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Nutrition for Children with Cancer

Nutrition is an important part of the health of all children, but it is especially important for children getting cancer treatment. This guide can help you learn about your child's nutritional needs and how cancer and its treatment may affect them. We also offer suggestions and recipes to help you ensure your child is getting the nutrition he or she needs.

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Why good nutrition is important

Nutrition is an important part of the health of all children. It's especially important for children getting cancer treatment to get the nutrients they need. Eating the right kinds of foods before, during, and after treatment can help a child feel better and stay stronger. The American Cancer Society has prepared this guide to help you cope with treatment side effects that might affect how well your child can eat.

Not every child has nutrition-related side effects, but this guide will help you address them if and when they come up. You don't have to read straight through all of the information here. You can just read the sections you need and use the information that applies to your child.

This information is not meant to replace the advice of a medical professional. If you have any questions or concerns, you should talk to a doctor, nurse, or dietitian about your child's nutritional needs. If you have questions about something in this guide, your child's cancer care team can give you a more detailed explanation.

Benefits of good nutrition

Good nutrition is especially important when a child has cancer. Both cancer and its treatments may affect a child's appetite, tolerance to foods, and their body's ability to use nutrients. Eating the right kinds of foods before, during, and after treatment can help a child feel better and stay stronger.

Cancer and cancer treatments can also affect the way the body tolerates certain foods and uses nutrients. The nutrient needs of kids with cancer vary from child to child. Your child's doctor, nurses, and a registered dietitian can help identify nutrition goals and plan ways to help your child meet them. Eating well during cancer treatment might help your child:

- Better tolerate treatment and treatment side effects
- Stay closer to the treatment plan schedule
- Heal and recover faster
- Have less risk of infection during treatment
- Have better strength and energy
- Keep up their weight and their body's store of nutrients
- Do better at keeping up normal growth and development
- Feel better and have a better quality of life – they are less irritable, sleep better, and work better with the health care team

Each child with cancer has their own nutrition needs. Talk to the health care team any time you have concerns about how much your child has been eating or drinking. Your doctor, nurse, dietitian, speech pathologist, and even your child's dentist can work with you to figure out your child's needs and come up with an eating plan.

A registered dietitian (RD) is one of your best sources of information about your child's diet. This health care professional has special training in food, nutrition, biochemistry, and physiology. The dietitian uses this knowledge to promote health and prevent disease through counseling and education. If you are going to meet with a dietitian, be sure to write down any questions before your meeting so you don't forget anything. Ask them to repeat or explain anything that is not clear. If you have a question about something in this guide, your dietitian can give you a more detailed explanation. For more information or to find a registered dietitian, contact the American Dietetic Association (see the "[To learn more](#)" section at the end of this document).

What children with cancer need: Nutrients

Children with cancer need protein, carbohydrates, fat, water, vitamins, and minerals. A dietitian can help you understand your child's specific needs and develop an eating plan. Your child's baseline nutritional status (Is he overweight? underweight?), diagnosis, treatment plan, age, activity levels, and current medicines are all used to make a nutrition plan.

Proteins

The body uses protein to grow; repair tissues; and to maintain the skin, blood cells, the immune system, and the lining of the digestive tract. Children with cancer who do not get enough protein might break down muscle for the fuel their bodies need. This makes it take longer to recover from illness and can lower resistance to infection. After a child has surgery, chemo, or radiation treatments, she may need extra protein to heal tissues and to help prevent infection.

Protein is also key to a child's growth and development. During illness, a child's need for protein goes up. Work with your child's cancer care team to figure out her specific needs at this time.

Good sources of protein include fish, poultry, lean red meat, eggs, dairy products, nuts and nut butters, dried beans, peas and lentils, and soy foods.

Carbohydrates

Carbohydrates are the body's major source of energy. Carbohydrates give the body the fuel (calories) it needs for physical activity and proper organ function. How many calories a child needs depends on their age, size, and level of physical activity. Healthy infants, children, and adolescents need more calories per pound than adults to support growth and development. Children being treated for cancer may need even more calories for tissue healing and energy. In fact, a child being treated for cancer may need anywhere from 20% to 90% more calories than a child who is not getting cancer treatment. This varies from child to child, and some kids have a problem with unwanted weight gain during treatment.

The best sources of carbohydrates – fruits, vegetables, and whole grains – give the body's cells the vitamins and minerals, fiber, and phytonutrients (key nutrients from plants) they need.

- **Whole grains** or foods made from them contain all the essential parts and naturally occurring nutrients of the entire grain seed. Whole grains are found in cereals, breads, flours, and crackers. Some whole grains can be used as side dishes or part of an entree. When choosing a whole-grain product, look for the words “whole grain,” “stone ground,” “whole ground,” “whole-wheat flour,” “whole-oat flour,” or “whole-rye flour.”
- **Fiber** is the part of plant foods that, for the most part, the body cannot digest. There

are 2 types of fiber. Insoluble fiber takes up space in the intestine, and speeds up the passage of food waste out of the body. Soluble fiber binds with water in the stool to help keep stool soft while it slows down digestion. It can be fermented so that part of it is absorbed.

Other sources of carbohydrates include bread, potatoes, rice, spaghetti, pasta, cereals, dried beans, corn, peas, and beans. These carbohydrate foods also contain B vitamins and fiber. Sweets (desserts, candy, and drinks with sugar) give your child carbohydrates, but very few other nutrients.

Fats

Fats play an important role in nutrition. Fats and oils are made of fatty acids and serve as a rich source of energy (calories) for the body. The body breaks down fats and uses them to store energy, insulate body tissues, and carry some types of vitamins through the blood.

You may have heard that some fats are better than others. For the most part, unsaturated fats (monounsaturated and polyunsaturated) should be chosen more often than saturated fats or trans fats.

- **Monounsaturated fats** are found mainly in vegetable oils such as olive, canola, and peanut oils. They are liquid at room temperature.
- **Polyunsaturated fats** are found mainly in vegetable oils such as safflower, sunflower, corn, and flaxseed oils. They are also the main fats found in seafood. They are liquid or soft at room temperature.
- **Saturated fats** (or saturated fatty acids) are mainly found in animal sources, such as meat and poultry, whole or reduced-fat milk, cheese, and butter. Some vegetable oils like coconut, palm kernel oil, and palm oil are saturated. Saturated fats are usually solid at room temperature.
- **Trans-fatty acids** are formed when vegetable oils are processed into margarine or shortening. Sources of trans fats include snack foods and baked goods made with partially hydrogenated vegetable oil or vegetable shortening. Trans fats also are found naturally in some animal products, such as dairy products.

Certain fatty acids, such as linoleic acid and alpha-linolenic acid, are called *essential fatty acids*. They are needed to build cells and make hormones, but because the body cannot make them, we must get them from foods. Soybean, canola, and walnut oils are

good sources of essential fatty acids.

Water

Water and liquids or fluids are vital to health. All body cells need water to function. If your child does not take in enough fluids or loses fluids from vomiting or diarrhea, he may become dehydrated (his body doesn't have as much fluid as it needs). If this happens, the fluids and minerals that help keep the body working can become dangerously out of balance.

Children get some water from foods, especially fruits and vegetables, but they need liquids to be sure that all the body cells get the fluid they need. How much fluid a child needs depends on his size and how much liquid he is losing. Extra fluids may be needed if he is vomiting or has diarrhea. Talk with the dietitian, doctor, or nurse about your child's fluid needs. Keep in mind that all liquids (soups, milk, even ice cream and gelatin) count toward your child's fluid goals.

You can see if your child is dehydrated by lightly pinching up the skin over the breast bone. If the skin does not return to normal and stays raised, your child may be dehydrated. Other symptoms include mouth dryness, dark colored urine, listlessness, and dizziness. If you think your child is dehydrated, call the doctor right away.

Vitamins and minerals

The body needs small amounts of vitamins and minerals for normal growth and development, and to help it function properly. Vitamins and minerals also help the body use the energy (calories) it gets from food.

Children who eat a balanced diet usually get plenty of vitamins and minerals. But studies have shown that even healthy kids often don't get enough calcium and vitamin D, which are especially important for bone growth. Some of the drugs used to treat cancer can lower calcium and vitamin D levels, too, so extra amounts may be needed.

It may be hard for a child getting cancer treatment to eat a balanced diet. Common treatment side effects, like nausea, vomiting, and mouth sores (*mucositis*) can make it hard to eat. If your child has eating problems, ask your doctor, nurse, or dietitian for help.

The doctor may recommend a daily multivitamin while your child is being treated. But a multivitamin does not replace eating enough calories and protein. **Always** talk to the doctor before giving vitamins, minerals, or any kind of supplement to your child, since

some of them might interfere with cancer treatment.

How your child can take in nutrients

There are many ways to help your child get the nutrients she needs. The most common are:

By mouth

If at all possible, your child should get needed nutrients from eating and drinking nutrient-rich foods and fluids that are part of a healthy, well-balanced diet. Try to stick to your normal family mealtime habits as much as you can. Regular healthy snacks can be helpful, too.

If needed, your child may be able to get extra nutrients by eating high-calorie, high-protein meals supplemented with snacks, and homemade drinks and shakes. But talk to your health care team before making diet changes like these. Liquid nutrition products you can buy at the grocery store or pharmacy are also options if she has trouble eating. There are many different types on the market and it is best to discuss them with your doctor first. Clinics often have samples your child could try before you buy any.

Taking in enough nutrients is not just about managing weight loss; it's also part of giving your child the chance for the best possible treatment outcome. If it gets too hard for your child to maintain or gain weight by eating and drinking, or if her calorie and nutrients needs have greatly increased, a feeding tube may be needed.

By feeding tube

Tube feedings are given by threading a thin, flexible tube through the nose and into the stomach. The tube can be passed further along into the small intestine if your child is having trouble with nausea or vomiting. Once the tube is in place, complete liquid nutrition formulas can be given through it. Most of the time, these feedings can give your child all of the calories, protein, vitamins, and minerals needed.

Tube feedings can be given at home, with the help of family, friends, or caregivers. Your health care team will teach you how to do this. Once tube feedings begin, your child will

usually feel better because his nutritional needs are being met.

Children who have feeding tubes usually can still eat. The tubes are very small and will not keep your child from swallowing. If your child needs a feeding tube, every effort will be made to allow him to take food by mouth, too. For example, he may be tube fed at night to allow him to eat during the day. Even if your child isn't eating, it's important to keep his mouth clean through regular rinsing and brushing.

Most young children get used to tube feedings within a few days, but older kids and teens may need longer. Talking with a peer who has had a feeding tube may help the older child who is having a hard time adjusting to the tube. Parents also benefit from talking with other parents who have dealt with feeding tubes. They often have fears or concerns about the way the tube works or looks. Children should be involved as much as possible in the decision to use a feeding tube.

Tube feedings are most often used to boost weight in children with poor appetites, but they may also be used in youngsters who cannot eat or drink. Talk to your health care team about your child's eating habits if you notice any changes. Ask about signs of problems you should watch for, and things you can do to help your child get the most from what he can eat.

A more long-term type of tube can be put through the skin of the belly (abdomen) right into the stomach (a gastrostomy or g-tube) or the intestines (a jejunostomy or j-tube). This surgery can usually be done in an outpatient setting.

Tube feeding does not come without problems. Talk to your health care team to fully understand the likely benefits and possible issues for your child.

By vein

Sometimes tube feedings are not able to give all the fluids and nutrients a child needs. In these cases, nutrient solutions can be given right into a vein. This is called *intravenous nutrition* or *parenteral nutrition (PN)*. PN is most often used when the stomach and intestines are not working properly.

PN solutions can usually meet all of a child's nutritional needs for a time. Like tube feedings, PN can be given at home. Short-term use of PN is a safe way to support your child until the stomach or intestine is better. Once these issues go away every effort should be made to switch to tube or mouth feedings because PN is not as good for the body as eating or tube feeding. It can also be hard on the liver.

When your child is taking steroids

Children with cancer often take steroids, such as prednisone or dexamethasone, as part of their treatment. Children taking steroids usually feel hungry all the time and may gain weight. Steroids also tend to make people retain fluid.

You can help your child make some diet changes to help prevent fluid retention and limit the weight gain. Your doctor, nurses, or dietitian can help you know what to do. They may suggest foods low in salt (sodium). Alternatives to salty foods include foods highly seasoned using other spices. High-sodium foods, such as most snack chips and pretzels, processed foods, or frozen meals should be avoided. (Those labeled “reduced sodium” are usually OK.) Also be aware of extra calories your child may not need at this time, like those in sodas and juices.

Your health care team can also give you tips on planning meals and snacks that are satisfying, but not high in calories, to keep your child at a healthy weight. Offer your child fresh, nutritious, filling foods, such as fruits and vegetables, homemade soups, non-processed meats, dairy products, breads, and pastas. Your child does not have to feel deprived of her favorite foods, but some changes in the recipe might be wise. Consider thin crust pizza with low sodium cheese for the pizza lover, and baked chicken tenderloin strips and baked potato fries for the chicken nugget and french fry lover. No food is especially bad, but how it is prepared or the portion size can be unhealthy.

The appetite changes and fluid retention caused by steroids will go away when treatment ends. Still, preventing excess weight gain during steroid treatment is important to prevent stretch marks around the belly (abdomen) and upper legs, and also prevent high blood pressure.

When steroid treatment ends many children will lose their appetites for a short time. The weight loss that may come with this is expected and will be closely watched. But some children, especially teens, may have a hard time losing the weight gained during treatment.

Cancer treatment side effects and what you can do about them

Changes in taste and smell

Cancer and its treatment can change your child's senses of taste and smell. These changes may make foods taste bitter or metallic and can affect your child's appetite. Here are some tips that may help you get your child to eat:

- Serve foods cold or at room temperature. This can decrease the foods' tastes and smells, making them easier to tolerate.
- To reduce smells
 - Cover drinks, and have your child drink through a straw.
 - Choose foods that don't need to be cooked.
 - Don't cook foods with strong odors when your child is around.
 - Avoid eating in rooms that are stuffy or too warm.
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- Try using plastic flatware and glass cups and plates if your child has a metallic taste in his mouth while eating.
- Try foods or drinks that are different from ones your child usually eats. Children seem to like salty foods, such as chips, pretzels, and crackers. (Remember, if your child is getting steroids sodium may be a problem, but there are low sodium varieties of many snack foods.)
- Freeze fruits such as cantaloupe, grapes, oranges, and watermelon, or buy frozen blueberries and strawberries and eat them as frozen treats.
- Offer fresh vegetables. They may be more appealing than canned or frozen ones.
- Try marinating meats to make them more tender.
- If red meats taste strange, try other protein-rich foods such as chicken, fish, eggs, or cheese.
- Blend fresh fruits into shakes, smoothies, ice cream, or yogurt.
- Keep your child's mouth clean by regular rinsing and brushing, which can help foods taste better.

Appetite changes

Cancer and its treatments often cause changes in a child's eating habits and desire to eat. Not eating can lead to weight loss, and can cause weakness and fatigue. Helping

your child eat as well as they can is an important part of helping them through treatment. If your child has been having trouble eating or has had a poor appetite, talk to your health care team. Treatment-related side effects like pain, nausea, and constipation can also cause loss of appetite. Managing these problems may help her eat better. Talk to the health team if you have:

- An infant with a poor appetite for more than 3 days
- A toddler or preschooler with a poor appetite for more than 5 days
- A school age child or teen with a poor appetite for more than 7 days

If your child doesn't want to eat at meal times, keep nutritious snacks handy to eat when they feel hungry. Try hard-cooked eggs, peanut butter, cheese, ice cream, granola bars, liquid nutritional supplements, puddings, nuts, canned tuna or chicken, or trail mix. Also try these tips:

- Try to make mealtime fun and praise a healthy appetite or good eating habits. Setting the table with pretty dishes, playing your child's favorite music, watching television, or visiting with friends while eating can also help.
- Offer frequent small meals and snacks throughout the day, rather than 3 large meals.
- Keep your child's mouth clean with regular rinsing and brushing. Keep the mouth moist – don't let it get dry.
- Let your child eat their favorite foods any time of the day; for example if she really likes breakfast foods, let her eat them for dinner.
- Let your child help you shop and prepare the foods.
- Avoid arguing, nagging, or punishing a child who is unwilling to eat. Talk to the doctor if you are worried that your child isn't eating enough.

Constipation

Certain medicines, changes in eating habits, and being less active can cause your child's bowels to move less often and stools to become harder to pass (constipation). If your child is constipated, your doctor, nurses, or dietitian may suggest adding high-fiber foods to your child's diet. Examples of high-fiber foods include whole-grain breads and cereals, raw fruits and vegetables, dried fruits, beans, and nuts. Drinking plenty of fluids

throughout the day, eating at regular times, and increasing physical activity can also help relieve constipation.

Laxatives should only be used if OK'd by your doctor first. Talk to your doctor or nurse about how long your child can go without a bowel movement before you need to do something.

Diarrhea

Cancer treatments and medicines can cause your child's bowels to move much more often and become very loose (diarrhea). Uncontrolled diarrhea can lead to weight loss, fluid loss (dehydration), poor appetite, and weakness. If your child has diarrhea, try these tips:

- Avoid high-fiber foods, like nuts, seeds, whole grains, beans, peas, dried fruits, and raw fruits and vegetables.
- Avoid high-fat foods, like fried and greasy foods.
- Avoid gassy foods, fizzy drinks, and chewing gum.
- Limit milk or milk products to 2 cups a day. Yogurt and buttermilk are OK.
- Limit apple juice and drinks that contain caffeine.
- Be sure to have your child sip fluids throughout the day to prevent dehydration.
- If OK with the doctor, have your child drink and eat high-sodium foods, such as broths, soups, sports drinks, crackers, and pretzels.
- If OK with the doctor, have your child drink and eat high-potassium foods, such as fruit juices and nectars, sports drinks, potatoes with the skin, and bananas.
- Increase soluble fiber foods such as applesauce, bananas, canned peaches and pears, oatmeal, and white rice.
- Do not give sugar-free gum, or offer candies and desserts made with sugar alcohols like sorbitol, mannitol, or xylitol. (These can make diarrhea worse.)

Call the doctor if diarrhea continues or increases, or if your child's stools have an unusual odor or color. Once the diarrhea has stopped, talk to your health care team about how to slowly add foods with fiber to your child's diet.

Mouth pain, throat pain, or mouth sores

Some cancer treatments can cause a sore mouth, mouth sores, or a sore throat. If your child has these problems, soft, bland foods and lukewarm or cool foods can be soothing. If he is old enough, help your child rinse his mouth regularly by swishing and spitting a salt solution (1 teaspoon of baking soda and 1 teaspoon salt mixed in 1 quart water – do not let the child swallow it). Or the doctor may suggest another gentle mouth rinse. This helps prevent infections and improves healing a sore mouth and throat. Also try these tips:

- Try serving milk, ice cream, homemade shakes or smoothies, or canned liquid food supplements or shakes that are high in calories and protein when your child can't eat enough regular foods.
- Have your child try soft, creamy foods such as cream soups, cheeses, mashed potatoes, macaroni and cheese, yogurt, eggs, custards, puddings, cooked cereals, casseroles, or canned liquid food supplements if his doctor recommends them.
- Blend and moisten foods that are dry or solid. Use in soups or with sauces, gravies, and casseroles.
- If your child is in a lot of pain, your doctor may have you give him pain medicine about 30 minutes before meals. (For more information on pain control, see [1Cancer Pain²](#).)
- Have your child use a straw to bypass mouth sores.
- Avoid tart or acidic foods, salty foods, and drinks like citrus fruit juices (grapefruit, orange, lemon, and lime), pickled and vinegary foods, tomato-based foods, and some canned broths.
- Avoid rough-textured or hard foods, such as dry toast, chips, crackers, nuts, granola, and raw fruits and vegetables.
- Puree or liquefy foods in a blender to make them easier to swallow.

Trouble swallowing

Cancer and its treatment can sometimes cause trouble with swallowing. If your child has this problem, give her soft, liquid, easy-to-swallow foods. Sometimes children may be better able to swallow thicker fluids than thin liquids. Serving high-calorie, high-protein

drinks can help boost your child's nutrient intake during times when she is unable to eat enough regular foods.

Talk to your health care team if you are worried that your child is not eating enough. Your doctor may refer her to a speech therapist. This expert health professional can teach your child how to swallow easier and how to decrease coughing and choking while eating and drinking. The speech therapist can help you figure out if and when nutrition support (such as tube feeding) is needed. Here are some other things that may help:

- Try to get your child to drink the recommended amount of fluid each day and thicken the fluid to the consistency that is easiest for them to swallow. Talk to your health care team about how much fluid your child should try to take in each day.
- Call your doctor right away if your child coughs or chokes while eating, especially if she has a fever.
- Offer small, frequent meals.
- Chop or puree your child's food in a blender or food processor.
- Use canned liquid nutritional supplements if your child is unable to eat enough food to meet her needs.

Thickening products

Talk to your health care team about using thickening products to help your child swallow. Here are some of the things you can use to make liquids thicker and easier to swallow.

- **Gelatin:** Use this mixture to soak cakes, cookies, crackers, sandwiches, pureed fruits, and other cold food: mix 1 tablespoon unflavored gelatin in 2 cups hot liquid until dissolved; pour over food. Allow food to sit until saturated.
- **Tapioca, flour, and cornstarch:** Use to thicken liquids. Note that these must be cooked before using.
- **Commercial thickeners:** Follow label instructions, and use to adjust a liquid's thickness.
- **Pureed vegetables and instant potatoes:** Use in soups. Note that these change the food's flavor.
- **Baby rice cereal or instant pudding:** Use to make a very thick product. These also change the food's flavor.

If thick liquids are needed, you can also offer buttermilk, eggnog, milk shakes, yogurt shakes, and ice cream.

Nausea and vomiting

A child can have nausea with or without vomiting. Be sure to tell the doctor or nurse if your child feels nauseated or is vomiting. If it's caused by chemo, nausea can happen on the day the child gets treatment and can last a few days, depending on which drugs he gets. Radiation treatment to the belly, chest, brain, or pelvis can cause nausea that lasts for several hours. Nausea and vomiting can have other causes, too.

There are medicines that can control these problems very well. These medicines should be taken on a regular schedule – around the clock – as prescribed by the doctor. And if a certain medicine does not work, the doctor or nurse should be able to give you another one that might. It may take a few tries to find the medicines that work best for your child.

If your child has nausea and vomiting, here are some things you can do:

- If the child is vomiting, encourage him to drink plenty of fluids to prevent dehydration. Have him sip water, juices, sports drinks, fruit drinks, and other clear calorie-containing liquids throughout the day. Clear, cool liquids are usually better than very hot or icy liquids. Gelatin and popsicles are also good ways to get fluids in your child.
- When vomiting has stopped, encourage your child to eat easy-to-digest foods, such as clear liquids, crackers, bread sticks, gelatin, dry cereal, and plain toast.
- Do not give him foods that have a strong odor.
- Offer cool foods instead of hot or spicy foods.
- Don't give him foods that are overly sweet, greasy, fried, or spicy, such as rich desserts and french fries.
- If your child needs to rest, have him sit up or recline with his head raised for at least an hour after eating.
- Try bland, soft, easy-to-digest foods on scheduled treatment days. Foods such as Cream of Wheat[®] and chicken noodle soup with saltines may be easier to keep down than heavy meals.

- Avoid eating in a room that is warm, or that has cooking odors or other smells. Cook outside on the grill or use boiling bags to reduce cooking odors.
- Help your child use a mouth rinse before and after meals.
- Older children can try sucking on hard candy such as peppermints or lemon drops if there is a bad taste in their mouth.
- After vomiting, have the child rinse his mouth and wait half an hour before trying to sip clear liquids or flavored ice.

Dry mouth or thick saliva

Radiation therapy to the head and neck areas, some kinds of chemo, and certain other medicines can cause your child to have a dry mouth. Some children may also have thick and sticky saliva. Dryness can be mild or severe, and a dry mouth can increase the risk of cavities or mouth infection.

If your child has either of these side effects, have her drink plenty of fluids throughout the day and get her to eat moist foods as much as possible. Also get her to brush her teeth and tongue and rinse her mouth often.

Here are some more things you can try to help your child's mouth feel better:

- Have her use a straw to drink liquids, and drink enough to help thin the mucus.
- Have her take small bites and chew her food well.
- Give her soft, moist foods that are cool or at room temperature. Try blenderized fruits and vegetables, soft-cooked chicken and fish, well-thinned cereals, popsicles, smoothies, and slushies. Avoid foods that stick to the roof of the mouth like peanut butter and soft bread.
- Moisten foods with broth, soup, sauces, gravy, yogurt, or creams.
- Give your child sugarless candy or sugarless gum to stimulate saliva. Lemon drops often work well.
- Avoid commercial mouthwash and acidic drinks.
- Limit drinks with caffeine, such as coffee, tea, cola, and chocolate.
- Use a cool mist humidifier to moisten room air, especially at night. (Be sure to keep the humidifier clean to avoid spreading bacteria or mold in the air.)

- Use saliva substitutes if your child's salivary glands have been removed by surgery or damaged by radiation therapy. These products add moisture to the mouth.
- Talk to the doctor about how well your child has been eating. Nutritional supplements, such as liquid meal replacements, may be helpful during this time. Talk to your child's health team about this.

Unwanted weight gain

Some children do not lose weight during treatment. They may even gain weight. This is often true for those taking certain medicines or some types of chemotherapy. You may find that your child craves unusual foods and may be hungry at unusual times, or even all the time.

If you notice your child is gaining weight, tell your doctor so you can find out what may be causing it. Sometimes, he may gain weight because certain cancer-fighting drugs cause his body to retain fluid. If this is the case, the doctor may ask you to talk with a registered dietitian for help limiting the amount of salt he eats. (Salt causes the body to hold extra water.) The doctor may also want to give your child a diuretic or "water pill." This is a medicine that causes the body to get rid of excess fluid and it will make them have to go to the bathroom a lot.

Increased appetite, eating more, and decreased physical activity can also cause weight gain. If this is the case and you want to help your child stop gaining too much weight, here are some tips that can help:

- Try daily walks with your child if he is able to and if it's OK with his doctor.
- Limit the size of food portions.
- Include plant-based foods like vegetables, whole grains, fruits, beans, and peas in your child's diet.
- Choose lean meats (lean beef or pork trimmed of fat, chicken without skin) and low-fat dairy products (skim or 1% milk, light yogurt, reduced fat cheese).
- Cut back on added butter, mayonnaise, sweets, and other extras.
- Choose low-fat and low-calorie cooking methods (like broiling and steaming).
- Limit high-calorie snacks between meals.
- Talk with a registered dietitian for other ideas.

Fatigue

Fatigue is feeling very tired all of the time. It doesn't get better with rest. It can be a problem for some children during cancer treatment. If your child feels tired or lacks energy, talk to the doctor or nurse.

Fatigue can have many causes, including the cancer treatment, not eating enough, lack of sleep, depression, low blood counts, and some medicines. There are many things you can do to help your child cope.

- Tell the doctor or nurse about your child's fatigue. If the fatigue has a medical cause, there might be treatment for it. Your doctor or nurse can help you figure out if there are other things you can do to help combat the fatigue.
- Have your child take short walks or get regular exercise, if possible. More and more research tells us that being moderately active can help decrease cancer-related fatigue.
- Be sure your child drinks plenty of fluids. Dehydration can make fatigue worse. Talk to your health care team about how much fluid your child should get each day. If your child is losing weight, be sure to include some fluids that have calories, like juices or milk.
- Make sure your child gets enough rest. Have her take 3 or 4 short naps or rest breaks during the day instead of a long rest. Plan the day to include rest breaks. Make rest time special with a good book in a comfortable chair or a favorite video with a friend. Try to balance rest and activity so that it doesn't interfere with nighttime sleep.
- Ask for a referral to a dietitian who can work with you to choose the best diet for your child.
- Try to avoid sugary foods. These foods may give your child a quick energy boost but when it wears off, she may feel even more tired.
- Get your child to eat some protein, fat, and/or fiber with each meal and snack. Protein, fat, and fiber can help keep blood sugar levels more stable. This will give her a more sustained feeling of energy from the food she eats. For example, try giving her 1 piece of fruit plus a small handful of walnuts, almonds, peanuts, or

other nuts. Or try fruit with cottage cheese.

- Be sure your child gets enough protein. The body needs protein to repair and build new tissue.
- Be sure your child gets the calories she needs.
- Be sure your child gets enough vitamins and minerals. A multivitamin supplement that contains no more than 100% of the RDA of each nutrient may help meet this goal. Always check with the doctor or nurse to make sure it is OK for your child to take a multivitamin. Some dietary supplements can interfere with cancer treatments and large doses of some can have harmful effects.

Low white blood cell counts

Cancer and its treatment weaken your child's immune system by affecting the white blood cells that protect us against disease and germs. As a result, your child's body cannot fight infection, foreign substances, and disease as well as a healthy person's body can.

Nutrition tips for children with weak immune systems

During your child's cancer treatment, there may be times when the body's natural defenses will not be able to protect him. While his immune system is recovering, you may be told to try to avoid exposing him to possible infection-causing germs. For example, he may need to avoid some foods that are likely to have high levels of bacteria.

The following recommendations were developed for patients with decreased immune function caused by chemo and radiation therapy. It's important to know that avoiding or eating certain kinds of foods will not help to increase white blood cell counts. You want to let your child choose healthy foods, yet avoid giving your child foods that are more likely to contain germs that could cause infection due to low white blood cell counts. Your child may not need to follow these recommendations during his cancer treatment, or may only have to use them at certain times. Talk with the doctor or nurse about these tips and if and when your child should follow them.

Recommendations for when your child's white blood cell count is low+

	Recommended	Avoid (do not allow your child to eat these)
Meat, poultry, fish, tofu, and nuts	Ensure all meats, poultry, and fish are cooked thoroughly.	
	Use a food thermometer to be sure that meat and poultry reach the proper temperature when cooked.	Raw or lightly cooked fish, shellfish, lo... sushi, or sashimi
	When using tofu from the refrigerated section (not shelf-stable), cut it into 1-inch cubes or smaller and boil 5 minutes in water or broth before eating or using in recipes. This is not necessary if using aseptically packaged, shelf-stable tofu.	Raw nuts or fresh nut butters
	Vacuum-sealed nuts and shelf-stable nut butters	
Eggs	Cook eggs until the yolks and whites are solid, not runny.	Raw or soft-cooked eggs – this includes... over-easy, poached, soft-boiled, and sunny side up
	Pasteurized eggs or egg custard	Foods that may contain raw eggs, such... as Caesar salad dressing, homemade... eggnog, smoothies, raw cookie dough... hollandaise sauce, and homemade... mayonnaise
	Pasteurized eggnog	
Milk and dairy products	Only pasteurized milk, yogurt, cheese, or other dairy products	Soft, mold-ripened, or blue-veined... cheeses, including Brie, Camembert,... Roquefort, Stilton, Gorgonzola, and bl... cheese
		Mexican-style cheeses, such as queso... blanco and queso fresco, since they a... often made with unpasteurized milk
Breads, cereal, rice, and pasta	Breads, bagels, muffins, rolls, cereals, crackers, noodles, pasta, potatoes, and rice are safe to eat as long as they are purchased as wrapped, pre-packaged items, not sold in self-service bins.	Bulk-bin sources of cereals, grains, and... other foods
Fruits and vegetables	Raw vegetables and fruits and fresh herbs are safe to eat if washed carefully under running	Fresh salsas and salad dressings found... in the refrigerated section of the groce...

	water and lightly scrubbed with a vegetable brush.	store – choose shelf-stable salsa and dressings instead
Desserts and sweets	Fruit pies, cakes, and cookies; flavored gelatin; commercial ice cream, sherbet, sorbet, and popsicles; sugar; commercially prepared and pasteurized jam, jelly, and preserves; syrup; and molasses are safe to eat.	Any raw vegetable sprouts (including alfalfa, radish, broccoli, or mung bean sprouts) Unrefrigerated, cream-filled pastry products Raw honey or honeycomb – select a commercial, grade A, heat-treated honey instead
Water and beverages	Use only water from city or municipal water services or commercially bottled water. Pasteurized fruit and vegetable juices, soda, coffee, and tea	Water straight from lakes, rivers, streams, or springs Well water unless you check with your doctor first Unpasteurized fruit and vegetable juices Sun tea – make tea with boiling water and use commercially prepared tea bags Vitamin- or herbal-supplemented water (these provide little, if any, health benefits)

⁺ Adapted from Grant BL, Bloch AS, Hamilton KK, Thomson CA. *American Cancer Society Complete Guide to Nutrition for Cancer Survivors, 2nd Edition*. Atlanta, GA: American Cancer Society; 2010.

Also talk to the doctor or nurse about whether your child should eat in restaurants. It's hard to know how safe the food is when you eat out because employees may handle food when they are sick and food storage also could be an issue.

When your child's immune system is weak, be especially careful when buying foods, preparing meals, and dining out. Following food safety guidelines reduces the risk of your child taking in germs that could multiply and cause a serious infection when their immune system is weak.

Food handling tips

- Wash your hands with warm soapy water for 20 seconds before and after preparing food and before eating. Dry with paper towels or a clean towel (that is only used to dry clean hands)
- Have your child wash her hands before eating. To be sure that handwashing lasts a full 20 seconds, you can sing the alphabet song with her before rinsing.
- Refrigerate foods at or below 40° F.
- Keep hot food hot (warmer than 140° F) and cold food 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.
- Rinse leaves of leafy vegetables one at a time under running water.
- Packaged salads, slaw mixes, and other prepared produce, even when marked pre-washed, should be rinsed again under running water; use a colander to make this easier.
- Do not give your child raw vegetable sprouts.
- Throw away fruits and vegetables that are slimy or show mold.
- Do not give your child produce that has been cut at the grocery store (such as melon, pineapple, or cabbage).
- Wash tops of canned foods with soap and water before opening.
- Use different utensils for stirring foods and tasting them while cooking. Do not taste the food (or allow others to taste it) with any utensil that will be put back in the food.
- Throw away eggs with cracked shells.
- Throw out foods that look or smell strange.

Do not cross-contaminate foods and surfaces

- Use a clean knife to cut different foods.
- In the refrigerator, store raw meat sealed and away from ready-to-eat food.
- Keep foods separated on the countertops. Use a different cutting board for raw meats, and clean in dishwasher (or as noted below) after each use.

- Clean counters and cutting boards with hot soapy water, or you can use a fresh solution made of 1 part bleach and 10 parts water. Moist disinfecting wipes may be used if they can be used around food.
- When grilling, always use a clean plate for the cooked meat.

Cook foods well

- Put a meat thermometer into the middle of the thickest part of the food to test for doneness. Test a thermometer's accuracy by putting it into boiling water. It should read 212° F.
- Cook meat until it is no longer pink and the juices run clear. The only way to know for sure that the meat has been cooked to the right temperature is to use a food thermometer. Meats should be cooked to 160° F and poultry to 180° F.
- Even though they are already cooked, heat all hot dogs, luncheon meats, cold cuts, and other deli-type meats until steaming (165°F) before your child eats them.
- Do not give your child raw, lightly cooked, or soft-boiled eggs.
- Do not let your child eat uncooked foods made with raw or undercooked eggs, such as raw cookie dough, cake batter, or salad dressings that contain raw or coddled eggs. Pasteurized eggs or liquid pasteurized egg products may be used in recipes for foods that will not be cooked and call for raw eggs.

Microwave cooking

- Rotate the dish a quarter turn once or twice during cooking if there is no turntable in the microwave. This helps prevent cold spots in food where bacteria can survive.
- Use a lid or vented plastic wrap to thoroughly heat leftovers. Stir often during reheating.

Water safety

- Water from your home faucet is generally safe if it comes from a city water supply or municipal well serving a highly populated area.
- Well water is not safe for a child with a weak immune system to drink unless it is tested daily and found safe.
- If your water is not from a city water or municipal well, your child should use boiled,

distilled, or bottled water to drink, as ice, and for brushing teeth. (Bring tap water to a rolling boil for a full minute.) Most water filters will not make the water safe if the water supply has not been chlorinated.

Grocery shopping

- Check “sell by” and “use by” dates. Pick only the freshest products.
- Check the packaging date on fresh meats, poultry, and seafood. Do not buy products that are out of date.
- Don’t use damaged, swollen, rusted, or deeply dented cans. Be sure that packaged and boxed foods are completely sealed.
- Choose unblemished fruits and vegetables.
- Don’t give your child deli foods. In the bakery, avoid unrefrigerated desserts and pastries with cream or custard.
- Don’t give your child foods from self-serve or bulk containers.
- Don’t buy yogurt and ice cream products from soft-serve machines.
- Don’t let your child eat free food samples.
- Don’t use cracked or unrefrigerated eggs.
- Pick up your frozen and refrigerated foods just before you check out at the grocery store, especially during the summer months.
- Refrigerate groceries right away. Never leave food in a hot car.

Dining out

- Eat early to avoid crowds.
- Ask that food be prepared fresh in fast food restaurants.
- Ask for single-serving condiment packages (mustard, ketchup) and avoid self-serve bulk condiment containers.
- Don’t allow your child to eat food from high-risk food sources including salad bars, delicatessens, buffets and smorgasbords, potlucks, and sidewalk vendors.
- Don’t let your child eat raw fruits and vegetables when eating out.
- Ask if fruit juices are pasteurized. Don’t let your child drink “fresh-squeezed” juices in restaurants.
- Be sure that your child’s utensils are set on a napkin or clean tablecloth or placemat, rather than right on the table.

- Ask for a container and put the food in it yourself rather than having the server take the food to the kitchen to do this, if you want to keep leftovers. Get them home and in the fridge quickly.

Ways to help your child take in more protein and calories

These tips may help your child eat better. Eating as well as possible is important for children with cancer, but don't make food a battleground. And always talk to the health care team if you're worried that your child isn't eating or drinking enough. They can help you with this before it becomes a serious problem.

- Serve your child small meals and snacks throughout the day, rather than 3 large meals. Good snacks are peanut butter and crackers, cheese sticks, pudding, fruit roll-ups, and cereal and milk.
- Let your child eat whenever she feels hungry, and be sure to include high-calorie, high-protein foods. Fat is a rich source of energy, so more fat can be helpful during times that your child is having trouble taking in enough calories. High-fat items such as hamburgers, fries, pizza, and ice cream give calories, protein, and other key nutrients.
- Have your child eat their biggest meal when she feels hungriest. For example, if she is hungriest in the morning, make breakfast the biggest meal.
- Use the Choose My Plate Food Guidance System as a guide for good nutrition. You can learn more about this at www.choosemyplate.gov¹.
- Try to get your child to drink most of her fluids between meals instead of with meals. Drinking fluid with meals can make her feel too full.
- Use colorful cups, mugs, and straws to encourage your child to drink fluids throughout the day.
- Use cookie cutters to cut shapes from sandwiches, gelatin, meats, and cheeses.
- Make faces out of fruits and vegetables. (Many children's cookbooks have examples.)
- Serve food in unusual containers or on cartoon character plates.
- Have picnics. (You can use the backyard, the living room, or even the attic.)

- Let your child help plan meals and prepare the food. Help with planning can be as simple as letting the child choose between 2 vegetables.
- Invite your child's friends to share meals.
- Plan ahead for meals missed because of things like doctors' appointments and treatment appointments. Take along juice packs, snacks, and non-perishable foods, such as fruit cups, puddings, and cheese and crackers.
- Talk to your child's teachers about letting them eat or drink in the classroom.
- Encourage your child to be physically active. Activity may make them want to eat.
- Encourage your child to eat more when she feels well.

Call the doctor or nurse if your child has treatment-related problems, such as constipation, diarrhea, or vomiting.

How to add protein to meals and snacks*

Milk products

Give your child cheese on toast or with crackers.

Add grated cheese to baked potatoes, vegetables, soups, noodles, meat, and fruit.

Use milk instead of water when cooking hot cereal and cream soups.

Include cream or cheese sauces on vegetables and pasta.

Add powdered or undiluted evaporated milk to cream soups, mashed potatoes, puddings, and casseroles.

Add yogurt or cottage cheese to favorite fruits or blended smoothies.

Eggs:

All eggs should be well cooked to avoid the risk of harmful bacteria.

Keep hard-cooked eggs in the refrigerator. Chop and add to salads, casseroles, soups, and vegetables. Make a quick egg salad.

Pasteurized egg substitute is a low-fat alternative to regular eggs.

Meats, poultry, and fish:

Add leftover cooked meats or fish to soups, casseroles, salads, and omelets.

Mix diced and flaked meat with sour cream and spices to make dip.

Beans, legumes, nuts, and seeds:

Sprinkle seeds or nuts on desserts such as 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 milkshake.

High-calorie foods***Butter, oil, and salad dressing:**

Melt butter or spoon salad oil over potatoes, rice, pasta, and cooked vegetables.

Stir melted butter into soups and casseroles.

Spread melted butter or regular (not low-fat) mayonnaise on bread before adding other ingredients to sandwiches.

Use regular (not low-fat or diet) salad dressing on sandwiches and as dips with vegetables and fruit.

Milk products:

Add whipping cream to desserts, pancakes, waffles, fruit, and hot chocolate; fold it into soups and casseroles. Use it in its liquid form for baking, soups, or casseroles; or sweeten and whip it to make dessert topping.

Add sour cream to baked potatoes and vegetables.

Sweets:

Add jelly to bread and crackers. Honey can be given to older children.

Add jam to fruit.

Use ice cream as a topping on cake.

**Adapted from Eldridge B, and Hamilton KK, Editors, Management of Nutrition Impact Symptoms in Cancer and Educational Handouts. Chicago, IL: American Dietetic Association; 2004.*

Don't forget about physical activity

Physical activity has many benefits for healthy children. It helps maintain muscle mass, strength, stamina, and bone strength. In adults, it can help improve appetite and reduce depression, fatigue, nausea, and constipation even during cancer treatment.

Physical activity has been shown to benefit adults during cancer treatment, but it has not been well studied in children with cancer. Talk to your doctor about activities your child can safely do, or if there are clinical trials of physical activity your child can enroll in. If the doctor approves, start small (maybe 5 to 10 minutes each day) and as he is able, let your child work up to a goal of 60 minutes. It's important to let your child do what he can when he feels up to it. Don't push him, and encourage him to rest when needed.

Recipes to try

If, for some reason, the doctor suggests lowering the fat in your child's diet, you may use low-fat products for milk, ice cream, sour cream, peanut butter, yogurt, cookies, etc.

Fortified milk

Drink or use in place of milk in any recipe to add protein

1 quart whole or low-fat milk 1 cup powdered non-fat dry milk

Blend and chill at least 6 hours (can also be made with buttermilk or dry buttermilk).

Approximate nutrients per 1 cup serving: 211 calories and 14 grams of protein

Banana berry shake

4 scoops vanilla frozen yogurt 10 fresh strawberries ½ banana

Rinse strawberries. Put all ingredients in a blender and blend until smooth. Makes 2 servings.

Approximate nutrients per serving: 198 calories, 7 grams protein, 2 grams fat

Chocolate cocoa drink

1¼ cup vanilla ice cream ½ cup whole milk 1 package of hot chocolate mix 2 teaspoons sugar

Place all ingredients in a blender container. Cover and blend on high speed until well mixed.

Chill drinks before serving. Makes 2 servings.

Approximate nutrients per serving: 600 calories and 24 grams of protein per serving

Taco dip

1 16-ounce container sour cream 1 envelope taco seasoning 1 head lettuce, shredded 2 tomatoes, chopped 1 cup shredded cheddar cheese 1 package tortilla chips

Combine sour cream and taco seasoning in a small bowl and chill for 1 hour.

Take a large shallow dish and layer the ingredients, one by one, in the dish in the following order: sour cream mix, lettuce, tomatoes, and cheese.

Serve with tortilla chips for dipping. Makes 8 servings.

Approximate nutrients per serving: 483 calories, 10 grams protein, 31 grams fat

Peanut butter, banana, and raisin sandwich

2 tablespoons peanut butter 1 small banana, sliced 4 slices raisin bread

Spread peanut butter on 2 slices of bread. Arrange banana slices on top and cover with remaining bread.

Cut into quarters and serve. Makes 2 servings.

Approximate nutrients per serving: 278 calories, 9 grams protein, 11 grams fat

Peanut butter and jelly rounds

4 teaspoons creamy peanut butter 2 teaspoons grape jelly 8 Ritz[®] crackers

In a small bowl mix some peanut butter and jelly together until smooth.

Spread onto a Ritz cracker and top with another cracker to make sandwiches. Makes 2 servings.

Approximate nutrients per serving: 140 calories, 4 grams protein, 9 grams fat

Worms in the dirt

2 small (4 oz.) packages chocolate pudding mix 3½ cups milk 1 tub frozen whipped topping 10 Oreo® cookies, crushed Bag of gummy worms (about 21 pieces) 8 small clear plastic cups

Prepare pudding mix according to directions, using the milk. Fold in whipped topping.

Fill each cup about a quarter of the way with pudding mixture.

Add some crushed cookies and gummy worms, more pudding, and end with crushed cookies to look like dirt.

Refrigerate for at least 1 hour before serving. Makes 8 servings.

Approximate nutrients per serving: 396 calories, 5 grams protein, 12 grams fat

No-bake granola balls

½ cup creamy peanut butter ½ cup honey ½ cup granola ½ cup crispy rice cereal ½ cup raisins ½ cup crushed graham crackers

Heat peanut butter and honey in a pan over low heat until creamy. Remove from heat and pour into a bowl to cool.

Add granola, cereal, raisins and graham cracker crumbs to the peanut butter mix, and stir it all together.

Roll into balls and set on wax paper.

Refrigerate at least 1 hour before eating. Makes 12 servings. (Caution: Not for children under 1 year or people with low white blood counts because honey isn't completely cooked.)

Approximate nutrients per serving: 152 calories 3 grams protein, 6 grams fat

Choose My Plate for children

The Choose My Plate food guide shows you how to make food choices for a healthy diet. The pyramid divides foods into 5 major food groups: grains, vegetables, fruits, dairy, and proteins. You can learn more and get help using it for your child based on her age at ChooseMyPlate.gov¹. At this website you can also find a menu planner and a tracking tool to help you look at what your child is eating and see whether she is getting enough of each food group to meet her needs. Keep in mind that during treatment your child's needs may be different from those in the Choose My Plate guide. Talk to your doctor, nurse, or dietitian about your child's nutrition needs and how to best meet them.

To learn more

More information from your American Cancer Society

We have a lot more information for you. You can find it online at www.cancer.org¹. Or, you can call our toll-free number at 1-800-227-2345 to talk to one of our cancer information specialists.

National organizations and Web sites*

US Department of Health and Human Services Website: www.foodsafety.gov²

- “Keep Food Safe” section provides podcasts and written information on safe food handling. Site has general information on food recalls, outbreaks of foodborne illness, and more

American Dietetic Association (ADA) Website: www.eatright.org³

- Provides information on food safety, diet, and nutrition; also has a directory of registered dietitians that can be searched by location

American Childhood Cancer Organization (ACCO) Phone number: 855-858-2226
Website: www.acco.org⁴

- Information for families of children with cancer and a network of parent support groups in most states which commonly provide meetings, speakers, parent-to-parent visitation, summer camps, transportation, and publications

CureSearch National Childhood Cancer Foundation (NCCF) Toll-free number: 1-800-458-6223 Website: www.curesearch.org⁵

- Has information about childhood cancers and long-term follow-up guidelines for after treatment

Teens Living with Cancer Website: www.teenslivingwithcancer.org⁶

- Information is specifically for teens and covers many cancer topics, including nutrition and exercise

ChooseMyPlate.gov (US Department of Agriculture) Toll-free number: 1-888-779-7264 (8 a.m. to 3 p.m. Eastern Time, Monday-Friday) TTY: 301-504-6856 Website: <http://www.choosemyplate.gov>⁷

- For answers to diet questions and information on healthy eating

**Inclusion on this list does not imply endorsement by the American Cancer Society. No matter who you are, we can help. Contact us anytime, day or night, for information and support. Call us at 1-800-227-2345 or visit www.cancer.org⁸.*

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