Maintaining a Healthy Lifestyle After Transplantation

International Transplant Nurses Society

Organ transplantation leads to better health, increased activity and an improved quality of life for most recipients. Now that you have received a transplant, your goal is to keep your transplanted organ functioning well. As you recuperate from surgery and get stronger, you can look forward to having a more normal and active life than before transplant. Maintaining a healthy lifestyle will help you enjoy the benefits of receiving your transplanted organ. This booklet will give you strategies for healthy living.

Why could I be at risk for health problems after transplant?

After transplant, there are several important reasons why you have a greater chance of becoming ill or having problems. The most common reason why recipients become ill or have complications after transplant is because the immune system is suppressed. The medications that you take after transplant to prevent rejection can lead to an increased risk of infection. You are at greatest risk of infection during the first six months after transplant and any time your immunosuppression is increased to treat rejection. Some of the medications that you take can also cause side effects in other systems of your body. For example, some recipients develop high blood pressure or high blood sugar after transplant.

When should I call my doctor and/or other members of the transplant team?

After receiving a transplant, it is important to keep in touch with your transplant team. Your team and local physician will be following your health through routine blood tests, check-ups, and transplant clinic visits. As you recover and are learning how to care for yourself, you should contact your transplant coordinator and/or physician with any questions or concerns. Finding and treating problems early, before they become more serious, is important for your long-term health. Remember that your team is there to help you and to provide support throughout your transplant journey!

Your transplant coordinator or nurse will discuss the most important signs, symptoms or problems to report as you recover and are discharged from the hospital. There are some symptoms that are specific to the transplanted organ. For instance, a lung transplant recipient has different concerns than a kidney transplant recipient. But, there are some symptoms or problems that occur with any type of organ transplant that are important to report:

- Fever greater than or equal to 101° F or 38.5° C
- Blood pressure readings that are higher than your usual limits
- Change in your urine: an increased or decreased amount from usual, red or rusty-brown colored urine, or a burning sensation when you urinate
- Change in your stools: an increased or decreased amount, a change in color or firmness (hard stools or liquid/watery stools), black or bloody stools
- Edema (fluid, swelling, or "puffiness") in the face, abdomen, or legs/feet
- Weight gain of two to three pounds/1 kilogram over night
- A new pain
- A loose cough that produces yellow/green mucous
- Shortness of breath or having difficulty breathing
- Chest pain or a tightness in the chest
- Nausea, vomiting
- Inability to take your medications or take care of yourself
- Light-headedness or being unusually weak or tired

How can I avoid health problems after transplant?

As in the general population, preventing problems and being aware of any potential risks is very important to lessen or avoid health problems. Some important guidelines for staying healthy after transplant include:

- *Wash your hands often and well.* Frequent and thorough hand-washing is the best way to prevent infections. Hands should be washed before preparing food, before eating, after using the bathroom, and before and after touching wounds. Hands should also be washed after touching pets or animals, after changing diapers, after touching plants or soil, and when visibly dirty.
- *Avoid close contact with people who are ill.* Many illnesses are passed through secretions from sneezing and coughing. Transplant recipients should avoid close contact with people who have colds, are sneezing and coughing, have symptoms of the "flu," or have diarrhea or are vomiting. Avoiding ill family members who live in your household may be difficult, particularly if they have respiratory symptoms (coughing, sneezing, cold and flu symptoms). In that case, some transplant centers recommend that both the transplant recipient and infected person wear a mask until the symptoms resolve. Direct contact with the household member who is ill should be avoided as much as possible and good hand washing should be maintained.
- *Avoid crowds.* Some transplant centers advise transplant recipients to avoid large crowds, particularly in the first three months after transplant and/or during cold and flu season. Remember that the higher your level of immunosuppression, the more likely you are to get an infection. Discuss your risk with your physician and transplant coordinator and follow your center's guidelines.
- *Avoid environments where potential infective organisms may live.* Transplant recipients should stay away from places that may lead to infection in immunosuppressed patients. These environments include construction sites, homes or buildings that have mold, indoor botanical gardens that are very humid, and rooms with a high level of tobacco smoke.

What routine health care providers should I see? What types of routine check-ups are important for me?

It is important to maintain your overall good health after transplant. All transplant recipients should have a primary care physician (PCP) or general practitioner (GP). This physician provides routine physical examinations, follows the results of blood tests, and manages preventative healthcare and screenings. Your PCP/GP provides medical care for common health problems and those related to transplant such as high blood pressure, diabetes, high cholesterol, or bone disease. Discuss your healthcare management with your transplant physician, transplant coordinator, and local physician to be sure that you are being followed in a comprehensive way. Each team member plays an important role in your long term care.

Having routine health *screenings* will help guide your care after transplant and detect problems early. Screening is a way to look for signs of a medical problem in a person who has no symptoms. If a disease or condition is found in its early stages, treatment may be more effective. Routine screenings for some common medical conditions are recommended for the general population as well. Ask your doctor and transplant team what screenings are right for you.

Routine Screenings and Examinations

Dental Care

Maintaining healthy teeth and gums is an important part of your care after transplant. As in the general population, transplant recipients can develop gum disease, tooth decay, mouth ulcers, dry mouth, and mouth infections. Some dental problems may be related to side effects of some of the medications you take after transplant. You can also develop infections more easily because your immune system is suppressed. Bacteria that are commonly in the mouth can cause infection.

It is important that you visit your dentist and hygienist for regular check-ups and cleanings every 6 months. If you develop problems, you may need check-ups every 3 or 4 months. Examine your mouth regularly and call your physician and/or dentist if you have chipped or cracked teeth, tooth pain, swellings or sores in your mouth, red or swollen gums, bleeding, or white patches on your tongue or the lining of your mouth. Be sure to brush your teeth at least twice a day, particularly after meals and before going to sleep. Floss between your teeth daily to remove food particles and plaque.

If you are having your teeth cleaned or having a procedure that may injure your gums, some transplant centers recommend taking an antibiotic before your dental appointment. Contact your transplant coordinator about your center's recommendations for infection prevention before dental work. Your dentist can prescribe the appropriate antibiotic to prevent infection.

For more complete information about dental care, refer to *What Every Patient Needs to Know about Dental Care*, published by the International Transplant Nurses Society. Available at: http://www.itns.org/education/patient-materials

Eye Care

Eye and vision examinations are important for everyone. Vision screenings (checking how well you see) can be completed regularly by a health care professional to detect problems. The need for a *dilated* eye examination by an eye doctor (ophthalmologist) is usually determined by age or a specific eye problem. For this test, the eye doctor uses eye drops to temporarily enlarge the pupil (the black center) of the eye. When the pupil is enlarged, the eye doctor can see the inside of the eye more easily. The dilated eye examination can detect serious problems such as glaucoma, cataracts, diabetes, infection, and cancer.

Transplant recipients may have an increased risk of developing eye problems from the medications that suppress the immune system. Discuss the risk of developing eye problems with your transplant physician or transplant coordinator. Some transplant centers recommend ophthalmology exams every year for those at risk. You and your doctor should decide on the frequency of an examination by an eye doctor that best meets your needs as a transplant recipient. Diabetic patients should have a dilated eye examination with an eye doctor at least once a year.

The most common eye problems seen after transplant include cataracts, changes in the pressure of the eye (*intraocular pressure*) leading to glaucoma, scarring in the layer of blood vessels behind the retina, and damage to the small blood vessels in the retina due to diabetes (*diabetic retinopathy*). Eye infections have also been reported but are not as common now due to improved anti-rejection protocols and treatments to prevent infection.

- A **cataract** is a clouding of the clear lens of the eye. Cataracts are usually related to aging of the eye. Other risk factors include diabetes, steroids, smoking, long term unprotected exposure to the sun's UV rays, and injury to the eye.

- **Glaucoma** results from damage to the optic nerve. This nerve carries the images we see to the brain. Damage to the optic nerve is often seen with increased pressure inside the eye (*intraocular pressure*). You are at increased risk for developing glaucoma if you:
  - are 60 years of age or older
  - are African American, particularly those over the age of 40
  - have a family history of glaucoma

- have a medical history of diabetes or a serious eye injury
- are taking medications that increase the risk of glaucoma

- **Diabetic retinopathy** occurs when the blood vessels inside the retina become damaged from high blood sugar levels. When the blood vessels are damaged, fluids may leak into the retina and block the flow of blood. Diabetic retinopathy may lead to vision loss.

Call your primary care physician and/or eye doctor if you have any symptoms of eye problems including:

- eye pain
- changes in vision such as blurring, double vision, or fading of colors
- flashes of light
- sensitivity to light
- seeing spots
- the appearance of dark spots in your vision
- distorted or wavy lines or edges of objects
- dry eyes with redness, itching, and/or burning

Routine Lab/Blood Tests

Having lab tests (blood tests) completed routinely is another important part of your care that contributes to a healthy lifestyle after transplant. Your transplant team will monitor the results of your lab tests to determine how your body is recovering and how well the transplanted organ and other body systems are functioning. Sometimes medications may be changed or added based on your blood tests.

Blood tests are obtained more frequently in the early weeks or months after transplant and then less often over time. You may be asked to get your blood tests repeated more frequently if you are sick or experiencing any complications related to your transplant.

There are many blood tests that are available to monitor your health. The most common tests obtained after transplant for most organ transplant recipients include:

- The level of your anti-rejection medicine: The blood level of your anti-rejection medicine (cyclosporine, tacrolimus, sirolimus) is monitored very closely after transplant. If this level is too low, the rejection process may start. If this level is too high, infection may develop because your immune system has been suppressed too much. This level will change over time, but is usually high for the first three to six months after transplant. This level may be decreased over time if you have not had any episodes of rejection or if you have a significant infection. Other factors that can change your immunosuppression level include: the affect of other medications (drug interactions), taking the medication on an empty or full stomach, and eating/drinking any form of grapefruit. The timing of your anti-rejection medicine can also affect the level. Remember that the blood test for your anti-rejection medication must be obtained no earlier than 2 hours *before* you take a dose of that medication. For example, if you take your anti-rejection medication at 9:00 AM, your blood level should be drawn between 7:00 AM and 9:00 AM, before you take your dose.

- Kidney function and electrolytes: These blood tests show how well the kidneys are functioning. If the kidneys are not working well, the electrolyte levels (magnesium, sodium, potassium, phosphorus) may not be in the normal range. The kidney function tests also include the blood urea nitrogen level (BUN) and creatinine. Abnormal kidney function tests in kidney transplant patients may be a sign of rejection.

- Liver function tests: The liver function tests monitor liver function in all patients. These lab values also help detect rejection, infection, or bile duct blockage for liver transplant patients. These tests include the ALT (alanine aminotransferase), AST (aspartate aminotransferase), GGTP (gamma-glutamyl transferase) and total bilirubin.

- Complete blood count (CBC) or full blood count (FBC): This blood test is monitored to check for infection, the effects of anti-rejection medications, anemia (low red blood cell count), and many other conditions related to the red cells and white cells of the blood.

- Infection: Tests to check for cytomegalovirus (CMV) and Epstein Barr Virus (EBV) are also drawn routinely in patients who are at risk for these viruses.

Post-transplant diabetes: Monitoring your blood glucose levels

Diabetes is an illness that effects how your body makes and uses a hormone called insulin. It is a serious disease that is associated with many health problems and complications. Risk factors for developing diabetes include:

- Family history of diabetes
- Ethnic background of African American, Native American, Native Alaskan, Hispanic and Pacific Islander
- Obesity
- Inactive life style
- Older age
- Abnormal blood levels of cholesterol or triglycerides
- Immunosuppressant medications

Diabetes is a significant risk for people who have had organ transplants. The medications that you take to prevent rejection of the transplanted organ may increase your risk of developing diabetes. Diabetes is diagnosed by checking levels of glucose in your blood. Your physician will monitor your blood glucose levels through several types of tests. Glucose levels are high in people who have diabetes.

Sometimes diabetes can be controlled in transplant recipients by making changes in anti-rejection medications. Losing excess weight, changing eating habits, and exercising daily can also help. Some individuals may need daily insulin shots while others may be managed with medications that are taken by mouth.

Although there is no cure for diabetes, it is treatable. Those who develop diabetes after transplant should work with their doctor and diabetic educator to understand their care, diet, and medications and to make healthy lifestyle choices.
For more complete information about diabetes, refer to *Post-Transplant Diabetes: What Every Patient Needs to Know*, published by the International Transplant Nurses Society. Available at: http://www.itns.org/education/patient-materials

Monitoring your cholesterol levels

Cholesterol is a waxy fat-like substance produced by the liver. It is important for body functions such as building new cells, insulating nerves, and producing Vitamin D and some hormones. If there is too much cholesterol in your blood, it can build up inside blood vessels, 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, eventually causing heart disease. HDL helps keep the LDL from building up in the arteries.

The level of LDL cholesterol in your blood is affected by diet. Other factors include weight, exercise, age, gender, heredity, and some medical conditions. Transplant recipients have a slightly higher risk of developing high cholesterol because some anti-rejection medications can increase cholesterol levels. Your transplant team or PCP/GP will monitor your cholesterol levels by performing routine blood tests.

You can help control your cholesterol levels in several ways:

- Choose lean meats and chicken.
- Avoid fried foods that are cooked in hydrogenated vegetable oil.
- Avoid processed foods.
- Use egg substitutes or egg whites instead of whole eggs.
- Use low fat milk products and low fat cheeses.
- Increase your fiber intake through whole grain products, fruits, and vegetables.
- 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 or PCP/GP to monitor your cholesterol levels.
- Ask your doctor if high cholesterol is a side effect of any of the medications that you are taking.

Gynecologic examinations

Recommendations for routine gynecologic and breast examinations vary by country, so it is important that you follow your doctor's advice and guidelines.

Many transplant centers advise their female transplant recipients who are 18 years of age or older and/or are sexually active to have a gynecologic examination every year. This examination is the same as for the general population and should include a pelvic exam to detect any abnormalities of the uterus, a breast examination to evaluate changes in the breast tissue, and a Papanicolaou's smear (Pap smear) to detect any abnormalities of the cervix. Women ages 18-39 should have a professional breast exam every 3 years, or as needed, and should perform a monthly breast self-examination. Women 40 years of age and older should have a yearly mammogram and perform a monthly breast self-exam. Physicians may advise women who have a family history of breast cancer or other risk factors to have a mammogram before the age of 40 or more frequently.

Prostate screening

The prostate is a walnut-sized gland that is part of the male reproductive system. It is located in front of the rectum and below the bladder. The prostate makes the fluid that carries sperm. Prostate cancer is one of the most common forms of cancer in men. Although the cause of prostate cancer is not known, some risks have been identified. These include:

- Age: The risk of getting prostate cancer is greater as men get older.
- Family history: A man is more likely to develop prostate cancer if his father or brothers had prostate cancer.
- Race: Prostate cancer is more common in some racial and ethnic groups. It is more common in African American men than Caucasian men. Men of Hispanic, Asian, Native American, or Pacific Islander descent are less likely to develop prostate cancer than Caucasians.

A blood test called the prostate-specific antigen test (PSA) is used to screen for prostate cancer. This test measures the level of a substance (*enzyme*) produced by the prostate and checks whether or not this level is within the normal range. Another test used to screen for prostate cancer is the digital rectal examination (DRE). For this examination, the physician inserts a gloved lubricated finger gently into the rectum to feel the back of the prostate. The physician checks the size of the gland and feels for any irregularities.

The screening recommendations for prostate cancer based on scientific studies are unclear. Some physicians who support regular screening believe that the research shows that finding and treating prostate cancer early may save lives. These physicians recommend that all men who expect to live for at least 10 more years should be given the opportunity to have the PSA blood test and DRE every year, starting at age 50. Men who are African American or have a family history should be tested earlier. However, some physicians do not recommend regular screenings because they believe that finding and treating prostate cancer early may not save that person's life. They believe that the side effects of treatment are worse than the possible benefits because most prostate cancers grow very slowly and may never affect the man's life.

It is important that you discuss prostate screening with your physician. You should know your risk factors for prostate cancer and the pros and cons of screening to make the best decision for you.

Colorectal Screening Tests

Recommendations for colorectal examinations vary by country, so it is important that you follow your doctor's advice and guidelines.

Colorectal screening (examination of the large intestine and rectum) is recommended for both men and women 50 years of age and older to detect signs of colorectal cancer. This cancer is an abnormal growth of tissue that occurs in the colon (large intestine) or rectum. It is the third most common cancer after prostate cancer and lung cancer in men. In women, it is the third most common cancer after breast cancer and lung cancer. Colorectal cancer is very treatable when diagnosed at an early stage. It can be prevented through regular screening tests that can find abnormal growths (*precancerous polyps*). These growths, or *polyps*, can be removed before they turn into cancer. Screening is important because polyps and colorectal cancer may not cause any symptoms, particularly in the early stages.

The most common tests or procedures used to screen for colorectal cancer include:

- **Fecal occult blood test (FOBT)**. This test is performed on samples of stool to check for blood that may not be easy to see in the stool. This testing should be done every year in men and women 50 years of age or older.

- **Colonoscopy**. This procedure is done by a gastroenterologist (GI doctor). The doctor uses a flexible, lighted tube called a colonoscope to look at the inside walls of the rectum and the colon (large intestine). During this procedure, samples (biopsy) of the colon tissue are taken for examination. If abnormal growths (polyps) are found, they may be removed. A colonoscopy is used as a screening test at the age of 50. This test may be done if other screening tests show a problem or to further diagnose a disease. This test should be done every 10 years, but may be repeated sooner if the results of the previous test were of concern.

- **Flexible sigmoidoscopy**. This is a procedure done by a gastroenterologist (GI doctor) using a flexible, lighted tube (sigmoidoscope) to examine the inside walls of the rectum and part of the colon. It is recommended for people at the age of 50 years and is repeated every 5 years.

- **Double-contrast barium enema**. This test involves having an enema with a special dye (barium). Following the enema, a series of X-rays are taken to view the dye going through the colon and rectum. The procedure is recommended for people at the age of 50 years and is repeated every 5 years.

Your doctor will advise you about when you should be screened for colorectal cancer and which test or tests are right for you. In addition to routine screening, it is very important to tell your PCP/GP about any changes in your stools or bowel routine such as an increased or decreased amount of stool, a change in color, a change in the firmness or texture of your stool (hard stools or liquid/watery stools), or the appearance of blood.

Skin cancer screening

Transplant recipients have an increased risk of developing skin cancer. This risk is up to 65 times greater than in people who have not had a transplant. The medications that transplant recipients take to suppress their immune system cause this increased risk. Your chance of developing skin cancer is also related to how old you are at the time of transplant, the types of anti-rejection meds you have taken, how long you have taken anti-rejection medications, and the amount of immunosuppression you have received. Additional risk factors for skin cancer include having:

- fair or easily burned skin
- lots of freckling
- red or blonde hair
- blue, green or hazel eyes
- history of extensive sun exposure
- family history of skin cancer
- previous skin cancers

Almost all skin cancers can be cured if detected early. As a transplant recipient, you should examine your skin every month. Look for any new or changing growths including pink patches or spots, scaly growths, bleeding spots, or changing moles. Your PCP/GP should thoroughly examine your skin during your annual check-up or refer you to a dermatologist. If you are at high-risk for developing skin cancer, you may be asked to see a dermatologist regularly. Transplant recipients should always use sun screen with a sun protection factor (SPF) of at least 30 to protect their skin from damaging light rays. Sunscreen should be used on all exposed areas of your skin. It is also important to wear sunglasses, a broad-rimmed hat, and protective clothing. Outdoor activities should be avoided or limited during the time when the sun's rays are the strongest, between 10:00 AM and 4:00 PM. Transplant recipients should not use tanning booths.

Bone density screening

Osteoporosis is a disease in which the bones become fragile and more likely to break or fracture. Most people think that osteoporosis occurs only in women, but men can develop this condition as well. Although any bone can be affected by osteoporosis, the bones of the hip, spine, and wrist are at greatest risk. Osteoporosis can progress painlessly until a bone breaks if not prevented or if left untreated.

Risks factors for developing osteoporosis include:

- Age: Your bones become weaker and less dense as you age.
- Gender: Women are more likely to develop osteoporosis because of the effects of menopause and because they have less bone tissue than men.
- Family history: Osteoporosis tends to run in families.
- Race: Caucasian and Asian women are at greater risk. Hispanic and African-American women have a lower risk.
- Bone structure and weight: Small framed women weighing less than 127 pounds/58 kilograms are at greater risk for osteoporosis.
- Menopause: Women lose up to 20% of their bone mass within the first five to seven years after menopause.
- Life style: Smoking, high alcohol intake, not getting enough calcium in your diet, and not exercising or having an inactive lifestyle can contribute to osteoporosis.
- Medications: Certain medications, such as steroids, can increase the risk of osteoporosis.
- Chronic disease: Some long-term health conditions, such as chronic kidney disease, can increase the risk of osteoporosis.

Transplant recipients are at an increased risk for developing osteoporosis. Some anti-rejection medications can cause osteoporosis, particularly in the first 6-12 months after transplant when immunosuppressant levels are high. Prednisone, cyclosporine, and tacrolimus are all associated with osteoporosis. Your chance of developing osteoporosis depends on your general risk factors as well as the amount of immunosuppression and length of time you are prescribed high levels of these medicines.

There are several things you can do to prevent osteoporosis.

- Eat a well-balanced diet that is rich is calcium and vitamin D. Talk to your transplant dietician for advice on the amounts and types of foods that are right for you, particularly if you have additional health problems.
- Be active! Exercise daily and include aerobic and weight-bearing exercises in your routine.
- Live a healthy lifestyle. Do not smoke. Avoid alcohol or follow your transplant center’s guidelines on alcohol intake.
- Ask your PCP/GP about your need for having a bone mineral density (BMD) test. Recommendations for having this test are based on your age, risk factors, and any recent fractures. A BMD measures the density of your bones, or bone mass, and is painless, safe, and noninvasive.
- Medications may be helpful in some people. Although osteoporosis can not be cured, there are several types of medications that treat this condition.

Your doctor and transplant team will always monitor your immunosuppression levels and your risks for developing osteoporosis. In some cases, medications or doses may be changed to decrease your risk. Never discontinue or change these medications on your own. Talk to your transplant team about your risks for developing osteoporosis after transplant.

Blood pressure screening

Blood pressure is the measurement of the force of blood pushing against the walls of the arteries in your body. The “top” number or *systolic* blood pressure measures this pressure at the highest level - when the heart beats. The “bottom” number, the *diastolic* blood pressure, measures the pressure between beats - when the heart is at rest. Normal blood pressure for most adults is 120/80. High blood pressure, called *hypertension*, is a blood pressure measurement of 140/90 or greater. In some patients however, a blood pressure of greater than 130/80 is considered high. Ask your doctor what range of blood pressure measurements is right for you.

The risk of developing high blood pressure is greater if you are:

- African-American
- a man greater than 45 years of age
- a woman greater than 55 years of age
- overweight
- diabetic
- have a family history of high blood pressure

The reason for developing high blood pressure is unknown in some people. This is called *primary* or *essential hypertension*. Other people develop high blood pressure as a result of another health problem or medications. This is called *secondary hypertension*.

In addition to the risk factors for developing high blood pressure, there are some lifestyle choices that can raise blood pressure. These include:

- inactivity
- diets with too much salt or not enough potassium
- stress that is long-lasting
- smoking
- excess alcohol use
- using some over-the-counter medications (decongestants, antihistamines)

There are often no symptoms for high blood pressure, so people may not realize they have high blood pressure until they start having health problems. It is important for everyone to have blood pressure readings done routinely to screen for high blood pressure. If high blood pressure is not detected and treated, it can damage your arteries, heart, and kidneys. High blood pressure can lead to stroke, heart attack, and kidney failure. Although high blood pressure can last for a long time, or even your life time, it can be treated and controlled to avoid these health problems.

Hypertension is very common after transplant for several reasons.

- Medications: As a transplant recipient, some of the medications that you take may affect your blood pressure. Sometimes the doses of these medications can be changed to have less affect on your blood pressure. Sometimes a different medication that does not affect blood pressure may be used. Remember, never stop taking your medications or change the dose unless told to do so by your doctor.
- Organ function: Your blood pressure may be affected by how well your transplanted organ is working.
- Lifestyle and other risks: Your lifestyle choices and risk factors can contribute to having a high blood pressure. Eating healthy, maintaining a healthy weight, being physically active, not smoking, and limiting alcohol may help lower your blood pressure. You can not change your family history, ethnic background, or age, but understanding these additional risks can lead to living a more healthy lifestyle.

If you have high blood pressure and it is not under control with changes in your health habits and medications, your doctor may also prescribe *antihypertensive* medications to lower your blood pressure. There are several types of blood pressure medicines that can be used to lower blood pressure. Some of these work by getting rid of extra fluid and salt from your body. Others work by slowing your heart rate or relaxing blood vessels. Doctors often prescribe more than one type of blood pressure medicine to more effectively lower your blood pressure. Most people need to take blood pressure medications for a long time to keep their blood pressure in the appropriate range.

You or your family members have been taught how to measure your blood pressure with a blood pressure cuff (*sphygmomanometer*) and a stethoscope or with an electronic monitor to use at home. Measure your blood pressure routinely as instructed by your doctor and know what blood pressure levels are right for you. It is also important to take your medications as prescribed if you have high blood pressure and make lifestyle changes to improve your health.

What should I know about immunizations?

Immunizations are an important part of routine healthcare for everyone. Adult transplant recipients have usually received all required immunizations before transplant but infants and young children may not because of their age or being too ill. If a transplant recipient needs immunizations, there are some important exceptions. Transplant recipients can not receive any "live" vaccines. These vaccines contain a small amount of weakened live virus to provide immunity from that virus. Receiving a live vaccine, even though weakened, may cause serious health complications in someone who is immunosuppressed.

There are several live vaccines. The most common live vaccines that immunosuppressed patients should **never** receive are:

- **Oral polio** (Sabin): The oral polio (Sabin) vaccine contains a live but weakened form of the polio virus that is given to provide immunity against the polio virus (*poliomyelitis*). The inactivated form or "killed" polio vaccine (Salk) is an injection or "shot." The shot form of the polio vaccine should be given to transplant recipients instead of the oral polio vaccine.
- **MMR** (Measles, Mumps, Rubella): Adults do not usually need the MMR vaccine because they received this shot and boosters when they were children. It is given to children at 12-15 months and again at 4-6 years.
- **Varivax** (chicken pox or varicella vaccine): This is a live vaccine given to children around the age of 12 months to protect them against chickenpox (varicella).

Should I get the “flu shot?”

The flu shot or injection is an inactivated (killed) vaccine that contains three influenza strains (types) that are expected to be seen most often in that year. People who want to decrease their risk of getting the flu should get the flu shot. Older people, very young children, and people with certain health conditions are at high risk for becoming very sick with the flu.

Transplant recipients are usually advised to get the flu shot every year. Ask your transplant team for your center’s recommendations. The best time to get the vaccine is in October or November, although your doctor may advise you to get it earlier. It takes about 2 weeks for protection to develop in your body and this can last for almost a year. Most transplant centers recommend that caregivers and other people in the household who have close contact with the transplant recipient also get the flu vaccine.

People should **not** get the influenza vaccine if they have had:

- a severe allergic reaction to eggs
- an allergic reaction to the flu shot in the past
- Guillain-Barré Syndrome (a disease that results in muscle weakness and sometimes paralysis)

Check with your transplant team about getting the flu shot if you are within the first three months after transplant or if you have recently been treated for rejection. You should not get the influenza vaccine if you have a fever when you visit the doctor’s office for your shot. Be sure to reschedule an appointment to get the vaccine at a later date when you are feeling better.

Can I get the flu nasal spray instead of having a shot?

A new form of the flu vaccine that is given as a nasal spray has been available since 2003 for use in healthy people, ages 5 through 49 years. Transplant recipients and people with suppressed immune systems can not get this form of the flu vaccine. The nasal spray flu vaccine contains weakened live influenza viruses instead of killed viruses. This live vaccine may place them at high risk for complications from the flu.

What other lifestyle issues are important after transplant?

Nutrition

A healthy diet is one that is made up of fruits, vegetables, whole grains, and low fat or fat free milk and milk products. It also includes lean meats, poultry (chicken, turkey), fish, eggs, nuts, and beans. A healthy diet should be low in saturated fats, trans fats, salt, added sugar, and cholesterol.

After organ transplant, most transplant recipients have few restrictions or limits in their diet. Your dietary guidelines are much the same as for any person who is trying to eat healthy. If you do have other health problems, such as high blood sugar or high blood pressure, your transplant team will give you special instructions about your diet. Fad diets, diet supplements, and herbal products should be avoided.

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®).

Exercise

Exercise and physical activity is important to your overall health. It is important to talk with your transplant team about increasing your activity level and when to begin an exercise routine. This will depend on how well you have recovered after transplant, what type of organ you received, and other medical problems.

Exercise improves your overall health. It makes you feel better and can help control stress. Regular exercise can help you maintain a weight that is right for you. It can also help prevent bone disease (osteoporosis). Any physical activity that you can do is beneficial. Walking, swimming, riding a bicycle, lifting weights, playing golf or tennis, participating in yoga classes or even doing housework counts as exercise! Staying active is key to living a full and healthy life.

All transplant recipients should discuss their exercise program with their doctor and transplant team so that a safe exercise plan can be developed. This is particularly important for heart transplant recipients because they must follow specific warm-up and cool-down routines. Discuss the exercise program that is right for you with your doctor and transplant team. Your team can help you develop a plan that is right for you.

To be healthy and fit is an important goal, but using common sense to reach this goal is just as important. Even months or years after your transplant, exercising when you are sick with a fever is not a good idea. If you ever experience any intense pain, chest pain, or shortness of breath while exercising, you should stop exercising immediately and seek medical attention or advice.

For more complete information about nutrition and exercise, refer to *Diet and Exercise After Transplant*, published by the International Transplant Nurses Society. Available at: http://www.itns.org/education/patient-materials

Sexual activity

Sexual activity is an important part of adult life. Before transplant, many patients experience a decreased desire (libido) to have sex or are unable to have sex (impotence) because of health problems. After transplant, both men and women find their desire and ability to have sex returns. Most transplant centers advise that patients wait for six to eight weeks before resuming sexual activity. How quickly you are ready to have sex after transplant depends on how you feel. Ask your transplant doctor or coordinator when it is medically safe for you to have sex. When you are ready to resume sexual activity, it may be helpful to discuss any concerns you may have with your partner.

Safe sex practices are important for everyone who is sexually active to avoid the risk of contracting sexually transmitted diseases (STD). Transplant recipients have an increased risk of getting an STD because their immune system is suppressed. Practicing safe sex is the best way to prevent STDs. Safe sex practices include:

- having sex with only one partner (a monogamous relationship)
- washing your genitals before and after sex
- always using latex condoms with spermicide
- avoiding sex with anyone who has sores, a rash, or a foul discharge from their genitals
- avoiding anal sex

Birth control and pregnancy

When you resume sexual activity after transplant, an appropriate method of birth control should be used. Barrier methods (condoms, diaphragms, and spermicidal jellies) are most often advised. When one or more barrier methods are used, it is possible to prevent conception as well as provide protection from sexually transmitted diseases. Some transplant centers have approved the use of low-dose oral contraception (“the pill”). However, oral contraceptive pills place the transplant recipient at greater risk for blood clots, high blood pressure, gastrointestinal (GI) problems, coronary artery disease, and depression. Cyclosporin levels may be higher in patients who take cyclosporine and oral contraception. Additionally, it is important to remember that the pill prevents pregnancy when taken correctly, but it does not protect against STDs.

Generally, becoming pregnant or fathering a child can be safe and successful for many women and men who have received solid organ transplants. Pre-pregnancy counseling is important so that you can plan your pregnancy to achieve the best possible outcome for you and your baby. Most transplant centers advise that female transplant recipients wait one to two years following transplant to become pregnant. This allows for a reasonable amount of time to be sure that the transplanted organ is healthy and functioning well.

When considering pregnancy, female transplant recipients should have:

- Stable function of the transplanted organ
- Stable level of immunosuppression
- Good kidney function
- Normal blood pressure or well-controlled high blood pressure
- Normal blood glucose levels or well-controlled diabetes
- Overall good health

If you are thinking about getting pregnant after your transplant, it is important to remember that each pregnancy has its own unique issues and possible risks. There are many issues to consider about your current health, the function of your transplanted organ, and your medications. Planning with a complete understanding of the issues and with appropriate medical care before, during, and after pregnancy can lead to the best outcome for you and your child.

For more information about pregnancy, refer to *Pregnancy and Parenthood After Transplant: What You Should Know* published by the International Transplant Nurses Society. Available at: http://www.itns.org/education/patient-materials

Understanding your emotions after transplant

The transplant process can be a very difficult emotional experience. Some transplant recipients experience more emotional difficulties and stress before transplant when they are waiting for an organ. Others have more stress after transplant as they learn to cope with the changes in their life. In the early months after transplant, transplant recipients can experience a variety of emotions including anger, frustration, guilt, and depression.

These feelings can affect you for different reasons and in different ways. What is emotional or stressful for you may not be as stressful for another person. Some common symptoms people experience when they are dealing with emotional problems may include:

- feeling sad, depressed, angry, anxious, or overwhelmed
- crying frequently or easily
- being unable to focus or concentrate
- not sleeping well, sleeping too much, or being unable to fall asleep
- mood changes
- changes in appetite

Feeling emotional can also be related to side effects of medications or even an underlying medical problem. Talk to your doctor and transplant team about how you feel. They will consider how you are feeling emotionally when reviewing your blood tests, medications, physical examination, and reports from procedures. It is always important to check for any medical problem that can affect how you feel.

You can also help yourself! It is important to develop strategies to deal with your emotions and feelings after transplant. Some things you can do to help yourself include:
- Exercise regularly and be as active as possible.
- Participate in social activities with friends and family at home and in your community.
- Eat a healthy diet.
- Establish a good sleeping routine. Take naps if needed and get adequate rest.
- Find a way to relax through music, social activities, arts and crafts, yoga, and/or meditation and deep breathing.
- Recognize and understand how you feel.
- Let your family and friends know that you need their support. Talk to them about how you feel. Talking or just spending time with them can be helpful.
- Talk to other transplant patients through support groups. Sometimes it is helpful to talk to other people who have shared the same experience.
- Talking to a professional counselor may also be helpful. Your transplant team can refer you to someone who can help.

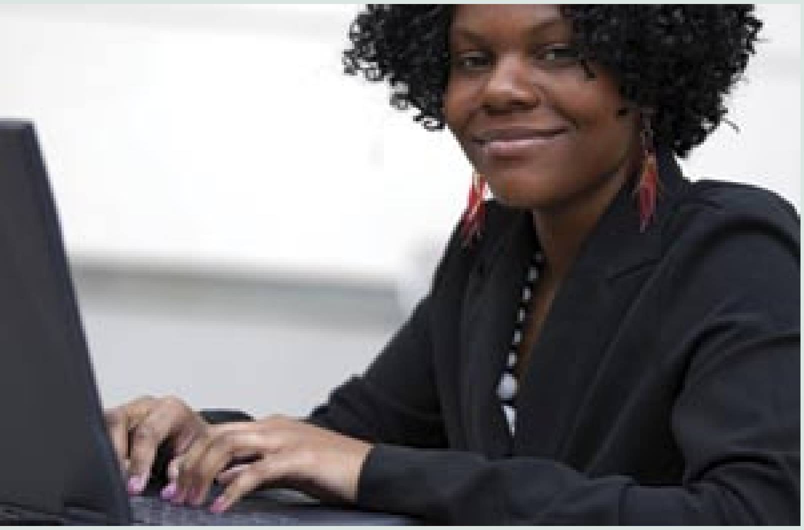
Maintaining a Healthy Lifestyle After Transplant

You can achieve and maintain a healthy lifestyle after transplant. Discuss strategies with your transplant team to help you make healthy lifestyle choices. General tips for living healthy after transplant include:
- Take your medications as prescribed by your physician. Do not stop any medication or change your dose unless directed by your physician.
- Have your labs drawn routinely as recommended by your transplant team.
- Schedule regular check-ups as recommended with your transplant physician.
- Schedule medical visits with your PCP/GP and specialists (consultants) as recommended.
- Have routine screening tests (dental, vision/eye, gynecology, prostate, colorectal, bone density) completed as needed.
- Exercise routinely several times a week.
- Eat a well-balanced diet.
- Maintain a healthy weight.
- Get enough sleep.
- Protect your skin from harmful light rays by using a sun screen with an SPF of at least 30.
- Maintain a healthy blood pressure with good nutrition, exercise, and medications as prescribed.
- Monitor your blood sugar if you have any problems with high blood sugar (hyperglycemia).
- Know your cholesterol level and any risks you have for developing high cholesterol.
- Do not smoke and avoid alcohol.
- Avoid risky behaviors such as tattooing, body piercing, unprotected sex, and illegal drugs.
- Maintain routine communication with your transplant team.

Now that you have received your transplant, you will face many new challenges. Although you will continue to get stronger and feel better after transplant, there are many things that need to be done to stay healthy. Maintaining a healthy lifestyle after transplant is important to your overall health and the health of your transplanted organ. Remember to keep in contact with your transplant team. They can help guide and support you in living a healthy lifestyle.

Related Links For More Information

ITNS is not responsible or liable for any information received from these websites. 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.



Additional information on living a healthy lifestyle after transplant can be found on these websites:

http://www.AT-RISC.org **After Transplant_Reduce Incidence of Skin Cancer Alliance**. The AT RISC initiative is an educational and awareness campaign for patients and medical professionals to reduce the incidence and severity of skin cancer in organ transplant recipients.

http://www.medem.com **American Academy of Opthalmology**. A public information website about eye care.

http://www.cambridge-transplant.org.uk/program/renal/womenshealth.htm **Cambridge University Hospitals NHS Foundation Trust, Addenbrooke's Hospital**. Women's health after renal transplant.

http://info.cancerresearchuk.org **Cancer Research UK**. Patient information on colorectal, prostate, and other types of cancers.

http://www.cdc.gov/cancer/colorectal/basic_info **Centers for Disease Control**. Information on colorectal cancer.

http://www.cdc.gov/cancer/prostate **Centers for Disease Control**. Information on prostate cancer

http://www.cdc.gov/flu/keyfacts.htm **Centers for Disease Control**. Information on the influenza vaccine.

http://www.healthytransplant.com/index.php?q=quality_of_life/emotional_well-being **Healthy Transplant**. American Society of Transplantation. A patient guide to care issues after transplantation.

http://www.itns.org/education/patient-materials **The International Transplant Nurses Society**. *Pregnancy and Parenthood after Transplant: What You Should Know; Diet and Exercise after Transplant; Post-Transplant Diabetes: What Every Patient Needs to Know; What Every Patient Needs to Know about Dental Care*

http://www.prostatecancerfoundation.org **The Prostate Cancer Foundation**. This site contains patient information and education about prostate cancer, screening, and treatments.

http://www.nhlbi.nih.gov/about/org/mission.htm **The National Heart, Lung, and Blood Institute** (NHLBI) provides education and information related to diseases of the heart, blood vessels, lung, and blood with an emphasis on prevention.

http://www.niams.nih.gov/bone **National Institute of Arthritis and Musculoskeletal and Skin Diseases** (NIAMS) of the National Institutes of Health. Contains information about bone health and NIAMS programs and activities.

http://www.kidney.org **National Kidney Foundation** "*Keeping Your Bones Healthy*" 2004.

http://www.nos.org.uk/about.htm **National Osteoporosis Society**. The NOS works in a variety of ways to improve the clinical standards for osteoporosis across the United Kingdom.

http://www.osteoporosis.ca/english/home **Osteoporosis Canada**. Organization that educates, empowers and supports individuals and communities in the risk-reduction and treatment of osteoporosis.

htpp://www.transplantliving.org/afterthetransplant/pregnancy.aspx **Transplant Living**. This website is affiliated with UNOS and contains patient education and resources for care after transplant.

Printed in the USA
7.5K 12/06

This project is supported by an educational grant from Novartis Pharmacueticals Corporation. ITNS gratefully acknowledges their support of this educational endeavor for improving patient care and outcomes.

Authors:
Beverly Kosmach-Park MSN, CRNP
Julie Dennison RN, MSN
Janet Hiller RN, MSN

Reviewers:
Kathy Lawrence MN, RN
Sandra Cupples PhD, RN
Patricia Folk RN, BSN, CCTC
Moira Perrin RGN, BSc (Hons)
Audra Hutton Lopez ARNP, FNP, MSN, CNS
Mariesa Janecka RN, CCTN
Kathy Schwab RN, BSN, CCTC

The International Transplant Nurses Society was founded in 1992 as the first professional nursing organization to focus on the professional growth and development of the transplant clinician. ITNS is committed to the promotion of excellence in transplant clinical nursing through the provision of educational and professional growth opportunities, interdisciplinary networking and collaborative activities, and transplant nursing research. This educational brochure is designed to enhance patient education as provided by individual transplant centers. Patients should follow their transplant team's specific guidelines for routine health screenings, examinations, and long-term care needs.

www.itns.org

1739 E. Carson Street
Box #351
Pittsburgh, PA 15203-1700, USA

+1 412-343-ITNS (4867)
itns@msn.com

INTERNATIONAL
TRANSPLANT
NURSES
SOCIETY