription of one's treating oncologist
- Increase physical activity as best one can, such as taking a walk or doing limited exercise every day. Ask the healthcare team how much exercise is right and good

Changes in Taste and Smell - Changes in taste and reactions to smells are common problems that can happen while undergoing and recovering from cancer treatment. These changes can affect one's desire to eat.

Try these ideas for managing taste and smell changes:

- Choose foods that are found appealing. Often, moist and naturally sweet foods such as frozen melon balls, grapes, or oranges work well. Some find tart foods and beverages appealing
- Try eating cooler temperature foods, rather than hotter temperature foods, as they have less aroma and taste
- Try mild marinades and spices to mask strange tastes

- Red meat often becomes less appealing, so try poultry, fish, beans, nut butters, or eggs
- If foods taste bitter or salty, try adding small amounts of sugar
- Brush teeth and tongue and rinse the mouth regularly, especially before eating
- Rinse the mouth several times a day with a mild homemade salt and baking soda solution (one litre of water combined with one teaspoon of salt and one teaspoon of baking soda) or an alcohol-free mouth rinse

Sore Mouth or Throat - A common side effect of certain chemotherapy agents or radiation therapy to the mouth and throat is an inflammation of the mucus membranes that line the mouth and throat. This condition is called mucositis and it can make it difficult to eat and swallow.

Try these ideas for managing a sore mouth or throat:

- Eat soft, moist foods with extra sauces, dressings, or gravies
- Avoid dry, coarse or rough foods
- Avoid alcohol, citrus, caffeine, vinegar, spicy foods, and acidic foods (like tomatoes)
- Experiment with temperatures of foods (warm, cool, or icy) to find which temperature is the most soothing
- Drink plenty of fluids. Focus on warm or cool milk-based beverages, non-acidic fruit drinks (diluted if necessary), “flat” carbonated beverages, and cream or broth-based soups
- Rinse the mouth several times a day with a solution as described above. Sip, swish, and then spit the solution to rinse and clean your mouth. Do not swallow.
- Speak with a healthcare professional about medications that can numb or soothe the mouth or throat

Unwanted Weight Gain - Weight gain can occur during or after treatment for hormone-sensitive cancers such as breast or prostate cancers. Inactivity can also cause weight gain. In addition, medicines such as steroids used as a part of some cancer treatments can contribute to increased weight.

Try these ideas for managing unwanted weight gain:

- Try to focus on foods naturally low in kilojoules and high in fibre to help one feel full, such as vegetables, fruits, whole grains, and beans. Include small amounts of higher kilojoule foods that is most enjoyable, and be sure to savour them for the most satisfaction
- Pay attention to portion sizes and fill most of the food plate with lower kilojoule plant foods
- Eat only when physically hungry.
- Try to get regular physical activity to help reduce fatigue, control weight gain, and improve mood

Low White Blood Cell Counts and Infection - Cancer and cancer treatment can weaken the immune system and increase the risk of infection. White blood cells are an essential part of the body’s defense against infection because they attack and destroy germs after they enter the body. The risk of infection increases as the number of white blood cells decreases as the

result of some cancer treatments. This condition is called neutropenia. If you develop neutropenia it is very important to protect yourself against infection. Contact your healthcare team right away if you think an infection is developing.

The following may be signs of infection:

- A temperature greater than 37°C
- Fever
- Shaking, chills
- Swelling or redness of any part of the body

If one experiences a period of time when one's white blood cell counts are low, eat a "safe food" diet to avoid harmful bacteria and food-borne illness. Follow these "safe food" suggestions when white blood cell counts are low:

- Do not eat raw or undercooked animal products, including meat, pork, game, poultry, eggs, fish and biltong
- Wash all fresh fruits and vegetables
- Avoid eating foods from salad bars, delicatessens, buffets, and smorgasbords
- Do not drink untested well water or water directly from lakes, rivers, streams, or springs
- If using filtered water, change the filter regularly

(American Institute for Cancer Research; University of Rochester Medical Center;

Staying Active During Cancer Treatment

Cancer treatment may cause extreme tiredness, which is not likely to inspire you to begin a new exercise program. Light, daily exercise before you start to feel tired will make it easier for you to continue regular daily physical activity after your treatment begins.

Once you begin treatment, light, regular physical activity is very good for you. It will improve your appetite, stimulate digestion, prevent constipation, and provide additional energy. Physical activity will also help decrease stress, improve mood, and maintain muscle tone. Always talk with your healthcare provider before beginning any exercise program.
(University of Rochester Medical Center).

Medical Disclaimer

These Nutritional Guidelines are intended to provide general information only and, as such, should not be considered as a substitute for advice, medically or otherwise, covering any specific situation. Users should seek appropriate advice before taking or refraining from taking any action in reliance on any information contained in these Guidelines. So far as permissible by law, the Cancer Association of South Africa (CANSA) does not accept any liability to any person (or his/her dependants/estate/heirs) relating to the use of any information contained in these Guidelines.

Whilst CANSA has taken every precaution in compiling these Guidelines, neither it, nor any contributor(s) to these Guidelines can be held responsible for any action (or the lack thereof) taken by any person or organisation wherever they shall be based, as a result, direct or otherwise, of information contained in, or accessed through, these Guidelines.

ADDITIONAL SUPPORT

For individualised nutritional advice, consult a registered dietitian in your area by visiting:
<http://www.adsa.org.za/Public/FindARegisteredDietitian.aspx>

Sources and References

American Cancer Society

<https://old.cancer.org/acs/groups/cid/documents/webcontent/002903-pdf.pdf>

American Institute for Cancer Research

<http://www.aicr.org/assets/docs/pdf/education/heal-well-guide.pdf>

Authority Nutrition

<https://authoritynutrition.com/7-health-benefits-of-water/>

Healthy Eating.SFGate

<http://healthyeating.sfgate.com/benefits-vitamins-minerals-5991.html>

Med-Health.Net

<http://www.med-health.net/Benefits-Of-Carbohydrates.html>

National Cancer Institute

<https://www.cancer.gov/about-cancer/treatment/side-effects/appetite-loss/nutrition-pdq>

National Health and Medical Research Council

<https://www.nhmrc.gov.au/health-topics/nutrition>

University of Rochester Medical Center

<https://www.urmc.rochester.edu/encyclopedia/content.aspx?contenttypeid=85&contentid=p07211>

WebMD

<http://www.webmd.com/men/features/benefits-protein#1>

<https://www.google.co.za/webhp?sourceid=chrome-instant&ion=1&espv=2&ie=UTF-8#q=benefits+of+water+in+the+body>

<https://www.google.co.za/webhp?sourceid=chrome-instant&ion=1&espv=2&ie=UTF-8#q=benefits+of+antioxidants+in+the+body>

WHFoods

<http://whfoods.org/genpage.php?tname=dailytip&dbid=286>

Wikipedia

<https://en.wikipedia.org/wiki/Nutrient>