

Nutrition/Dehydration

Your Guide To Eating Healthy After Your Kidney Transplant

These diet guidelines are meant to help you to optimize your new kidney and prevent problems. The diet guidelines include: food safety, optimizing caloric and protein intake for healing (while preventing weight gain), monitoring carbohydrate intake to prevent high blood sugars, following an overall heart-healthy diet and adjusting the electrolytes in your diet if necessary.

Short-Term (Recovery) Goals

- Caloric and protein requirements immediately after transplant are increased due to the stress of the surgery and wound-healing needs. Adequate oral intake is important to provide the building blocks for healing and to help prevent infection and muscle loss. Depending on the level of kidney function in the transplanted kidney, an appropriate diet will be prescribed – typically a general diet! If the new kidney has delayed function, you temporarily may need sodium, potassium or fluid restrictions.
- During the first few weeks of recovery, be sure to include nutritious foods at meal and snack times. For example: lean beef and pork, chicken, turkey and fish; low fat milk, cheese and yogurt; eggs; nuts; whole grain breads and cereal; and fruits and vegetables will provide the protein, vitamins and minerals you need rather than empty caloric foods like chips and sweets.

- If you experience poor appetite or unintentional weight loss, contact the transplant dietitian.
- It is important to drink 1-2 liters of fluid (8 full 8-ounce glasses of fluid) per day, **minimum**. Some people may be instructed to drink 2-3 liters of fluid. Make sure you understand what your fluid needs are. It is best to avoid fluids that have caffeine or limit your caffeine drinks to 1-2/day. Alcohol beverages are permitted; however, strict moderation is necessary. Alcohol has the potential to affect the way the liver breaks down the anti-rejection medications and may cause you to reject.
- Maintain blood glucose control after transplant if you are diabetic. Prednisone (an anti-rejection medication) and Prograf can elevate blood sugars and cause medication-induced diabetes in non-diabetics. If this occurs after transplant, you will be seen by a diabetes educator for instructions.

Long-Term Goals

- **Maintain a desirable weight.** Weight gain after a transplant can be problematic and is common due to improved appetite and fewer diet restrictions. Weight gain also can occur from side effects of anti-rejection medications. Weight gain after transplant increases your risk for high blood pressure, diabetes, heart disease, joint or bone disease and may shorten the life of your new organ. We want you to be as healthy as possible to enjoy the life of your new organ for as long as possible. To control

Nutrition/Dehydration, continued

your weight, limit caloric intake in food and in drinks. Fat adds the most calories to your diet, so try low-fat ways to prepare your meals and trim added fats from your diet to save calories. Limit/avoid fast food. Have low-calorie snacks, fruits, vegetables and low-fat dairy products on hand for snacking. Read labels and pay attention to portion sizes. To keep your mind off of food, try to stay busy with your favorite hobbies and activities (reading, gardening or yard work, housework, dancing, crafts, etc.). Keep moving daily with exercise and activities you enjoy to burn more calories. Make a plan and stick with it. If you struggle to control your weight, contact the transplant dietitian – what do you have to lose besides weight?!

- **Cholesterol Control.** Genetics, diet and lifestyle, obesity, diabetes and the side effects of some anti-rejection medications affect cholesterol levels. High cholesterol and triglyceride (blood fat) levels increase your risk of heart disease, vascular disease and the risk of chronic rejection of your new organ. Ideally, cholesterol levels should be less than 200, HDL (good cholesterol) should be above 50, LDL (bad cholesterol) should be less than 100 and triglycerides should be less than 150.
- **Cholesterol and LDL (Bad Cholesterol).** If you experience a high total cholesterol level (greater than 200) or a high LDL (bad cholesterol level greater than 100), limit your diet in saturated fat. Saturated fat is the fat that is solid at room temperature (butter, whole fat milk and cheeses; meat fats

and drippings; coconut and palm kernel oil; lard). In addition, portion sizes of all animal products (lean meats, poultry, fish, eggs, low-fat dairy) will need to be limited because these foods naturally are sources of animal cholesterol. Your diet should consist of extra-lean cuts of beef or pork, skinless white meat chicken and turkey and fish. Meats should not be fried. Low-fat dairy products such as 1 percent or skim milk, cheese, cottage cheese and yogurt are allowed. Soft tub margarines or sprays, low-fat dressings, olive or canola oil are preferred oils. The majority of your diet should consist of fruits, vegetables, whole grain breads, cereals, pastas and rice.

- **Triglycerides.** If you experience a high triglyceride level (greater than 150), make sure you are at a desirable weight (lose weight if needed) and exercising regularly. Alcohol should be avoided. Also, it is recommended to limit intake of carbohydrates. Simple sugars from sugary drinks, sweets, desserts, candies, pastries and sugary cereals can easily be stored as triglycerides. Substitute sugar-free products in their place. Excessive intake or large portions of white bread products, white rice or pastas can also lead to elevated triglyceride levels. Your diet should consist of lean meats and low-fat dairy (as above) and include a variety of vegetables, fruits, nuts, beans and whole grains (with emphasis on portion control of whole grains). Eating fish (salmon, tuna and halibut) at least twice a week and moderate use of olive oil may be helpful.

Nutrition/Dehydration, continued

- **HDL or Good Cholesterol.** In order to maintain/increase your HDL cholesterol (good cholesterol greater than 50), it is important to follow the above low-fat guidelines with a diet high in fruits, vegetables and whole grains. Avoid smoking. Exercise (get your heart rate up) regularly.

A heart-healthy diet is meant to help lower cholesterol levels and blood pressure. It may help to decrease the risk of heart disease. It includes eating a variety of foods that are low in fat, especially saturated fat and trans fats. The diet is also low in cholesterol and low in sodium. Adding fiber and Omega-3 fatty acids to your diet are recommended.

Tips In Preparing Heart-Healthy Foods

- Use nonstick cookware or a fat-free nonstick spray (like Pam, etc.).
- Bake, boil, broil, grill, microwave, poach or roast instead of frying foods.
- Trim any fat and skin from meat before cooking it.
- Place meat on a rack so the fat can drain; discard meat drippings.
- Use herbs and spices to add flavor to the food instead of butter and/or salt.
- Try using marinades to flavor and tenderize meats. Anything that contains acid will work as a marinade (like seasoned vinegars, lemon or lime juices, fruit or fruit juices, etc.).
- Buy lean cuts of meat (90 percent lean or leaner).

- Cook soups, stews, chili, spaghetti sauces and gravies the day before and refrigerate. Skim off any solid fat before reheating.
- Steam vegetables in water or low-sodium broth instead of fat.
- Have fruit for dessert.

For more information on heart-healthy eating or for recipe ideas, you can visit these web sites:

- <http://www.heart.org/HEARTORG/>
- http://www.heart.org/HEARTORG/GettingHealthy/NutritionCenter/Recipes/Delicious-Decisions-Cookbooks-and-Recipes-from-American-Heart-Association_UCM_452733_SubHomePage.jsp
- www.diabetes.org
- **Bone Health.** Anti-rejection medications can have negative side effects on bone strength. In addition, any poor bone health that was present before transplant may make bone disease after transplant even more likely. Eat calcium-rich foods (low-fat dairy and cheese). Take calcium supplements and medicines as prescribed. Exercise to keep your bones strong. Avoid smoking.
- **Electrolytes.** Your medications may affect the levels of certain electrolytes in your body, especially potassium and magnesium. You may need to decrease or increase your intake of foods high in these electrolytes.

Nutrition/Dehydration, continued

Blood Sugar

Controlling your blood sugar if you develop near onset of diabetes after transplant (NODAT).

Diabetes is an illness that affects how your body makes and uses a hormone called insulin. It causes the amount of glucose (sugar) in your blood to be too high because of the problems with insulin. Insulin is a hormone made and released by the pancreas, and it helps to convert glucose into energy so that it can be used by the body.

You may already know a lot about this common illness if you had diabetes before your transplant. There are many factors that put a person at risk for diabetes including:

- A family history of the diabetes
- Obesity
- Being African American or Latino
- Being over 40 years old
- Inactive life style
- Anti-rejection drugs
- Hepatitis C

The type of diabetes that occurs after transplant is called “new onset diabetes after transplant” (NODAT). It can develop after transplantation of any organ, but it is very likely after transplantation. If you already have diabetes, the anti-rejection medications will make your disease more difficult to control for awhile.

You can reduce your risk of having diabetes if you:

- Maintain a healthy weight
- Eat a healthy diet and regularly exercise
- Don't smoke

NODAT is important to treat because if not treated it:

- Increases the risk that the transplanted organ will fail
- Increases the risk of premature death, especially from heart disease and stroke
- May increase the risk of other complications seen in Type 1 and Type 2 diabetes such as blindness (retinopathy), nerve damage (neuropathy) or kidney failure (nephropathy)

However, treatment can lower the chance of serious complications from this condition.

If you develop NODAT, your doctor will work out the treatment that is right for you as an individual. Generally the approach is similar to that used to protect against possible long-term complications of Type 2 diabetes:

- Healthy lifestyle
- Oral medications or insulin (or both) to control your blood sugar
- Regular checks of your blood sugar

While you are in the hospital, diabetes educators and nutrition specialists will talk

Nutrition/Dehydration, continued

to you about the diabetes, your individual treatment plan and how to monitor yourself at home. You will be taught how to use your blood sugar machine and how to give yourself insulin. You will also need to be able to recognize the signs of high and low blood sugars (hyperglycemia and hypoglycemia). Your overall blood sugar control will also be assessed at intervals by your transplant doctors during clinic visits. Your endocrinologist will continue to monitor your diabetes.

Living With Diabetes

Be sure to write down all the questions that you have so you learn as much as you can about this disease. Get support from your family, friends and other diabetics as well as your transplant team and primary care physician. The more you learn, the more you can do to help keep diabetes under control. Control of your diabetes is the most important factor in preventing the development of post-transplantation heart disease.

You will be given an individual blood glucose target and medication will be adjusted to achieve this target.

Getting diabetes after a transplant can be scary. It does add a few more challenges to your daily life. You'll have to watch what you eat and check your blood sugars regularly. But you'll get used to it. Being careful and taking control of your condition makes a huge difference. And the good news is that diabetes after a transplant may not be permanent. If you did not have diabetes before transplantation, blood sugars may return to normal with changes in transplant medication. Or you may always require treatment. Your doctor will determine your needs based on your blood sugar logs.

Never stop or change any of your treatments without first talking to your doctor or transplant coordinator.

Nutrition/Dehydration, continued

Potassium

Potassium Rich Foods

Vegetables

Low Potassium (0-100 mg)

- Cucumbers
- Green Beans
- Green Peppers
- Lettuce: all varieties
- Wax Beans: canned (low sodium or rinsed)

Medium Potassium (100-200 mg)

- Asparagus: fresh, cooked
- Broccoli
- Cabbage
- Carrots
- Cauliflower
- Celery
- Collard, mustard or turnip greens
- Corn
- Eggplant
- Mushrooms: canned, fresh
- Onions
- Peas
- Radishes
- Spinach: fresh

- Turnips
- Summer Squash; Zucchini

High Potassium (200-350 mg)

- Beans, canned with pork
- Beets
- Beet Greens
- Brussel Sprouts
- Chinese Cabbage
- French Fried Potatoes
- Kohlrabi: fresh, cooked
- Okra
- Potatoes: boiled, mashed
- Pumpkin: canned
- Rutabagas
- Spinach: cooked
- Sweet Potatoes/Yams
- Tomato: 1 medium
- Tomato or Vegetable Juice: (low sodium)
- Winter Squash: acorn and butternut

Very High Potassium (>350 mg)

- Avocado
- Beet Greens
- Potato: baked
- Spaghetti Sauce
- Tomato Sauce/Paste

Fruits And Juices

Low Potassium (0-100 mg)

- Applesauce
- Peach Nectar
- Blueberries
- Pear Nectar
- Cranberry Juice
- Pears: canned
- Cranberry Sauce
- Lemon
- Grape Juice

Medium Potassium (100-200 mg)

- Apple
- Apple Juice
- Apricot Nectar
- Gooseberries
- Blackberries
- Grapes: (15 small)
- Cherries
- Papaya
- Figs: canned
- Mango
- Fruit Cocktail
- Lemon Juice
- Peach: fresh
- Pineapple: canned
- Pineapple Juice

Nutrition/Dehydration, continued

- Plums: canned
- Plums
- Raisins: (2 tbsp)
- Raspberries
- Rhubarb
- Tangerine
- Watermelon: (1 cup)

High Potassium (200-300 mg)

- Apricots: canned or dried
- Banana: (1/2)
- Cantaloupe: (1/8 small)
- Dates: (1/4 cup)
- Figs: 2 whole
- Kiwi: (medium)
- Nectarines
- Orange: fresh
- Orange Juice
- Pears
- Prune Juice
- Prunes
- Honey Dew Melon: (1/8 small)

Magnesium

Magnesium Rich Foods

Vegetables

Low Magnesium (below 40 mg)

- Chestnuts: 1 ounce
- Kidney Beans: all types, cooked, 1/2 cup
- Purslane: cooked, 1/2 cup
- Broadbeans: cooked, 1/2 cup
- Split Peas: cooked, 1/2 cup

Medium Magnesium (40-69 mg)

- Tomato Paste: canned, 1/2 cup
- Small White Beans: cooked, 1/2 cup
- Sweet Potato: canned, mashed, 1/2 cup
- Black Beans: cooked, 1/2 cup
- Dock: (sorrel), cooked, 1/2 cup
- Nuts & Seeds: all types, 1 ounce
- White Beans: cooked, 1/2 cup
- Baked Beans: 1/2 cup
- Navy Beans: cooked, 1/2 cup
- Succotash: cooked, 1/2 cup
- Beet Greens: cooked, 1/2 cup
- Lima Beans: baby, cooked, 1/2 cup
- Refried Beans: canned, 1/2 cup

Nutrition/Dehydration, continued

- Mung Beans: cooked, 1/2 cup
- Artichoke: cooked, 1 medium
- Whole Grain Cereals: ready-to-eat, 1 ounce
- Blackeyed Peas: dried, cooked, 1/2 cup
- Okra: cooked, 1/2 cup
- Great Northern Beans: 1/2 cup
- Acorn Squash: baked, 1/2 cup cubed
- Lima Beans: large, cooked, 1/2 cup

High Magnesium (70 mg and above)

- Spinach: cooked, 1/2 cup
- Swiss Chard: cooked, 1/2 cup
- Soybeans: cooked, 1/2 cup
- Pumpkin Seeds: 1 ounce
- Broccoli: cooked, 2 large stalks
- Peanuts: all types, raw, 1/2 cup
- Tofu: raw, regular, 1/2 cup
- Peanuts: all types, roasted, 1/2 cup

Dairy Products

Low Magnesium (below 40 mg)

- Yogurt: low-fat varieties, 1 cup (8 ounces)
- Milk: all types, 1 cup (8 ounces) = 35 mg

Meat Products

Medium Magnesium (40-69 mg)

- Vegetarian meat products, made of soy, 1 ounce

It is best to direct all of your nutrition-related questions to a Registered Dietitian (RD). An RD has had specific training and can provide you with the best information regarding the foods you eat and any diet restrictions you may need. Your transplant team has a RD available for you. Please contact:

Molly Stirek, RD, LMNT
402.552.3648

Dehydration

Symptoms of rejection and infection are covered in previous sections of this manual. Symptoms of dehydration are also important for you to know because dehydration is often a cause for an increase in BUN and creatinine levels. Dehydration (and low blood pressure) can also cause acute tubular necrosis (ATN) in which the kidney can temporarily shut down, causing a rise in creatinine and BUN.

Signs Of Dehydration

- Low blood pressure (especially when standing up)
- Dizziness when standing up
- Rapid pulse rate
- Weight loss
- Fatigue, loss of strength, confusion
- Dry mouth
- Certain lab values may increase, such as your BUN, creatinine and hematocrit
- Low urine output
- Constipation/abdominal pain

Nutrition/Dehydration, continued

Drink one to two liters of fluids (8 full glasses) per day **minimum**. Some people may be instructed to drink two to three liters of fluids per day.