

Managing and Avoiding Complications

Rejection

It is very common for liver transplant patients to experience a rejection episode. Rejection of your transplanted liver may occur at any time following your surgery. Rejection episodes most commonly occur during the first few months of a transplant. Try not to become too alarmed if you are told that you are experiencing rejection. Episodes of rejection are expected, and other than taking your immunosuppressive medications correctly, there is nothing you can do to prevent them from happening.

Rejection can usually be reversed if it is detected early. For this reason, it is important for you to be able to recognize signs and symptoms of rejection. These include:

- ◆ Fever (greater than 100.5° F)
- ◆ Jaundice
- ◆ Fatigue
- ◆ Elevated liver function tests

We will biopsy your transplanted liver whenever your liver function tests are elevated. Biopsy may be performed in the hospital or as an outpatient. Treatment of rejection usually consists of three daily doses of intravenous methylprednisolone. This drug is also known as solu-medrol and is an intravenous form of prednisone. You may be admitted to the hospital to receive the solu-medrol. In some cases, we arrange for a home care company or your local doctor to give you your solu-medrol at home. One of the major side-effects of solu-medrol is increased blood sugar. You may need extra monitoring if you are diabetic.

If rejection is extremely severe, or if it persists after the above treatment, a second anti-rejection medicine may be used. Your normal immunosuppression medicines be adjusted or changed also during a rejection episode.

Infection

Your immune system is the part of your body that is responsible for fighting infection. When this system is weakened by the immunosuppressive drugs in order to prevent rejection of the transplanted liver, you become more susceptible to infections. Your susceptibility to infection is directly related to the amount of immunosuppression that you are receiving at any given time.

The highest level of immunosuppression is immediately after the transplant operation. One of the best methods to prevent infection is good handwashing. Everyone who comes into your room will be required to wash their hands thoroughly in order to prevent transfer of bacteria, viruses and other micro-organisms to you.

Symptoms of Infection

If you experience any of the following symptoms of infection, you should notify your transplant doctor or coordinator immediately. As always, if there is ever a question, please call and ask!

- ◆ Temperature greater than 100°F or 38°C
- ◆ Productive cough, change in color of sputum, or shortness of breath
- ◆ Sores, blisters, or lumps
- ◆ Chills or shaking episodes
- ◆ Flu-like symptoms or severe cold symptoms
- ◆ Drainage or swelling from a cut or wound
- ◆ Nausea, vomiting, or diarrhea that is severe and prolonged (lasting more than 24 hours)
- ◆ Increase in fatigue and decrease in exercise tolerance
- ◆ Burning on urination, or very frequent urination
- ◆ Weight gain or loss of more than 5 pounds in a week.

Common-Sense Precautions

Infection in a transplant patient can be quite serious, even life-threatening. It is therefore very important that you take some precautions to prevent infection whenever you can.

Especially during the first three months following your transplant, we urge you to practice frequent handwashing. We do not recommend wearing a mask, but encourage you to avoid crowded spaces with coughing and sneezing people. This is most important in flu season. If you wash your hands frequently and avoid close contact with potentially sick people you will escape most common germs. We recommend that you and your family get a flu shot every year early in the fall unless your transplant was within the last six months.

It is important that you avoid large crowds, where someone with a contagious illness could be present. This does not mean that you must always stay at home; it just

means using common sense. For example, plan to eat out when restaurants are not crowded, for an early lunch or dinner. Matinee showings of movies are rarely crowded, but later shows often are.

It is also important to avoid a crowd in your own home. If you are staying in a small apartment after transplant, do not invite guests and family members to come out and see you right away. It is best not to have a large number of house guests at any one time for at least two months after your transplant. For those people who do visit, please be sure they have not had recent infections, colds or exposures to childhood illnesses like the measles.

Around the House

Light housekeeping will not harm you and is a very good way to get back into shape. It is important, however, to observe the following precautions.

- ◆ Do not lift more than five pounds for the first six weeks after your surgery.
- ◆ Avoid inhaling strong fumes from some cleaning products such as ammonia or bleach.
- ◆ Wear gardening gloves if you enjoy gardening or working with plants and flowers since many infectious organisms live in the soil.

Pet Care

If you have always enjoyed having a pet or pets in the house, there is no reason for that to change. Here, too, you should take care to avoid contact with infection-causing organisms.

- ◆ You should not change cat litter boxes nor clean the droppings from bird cages. Cat and bird feces may carry infections that could be harmful to you.

First Aid and Hygiene

The natural ability of your body to heal wounds will be slower because of the immunosuppressive medication.

- ◆ Clean any cut or injury and keep a clean, dry dressing on the wound.
- ◆ If healing is prolonged or if you experience pain, swelling, redness, or other signs of infection, see your healthcare provider.

- ◆ Be aware of unusual rashes, blisters, or other lesions on your skin. Report these to your doctor if they persist.
- ◆ Good care of your teeth and gums is also very important, since your mouth has many germs. Visit your dentist every six months to avoid tooth and gum disease.
- ◆ Contact your dentist prior to your appointment in order to obtain an antibiotic before having any dental work done for the first six months after your transplant. He may prescribe his routine medicine as long as you do not have an allergy to the medicine. *If it has been more than 6 months after your transplant, you do not need an antibiotic.*
- ◆ Notify your physician if you notice sores, ulcers, or white patches in your mouth.

Nutrition and Exercise After Transplant

After liver transplant, it is important to follow a nutrition and exercise plan that promotes a healthy lifestyle. Nutrition and exercise are vital components to a successful liver transplant.

Some of the medications you are taking can cause an increase in your appetite, high blood pressure, high cholesterol, high blood sugar, osteoporosis, and fluid retention. Nutrition and regular exercise can help prevent these side effects.

The basic diet and exercise principles to follow are outlined below. Following these guidelines is one way you can prevent medication side effects from occurring.

Limit Sodium

Too much sodium, or salt, in your diet can contribute to high blood pressure and fluid retention. Your anti-rejection medicines can also contribute to these side effects. Reducing the amount of sodium in your diet will help prevent these problems. Limit your sodium intake to less than 3000 mg per day. This is especially true if you are still taking fluid medication after transplant.

1. Never add salt to food. Keep the salt shaker off of the table.
2. Do not cook with salt. Do not use salt containing seasonings. Use herbs and spices in cooking to replace salt.

3. Avoid foods with visible salt like crackers, chips, pretzels, salted nuts, salted popcorn and salted french fries.
4. Limit highly processed foods. Canned, processed, and preserved foods contain high amounts of sodium. Watch out for processed meats and cheeses, canned soups, frozen dinners, and pickles.
5. Limit dinner and side dish mixes that come with sauce or seasoning packages (like Hamburger Helper, Rice-a-Roni, and au gratin potato mixes).
6. Limit high sodium sauces (like soy sauce, canned spaghetti sauce, and packaged sauce, gravy and seasoning mixes).
7. Do not use Potassium Chloride salt substitutes (Lite Salt, No Salt, Salt Sense).

You should also avoid low sodium foods that contain Potassium Chloride (low sodium bouillon, low sodium baking powder)

Reach and Maintain Your Ideal Weight

Your dietitian will help you determine your ideal body weight. Being overweight increases your risk for developing heart disease, diabetes, high blood pressure and complications from surgery. Being underweight also has its risks. Your dietitian will help you develop a plan to either lose or gain weight as needed. Following a healthy nutrition and exercise plan will help you reach and maintain an ideal body weight.

Reduce Concentrated Sweets and Sugars

Steroids (i.e. Prednisone) and other anti-rejection medications can increase the level of sugar in your blood. High blood sugars can cause many health problems. Therefore, it is recommended that you decrease the amount of sweets and sugars in your diet to limit this effect.

Steroids can also increase your appetite. Limiting your concentrated sweets intake will help you prevent excess weight gain. Examples include cakes, cookies, pies, ice cream, donuts, and regular soda. Healthier dessert choices include angel food cake, graham crackers, sugar free Jell-O or pudding, and vanilla wafers.

Get Enough Protein Daily

A diet high in protein is needed to help your body heal from surgery, and to help strengthen body muscles and organ tissues. Steroids can have a negative effect on muscles and break down muscle protein. A high protein diet can help overcome this effect. Good sources of protein include lean meat, fish chicken, and low-fat dairy products. Include a high protein food at all meals. Also include protein in snacks (like peanut butter, cheese and milk).

Modify Fat and Cholesterol

Some of your anti-rejection medicines can increase your cholesterol level. High cholesterol levels cause fatty deposits to build up in the walls of the blood vessels and are associated with heart disease and blood vessel disease. Reducing the amount of saturated fat and cholesterol in the diet can lower cholesterol levels. Cholesterol levels can also be lowered if polyunsaturated fats are substituted for saturated fats and cholesterol in your diet. Even if your cholesterol level is normal, it is recommended that you decrease the fat and cholesterol content of your diet. Excess amounts of fat in the diet can also contribute to undesirable weight gain. Follow these guidelines:

1. Choose high protein foods which are lower in fat such as skim or 1% milk, low fat cheese, lean cuts of red meats (center cut loin chops, chuck or round and flank steak), chicken and turkey without the skin, and fish. Avoid organ meats (liver, brain, and kidney).
2. Trim all visible fat and skin from meats.
3. Limit fried foods. Bake, broil, roast, grill, or boil more frequently than frying.
4. Try using low cholesterol egg products or egg whites.
5. When choosing fats to cook with or to add to food, use fats from vegetable sources (corn oil, safflower oil, canola oil, and margarine). Avoid fats from animal origin (butter, lard, and bacon fat).

Get Enough Calcium in Your Diet

The long-term use of steroids can cause thinning of the bones, or osteoporosis. Getting enough calcium in your diet and participating in weight bearing exercise will

help prevent fractures and maintain bone density. Milk products are the best source of calcium. Many juices, cereals and breads are fortified with calcium. A calcium supplement may be necessary if you are unable to regularly include enough calcium in your diet. Your doctor and dietitian will determine your need for a calcium supplement.

Exercise Regularly

Exercise is one of the single most important contributions you can make to your successful transplant and a longer, healthier life. Inactivity after your transplant will make you very weak and increase the chances of medical problems. Activity is expected after your transplant while you are still in the hospital. We encourage walking in the hallways when you are transferred from the ICU. Exercise, however, is not just expected right after transplant. Regular exercise should continue through your life. Regular exercise helps you maintain an ideal body weight, prevent high blood pressure and high blood cholesterol, reduce stress, and prevent osteoporosis. During the first few months after your transplant, low-impact exercise such as walking is recommended. As time passes, you may increase your activity as tolerated to more strenuous activities. Choose an activity that you enjoy. You will likely continue to exercise if you enjoy what you are doing. It is recommended that you exercise at least 3 times a week for a minimum of 30 minutes. Always check with your physician before beginning a new exercise program.

Monitoring and Follow-Up

Lab Studies

Periodically, you will need to have a blood count and blood chemistries drawn. You will also need to have Prograf or other drug levels check. These drug levels cannot usu-

ally be completed in local doctor offices or hospitals. These lab studies are generally done at least monthly, and more often if necessary. Your transplant coordinator will give you specific instructions on when to obtain blood work. Please remember that whenever blood is to be drawn, it should be drawn first thing in the morning, before you take your morning dose of Prograf, Cyclosporine or Rapamune.

The Liver Transplant Team members are available to your local doctor twenty-four hours a day if he or she needs our help especially if you have been hospitalized. If your doctor wants to start you on any medications, we would like you to let us know so that we can keep your records up to date. We will also continue to follow you at regular intervals in the Duke Liver Transplant Clinic.

Self-Monitoring

You will be asked to measure your temperature, weight, and often your blood pressure or blood sugar once you are home.

Temperature

Your temperature should be taken at the same time each day and whenever you feel feverish. If your temperature is above 100°F or 38°C, call your transplant physician. Fever may indicate that you have an infection or rejection episode. Do not take any medications that can lower your temperature, such as aspirin or Tylenol, unless instructed to do so by your transplant physician.

Weight

Weigh yourself at the same time each day, preferably in the morning. Weigh yourself with the same type of clothing on and on the same scale each day. A weight gain of two pounds a day for two days is significant, and needs to be reported to the transplant physician.

Blood Pressure

Your blood pressure may need to be measured and recorded daily. Your nurse will teach you how to measure your blood pressure if you do not know how, or do not have a family member who can do it for you. You may need to purchase a blood pressure cuff if you do not already have one. We generally recommend the digital read-out type cuffs because they are more convenient. Please call your transplant coordinator for blood pressure higher than 160/100 or lower than 90/60.

Blood Sugar

If you are taking insulin, you will be taught how to monitor your blood sugars using a glucometer. There are several commercial varieties of this machine. You should call your transplant coordinator for blood sugars over 300 or less than 70.

Biopsies

After your liver transplant, almost all patients require at least one liver biopsy. We will need to do a liver biopsy if your liver tests become elevated and we suspect liver rejection or infection. If you are admitted to the hospital when this occurs, then we will do the liver biopsy in your room. If you are an outpatient, we usually do the liver biopsies in our outpatient biopsy area in Duke Clinic.

Many patients have had biopsies before their transplant and know that we do these by placing a needle through the skin into the liver. We always inject the skin with a drug like Novocaine to minimize any pain during the biopsy. We remove a tiny piece of liver about one inch long and about as thick as a piece of string and then examine the liver under the microscope to help us make a diagnosis.

There is very rarely any damage done to the liver and the tiny piece of liver removed does not effect the liver's ability to function. While there is some pain during the biopsy, patients tell us that the pain from the liver biopsy after the transplant is like having an IV put in the arm. They also tell us that the pain is much less than biopsies done before the transplant.

If we do the biopsy while you are an outpatient, we will need for you to stay for six hours after the biopsy to observe you for any problems. You will need to stay in a local hotel if you live more 50 miles away in case you experience complications after your biopsy. You will need somebody to stay with you in case you need to go to the emergency department. The results are not available immediately but you will be told as soon as possible. Overall, liver biopsies after your transplant are not particularly painful or unpleasant.