

Nutrition

After your heart transplant

A healthy diet is important, especially after a transplant. Eating well and making good food choices will help you recover faster from your surgery. It can also help prevent long-term problems.

Eating healthy foods and making good food choices will help you:

- Reduce food-related side effects of some of your medicines.
- Lower fluid retention and high blood pressure.
- Keep your body weight at a stable and healthy level.



The more colorful vegetables are, the more nutritious they are likely to be (see pages 5 and 6).

Manage Your Fluid Intake

During surgery, you will be given large amounts of IV fluid. But, having too much fluid in your body makes your heart work harder.

To help your body get rid of the extra fluid after surgery:

- You may be put on a low-fluid diet right after your transplant.
- Your fluid intake will be limited. Your nurse will keep track of the liquid you drink and the amount you get through your IV.
- We will give you medicines called *diuretics* for a few weeks. These help your body get rid of fluid through your urine.

The first few days may be hard. You might have a dry mouth and be very thirsty while your fluid intake is low. But, you will be allowed more fluids as time goes on.

To ease thirst and mouth dryness, try:

- Ice chips
- Popsicles
- Fresh or frozen fruit
- Lemon wedges
- Tart foods
- Sugar-free gum or hard candy

Your body will need more protein than usual to help you heal after your transplant surgery. There are many easy and tasty ways to get extra protein into your diet.

Eat More Protein

Protein helps the body heal and also rebuilds muscle. After your transplant, your body will need extra protein to heal from the surgery. And, prednisone and the other immunosuppressive medicines you will be taking can break down your muscle tissue. You will need extra protein when you are taking more than 20 mg of prednisone a day.

Some good protein sources are:

- Lean red meat, poultry, and fish
- Low-fat cottage cheese
- Water-packed tuna fish
- Egg whites, egg substitutes, or whole eggs*
- Tofu
- Low-fat yogurt

**Limit to 2 whole eggs per week.*

Tips to Increase Your Protein Intake

- **Nonfat (skim) and 1% milk, or evaporated skim milk:** Drink milk as a beverage. Add it to cereal, soups, puddings, and sauces.
- **Powdered skim milk:** This can be used to increase the protein in liquid milk. Add 1 cup of milk powder to 1 quart of skim or 1% milk, then blend and chill the mix until you are ready to use it. You can also add milk powder to soups, mashed potatoes, bread, casseroles, meatloaf, and sauces.
- **Low-fat cottage or ricotta cheese:** Add low-fat cottage cheese or ricotta cheese to noodles or casseroles, or as a stuffing for pasta shells or a topping for pancakes and waffles. Eat with fruit or mix into gelatin.
- **Low-fat or nonfat yogurt:** Eat it out of the container. Use it in desserts and sauces. Mix in fruit salads.
- **Low-fat cheese:** Melt it onto tortillas and add it to sandwiches. Grate it over casseroles, sauces, vegetables, and mashed potatoes. Sprinkle it on soups, rice, and noodle dishes.
- **Eggs or egg substitutes:** Hard boil eggs and discard yolks. Chop up whites for salads, sandwiches, and casseroles. Use egg substitutes for quiches, pancakes, waffles, and French toast.
- **Frozen desserts:** Use low-fat frozen desserts, such as ice milk and frozen yogurt, to make milkshakes or to add to soda for floats. Add to cold cereal and fruit gelatin. Whip with canned or fresh fruit.

There are many ways to add protein to your diet. Try eating more meat, eggs, cheese, beans, yogurt, and milk. Eating healthy food does not mean you have to eat boring or tasteless food.

- **Beans and legumes:** Use beans or legumes in casseroles, soups, salads, pasta, stews, and grain dishes such as pilaf and couscous.
- **Lean red meat, poultry, and fish:** After cooking, chop and add to casseroles, sandwich fillings, salads, soup, sauces, quiches, and baked potatoes.
- **Nutritional supplements:** These can be used if your protein and calorie intake levels are too low. They come in several forms, such as drinks, powder, snack bars, and pudding. Your dietitian will tell you if you need to start taking a nutritional supplement.

Calorie Needs

You will need more calories than usual right after your transplant to help you recover and heal. Eat healthy, nutritious foods for best results.

After surgery of any kind, many people do not feel like eating very much. Here are some ideas to help you eat more:

- Eat when you are hungry.
- Do not hurry at mealtimes.
- Eat several small meals and snacks during the day.
- Eat different foods to add variety to your diet.
- Keep a supply of healthy snacks on hand.
- Let someone else do the cooking.

If you are underweight, try to gain weight slowly until you are at an ideal body weight. When you reach your goal, try to stay at that weight. Your dietitian can help you plan a diet that will meet your calorie needs.

Healthy Snacks

Because you may not feel like eating a full meal for a while after your transplant surgery, it is helpful to keep snacks handy for when you do get hungry. Try to eat healthy snacks rather than chips or candy. Some ideas for quick, healthy snacks are:

- Fresh, canned, or dried fruit
- Low-fat cheese
- Applesauce
- Low-fat cottage cheese
- Light ice cream or ice milk
- Popsicles
- Low-fat pudding

Limit the sodium (salt) you eat because too much can increase your blood pressure. Many processed foods contain a lot of sodium. Check the nutrition labels to see how much sodium is in the foods you choose.

- Low-fat yogurt
- Whole-grain bread or rolls
- Powdered breakfast drinks
- Vegetables
- Popcorn (no butter, light salt)
- Cereal with skim milk
- Skim or 1% chocolate milk
- Light cream cheese on crackers or a bagel
- Gelatin desserts and salads
- Frozen yogurt
- Juice
- Soup (low-salt, if canned)
- Sandwiches

Limit Sodium

Most people need to eat less sodium (salt) before their transplant. You will need to follow a 4-gram (4,000 mg) sodium diet after you go home from the hospital. The easiest way to lower your sodium intake is to eat fewer processed foods and to use no more than ¼ teaspoon a day of table salt.

You will also need to limit the number of high-sodium foods you eat as well. Some of these are:

- Salted snacks, such as potato chips, pretzels, nuts, and corn chips
- Salted, smoked, and cured meats such as ham, bacon, corned beef, lunch meats, sausage, hot dogs, and beef jerky
- Seasoning mixes for tacos, rice, and noodle dishes
- Vegetable juices, tomato juice, sauerkraut, pickles, and other vegetables packed in brine
- Processed cheese and cheese spreads
- Breads, crackers, and rolls topped with salt
- Regular canned soups, many frozen dinners, broth and bouillon cubes, soy sauce, and Worcestershire sauce

Many of these foods now come in reduced- or low-salt versions. Be sure to read nutrition labels to check for sodium content.

One way to think about fruits and vegetables is that the more colorful they are, the more nutritious they are likely to be. Leafy green vegetables such as spinach, ripe blueberries, and deep yellow-orange yams are full of vitamins and other nutrients.

A Healthy Food Plan

Eating a healthy diet will help keep your body working well. Eating a variety of foods each day will give you the nutrients you need.

Here are some tips to help you make healthy food choices.

Whole Grains, Breads, and Cereals

It is best to eat whole, cooked grains and whole-grain breads and cereals. We suggest that you eat 6 servings of grains a day.

These are examples of 1 serving:

- ½ cup cooked rice, pasta, or cereal
- 1 slice of bread, or a small biscuit, roll, or muffin
- ½ English muffin, ½ hamburger bun, or ½ bagel
- 3 or 4 small crackers, or 2 large crackers
- 1 ounce cold cereal

Fruits

Berries, melon, apples, oranges, and bananas are just some of the fruits to include in your healthy food plan. We suggest you eat 2 servings of fruit a day.

These are examples of 1 serving of fruit:

- 1 medium apple, orange, banana, or pear
- 1 wedge of melon (about 1 inch wide)
- ½ cup of berries (any type)
- ¾ cup of fruit juice
- ¼ cup dried fruit
- ½ cup cooked or canned fruit

Do NOT Eat These Fruits

Some fruits contain a substance that makes immunosuppressive medicines less effective. Because of this, **do NOT eat**:

- **Grapefruit or drink grapefruit juice**
- **Pomegranates or any foods made with pomegranates or their juice**

Vegetables

We suggest you eat 3 servings of vegetables a day, and eat legumes and dark green leafy vegetables several times a week.

Healthy vegetables to choose from include:

- Dark green leafy vegetables such as chard, spinach, and kale
- Deep yellow or orange vegetables such as winter squash and yams
- Legumes such as dried peas, beans, and lentils
- Other starchy vegetables

These are examples of 1 serving of vegetable:

- ½ cup cooked vegetables
- ½ cup chopped or sliced raw vegetables
- 1 cup of leafy raw vegetables

Meat, Poultry, Fish, and Protein Alternatives

Protein alternatives include eggs, dry beans and peas, nuts, seeds, and tofu. We suggest you eat 2 servings of protein a day.

These are examples of 1 serving of protein:

- 5 to 7 ounces of cooked lean meat, chicken, or fish
- 3 to 4 ounces of cooked tofu
- 1 egg (no more than 2 whole eggs per week)
- ½ cup cooked beans or peas
- 2 tablespoons of peanut butter

Milk, Cheese, and Yogurt

We suggest you eat 3 servings a day from the dairy group.

These are examples of 1 serving of dairy:

- 1 cup skim or 1% milk
- 8 ounces of low-fat or non-fat yogurt (plain or with fruit)
- 1 to 1½ ounces of low-fat natural cheese

[Source: USDA: *Preparing Foods and Planning Menus Using the Dietary Guidelines*]

You need to stay at a healthy weight after your transplant. Being overweight is not good for your new heart. If you are overweight, your dietitian can help you create a healthy eating plan to reduce your weight and still get the nutrients you need.

Keep a Healthy Weight

Some medicines given before surgery can lower your appetite. After your transplant, you may overeat because you are feeling good again and have your appetite back. Prednisone can also increase your appetite.

But, overeating can lead to weight gain. Being overweight is not healthy for your new heart. Keep track of weight changes in your vital signs diary to see if you are gaining or losing weight. It is important to stay at your ideal weight.

Eating less fat can help you lose weight and lower the levels of cholesterol in your blood. Regular exercise can also help you meet both of these goals.

If you need to eat less to maintain a healthy weight, eating a variety of healthy foods is very important. Here are some tips to help you lose weight, if needed:

- Decrease your intake of added fats and foods that contain fats.
- Limit the amount of sweets you eat.
- Have smaller portions of food.
- Substitute low-calorie foods for high-calorie foods.
- Exercise regularly.
- Notice what causes you to overeat and work on changing your behavior toward food.

When you have a craving for a high-calorie food, try the 20-minute rule. Tell yourself, “I will let myself eat this food, but I will wait 20 minutes before I have it.” Then get busy with another activity – go for a walk, read a book or magazine, listen to some music, or do something else you enjoy. You may forget to eat the food after 20 minutes. Or, if you do decide to eat it, your craving will probably be under better control and you will likely eat less.

Your dietitian can give you other ideas to reduce calories if you need to lose weight. Talk with your doctor or dietitian before starting any weight-loss diet. Not all of them are right for transplant patients.

Healthy Blood Cholesterol

Keeping your blood cholesterol levels within normal limits is very important. Some ways to do this are:

- **Decrease your total fat intake.** Limit all sources of fat in your diet, including oils, margarine, butter, gravy, and meat sauces.
- **Eat less saturated fat.** Saturated fats and foods that contain saturated fats raise blood cholesterol levels more than any other foods. These fats should be limited in a cholesterol-lowering diet. No more than 10% of your daily calories should come from saturated fat.
 - The fat in animal products (meat, eggs, milk, cheese, and butter) is mainly saturated fat.
 - *Hydrogenated* fats are also high in saturated fat. These are unsaturated vegetable oils that have been processed so they stay fresh longer and are solid at room temperature. This process also makes them more saturated.
 - A few vegetable oils (coconut, palm, and palm kernel oils, and cocoa butter) are naturally high in saturated fat. These are also called “tropical oils.”

Not all types of fat are bad for you. Omega-3 fatty acids, which are found in fish, seafood, and flaxseed oil, can help lower cholesterol levels in the blood. The main fat in olive oil, monounsaturated fat, has also been shown to help cholesterol levels.

- **Substitute polyunsaturated and monounsaturated fats for saturated fats.** When you replace saturated fats with polyunsaturated and monounsaturated fats, your cholesterol levels can be lowered. Most foods contain a mixture of all 3 types of fat, but they will have more of 1 type than the other 2. Soybean, corn, safflower, and sesame oils contain mostly polyunsaturated fats. Olive, canola, and peanut oils are mostly monounsaturated fats.
- **Eat less cholesterol.** Your body makes all the cholesterol it needs naturally. Eating foods that are high in cholesterol can make your blood cholesterol too high. Egg yolks and organ meats (liver, kidneys, sweetbreads, and brains) are very high in cholesterol. Do not eat more than 300 mg a day of cholesterol.
- **Eat more high-fiber foods.** One kind of fiber, called “soluble fiber,” helps keep your body from absorbing cholesterol. Legumes (such as dried beans, peas, and lentils) are great sources of soluble fiber. Oats (such as oatmeal and oat bran) are also very good. Oat bran can be added to hot cereal, soups, stews, ground meat mixtures, muffins, pancake or waffle batter, and stuffing. There are also several fiber supplements available at grocery and drugstores if your doctor or dietitian feels you should try those. Add fiber to your diet slowly and drink plenty of fluids. This will help prevent bloating and gas.
- **Eat fish or seafood at least 2 times a week.** Besides being very low in fat, fish also has a special kind of fat called *omega-3 fatty acids*. This fat helps lower cholesterol. Ask your doctor if you can take fish oil capsules to get omega-3 fatty acids. If you have a seafood allergy or another reason you cannot eat fish, ask your dietitian about other sources of omega-3 fatty acids. Flax seeds and flaxseed oil may be alternate sources.
- **Maintain a healthy weight.** A healthy weight can reduce the level of low-density lipoproteins (LDL) or “bad” cholesterol in your blood. Reducing fat in your diet can help you lose weight, since fat contains nearly twice as many calories as protein or carbohydrates.
- **Exercise regularly.** Besides helping you lose weight, regular exercise increases the level of high-density lipoproteins (HDL) or “good” cholesterol in your blood. Exercise also strengthens the heart muscle and reduces blood pressure. Follow the guidelines in Chapter 6, “Physical Therapy,” for your exercise program.
- **Cholesterol-lowering drugs.** If a heart-healthy diet, weight loss, and exercise do not lower your blood cholesterol levels to normal limits, your doctor may prescribe medicine to help lower your cholesterol. You may also be referred to a dietitian if your cholesterol levels get too high.

Some transplant patients develop a form of diabetes from their high prednisone doses. If your blood sugars get too high and you cannot keep them under control with your diet, you may need to visit the Diabetes Care Center to be checked.

Manage High Blood Sugars

High doses of prednisone after your transplant can also lead to high blood sugar levels. These high levels are not usually related to your diet.

If you were already taking insulin before your transplant, you may need to increase your dose while your prednisone dose is high. As your prednisone doses change, your insulin needs should also change. If your blood sugars become hard to control, you can get help at UWMC's Diabetes Care Center.

You can also help control your blood sugars through your diet:

- Eat on a regular schedule – do not skip meals.
- Eat healthy, balanced meals and snacks.
- Limit foods that contain simple sugars, like candy.
- Try to eat more fiber.

Get Enough Calcium

- You need to eat plenty of foods that contain calcium when you take prednisone. Prednisone reduces the amount of calcium that your bones absorb. This can put you at risk for weakened or thinning bones or *osteoporosis* (**os**-tee-oh-pore-oh-sis).
- We suggest that you get 800 to 1,000 mg of calcium a day. Good sources of calcium are nonfat or low-fat dairy products such as milk or yogurt. One cup of milk or yogurt has 250 mg of calcium. Your doctor may also ask you to take calcium tablets if you are not getting enough calcium in your regular diet.

Potassium Intake

Cyclosporine can cause high levels of potassium in your blood. Most people can eat a normal diet after transplant without having to limit their potassium intake. But, if your blood potassium levels get too high, you may need to limit how much potassium you eat.

High-potassium foods include fruits, vegetables, and dairy products. Salt substitutes that contain potassium chloride (KCl) can have a lot of potassium, too. Your dietitian can help you plan your meals and snacks if you need to reduce the amount of potassium in your diet.

There are many choices and challenges when it comes to your diet and nutrition plans after your transplant. Your doctor, nurse, and dietitian can help you make healthy food choices to help keep your body working well in the years to come.

Vitamin and Mineral Supplements

You may be asked to take a multivitamin with minerals to make sure you are getting all of the nutrients you need to stay healthy. Several of your medicines can lower certain vitamin and mineral levels in your body, so you may need to take a vitamin supplement to make up the difference.

One of the most effective supplements is a prenatal vitamin, which pregnant women usually take to make sure they are getting all of their vitamins and minerals. But, check with your transplant team before you start taking any dietary or nutritional supplements.

Changes to Lessen the Side Effects of Medicines

This table gives the side effects of some of your medicines and what diet changes you can make to lessen them.

Side Effect	Caused by	How to Limit Side Effect
Fluid buildup	Prednisone, Sirolimus (Rapamune)	<ul style="list-style-type: none"> Limit sodium – do not eat salty foods or add salt to foods
High blood pressure	Cyclosporine, Tacrolimus (FK-506)	<ul style="list-style-type: none"> Limit sodium – do not eat salty foods or add salt to foods
Increased appetite	Prednisone	<ul style="list-style-type: none"> Choose low-fat, low-calorie foods Exercise
Loss of muscle mass	Prednisone	<ul style="list-style-type: none"> Eat high-protein foods Exercise
High blood sugar	Prednisone, Cyclosporine, Tacrolimus, Sirolimus	<ul style="list-style-type: none"> Control carbohydrate intake Control portion sizes Exercise
Low absorption of calcium and phosphorus	Prednisone, Sirolimus	<ul style="list-style-type: none"> Include 3 servings from the dairy group each day or take calcium supplements
High blood cholesterol	Prednisone, Cyclosporine, Tacrolimus	<ul style="list-style-type: none"> Choose low-fat, low-cholesterol foods
High blood potassium	Cyclosporine, Tacrolimus, Sirolimus	<ul style="list-style-type: none"> Limit high-potassium foods
High levels of medicines in blood	Cyclosporine, Tacrolimus, Sirolimus	<ul style="list-style-type: none"> Avoid grapefruit, grapefruit juice Avoid pomegranates and any food made with pomegranate juice

Questions?

Your questions are important. Call your doctor or health care provider if you have questions or concerns.

Cardiology Clinic:
Weekdays 8 a.m. to 5 p.m.,
call 206-598-4300.

After hours and on weekends and holidays, call 206-744-2500. Say you are a heart transplant patient. A nurse will assess your problem and help you.