PATIENT & CAREGIVER EDUCATION

Eating Well After Your Stem Cell Transplant

This information will help you plan your diet after your stem cell transplant. It explains how to avoid foodborne illness, get enough calories and proteins from your diet, and manage side effects using your diet.

Food Safety After Transplant

What is foodborne illness?
Foodborne illness (often called food poisoning) is an illness that comes from a food you eat.

Sometimes, bacteria, viruses, or parasites attach to food and grow. You can’t always see, smell, or taste them. When certain bacteria, viruses, or parasites contaminate (get into) the food you eat, they can cause foodborne illness.

Who is at risk?
Foodborne illness can happen to anyone, but some people are more likely to get it than others. For example, people who have a weakened immune system from
cancer and cancer treatment are at higher risk of getting a foodborne illness.

Some people (such as people who’ve had a stem cell transplant) may need to take extra steps to avoid foodborne illness. Your healthcare team will tell you if this applies to you.

**What are the symptoms?**
Foodborne illness usually happens within 1 to 3 days after eating the contaminated food. But, it can also happen within 20 minutes or up to 6 weeks later. Symptoms of foodborne illness include:

- Vomiting (throwing up)
- Diarrhea (loose or watery bowel movements (poop))
- Pain in your abdomen (belly)
- Flu-like symptoms (such as fever above 101.3 °F (38.5 °C), headache, body aches, and chills)

If you have any of these symptoms, contact your healthcare provider right away.

**What steps can I take to prevent foodborne illness?**

It’s important to handle food safely to lower your risk of getting a foodborne illness. Foodborne illness can be
serious or even fatal.

To help keep yourself safe from foodborne illness, follow these 4 simple steps: **clean, separate, cook, and chill**.

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**Clean**

Clean your hands and surfaces often.

- **Wash your hands with warm water and soap for at least 20 seconds:**
  - Before and after handling food.
  - After using the bathroom, changing diapers, handling garbage, or handling pets.

- **Wash cutting boards, dishes, utensils (forks, spoons, and knives), and countertops with hot soapy water after preparing each food item.**

- **Use a glass or plastic cutting board instead of a wooden one. Glass and plastic are easier to clean.**

- **Use paper towels to clean up kitchen surfaces, if you can.** Bacteria, viruses, and parasites can grow on wet or dirty cloth towels and sponges.
  - If you use cloth towels, wash them often using hot water.
  - If you use a sponge, squeeze out all the water after each use. Replace it every 2 weeks.

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*Eating Well After Your Stem Cell Transplant*
• Use an antibacterial cleaning spray to clean surfaces. Look for products that have bleach or ammonia (such as Lysol® or Clorox®).

• Rinse all produce (such as fruits and vegetables) under running water. This includes pre-washed salad greens and produce with skins and peels that aren’t eaten (such as bananas and avocados). Scrub firm produce (such as melons, oranges, and lemons) to clean them.
  
  ◦ If you use a produce brush, clean it every 2 to 3 days by putting it in your dishwasher or washing it with hot, soapy water.

• Avoid produce that has bruises or blemishes.

• Clean the lids of canned goods before you open them.

**Separate**

Separate raw meats from other foods.

• Put raw meats, poultry, and seafood into individual bags in your shopping cart and grocery bags. This will keep any liquids that leak from getting onto other foods.

• In your refrigerator, don’t store raw meats, poultry, or seafood above produce and other foods that you don’t cook before eating.
• Use one cutting board for produce and a separate one for raw meats, poultry, and seafood.

• Never put cooked food on a plate that previously held raw meat, poultry, seafood, or eggs unless the plate has been washed in hot, soapy water.

• Don’t reuse marinades used on raw meats, poultry, or seafood unless you heat them to a boil first.

**Cook**

Cook to the right temperature.

• Use a food thermometer to check the internal temperature of meat, poultry, seafood, and egg products when you’re cooking them. These foods must be cooked to a certain temperature to destroy any harmful bacteria. This is called the safe minimum internal temperature.

• Color and texture can help you know when foods are cooked, but they’re not reliable ways to tell if the food is cooked enough to be safe. The best way is to use a food thermometer.

• Cook eggs until the yolk and white are firm. Only use recipes in which eggs are cooked or heated thoroughly.

• When cooking in a microwave oven, cover, stir, and
turn the food to make sure it’s cooked evenly. If the microwave doesn’t have a turntable, rotate the dish by hand once or twice during cooking. Always wait about 10 minutes after the food is done before checking the food’s internal temperature with a food thermometer. This lets the food finish cooking.

- When reheating sauces, soups, or gravy, heat them to a boil.
- Eat reheated leftovers within 1 hour.
- Don’t reheat leftovers more than once. If you don’t finish the food that you reheated, throw it away. Don’t put it back in the refrigerator.

<table>
<thead>
<tr>
<th>Safe Minimum Internal Temperatures</th>
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<tbody>
<tr>
<td>Beef, pork, veal, and lamb (steaks, roasts, and chops)</td>
<td>145 °F (63 °C) with a 3-minute rest time</td>
</tr>
<tr>
<td>Beef, pork, veal, and lamb (ground)</td>
<td>160 °F (71 °C)</td>
</tr>
<tr>
<td>Poultry (including chicken, turkey, and duck)</td>
<td>165 °F (74 °C)</td>
</tr>
<tr>
<td>Egg dishes and sauces</td>
<td>160 °F (71 °C) or until the yolk and white are firm (not runny)</td>
</tr>
<tr>
<td>Fish and shellfish</td>
<td>145 °F (63 °C) and flesh is opaque (not see-through)</td>
</tr>
<tr>
<td>Leftovers and casseroles</td>
<td>165 °F (74 °C)</td>
</tr>
</tbody>
</table>
Chill
Chill foods promptly.

- Make sure the refrigerator temperature is 40 °F (4 °C) or below and the freezer temperature is 0 °F (-18 °C) or below.

- Refrigerate or freeze meat, poultry, eggs, seafood, and other perishables (foods that can go bad) within 1 hour of cooking or buying them.

- When it’s hot out, use an insulated bag or cooler with ice or frozen gel packs to bring perishables home after shopping.

- Never defrost food at room temperature (such as on the countertop). Defrost food in the refrigerator, in cold water, or in a microwave. If you use cold water or a microwave, cook the food right away once it’s defrosted.

- When you marinate food, always marinate it in the refrigerator.

- Divide large amounts of leftovers into shallow containers before refrigerating them. This helps them cool more quickly.

- Eat leftovers within 2 days.
Are there any foods I should avoid?
Some foods are more likely to cause a foodborne illness than others. It’s best to avoid these foods. Examples include:

- Raw or undercooked meat, poultry, seafood (including sushi), eggs, and meat substitutes (such as tempeh and tofu)
- Unpasteurized or raw milk, cheese, other dairy products, and honey
- Unwashed fresh fruits and vegetables
- Raw or uncooked sprouts (such as alfalfa and bean sprouts)
- Cold or uncooked deli meats (cold cuts) and hot dogs

Some other foods aren’t as risky as the ones above but still have a risk of causing a foodborne illness. Examples are listed in the table below. You can decide if you want to eat or avoid these foods. Your clinical dietitian can help you decide. You may want to be more cautious during the first 3 months after your transplant.

<table>
<thead>
<tr>
<th>Food Group</th>
<th>Food Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>Milk and dairy</td>
<td>• Unrefrigerated milk, cheese, and other dairy products.</td>
</tr>
<tr>
<td></td>
<td>• Cheese sliced at a deli counter. Choose</td>
</tr>
</tbody>
</table>
| Meat, poultry, seafood, and eggs | • Meat sliced at a deli counter. Choose sealed, pre-packaged deli meat instead.  
• Raw or partially cooked fish and shellfish, including caviar, sashimi, sushi, ceviche, and cold smoked seafood (such as lox).  
• Clams, mussels, and oysters in the shell.  
• Refrigerated pâtés and meat spreads. |
|---|---|
| Fruits and vegetables | • Blemished or bruised produce.  
• Salads and produce from a deli or salad bar.  
• Raw or frozen rough-textured fruits and vegetables that can’t be washed well (such as strawberries, raspberries, blackberries, broccoli, and cauliflower). These are safer if cooked.  
• Pre-cut fruits and vegetables.  
• Vegetarian sushi, unless you make it yourself at home. Vegetarian sushi made at a store or restaurant may be prepared near raw fish. |
| Drinks | • Unpasteurized eggnog, apple cider, or other fruit or vegetable juices.  
• Fresh-squeezed fruit or vegetable juices, unless you make it yourself at home.  
• Unpasteurized beer and wine (such as |
microbrewery beers and those that aren’t shelf-stable). Talk with your doctor before having any alcohol.

- Fountain soda and other fountain drinks.
- Water from a water fountain or other shared container.

### Nuts and grains
- Unroasted nuts in the shell.

### Miscellaneous
- Herbal and nutritional supplements, including probiotic supplements.
- Shared containers used by many people (such as condiments and milk at a coffee shop).
- Any unpackaged, communal, or shared food items (such as free samples).

## How can I shop safely?

- Check containers for an expiration date. Buy and use food before that date.

- Don’t buy canned, jarred, or boxed foods with dents, swelling, or a broken seal.

- Don’t buy foods from self-service bulk containers or bins.

- Pick up cold and frozen foods (such as milk and frozen vegetables) at the end of your shopping trip. This helps limit the time they will be outside of a refrigerator or freezer.
• If you need to make a stop after grocery shopping, put perishable foods in an insulated bag or cooler with ice or frozen gel packs.

• Put eggs and milk on a shelf inside the refrigerator. Don’t store them in the refrigerator door. The inside of the refrigerator stays cooler than the door area.

• If you use a grocery delivery service, make sure all refrigerated and frozen items are at a safe temperature when they’re delivered. Put these items into the refrigerator or freezer right away.

**Can I eat at restaurants?**

Most people should avoid eating at restaurants for about 3 months after their stem cell transplant. Talk with your medical team about when it’s safe to eat at restaurants.

Once your healthcare team says you can start eating at restaurants, follow the guidelines below to lower your risk of getting a foodborne illness.

• Choose the restaurant carefully. You can see a restaurant’s recent health inspection score by visiting the local Department of Health (DOH) website.

• Order food that’s properly cooked. Send back any meat, poultry, fish, or eggs that are undercooked. Food that’s steaming hot is usually safer than room
temperature and cold foods (such as sandwiches and salads).

- Refrigerate any leftovers within 2 hours of eating out. Reheat them until they’re steaming hot (165 °F) and eat them within 2 days.

- Avoid foods that may have raw, unpasteurized eggs (such as Caesar salad dressing, fresh mayonnaise or aioli, and hollandaise sauce).

Some restaurant foods are riskier than others. These include:

- Foods from buffets and salad bars.
- Food that isn’t cooked to order (such as fast food and other foods stored under heat lamps).
- Containers used by many people (such as condiments and milk at a cafe).
- Any food handled by employees without gloves or utensils.

Take-out food, delivery food, and food from food trucks can also be riskier because food may not be kept hot or cold enough during transit.
Can I take dietary supplements?
Don’t take any supplements, probiotics, homeopathic remedies, or herbal products (such as St. John’s wart or traditional Chinese medicines) without talking with your Memorial Sloan Kettering (MSK) medical team first.

In the United States, the way these products are made and stored isn’t regulated. This means they may pose a health risk, such as infection or foodborne illness. Dietary supplements can also keep some medications from working as well as they should.

Is my drinking water safe?
Tap water from most highly populated areas (including New York City) is safe to drink. If you’re not sure if the tap water is safe, check with the local health department.

If you use well water that isn’t routinely tested for bacteria, use bottled water or boil the well water before drinking it. To do this:

- Bring the water to a rolling boil for 15 to 20 minutes.
- Store the water in the refrigerator.
- Don’t drink any water that you don’t use within 48 hours (2 days).
- Never drink from lakes, rivers, streams, or springs.
General Nutritional Guidelines

Your body needs a balance of calories and protein to work its best. The tips in this section will help you increase the calories and protein in your diet.

These suggestions may be different from the general nutrition guidelines you already know. Your clinical dietitian nutritionist can help you find an eating plan that works best for you.

Tips for adding more calories to your diet

- Don’t eat foods that are fat-free or reduced in fat. Avoid food and drink labels that say “low-fat,” “non-fat,” or “diet.” For example, use whole milk instead of skim.
- Snack on dried fruits, nuts, or dried seeds. Add them to hot cereals, ice cream, or salads.
- Add butter, margarine, or oils to potatoes, rice, and pasta. You can also add them to cooked vegetables, sandwiches, toast, and hot cereals.
- Use high-calorie dressings on salads, baked potatoes, and chilled cooked vegetables (such as green beans or asparagus).
- Add sour cream, half and half, or heavy cream to mashed potatoes and cake and cookie recipes. You
can also add it to pancake batter, sauces, gravies, soups, and casseroles.

- Use mayonnaise, creamy salad dressing, or aioli sauce in salads, sandwiches, and vegetable dips.
- Top your ice cream or unfrosted cakes with sweetened condensed milk. Mix the condensed milk with peanut butter to add more calories and flavor.
- Drink homemade shakes and other high-calorie, high-protein drinks (such as Carnation® Breakfast Essentials or Ensure®).

**Tips for adding more protein to your diet**

- Eat foods that are rich in protein, such as chicken, fish, pork, beef, lamb, eggs, milk, cheese, beans, and tofu.
- Add powdered milk to creamy soups, mashed potatoes, milkshakes, and casseroles.
- Snack on cheese or nut butters (such as peanut butter, cashew butter, and almond butter) with crackers, fruits, or vegetables (such as apples, bananas, and celery).
- Blend nut butter into your shakes.
- Add cooked meats to soups, casseroles, salads, and omelets.
• Add wheat germ or ground flax seeds to cereals, casseroles, yogurt, and meat spreads.

• Add grated cheese to sauces, vegetables, and soups. You can also add it to baked or mashed potatoes, casseroles, and salads.

• Add chickpeas, kidney beans, tofu, hard-boiled eggs, nuts, and cooked meats or fish to your salads.

Managing Symptoms and Side Effects with Nutrition

Early Satiety

Early satiety is when you feel full more quickly than usual. For example, you may feel like you can’t eat any more when you’re only halfway through your meal.

If you feel full quickly, try to:

• Eat small, frequent meals. For example, have 6 small meals instead of 3 large ones.

• Drink most of your liquids before or after meals.

• Choose foods that are higher in calories and protein when making meals.

• Do light physical activity (such as walking). This helps food move through your digestive system.
Nausea (feeling like you’re going to throw up) can be caused by radiation therapy, chemotherapy, and surgery. It can also be caused by pain, medication, and infection.

If food odors (smells) make you nauseated:

- Try cold foods (such as a sandwich or salad). Cold foods don’t smell as strong as hot foods.
- Leave the area while hot foods are cooking, if you can.
- Ask someone else to plate your food for you.
- Let your food cool down for a few minutes before eating.
- Avoid places with strong odors.

The following tips may also help you avoid nausea:

- Eat small, frequent meals. This can stop you from getting too full and help you eat more food throughout the day.
- Drink most liquids between your meals, not with them. This can help you avoid feeling full too fast or feeling bloated.
- Eat slowly and chew your foods well. Avoid moderate or intense physical activity right after meals.
• Eat your meals in a pleasant setting. Choose a relaxing place with a comfortable temperature. Wear loose-fitting clothing to stay comfortable.

• Eat with friends or family. This may help distract you from your nausea.

• Avoid foods that are:
  ○ High-fat, such as fatty meats, fried foods (such as eggs and French fries), and soups made with heavy cream
  ○ Very spicy, such as foods made with heavy spices
  ○ Very sweet

**Diarrhea**

Diarrhea is frequent, loose, watery bowel movements. It causes food to move quickly through your intestines.

• Drink at least 8 to 10 (8-ounce glasses) of liquids daily. This will help replace the water and nutrients you lose when you have diarrhea.

• Avoid foods that are very hot, very cold, high-sugar, high-fat, or spicy. These are hard on your digestive system and may make your diarrhea worse.

• Avoid raw fruits and vegetables, whole nuts, and seeds and vegetables that can cause gas (such as broccoli, cauliflower, cabbage, beans, and onions).
Choose fruits and vegetables that are well-cooked, peeled and puréed, or canned.

**Constipation**

Constipation is having fewer bowel movements than usual. Constipation can be caused by many things, including your diet, activity, and lifestyle. Some chemotherapy and pain medications can also cause constipation.

If you’re constipated, try eating more high-fiber foods. Add fiber to your diet one food at a time. Examples of high-fiber foods include:

- Fruits
- Vegetables
- Whole grains (such as whole-grain cereals, pastas, muffins, breads, and brown rice)
- Nuts and seeds

Be sure to drink enough liquids to prevent gas and bloating. Try to drink at least 8 to 10 (8-ounce) glasses of liquids per day. This will help keep your bowel movements soft.
Dry or sore mouth
When your mouth is dry or sore, eating can be hard or painful. Some foods may be hard to chew and swallow. The way you eat can make a difference.

- Cook your foods until they’re soft and tender. Use a blender to purée foods. Ask for a copy of the resource *Eating Guide for Puréed and Mechanical Soft Diets* ([www.mskcc.org/pe/pureed_mechanical_soft_diets](http://www.mskcc.org/pe/pureed_mechanical_soft_diets)) for more tips.
- Cut your foods into small pieces that are easy to chew.
- Rinse your mouth with water often.
- Drink liquids with your meals. Take small sips between bites.
- Use a straw when you drink. This will keep the liquid from touching your sore mouth.
- If you have dry mouth, try sugar-free mints or gum. This will help you make more saliva.

Taste changes
Chemotherapy, radiation therapy, and some medications can change your sense of taste. Changes in taste be different from person to person.

If your food seems tasteless, use more spices and flavorings (unless they cause discomfort). For example:
• Add sauces and condiments (such as soy sauce or ketchup) to your food.

• Marinate your meats or meat substitutes in salad dressings, fruit juices, or other sauces.

• Use onion or garlic to flavor your vegetables or meats.

• Add herbs (such as rosemary, basil, oregano, and mint) to your food.

If there’s a bitter or metallic taste in your mouth:

• Rinse your mouth with water before meals.

• Maintain good oral hygiene (keep your mouth clean) by:
  ○ Brushing your teeth (if your doctor says it’s okay)
  ○ Brushing your tongue
  ○ Drinking more liquids to stay hydrated

• If meats taste bitter, try marinating them in sauces or fruit juices or squeeze lemon juice on them, if your mouth isn’t sore.

• Get some of your protein from meat substitutes (such as dairy products and beans).

• Use plastic utensils to reduce the metallic taste.

• Try sugar-free mints or gum.
Fatigue
Fatigue is feeling more tired or weak than usual. It’s the most common side effect of cancer and cancer treatments. Fatigue may keep you from doing your daily activities. It can be caused by many things, such as:

- Poor appetite
- Depression
- Nausea and vomiting
- Diarrhea or constipation

Managing these things can give you more energy and help you feel less fatigued. It can also increase your feeling of well-being. Your healthcare team can help you.

Saving your energy can also help you feel less fatigued. You can do this by:

- Asking family and friends for help with shopping and making your meals.
- Buying premade or takeout foods when your energy is low.
- Keeping ingredients and utensils that you use often close at hand.
- Sitting instead of standing when cooking.
• Eating small, frequent, high-calorie meals or snacks. This may help your body need less energy to digest your food.

Often, doing physical activity may actually increase your energy levels. It can also make it easier to do your usual daily activities, increase your appetite, and help you be in a better mood. Talk with your doctor about doing light-to-moderate intensity activities, such as walking or gardening.

If you live alone and can’t shop for food or make meals, you may be eligible for food programs, such as God’s Love We Deliver or Meals on Wheels. There may be age or income requirements for some programs. Your social worker can give you more information.
If you have any questions, contact a member of your healthcare team directly. If you're a patient at MSK and you need to reach a provider after 5:00 p.m., during the weekend, or on a holiday, call 212-639-2000.

For more resources, visit www.mskcc.org/pe to search our virtual library.