

Nutrition Recommendations for Patients with Compromised Immune Systems

What is foodborne illness?

Pathogens are disease-causing bacteria, viruses, or parasites. Some pathogens can contaminate foods and drinks. If you swallow a contaminated food, it can cause foodborne illness (food poisoning). The U.S. food supply is relatively safe, but it can still cause infection and illness. According to the U.S. Centers for Disease Control and Prevention (CDC), there's 48 million foodborne illnesses and up to 3,000 deaths a year. **Everyone needs to use safe food handling methods to lower the risk of infection and illness.**

Why modify your diet if your immune system is compromised?

Certain groups of people are more likely to be susceptible to foodborne illness, meaning they are not just more likely to get sick from eating contaminated food – the effects can be much more serious.

Those at greater risk for foodborne illness include:

- people being treated for cancer, especially with prolonged neutropenia (low white blood cell count)
- people who have diabetes
- adults aged 65 and older
- people with autoimmune diseases
- people who have had a transplant

What foods are most likely to cause illness?

- Unwashed fruits and vegetables
- Unpasteurized (raw) milk and products made from unpasteurized milk
- Raw or undercooked eggs
- Raw or undercooked meat, poultry, fish, or shellfish
- Store-prepared deli salad

How long do I need to follow these guidelines?

Neutrophils are special white blood cells that find and destroy harmful pathogens, including those that cause foodborne illnesses. Normally, bone marrow creates thousands of neutrophils every day. They enter the bloodstream, ready to recognize and destroy foreign invaders/pathogens. As people age, the neutrophils they produce work less efficiently. Conditions such as an autoimmune disorder, or treatments such as chemotherapy, destroy neutrophils faster than your body can make more. When your neutrophil level gets too low, your body is very open to infection. This medical condition is called

neutropenia. Your ANC (absolute neutrophil count) measures the number of neutrophils in your body. A low ANC means you are more likely to get ill if you get an infection.

For those on high-dose chemotherapy or radiation

You will need to follow this diet until your treatment ends and you no longer have neutropenia. Your medical team will monitor your ANC closely. Your risk for infection is greater if your ANC is less than 500 per uL of blood. (Your lab results will list it as 0.5K/uL.) When your ANC is greater than 0.5, you are no longer considered to be “neutropenic”.

Please note: If your medical team expects you to have more chemo or radiation, they **may** want you to stay on this diet even if you no longer have neutropenia

For those having a stem cell transplant

❖ Autologous stem cell transplant

You must stay on this diet until day 100. Day 100 is **about 3 months after your Day Zero (the day of transplant)** and you are no longer neutropenic. (ANC is greater than 0.5uL).

❖ Allogeneic stem cell or cord blood transplant

Continue this diet until you have completed immune suppressive therapy. Your medical team will also consider discontinuing this diet if:




- you are at least **6 months past Day Zero**
- you are on a tapering schedule of tacrolimus, **OR** your therapeutic levels for tacrolimus are no longer being monitored, **OR** you’ve been on low-dose steroids* for **the past 30 days**. (*Such as less than 0.1 milligram of methylprednisolone per kilogram of weight per day)
- you have not received any other systemic agents to control Graft vs Host Disease (GvHD) such as rituximab, infliximab, ruxolitinib, or tocilizumab **within the past 6 months**.

❖ CAR-T cell therapy

You need to continue this diet:

- **until 1 month after the therapy**
- until you are no longer neutropenic
- **And** until you no longer need growth factor shots

Please note: You may need to continue or restart the Immunocompromised Diet, following these guidelines if you are readmitted to the hospital for illness, have a flare-up of GvHD, or if it is in your best interest according to your doctor’s judgement.

Food Group	Foods Not Recommended
Dairy	<ul style="list-style-type: none"> • Unpasteurized or raw milk, or milk products made from unpasteurized or raw milk • Cheeses with: <ul style="list-style-type: none"> ○ chili peppers or other uncooked vegetables ○ molds such as blue, Stilton, Roquefort, and gorgonzola • Deli-sliced cheese served cold • Soft cheeses made from unpasteurized (raw) milk such as feta, brie, blue-veined cheese, camembert, queso blanco, or queso fresco
Protein Foods 	<ul style="list-style-type: none"> • Raw, rare, or undercooked meat, poultry, game, and tofu • Raw or undercooked fish or shellfish (including sushi, sashimi, or ceviche) • Raw Tempeh products • Refrigerated smoked fish, lox, pickled fish, raw fish, clams, and oysters • Raw or undercooked eggs (including runny, soft-cooked, or poached), non-pasteurized egg substitute; foods containing unpasteurized egg • Raw or unroasted nuts and seeds • Nuts in the shell
Processed Meats	Hot dogs, bacon, sausage, fresh-cut deli meats/cheeses or luncheon meats that have not been heated to steaming hot (165 °F).
Pâtés	Unpasteurized and/or refrigerated pâtés or meat spreads
Entrées and Soups	<ul style="list-style-type: none"> • All miso products, such as miso soup or paste • Self-serve soups at grocery stores or restaurants
Fruits and Vegetables 	<ul style="list-style-type: none"> • Fresh fruits and vegetables (including packaged salad kits) that have not been washed under cold, running water • Any produce with bruises or splits in the skin • Pre-cut fresh produce served raw • Salads from restaurants, delicatessens, or salad bars • Fresh, non-pasteurized salsas found in the refrigerator case • Non-pasteurized sauerkraut • All raw vegetable sprouts, such as alfalfa or bean sprouts
Grains 	<ul style="list-style-type: none"> • Raw or uncooked grain products (such as Muesli cereal) • Breads, rolls, or pastries in self-serve bins or open-ended bags (such as artisan breads)

Food Group	Foods Not Recommended
Fats	Refrigerated salad dressings containing unpasteurized eggs or cheeses that are listed as “not recommended” in “Dairy” section.
Beverages 	<ul style="list-style-type: none"> • Well water that has not been boiled • Unpasteurized fruit juice, vegetable juice, or cider (<i>Must boil for 1 minute; cool before drinking.</i>) • Cold-brewed tea made with warm or cold water • Maté tea or loose tea
Desserts	<ul style="list-style-type: none"> • Unrefrigerated, cream-filled pastry products (not shelf-stable) • Unwrapped or self-serve desserts (such as cookies, muffins, pastries, or candies)
Other 	<ul style="list-style-type: none"> • Bulk food that is not wrapped or in a sealed container (such as unwrapped candy, nuts, granola, or dried fruit) • Raw, unpasteurized, or non-heat-treated honey; honey in the comb • Brewer's yeast, if uncooked • Homemade mayonnaise, eggnog, or raw cookie dough containing raw egg • Street vendor foods or food samples in stores

Water, water everywhere...but is it safe to drink?

- **Tap water** that is rigorously tested daily for parasites, bacteria, and viruses - such as that of the Erie County Water Authority which works in conjunction with the Buffalo Water Authority – **is considered safe for you to drink.**
- **Bottled water** is another **safe choice.**

Untreated well water is NOT SAFE!

It may contain a variety of bacteria or viruses that could be life threatening. **Well water must be boiled before you can drink it safely.** (Well water must come to a rolling boil for a minimum of 1 minute. Then cool, store in the refrigerator, and use within 48 hours.)

How to Handle and Prepare Food Safely

Unfortunately, there is no way to “know” if pathogens are present in your food. These microbes are typically not something you can see, smell, or taste. The best approach to avoid foodborne illness is to follow the **USDA four basic steps for food safety**:

1. CLEAN

- Wash your hands in warm soapy water for at least 20 seconds before and after handling food.
- Wash cutting boards, dishes, utensils, and counter tops with hot soapy water between the preparation of raw meat, poultry, and seafood products and preparation of any other foods that will not be cooked.
- **Wash all produce.** Rinse all raw fruits and vegetables under running water and scrub firm-skinned fruits and vegetables with a produce brush, including produce with skins or rinds that will be removed before eating, peeling, or slicing.
- Packaged fresh vegetables and salad kits must also be washed – even if it states “triple washed” on the package.
- Avoid eating raw fruit or vegetables with bruised areas or openings in the skin. Bacteria can thrive in these places.
- Wash the top of cans and can opener with hot, soapy water before use.
- Use paper towels to clean kitchen surfaces. If you prefer cloth towels, wash them often on the hot cycle of your washing machine.



2. SEPARATE

- **Don't cross-contaminate.** This happens when bacteria are spread from one food product to another. Cross-contamination commonly occurs when handling raw meat, poultry, seafood, and eggs. These raw foods and their juices **must not** come in contact with ready-to-eat or cooked foods.
- Separate raw meat, poultry, seafood, and eggs from other foods in your grocery cart, grocery bags, and refrigerator.
- Never put cooked food on a plate that previously held raw meat, poultry, seafood, or eggs. If you must use the same plate, wash it with hot soapy water before using it to hold cooked or ready-to-eat foods.
- If possible, use one cutting board only for raw meat, poultry, and seafood and another only for fresh produce, breads, and cooked foods.
- Do not reuse marinades used on raw foods unless you bring them to a boil first.

3. COOK

- Remember – the color of food is **not** a reliable indicator of safety or doneness. **Use a food thermometer** to check the internal temperature in several places to make sure meats, poultry,

seafood, or egg products are cooked to safe minimum temperatures as shown on the “**Is It Done Yet?**” **food chart** (see below).

- Cook **shrimp, lobster, and crab** until the shells turn red and the flesh is pearly opaque.
- Cook **clams, mussels, and oysters** until the shells open. If the shells do not open, do not eat the oyster inside.
- Bring all **saucers, soups, and gravy** to a boil when reheating. Heat other **leftovers** to 165°F.
- Heat **hot dogs, bacon, sausages, and fresh-cut deli meats/ luncheon meats** until steaming hot or 165°F before eating.
- Stir and rotate foods when cooking in the microwave to ensure even cooking. Always allow standing time to complete cooking before checking the internal temperature with a food thermometer.

USDA “Is It Done Yet?” Chart

Product	Minimum Internal Temperature & Rest Time
Beef, Pork, Veal & Lamb Steaks, chops, roasts	145 °F (62.8 °C) and allow to rest for at least 3 minutes
Ground Meats	160 °F (71.1 °C)
Ground Poultry	165 °F
Ham, fresh or smoked (uncooked)	145 °F (62.8 °C) and allow to rest for at least 3 minutes
Fully Cooked Ham (to reheat)	Reheat cooked hams packaged in USDA-inspected plants to 140 °F (60 °C) and all others to 165 °F (73.9 °C).
All Poultry (breasts, whole bird, legs, thighs, wings, ground poultry, giblets, and stuffing)	165 °F (73.9 °C)
Eggs	160 °F (71.1 °C)
Fish & Shellfish	145 °F (62.8 °C)
Leftovers	165 °F (73.9 °C)
Casseroles	165 °F (73.9 °C)

<https://www.fsis.usda.gov/food-safety/safe-food-handling-and-preparation/food-safety-basics/safe-temperature-chart>

4. CHILL

- Refrigerate or freeze meat, poultry, eggs, seafood, and other perishables within 2 hours of cooking or purchasing. If outside temperature is above 90°F, refrigerate within 1 hour.
- Never thaw food at room temperature, such as on a countertop. It is safest to thaw food in the refrigerator, in cold water, or in the microwave. If thawed in cold water or in the microwave, you should cook the food immediately.
- Refrigerate leftover cooked foods immediately after a meal in an uncovered, swallow container on the top shelf of the refrigerator. Cover after cooled. **Use leftovers within 3 days (72 hours). Reheat leftovers to at least 165°F.**

ALWAYS REMEMBER....



When in Doubt, Throw it Out!

Disinfecting

- Sanitize cutting boards, knives, and appliance blades after each use with the sanitizing solution mixture.

Sanitizing Mix



3 Tablespoons unscented bleach + 1 quart (4 cups) water

- Keep appliances and countertops free of food particles.
- If you have a dishwasher, use it to wash your dishes instead of washing dishes by hand. The hot water temperatures and the heat from the drying cycle are more effective at sanitizing your dishes.
- If you wash dishes by hand, wear rubber gloves and use hot water to wash and rinse the dishes. Allow dishes to air dry whenever possible to reduce bacteria that may contaminate dishes from dish towels.
- Replace dish cloths and dish towels daily: sanitize them in the sanitizing solution.
- Replace sponges at least weekly. These also can be cleaned with the sanitizing solution if you plan to use them again.

What Else Can I Do to Prevent Foodborne Illness?

Be a Smart Shopper

- Select unblemished fresh fruits and vegetables with the skin intact.
- Check “sell by” and “use by” dates when you buy meats, dairy products, eggs, etc.
- Choose canned goods that are free of dents, cracks, or bulging lids.
- **Never** buy food that is displayed in unsafe or unclean conditions. (Avoid frozen foods that are not frozen solid and foods in damaged packaging.)
- Pick up refrigerated and frozen items last when shopping to reduce warming or thawing.
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What Else Can I Do to Prevent Foodborne Illness? (continued)

- Keep a cooler in the car to prevent refrigerated and frozen foods from thawing or warming on the way home.
- Store eggs in their original carton in the main part of your refrigerator when you get home.
- Do not taste free food samples while you shop. Store groceries promptly.
- Refrigerate/freeze foods according to the USDA Cold Storage Chart.

For more information on proper cooking and food storage temperatures

- Download the **USDA Foodkeeper App** (Free for android and apple devices)
- Or visit their website: <https://www.foodsafety.gov/keep-food-safe/foodkeeper-app>
- Or scan the QR code below (with camera on cell phone)



NOTES

Tips for Eating Out

1. The cafeteria and food/beverage kiosks in the hospital must be treated like an outside restaurant when it comes to safety and food selection.
2. Try to get food from restaurants you are familiar with – places that are clean and that serve the food thoroughly cooked. If you are unfamiliar with the restaurant, here are a few things to look for to help you evaluate the safety:
 - ✓ The restaurant and restroom should be clean and orderly.
 - ✓ If you can see the staff in the food prep area, make sure they are wearing gloves.
 - ✓ Check out the meals coming out of the kitchen – if you see a lot of fresh or raw vegetable or fruit garnishes, ask that yours be served without these items.
3. Avoid buffets, potlucks, salad bars, sidewalk vendors, and food samples offered at grocery stores.
4. Avoid fresh produce. Think “cooked foods” when you eat out.
5. Avoid any self-serve foods that could be potentially touched with bare hands. (Salad bars, buffets, potlucks)
6. Avoid cold delicatessen meats or cheeses unless heated to steaming hot. For example, a cold turkey sandwich is not allowed, but a grilled turkey and cheese sandwich is okay.
7. Uneaten portions of cooked foods should be dated, promptly refrigerated, and should only be eaten/reheated within 3 days (72 hours) of the food being made.

**If you have any questions, please call the
Roswell Park Dietitian Office
716-845-2398**