



International
Transplant Nurses
Society

What You Should Know

DIET AND EXERCISE AFTER TRANSPLANT



Eating Well after My Transplant

Diet is a four letter word, but eating healthy does not have to sound or even look like a “diet!” Before transplant, you may have been on a restricted or special diet. Sometimes patients waiting for transplant are asked to follow diets that are low in sodium (salt), low in protein (meat), or low in sugar (for diabetics). After transplant, your transplant team will continue to advise you about eating healthy. The good news is that most transplant recipients have fewer restrictions in what they are allowed to eat. Your guidelines for good nutrition after transplant are much the same as for anyone wishing to improve their health by eating a healthy, balanced diet.



How Does My Body Use the Food I Eat?

You need food to power your body, give it energy, and provide the materials it needs for repair or growth. When you eat, food is broken down in your stomach and absorbed in your intestine. Our bodies use three main nutrients from the foods we eat: carbohydrates, fats, and protein. These nutrients are absorbed into the bloodstream and carried to your liver. Your liver either stores these nutrients or changes them so that your body can use them immediately.

Carbohydrates: Food for Energy

Carbohydrates come from starch and sugar. Carbohydrates are found in bread, potatoes, rice, pasta, and cereals. The liver breaks down carbohydrates to form a type of sugar called glucose which is used to make energy. Any glucose not used immediately for energy is stored in the liver and muscles as a substance called glycogen. When your body needs energy to complete an activity, the glycogen is quickly changed back into glucose.

Fat: Another Energy Source

Fat comes from butter, lard, cooking oil, and animal fat such as meats and cheese. There are also hidden sources of fats such as the fat in chocolate, biscuits, pastries, and cakes. Fat can be used for long term energy stores. It also provides essential fatty acids and vitamins A, D, E, and K.

Proteins: Food for Repair and Growth

Protein comes from foods such as meat, fish, eggs, nuts, and dairy products. Proteins are made up of smaller protein particles called amino acids. Amino acids are the building blocks to make the cells and tissues of the body.

Vitamins and Minerals

Your body carries out millions of chemical reactions every day. Although your body uses carbohydrates, fats and proteins to do this, vitamins and minerals are also needed. Most people can get all the vitamins and minerals they need by choosing a variety of foods from a healthy well-balanced diet.

What Types of Food are Included in a “healthy diet” for me as a Transplant Recipient?

This plan outlines several changes to improve nutrition. Recommendations include increasing fruits and vegetables to 5 portions daily, increasing fiber, and reducing the intake of salt, saturated fat, and added sugar. Similarly in Canada, there is Canada’s Food Guide, which was designed to help Canadians make wise food choices. This guide presents healthy eating with food choices to meet nutritional needs, promote health, and to minimize the risk of chronic diseases.

Following surgery, transplant recipients are asked to follow healthy diet guidelines. Unless otherwise directed, you should include the basic food groups in your daily diet. Your transplant team may give you special instructions about your diet depending on any complications you may have, such as high blood sugar. Although the main food groups and descriptions vary by country or culture, the most commonly described groups include grains, vegetables, fruits, milk products, meats/beans, and oils or fats.

In addition to being a transplant recipient, the amount of food you need from each food group also depends on your age, body size, gender, and whether you are pregnant or breastfeeding. The right balance of food and activity will help you feel your best and maintain a healthy weight. Your dietitian and transplant team will guide you on the amount of servings that are best for you from each food group.



Grains

Why do you hear so much about whole grain products?

Grains (wheat, oats, barley, corn meal) can be either whole or refined. Whole grain foods contain all three parts of the whole grain kernel: the bran, the endosperm, and the germ. The bran layer is full of fiber, B vitamins, and other healthy substances. The endosperm has small amounts of protein, complex carbohydrates, and B vitamins. The germ portion of the grain contains B vitamins, Vitamin E, minerals, healthy unsaturated fats, and antioxidants. Whole-wheat flour, whole grain or multigrain bread, oatmeal, whole wheat breakfast cereals, popcorn, pearl barley, and brown rice are examples of whole grains. Whole grains are low in fat and have no cholesterol. They are high in fiber, vitamins, minerals, and many other healthy substances. Whole grains provide a slow release of energy. Eating a variety of grains every day, especially whole grains, can reduce your risk of many major chronic diseases such as disorders of the digestive system, several types of cancer, heart disease, high cholesterol, high blood pressure, stroke, obesity, and type 2 diabetes.

Refined grains have been crushed or milled to remove the germ and bran. Crushing the grain makes the grain a finer texture and can also extend the expiration date of that product. Examples of refined grains are white flour, white bread, pasta, and white rice. Notice the color white is the problem! Refined grain foods are usually enriched with some of the nutrients lost when the grain is milled. These foods provide a slow release of energy as well as some vitamins and minerals, but they are digested much more quickly than high fiber foods. Refined grains do not have the same benefits as whole grains for the digestive system and your overall health.

Helpful hints in choosing whole grain foods:

- Look for the words “whole grain” on the package.



- The word “whole” should be in front of the grain that is named first on the label’s ingredient list.
- Look for whole grain health claim as approved by your country’s dietary regulating agency, such as the Food and Drug Administration (FDA) in the US: “Diets rich in whole grain foods and other plant foods, and low in total fat, saturated fat and cholesterol, may reduce the risk of heart disease and certain cancers.”
- Color does not identify a product as whole grain. Dark bread may be whole grain, but may also be dark because of added coloring. Whole grains may also be light, such as food products made from oats or white wheat.
- In the United Kingdom (UK), wheat flour is most commonly used in food products. UK law requires iron, thiamin, and niacin to be added to brown and white flour because of losses from the milling process. Calcium may also be added.

Milk

What foods are included in the milk group?

The milk group includes milk products that are liquid. Many of these foods are made from milk. Yogurt is also in this group. Milk group foods must retain their calcium content after processing to be included in this group. Although butter and cream are made from milk, they are not included in the milk group because they do not hold on to their original calcium content after being processed. You should choose foods from the milk group that are low fat or fat free, such as skim milk or low fat yogurt. These foods are high in protein and are good sources of calcium.

Meat and Beans

What does this food group do for my body?

All of the foods in this group are proteins, which function as the building blocks for making bones, muscles, skin, and blood. Proteins help your body heal after transplant and help muscles and tissues regain strength. Be sure to eat a lot of protein after your transplant to help heal your wounds, protect your muscles, and help you recover quickly. Proteins also help you work, play, and be physically active because they provide energy and calories. These foods supply B vitamins, vitamin E, iron, zinc, and potassium.

Food sources from this group include meat, poultry, fish, eggs, nuts, and seeds. Dried beans, peas, and lentils, called pulses in the UK, are a vegetarian source of protein and are also high in fiber. Meat and poultry (chicken and turkey) should be lean or low in fat. Red meat is higher in fat than chicken, turkey, and fish, but it is a good source of iron. Choose lean cuts of red meat at least twice a week if possible. Fish and nuts are good choices from this group because they contain healthy oils and also add variety to your diet. Eggs, especially egg whites, are also a good source of protein. Some people may have to limit the amount of eggs in their diet if they have high cholesterol.

Most people eat enough food from this group, but need to choose leaner meats and select a variety of foods from this group. Instead of having meat or poultry every day as your main dish, choose from a variety of fish, nuts, and seeds. When selecting fish, try to regularly include those that are high in omega-3 fatty acids, such as salmon, trout, sardines, pilchards, fresh tuna and herring. There is some research that suggests that eating fish high in omega-3 fatty acids may reduce the risk of heart disease.

Make Better Choices and select:

- The leanest beef cuts: round steaks and roasts (round eye, top round, bottom round, round tip), top loin, top sirloin, and chuck shoulder and arm roasts.

- The leanest pork: pork loin, tenderloin, center loin, and ham.
- Extra lean ground beef (mince) that is at least “90% lean.”
- The leanest poultry such as skinless chicken breasts and turkey cutlets.
- Trim all the visible fat from meats and poultry before cooking.
- Drain off any fat that appears during cooking.
- Avoid frying. Broil, grill, or roast meat, fish and poultry.

Vary your protein choice:

- Choose fish more often, particularly fish that is high in omega-3 fatty acids (salmon, trout, sardines, and herring).
- Choose dry beans or peas more often as a main dish or part of a meal. Some choices include: chili with kidney or pinto beans, stir-fried tofu, baked beans, rice and beans, and split pea, lentil, minestrone, or white bean soups.
- Choose nuts as a snack, on salads, or in main dishes. You can add slivered almonds to steamed vegetables, toasted cashews to a vegetable stir fry instead of meat, or add pecans to a green salad instead of cheese. When snacking on nuts, be aware that although they contain a healthy type of fat, they are very high in calories. Pour a small amount as a snack rather than snacking from the container!



Fruits and Vegetables

Does a fruit or vegetable juice count as a good choice from this food group?

Fruits and vegetables are essential to a healthy diet. They are high in fiber, vitamins, and minerals. Fruits and vegetables help protect the body against heart disease and some forms of cancer. Although you might think that a glass of juice provides a serving from this group, a vegetable or fruit juice can only be substituted for a serving of fruits or vegetables if that juice is a 100% fruit or vegetable product. Be sure to read the label! Drinks with labels that say “added fruit juice” or labels that list only a percentage of juice, such as 20% vegetable juice, would not count as a complete selection.

Fruits or vegetables may be fresh, frozen, canned, cut, or whole. You can eat them raw or cooked. If you are on a low salt or limited sugar diet, your dietician will give you suggestions about how to make the best choices when shopping for fruits and vegetables and how to prepare them. Fresh or frozen vegetables may be the best choice if you are on a low sodium diet.



Canned vegetables are often high in salt. Canned fruits can be high in sugar. Reading the nutrition labels on food packaging will help you make the best choices for your nutritional needs. Look for canned vegetables that are labeled low-salt. If you are buying canned fruit instead of fresh, be sure to buy canned fruits that have no sugar added or those that are canned in natural juices instead of syrup.

What fruits and vegetables should I avoid if my potassium level is high?

Sometimes transplant patients have high potassium levels after transplant. Potassium is a mineral and is in most of the foods we eat (some foods more than others). Your body needs potassium to help your muscles contract – including your heart. Potassium helps keep your nervous system and digestive system healthy. It also works with sodium to regulate the flow of fluids throughout the cells of your body. The kidneys regulate potassium, so if your kidneys are not working as well as they should, you may have high levels of potassium in the blood. Some medications given after transplant can affect your kidneys. If your potassium level is high, your doctor may ask you to follow a low potassium diet which means avoiding or limiting foods high in potassium. Some foods containing high potassium include: broccoli, mushrooms, spinach, greens, white potatoes, sweet potatoes, dried beans, black-eyed peas, tomatoes, dried fruits (raisins, prunes), bananas, orange juice, melons, apricots, figs, and pears.

Transplant recipients should be aware of the interaction between some anti-rejection medications and grapefruit. The level of some anti-rejection medications is affected when taken with grapefruit or grapefruit juice. Most transplant centers recommend that transplant recipients avoid all forms of grapefruit if they are taking cyclosporine or tacrolimus (Prograf®). Grapefruit is the only type of fruit that interacts with these medications. Other citrus fruits and juices do not affect cyclosporine or tacrolimus. Talk to your transplant coordinator about your center’s policy.

Oils

What are the best types to use?

Oils are fats that are liquid at room temperature, like the vegetable oils that you use in cooking. These oils come from certain types of fish, nuts, and plants. The most common are corn, olive, sunflower, or rapeseed oil. Using these oils to cook and season your food is much healthier than using solid fats like butter, stick margarine, or shortening. Keep in mind that oils should be used sparingly. They contain the same amount of fat as solid fats and are high in calories.

Food labels now include “trans fat.” What is this?

Trans fatty acids, or trans fat, is a fat that is more likely to clog the arteries. Trans fat increases the risk of heart disease. Trans fat can increase blood levels of low density lipoprotein (LDL), or “bad” cholesterol and can lower high density lipoprotein (HDL), the “good” cholesterol.

Trans fat is formed when vegetable oils are hardened into margarine or shortening and is found in foods like French fries (chips), fried chicken, doughnuts, cookies, pastry, and crackers. Trans fat is often used in these foods instead of oil because it can improve taste, extends the shelf life of the food product, and can reduce cost. Read food product labels carefully to avoid eating foods that contain trans fats.



I know I need to be careful about fats in my diet. What are the best kinds?

A small amount of fat is recommended in your daily diet. But remember that all kinds of fats are high in calories, so choose your fat content wisely. There are three types of fats in foods.

- Saturated fats: This is the bad type of fat that increases the cholesterol level in your blood (see below). Saturated fats come from animal meats, lard, butter, cream, milk, cheese and whole milk products. You should reduce the amount of saturated fat in your diet.
- Polyunsaturated fat: This is a liquid fat found in liquid vegetable oils, many nuts and seeds and their oils, and some fish. Sources include sunflower margarines and oils, flax seed, safflower oil, sesame and sunflower seeds, and soybeans. Your daily fat intake should include more of the polyunsaturated fats.
- Monounsaturated fat: This type of fat is liquid at room temperature, but will become a solid when cooled. Canola and olive oils are monounsaturated fats. Other sources include avocados, peanuts, cashews, hazelnuts, and almonds. Your fat intake should include more of this fat.

What is cholesterol and how can I help control my levels?

Cholesterol is a waxy fat-like substance produced by the liver. We also take in more cholesterol from the food we eat. Animal products (meat, egg yolks), foods high in saturated fats (ice cream, cheese, fatty meats) and trans fats add to the cholesterol that our liver produces. Cholesterol helps perform necessary functions in the body such as building new cells, insulating nerves, and producing Vitamin D and some hormones. But if there is too much cholesterol in your blood, it can build-up on artery walls, clogging these important blood vessels and causing heart disease.

There are two types of cholesterol: low-density lipoprotein, LDL or “bad cholesterol,” and high-density lipoprotein, HDL or “healthy cholesterol.” LDL cholesterol leads to the build-up of plaque in your arteries that can eventually cause the blood vessels to become narrowed and lead to heart disease. People are usually not aware that they have a high LDL level, since there are no symptoms at first. The HDL helps keep the LDL from building up in the arteries.

In addition to diet, the level of LDL cholesterol is also affected by weight, exercise, age, gender, heredity, and medical conditions. Transplant patients have a slightly higher risk of developing high cholesterol because some anti-rejection medications can increase cholesterol levels. Your healthcare team will monitor your cholesterol levels by performing routine blood tests.



Helpful hints to control your cholesterol level:

- Choose lean meats and chicken. Trim off extra fat and skin when cooking.
- Avoid fried foods that are cooked in hydrogenated vegetable oils. These contain trans fats.
- Avoid processed foods.
- Use egg substitutes or egg whites instead of whole eggs.
- Use low fat milk products: skim, 1% or 2%.
- Select low fat cheeses such as low fat cheddar, cottage cheese, or reduced fat cheese spreads.
- Increase the fiber in your diet through whole grain products, fruits, and vegetables.
- Choose monosaturated fats (olive or canola oil) and fish high in omega-3 fatty acids (salmon).
- Attempt to maintain a Body Mass Index (BMI) of less than 25 (see next section).
- Exercise daily. Regular exercise can decrease your LDL (bad cholesterol) and increase your HDL (good cholesterol).
- Have your blood tests completed as requested by your transplant team to monitor your cholesterol level. Ask your provider if high cholesterol is a side effect of any of the medications that you are prescribed.

What is BMI and why does my provider keep telling me that 25 is the magic number?

Body Mass Index, or BMI, is a number or “score” that can help predict your risk for developing health problems related to your weight. The BMI is obtained from a calculation using your height and weight. BMI scores range from 19 to 40. The higher your score becomes, the greater your risk for developing health problems. The range of BMI scores are grouped as follows:

- 19 – 25: considered to be in the healthy range
- 26 - 30: overweight
- 31 – 35: obese
- 35: morbidly obese

Many health problems, like diabetes, high blood pressure, and heart disease are associated with this condition. As a transplant patient, it is very important that you do not allow your BMI to “grow” outside the healthy range. If you have a BMI of greater than 25, you should eat less, exercise daily, and avoid high fat or high sugar foods. If you have a BMI of greater than 30, you can still gain health benefits by losing 10% of your body weight. Making gradual lifestyle changes will be helpful. Focus on what foods you should be eating, rather than on what foods you should avoid. Monitor your food portions.

Maintaining a weight that is right for you is just a matter of balance – the amount of calories (energy) you take in balanced with the amount of calories or energy you use daily. If you are losing weight without trying, then you need to take in more calories. If you are gaining weight, you need to eat less and exercise more often. To reduce weight effectively, it is important that the amount of energy you use during your daily activities is greater than the amount of calories you take in with the food you eat.

An important way to decrease or limit calories is through portion control or serving size. In this day of “super-sizing” everything, it is surprising how little we really know about what an appropriate portion size is for most foods. Serving size also depends on how many calories the food contains. Despite all the current diets that are available, there is no getting around the fact that calories do matter. Although you can eat as many green leafy vegetables as you like, a healthy serving size of meat is the amount that fits in the palm of your hand. To help control portions when eating at home, you can use a smaller plate size or keep serving bowls on the counter instead of the table to avoid taking “just one more spoonful.” When eating at a restaurant, order a cup of soup instead of a bowl. Order an appetizer (starter) portion as your main course. Consider eating only half of your sandwich or meal and put the other half into a carry out container before you start eating.

Discuss your nutritional requirements and calorie needs with your transplant dietitian. Your dietitian can tell you your BMI score and help you understand how to achieve and maintain a healthy BMI.

Another way to impact your BMI is to be active, sit less, and do more. Physical activity does not necessarily mean exercise. Any body movement that burns calories will help you control your weight and your BMI, as well as make your bones and muscles stronger. If you are not active, you have a higher risk of developing health problems, including gaining weight, high blood pressure, high cholesterol, and diabetes. That old saying about how extra weight you have around our middle section is especially true for transplant patients. Some medicines that transplant patients take add to the tendency for added weight to be in your abdomen or tummy area. That added layer of fat is linked to a higher risk of heart disease and diabetes, two diseases that transplant patients already have an increased risk for getting. So, get moving and lower your BMI. You will be healthier and you will feel better!

Fluids

Drinking enough fluids, especially water, helps your body stay well hydrated. Drinking the right amount of fluids for your needs after transplant is important in



maintaining good organ function. The joints and tissues of your body and your organs need plenty of fluid to work properly. The skin, your largest organ, becomes less elastic and more easily damaged if you are not taking in enough fluids. Water is better than other fluids, such as caffeinated beverages or sugary drinks. Each type of organ transplant has different fluid needs. Talk to your transplant team about your fluid requirements. For example, if you had a kidney transplant, your team will give you very specific guidelines about how many ounces of water or fluids you should drink every day to help your kidney function well. Intestine transplant patients may need additional fluids if they have increased stool output.

Dietary Guidelines

Many countries have published dietary guidelines (see websites below). The following example from the Dietary Guidelines for Americans is published jointly every 5 years by the Department of Health and Human Services (HHS) and the Department of Agriculture (USDA). Before making any changes to your diet after transplant, check with your provider and dietitian.

USDA Food Guide at the 2,000-Calorie Level (MyPlate replaced MyPyramid in 2011)

Source: <http://fnic.nal.usda.gov/dietary-guidance/myplate-and-historical-food-pyramid-resources>

Amounts of various food groups that are recommended each day or each week in the USDA Food Guide at the 2,000-calorie level. Also identified are equivalent amounts for different food choices in each group. To follow either eating pattern, food choices over time should provide these amounts of food from each group on average.

Food Groups	Food Guide Amount	Equivalent Amounts
Fruit Group Focus on fruits *make half your plate fruits and vegetables	1 ½ to 2 cups (4 servings)	1/2 cup equivalent is: <ul style="list-style-type: none"> • 1/2 cup fresh, frozen, or canned fruit • 1 med fruit • 1/4 cup dried fruit • 1/2 cup fruit juice
Vegetable Group <ul style="list-style-type: none"> • Dark green vegetables • Red and Orange vegetables • Beans and Peas • Starchy vegetables • Other vegetables 	2.5 - 3 cups (5 servings) 1 ½ - 2 cups/week 5 ½ - 6 cups/week 1 ½ - 2 cups/week 5 - 6 cups/week 4 -5 cups/week	1/2 cup equivalent is: <ul style="list-style-type: none"> • 1/2 cup of cut-up raw or cooked vegetable • 1 cup raw leafy vegetable • 1/2 cup vegetable juice *Vary your vegetables
Grain Group <ul style="list-style-type: none"> • Whole grains • Other grains 	6-7 ounce-equivalents *at least half of all grains eaten should be whole grains	1 ounce-equivalent is: <ul style="list-style-type: none"> • 1 slice bread • 1 cup dry cereal • 1/2 cup cooked rice, pasta, cereal
Meat and Beans Group <ul style="list-style-type: none"> • Choose lean and low fat meats • Select seafood high in omega-3 fatty acids 	5 ½ - 6 ounce-equivalents Avoid processed meats (high in sodium)	1 ounce-equivalent is: <ul style="list-style-type: none"> • 1 ounce of cooked lean meats, poultry, fish • 1 egg • 1/4 cup cooked dry beans or tofu, • 1Tbsp peanut butter, 1/2 oz nuts or seeds
Milk Group	3 cups	1 cup equivalent is: <ul style="list-style-type: none"> • 1 cup low-fat/fat-free milk, yogurt • 1-1/2 oz of low-fat or fat-free natural cheese • 2 oz of low-fat or fat-free processed cheese
Oils	5-6 tsp Most people already consume their daily allowance in the foods they eat	1 tsp equivalent is: <ul style="list-style-type: none"> • 1 Tbsp low-fat mayo • 2 Tbsp light salad dressing • 1 tsp soft margarine
Empty Calories	150-250 calories/day	

Are there any foods that are unsafe for me to eat?

Because your immune system is suppressed, you may be at a higher risk of getting a food borne illness. This risk is greatest in the first few months after transplant. Once you are on maintenance levels of anti-rejection medications, your risk decreases. Recommendations vary by transplant center, so ask your transplant team for your center's guidelines on foods to avoid. Some recommendations include:

- Avoid cold hot dogs, deli meats, lunch meats, meat spreads, soft cheeses (Brie, Feta, Camembert), unpasteurized milk, raw seed sprouts (alfalfa sprouts), unwashed fruits and vegetables, deli salads (coleslaw, seafood salad), unpasteurized juice or cider.
- Only buy milk, refrigerated juice, cheese, and other dairy products that are **pasteurized**.
- Do not eat raw or undercooked seafood. Cook fish until the flesh is firm and can be flaked easily with a fork.
- Do not eat foods with raw eggs (hollandaise sauce, Caesar dressing).
- Cook eggs until both the yolk and white are firm.



Food Safety

It is also important to be safe in the way you prepare and store the foods you eat. Foodsafety.gov, partnered with The Food Safety and Inspection Service (FSIS) of the U.S. Department of Agriculture, the U.S. Food and Drug Administration (FDA), and the Centers for Disease Control and Prevention (CDC), (www.foodsafety.gov) and list four important steps in safe food handling.

- **Clean:** Wash your hands and kitchen surfaces before and after preparing foods. Good hand washing means rubbing your hands together with warm water and soap for at least 20 seconds. Wash your dishes, countertops, and utensils with hot soapy water. Fruits and vegetables should be rinsed well under running tap water. If the produce has firm skin, it should also be rubbed with your clean hands or scrubbed with a vegetable brush under running tap water.
- **Separate:** Keep cooked and ready-to-eat foods away from any types of raw meat, poultry, seafood, and their fluids. Separate them in your grocery shopping cart, in your refrigerator, and on cooking surfaces or dishes.
- **Cook to proper temperatures:** Food must be cooked to a safe internal temperature to kill the harmful bacteria that can cause illnesses. Cook your food to the recommended temperature as measured by a food thermometer. It's also important to keep food hot during serving.
- **Chill promptly:** One of the most effective ways of reducing the risk of food borne illnesses is to refrigerate food at 40°F / 5°C or below. Always refrigerate meat, eggs, poultry, and other perishable foods as soon as you return home from the store. Defrost food in the refrigerator, not on the kitchen countertop. Bacteria can multiply as the food warms at room temperature.

Exercising after your Transplant

Before your transplant, you probably lost physical strength. Your chronic organ disease most likely caused you to feel weak and very tired. You may have had to limit your activity because your endurance level was so low. After transplant, you started feeling better as you recovered from surgery and the complications of your chronic disease. The transplant team, with your nurses and physical therapist, encouraged you to increase your activity each day. Many transplant patients find that after they have recovered from surgery, they have more energy and are eager to increase their activity level.



What is Exercise?

Exercise is physical activity. It is any movement of our bodies that uses energy. Studies have shown that exercise has many disease-fighting effects and can actually extend our lives. Exercise usually is described as being moderate or vigorous. Moderate physical activities include walking briskly at a pace to cover 3.5 miles in an hour. Moderate exercise also includes hiking, dancing, bicycling (less than 10 miles an hour), or gardening. Vigorous activities include jogging/running (5 miles per hour), swimming freestyle laps, biking (more than 10 miles per hour), aerobics, competitive basketball, or heavy yard work like chopping wood.

Because vigorous activities increase your heart and breathing rates enough to make you sweat, they are considered aerobic exercise. Aerobic exercise is good for you because it helps reduce the risk of heart disease, diabetes and cancer. In addition to moderate and vigorous exercise, you may also benefit from working with a physical therapist or personal trainer to learn how to include strength training or resistance training into your physical activities. These types of exercise burn calories and strengthen bones and muscles.

Strength training exercises are usually done at least twice a week. In strength training, weights are lifted 8 to 15 times (repetitions or “reps”). Lifting is stopped before the muscles get tired. If your doctor recommends strength training, you will be instructed to start slowly and gradually increase your “reps” and the amount of weight you lift. Some transplant medications may cause muscle weakness, so be sure to talk to your transplant team before beginning any strength training exercises.

Resistance training exercises use the muscles in repetitive motions against resistance. Riding a stationary bike or exercising on a rowing machine are examples of resistance training.

Other types of exercises that can be helpful include stretching exercises, yoga, and Pilates. It is important to stay flexible as you get older to decrease your risk of pulling muscles and breaking bones. These types of exercise routines can be helpful in maintaining your flexibility.

When can I start to exercise after transplant?

It is important to talk with your transplant team about the best time to begin increasing your activity level and when to begin an exercise routine. This will depend on how well you have recovered, what type of organ you received, and any complications you are having during your recovery period. Some patients may begin exercising in the hospital with a physical therapist. You and your physical therapist can discuss a plan that is right for you as you recover in the outpatient setting. Every transplant patient should leave the hospital with an exercise program as part of their treatment plan. Think of yourself as an athlete getting back into training!



How can I increase my activity level?

After you have your provider's approval to increase your activity level, there are many simple things you can do every day as you recover:

- Stretch your arms and legs before you get out of bed every morning.
- Hold onto the sink with both hands after brushing your teeth and do leg squats at a level that is comfortable to you. Inhale and exhale as you go up and down.
- Climb one or two flights of stairs instead of riding the elevator.
- Lift small weights or do stretches while watching the evening news or listening to music.
- When the weather is too hot or too cold for enjoyable outdoor exercise, increase your activity by walking at an indoor mall.
- When you return to work, find some opportunities to walk, particularly if you have the type of job where you are sitting at a desk most of the day. You may want to try a desk where you stand instead of sit.
- Walk during your lunch break with some co-workers.
- Try parking farther away from your office or other destinations to increase the distance you need to walk.

What kind of exercise is best for me?

It has been said that the best exercise is one that you will really do! Any physical activity that uses energy counts as exercise. You can walk, swim, ride a bicycle, lift weights, play golf or tennis, participate in yoga classes or even do housework as exercise! There is no magic in any specific activity, sport, gym, or the time of day that you choose to exercise. Any physical activity that you can do is beneficial. Exercise improves your overall health. It also makes you feel better and can help control stress. Make it fun!



Is there anything I should be concerned about when I exercise?

It is important to follow the exercise guidelines that your transplant team has discussed with you. A good rule of thumb is not to lift anything heavier than a gallon of milk in the first month following your transplant. Lifting, pushing, or pulling too much weight within 4 to 6 weeks after surgery may cause hernias to develop through weaker sections of any abdominal incisions. Additionally, some transplant medications can cause poor wound healing or delay wound healing.

Although you will be able to participate in a variety of activities as you recover, most transplant centers advise patients to avoid activities that risk direct hits to your body such as boxing, football, or ice hockey.

If you ever experience any intense pain, chest pain, or shortness of breath you should stop exercising and seek medical attention or advice. Even months or years after your transplant, exercising when you are sick with a fever is not a good idea. If you have joint pain that worsens with activity, do not exercise. To be healthy and fit is an important goal, but using common sense to reach this goal is just as important. It is important to listen to your body! If you feel like you have done too much, do a little less the next time you exercise, then slowly build up again. If you are uncertain about your activity, check with your transplant team.

How much exercise should I plan for every day?

Planning is a key word. Like most important things in our lives, we have to plan or make time to do the things that are truly important to us. Once you have recovered enough to return to work or other routines in your life and with your family, it may become more difficult to find the time to exercise. Plan ahead and make this a priority in your day!

Start with an amount and intensity of exercise or activity that you can manage and that is approved by your provider. You should be able to carry on a conversation easily while exercising. As you become more comfortable in exercising, gradually add two to three minutes to your routine to build up your activity over time. With increased strength and endurance, you should aim for 20 to 30 minutes of physical activity or exercise daily. Strength training sessions, such as lifting weights, can be shorter with days in between for muscles to recover. Aerobic exercise sessions, like walking briskly, can be longer.

Your exercise session should begin slowly with a two to five minute warm up, without exerting yourself too much. This is followed by a period where you work harder. Your breathing should increase, but you should still be able to talk while exercising. This intense period should gradually be increased to about 30 minutes as your endurance improves. You should end your session with a brief cooling down period at an easy level of effort. Stretching exercises after your workout can also be helpful.



What if I get bored of my exercise routine?

The key to a successful exercise program is variety. Changing your exercise routine will not only be easier for your muscles and bones, but it will keep you from getting bored. A variety of routines, or “cross training,” is a strategy that professional athletes use to improve their endurance and performance. As a transplant recipient, you can also use that concept to your advantage. In addition to your routine exercise, add some different physical activities. Remember: All activity counts!

Feel Fit and Enjoy Life!

Transplantation has given you a second chance for life. Enjoy feeling better and increasing your activity! Although your ability to exercise will depend on your health after transplant, most transplant recipients are able to achieve a “normal” activity level compared to their peers. Some transplant recipients are able to achieve a high level of activity and participate in competitive sporting events. No matter what your level, regular exercise is important for your general good health and well-being.

RELATED LINKS FOR MORE INFORMATION

These sites are provided as a network resource. Information from the Internet in regard to your transplant should always be discussed with your transplant team. ITNS is not responsible or liable for any information received from these websites.

ITNS is the first professional nursing organization to focus on the professional growth and development of the transplant clinician. ITNS offers nurses a forum for learning about the latest advances in transplantation and transplant patient care. To access more transplant education materials for patients and healthcare workers, please visit the International Transplant Nurses website at itns.org.

www.nutrition.org.uk

The British Nutrition Foundation promotes the nutritional wellbeing of society by providing scientifically based nutritional knowledge and advice. It works in partnership with academic and research institutes, the food industry, educators and government.

www.health.gov/dietaryguidelines/dga2000/document/aim.htm

Website with dietary guidelines and how to evaluate your BMI. The Dietary Guidelines are published every 5 years by the Department of Health and Human Services (HHS) and the Department of Agriculture (USDA). The Guidelines provide advice about how good dietary habits can promote health and reduce the risk for major chronic diseases.

www.eufic.org

The European Food Information Council, EUFIC, is a non-profit organization which provides science-based information on food and food-related topics to the media, health and nutrition professionals, educators, and opinion leaders. The EUFIC channels information from nutrition and food safety experts to the consumers and directs its resources towards the safety and quality of food and food products; nutrition, diet and health; and the application of new technologies in the food chain.

www0.nih.go.jp/eiken/English

National Institute of Health and Nutrition, Japan. Provides leadership for the public by conducting surveys and research on maintenance and promotion of health, nutrition, diet, and lifestyle in Japan.

www.hc-sc.gc.ca

Office of Nutrition Policy and Promotion (ONPP) is the authoritative source for nutrition and healthy eating policy and promotion in Canada.

www.hec.osu.edu/highriskfoodsafety/resources.php

www.foodsafety.gov

Food Safety for High Risk Populations

Fitness programs and exercise information:

www.acefitness.org/

The American Council on Exercise (ACE) is a nonprofit organization committed to enriching quality of life through safe and effective physical activity

www.netfit.co.uk/wkmen.htm

A health and fitness site from the UK with exercise training programs.

www.pilatesmethodalliance.org

A method of exercise and physical movement designed to stretch, strengthen, and balance the body.

www.curvesinternational.com

Provides a complete aerobic and strength training workout for women through a 30 minute circuit training session.

www.cutsfitness.com

Provides a comprehensive, 30 minute full body workout for men of all ages and fitness levels.

ITNS would like to thank the Heart Exchange Support Group from Houston, Texas for their generous contribution to this educational endeavor.

Original Contributors:

Lisa Bakken RN, BSN, CCTC
Shannon Dowell RN, MSN, CCTN
Julie Hudson CCTC, MSN, RN
Jill Johnson BSc (Hons), RD

Beverly Kosmach-Park DNP, FAAN, RN
Lori Kowalski MS, RD
Kathy Lawrence MN, RN
Moira Perrin RGN, BSc (Hons)

2016 Revisions:

Ann Herbage Busch, MS, RN, CWOCN,
ACNS-BC-PP, FAAN
Amanda Chaney ARNP, MSN
Shannon McCloseky BSN, CCTN, RN

