

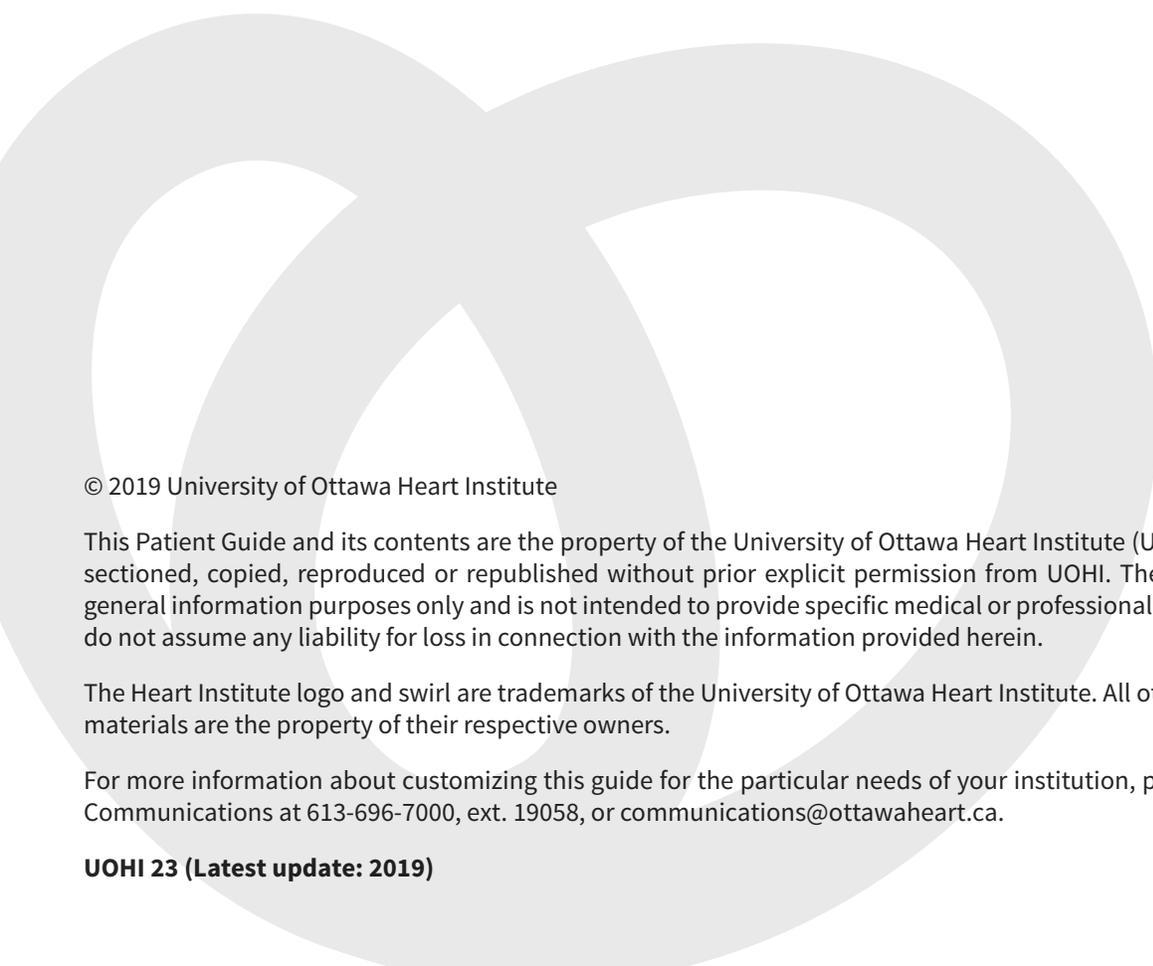


UNIVERSITY OF OTTAWA  
HEART INSTITUTE  
INSTITUT DE CARDIOLOGIE  
DE L'UNIVERSITÉ D'OTTAWA

# Heart Transplant



A GUIDE FOR PATIENTS AND FAMILIES



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**UOHI 23 (Latest update: 2019)**

# PLEASE BRING THIS BOOK WITH YOU TO THE HEART INSTITUTE

Patient Name \_\_\_\_\_



## IMPORTANT

Please call the nursing coordinator if you have any symptoms or concerns at any time during your early recovery period.

Nursing Coordinator: 613-696-7000, press 0 and ask for the Nursing Coordinator

## PLEASE COMPLETE THE FOLLOWING INFORMATION

**Contact Person**  
*(relative, friend)*

Name \_\_\_\_\_

Phone Number (Home) \_\_\_\_\_

Phone Number (Cell) \_\_\_\_\_

**Surgeon**

Name \_\_\_\_\_

Office Number \_\_\_\_\_

**Family Doctor**

Name \_\_\_\_\_

Phone Number \_\_\_\_\_

**Pharmacy**

Name \_\_\_\_\_

Phone Number \_\_\_\_\_

**Cardiologist**

Name \_\_\_\_\_

Phone Number \_\_\_\_\_

**Cardiac Rehabilitation**

Name \_\_\_\_\_

Phone Number \_\_\_\_\_

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# REFERRAL FOR HEART TRANSPLANT

You have been referred for a heart transplant by your doctor because he or she feels that your heart failure symptoms are getting worse and can no longer be managed effectively with medication or a less-invasive surgical procedure (e.g., special pacemaker).

Heart failure occurs as a result of one of the following:

- Coronary artery disease (blocked arteries)
- Hereditary condition
- Congenital heart disease
- High blood pressure
- Viral infection
- Side effects of medication
- History of alcohol use
- Pregnancy

## Heart Transplant Workup

Your workup will include a number of tests to determine your eligibility for a heart transplant. An evaluation will determine whether you:

- Have a medical condition that would benefit from a heart transplant
- Would get greater benefit from other treatment options
- Are too healthy for a heart transplant
- Are too sick to have the surgery and post-transplant treatments
- Have any conditions that would not allow you to have a transplant
- Have an addiction (smoking, drinking and/or drugs) that you need to quit before you are accepted for a transplant
- Are willing to follow the steps required after a heart transplant (i.e., frequent follow-up appointments, blood work, tests and medication schedule)
- Are dealing with any other cognitive, behavioral or psychological factors that would impact your ability to cope with the process of the transplant

Sometimes the evaluation can be done on an outpatient basis, but it is usually completed while you are in the hospital. It takes about seven days for the tests to be completed. You may have some or all of the following tests.

Extra tests are sometimes needed. Any extra tests will be explained to you.

## BLOOD WORK

To assess the following:

- Electrolytes
- Blood counts
- Kidney function
- Liver function
- Hepatitis B and C
- HIV
- Prostate level (for men only)
- Thyroid function
- Virus status (cytomegalovirus, Epstein-Barr virus, human T-cell lymphotropic virus (HTLV))
- Toxoplasmosis
- Tissue typing to determine whether you have any antibodies in your blood
- Blood group

## BASIC TESTS

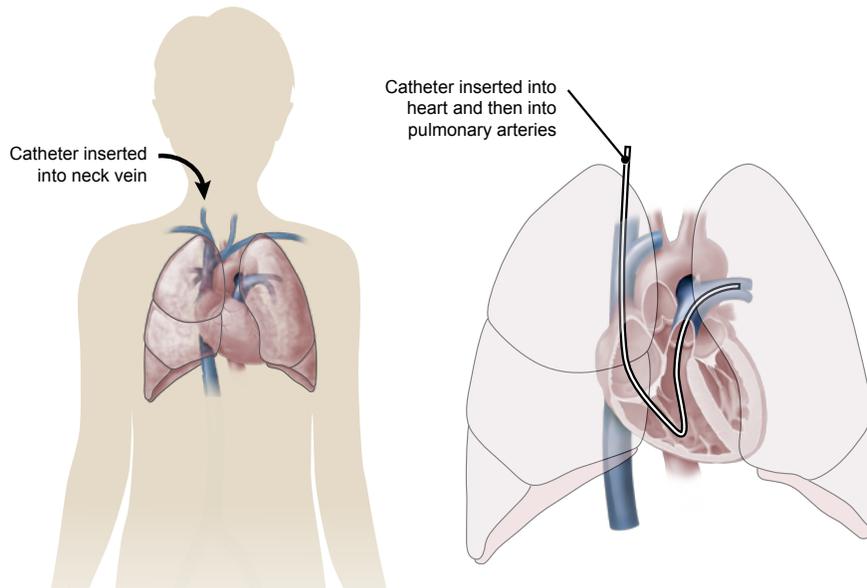
- Urine and stool samples
- Chest X-ray
- Electrocardiogram

## HEART TESTS

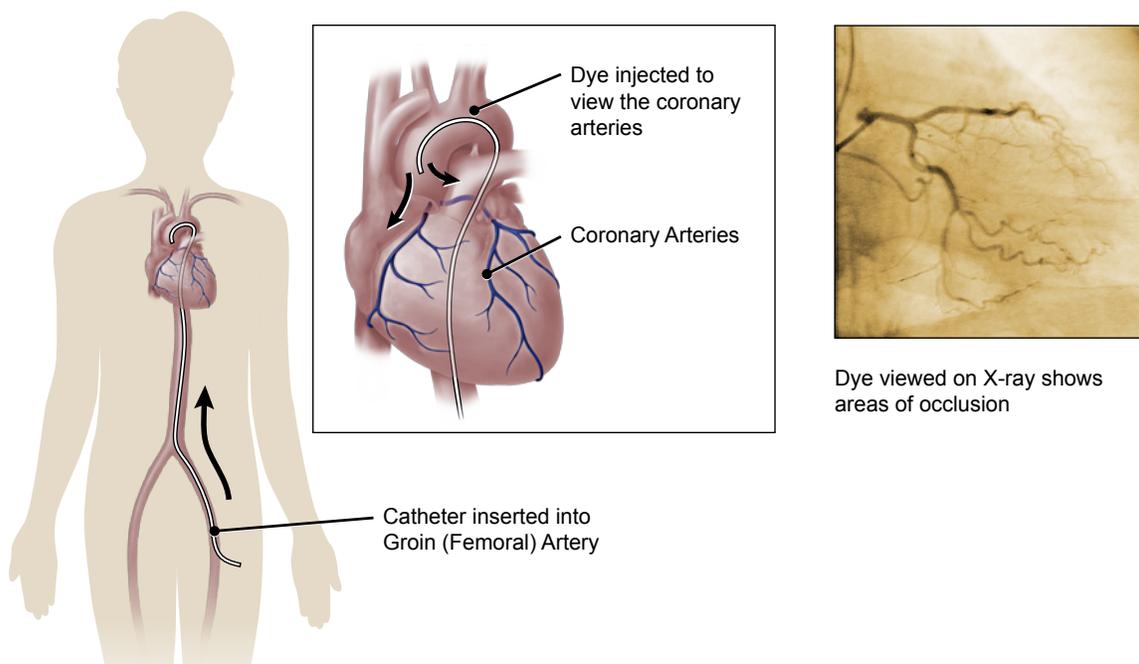
A number of other tests will be necessary for your evaluation, including:

- An **echocardiogram** is an ultrasound of your heart. It shows the four chambers of the heart and indicates how well the right and left ventricles and all of the valves are working. It can also reveal any clots in the chambers, which sometimes happen with heart failure. You do not need to prepare for the test. You will be asked to wear a patient gown and to remove only your top. Electrodes will be attached to your chest, and the technician will ask you to lie on your left side. A gel will be applied to your chest and pictures of your heart will be taken with a special probe.
- A **MUGA (multiple-gated acquisition)** scan provides an exact measurement of how well the left ventricle is working as a pump. For the test, you will be given an injection through an intravenous line, which will be inserted in your arm. The tracer material given during this injection will attach itself to the red blood cells circulating in your body. A camera will then take pictures of your heart chambers and the blood vessels leading to and from the heart. The test will show how much blood the heart pumps out (ejection fraction or EF) and how quickly it is pumped out.

- **Right heart catheterization** is a test in which the tip of a catheter is inserted into a vein in your neck and then advanced into your heart using a TV screen and X-rays. The catheter is moved around inside your heart and into the blood vessels going to your lungs. This test measures the pressure levels in your heart and indicates how well your heart is working. The procedure does not take very long and you can usually walk after the test. If the catheter is inserted through your leg, you will require bed rest afterward. The following picture shows how the catheter enters the heart and the path it follows.



- **Left heart catheterization** is performed if you have not had one in the past couple of years. A catheter is inserted in your groin and is advanced up to your heart. This is done with the assistance of TV and X-ray equipment. A dye is injected that shows how well the blood is flowing through the coronary arteries and whether there are any blockages present. This takes a little longer than a right heart catheterization, and you will require bed rest for about four hours afterward.



- A **cardiopulmonary stress test** measures how well your lungs work and shows how well your heart pumps blood to your muscles as you exercise. The stress test also assesses the electrical activity of your heart. An electrocardiogram (ECG) is performed while you exercise on a treadmill or stationary bike. During the test, you will be hooked up to electrodes that will record the rhythm of your heart. You will breathe into a breath analyzer, which measures the gas exchange in your lungs. A clip will be placed on your finger to determine the percentage of oxygen in your blood during the exercise. Your blood pressure and pulse will be taken at regular intervals.

## SCANS AND OTHER TESTS

A **CT (computerized tomography) scan** will be done on your chest and abdomen. You may or may not be given a contrast dye prior to the test. During the test, you will lie on a motorized table that moves you through the CT scanner, which is shaped like a large doughnut.

A **carotid Doppler ultrasound** will be done to make sure there are no severe blockages of the arteries in your neck. A gel is applied to the left and right sides of your neck and pictures are taken with a special probe.

**Arterial blood flow studies** will be done on your legs to make sure there are no blockages. Cuffs similar to a blood pressure cuff will be wrapped around each leg and will be inflated and deflated to measure the flow of blood through the arteries.

A **pulmonary function test** will be done if needed. This test measures your lung function. You will be asked to blow into a mouthpiece both before and after using an inhaler.

A **bone mineral density test** measures the density of minerals (such as calcium) in your bones using a special X-ray. As we age, we do not build up the store of calcium in our bones as quickly as when we were young. We lose calcium and other minerals, making our bones more porous and sponge-like. Our bones become weaker and more at risk of breaking.

A **tuberculin skin test** will be done if you have a history that puts you at risk of having tuberculosis.

## Referrals to Other Health Care Services

During the evaluation, you will be referred to different health care professionals who are part of the transplant team. These include:

- **Social workers:** There are two social workers at the Heart Institute who are assigned to heart transplant patients and their families. You will be referred to one of them during your evaluation. They can help you with information such as:
  - Temporary living accommodations in Ottawa for you and your family
  - Disability pensions and financial information
  - Community resources and services to support lifestyle changes
  - Drug benefit plans
- **Registered dietitian:** The registered dietitian will assess and help optimize your nutritional status. The registered dietitian may also provide education on nutrition to you and your family.
- **Physiotherapist:** The physiotherapist will review exercise and energy conservation for people living with heart failure. The physiotherapist will also review the exercise routines that are recommended post-surgery.
- **Psychologist:** A psychologist will assess your ability to think, remember and cope with the transplant procedure. The Psychologist will also assess what if any treatment recommendations would be useful for you.

Specialists in other areas may be consulted during your evaluation if appropriate. Some of these may include:

- Electrophysiology
- Endocrinology
- Gastroenterology
- Hematology
- Infectious Diseases
- Psychiatry
- Respiriology

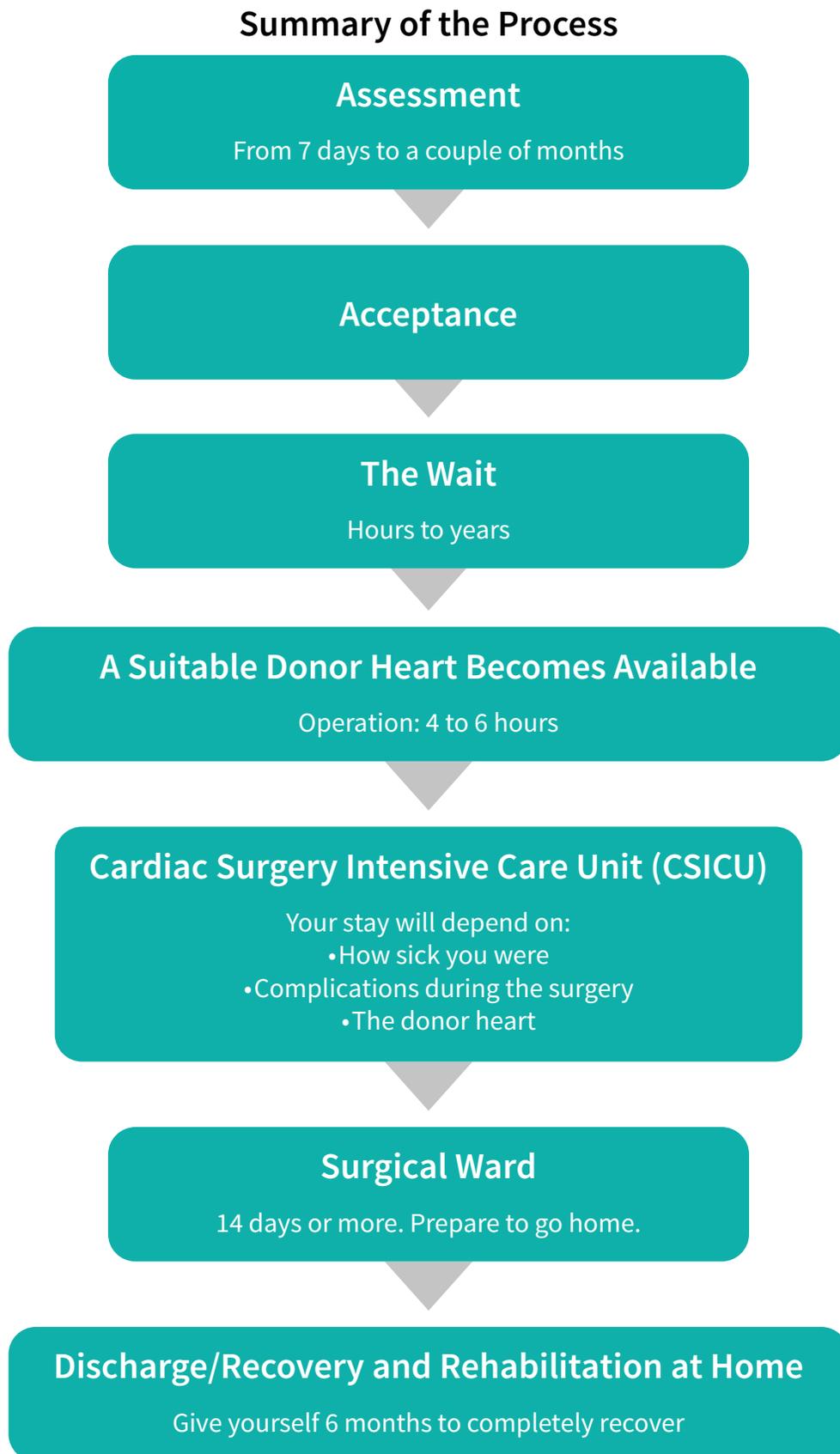
The information gathered from these tests and consultations is presented to a team of cardiologists, heart surgeons, other specialists, social workers, physiotherapists, dietitians and an advanced practice nurse. Your medical history, diagnostic test results, social history and the results of any consultations are reviewed to determine whether you are able to survive the heart transplant procedure and comply with the continuous care needed to live a long and healthy life.

Once the decision is made, your cardiologist will give you the results.

If the team finds that a heart transplant is not something you will benefit from, you will continue to be monitored by your cardiologist as an outpatient.

If the team determines that a heart transplant is something you will benefit from, the transplant advanced practice nurse will review with you and your family what is involved in the heart transplant process. *Heart Transplant: A Guide for Patients and Families* will provide you and your family with much of the information you will need to help you through the transplant experience.

The following diagram summarizes the transplant process and shows the time frame for the various stages:



# DEPRESSION

Depression is common in people with heart problems; about one in five patients (20 per cent) experience clinical (or major) depression. If you are experiencing at least five of the symptoms listed below for a two-week period, you may be developing depression and you may need to speak to a health professional.

These symptoms may include:

- Sad feelings
- Loss of interest in activities that you usually enjoy
- Changes in appetite
- Significant unplanned weight loss or weight gain
- Sleep problems
- Loss of energy
- Difficulties with concentration or memory
- Decrease in your normal social activities or withdrawal from friends and family
- Feelings of worthlessness, helplessness, or hopelessness
- Changes in sexual desire
- Thoughts about death or suicide

## HOW DEPRESSION AFFECTS YOUR HEART

Depression may affect your heart directly and indirectly. Depression affects your heart directly by increasing the risk of blood clotting, plaque build up and atherosclerosis. Depression also negatively affects your immune system, so you are less able to fight off germs and viruses.

Depression may affect your heart indirectly by influencing some of the decisions you make. People with depression often find it difficult to make healthy choices, e.g. quitting smoking, getting exercise, eating well, or taking medications regularly. They find it difficult to find the drive or energy to make healthy lifestyle changes.

## WHAT YOU CAN DO IF YOU ARE FEELING DEPRESSED

Negative thinking is often involved in depression. Getting help to learn new ways of thinking and stopping the negative thinking can be beneficial. Seek support by talking with your family and friends and/or joining a support group. You can also talk to your doctor or a mental health professional (social worker, psychologist, or psychiatrist) about proven treatments and strategies for coping with depression.

Do more pleasant activities—even when you don't feel like it. They can help to improve your mood. Regular exercise can also improve your mood. Set realistic goals for yourself and celebrate when you achieve them. You may need to record your daily activities to prove to yourself that you are making gains.

Make sure to take time for yourself away from daily stresses. Consider participating in a Cardiac Rehabilitation Program to educate yourself and gain confidence about your recovery.

## More Information about Depression

### BOOKS

- **Feeling Good: The New Mood Therapy.** Burns, D. (1990)
- **Mind Over Mood: Change How You Feel by Changing the Way You Think.** Greenberger & Padesky. (1995)

### WEBSITES

- **Canadian Mental Health Association:** [www.cmha.ca](http://www.cmha.ca)
- **Canadian Psychological Association :** [www.cpa.ca](http://www.cpa.ca)

# ANXIETY

Anxiety is one of the most distressing emotions that people feel. At some point in time, most cardiac patients will experience varying degrees of fear or nervousness related to their health condition. Anxiety describes a number of problems including generalized anxiety (a mixture of worries experienced most of the time), panic attacks (intense feelings of anxiety; sometimes people feel like they are going to die), and posttraumatic stress disorder (repeated memories of terrible experiences with high levels of fear.) Like depression, about one in five cardiac patients experience significant anxiety symptoms.

Anxiety symptoms may include:

- Uncontrollable worry
- Feeling “on edge” or restless
- Feeling irritable
- Muscle tension
- Light-headedness
- Sleep problems
- Being easily fatigued
- Difficulty breathing
- Increased heart rate
- Headaches
- Sweating

## HOW ANXIETY AFFECTS YOUR HEART

Anxiety may play a role in cardiac problems by increasing the risk of an irregular heart beat and triggering spasms; both of these responses may lead to cardiac complications. Anxiety may also lead to unhealthy behaviours such as: smoking, overeating, poor sleep and decreased physical activity.

## PSYCHOLOGICAL RESOURCES AT CARDIAC REHABILITATION

If you are feeling a high degree of anxiety or sadness for more than two weeks and you think that it may be connected to dealing with your heart health, you may be referred to a psychologist for an assessment and treatment recommendations.

## WHAT YOU CAN DO IF YOU ARE FEELING ANXIOUS

- Learn to recognize when you are starting to feel anxious and plan ways to manage your feelings. Learn new coping strategies to handle stressful situations instead of avoiding them. For example: practise slow and deep breathing.
- Imagine scenes that are relaxing and pleasant for you.
- Learn relaxation skills (e.g., tense and release the muscles throughout your body).
- Distract yourself from the thoughts or physical symptoms that contribute to your anxiety (e.g., count backwards from 100 in three's).
- Do something pleasurable like reading a funny book or getting a back rub.
- Share your fears and worries with someone you trust.

Challenge yourself to change the way you are thinking about a problem. For example, tell yourself “I can handle this, I’ve done it before” or “I’m not going to die, it is normal for my heart to pump harder when I am exercising”.

When facing stressful situations, it helps to be prepared. Think of solutions to problems that cause you anxiety, so you are ready in advance when the problems come up. When you’re in a stressful situation, try and let go of the things that are beyond your control.

Considering participating in the Cardiac Rehabilitation Program so you can educate yourself, alleviate some worries and get answers to your questions and concerns. If you need to, talk to your doctor or a mental health professional (social worker, psychologist, or psychiatrist) about proven treatments for anxiety.

## More Information about Anxiety

### BOOKS

- *The Anxiety and Phobia Workbook* (4th Ed.). Bourne, E. (2005)

### WEBSITES

- **Canadian Mental Health Association:** [www.cmha.ca](http://www.cmha.ca)
- **Canadian Psychological Association:** [www.cpa.ca](http://www.cpa.ca)
- **Anxiety Disorders Association of Canada:** [www.anxietycanada.ca](http://www.anxietycanada.ca)

# THE JOURNEY

This booklet will help guide you and your family through the transplant experience. You are encouraged to become familiar with the information provided here.

As you read through the guide, write down any questions you have so that you can review them at a later date with your doctor or nurse.

## The Health Care Team

The transplant team works together with you and your family to help you return to an active and productive life after your transplant. Both the Heart Institute health care professionals and your loved ones will be directly and indirectly involved in your care.

The transplant team consists of the following health care professionals:

|                                    |                      |                                                           |
|------------------------------------|----------------------|-----------------------------------------------------------|
| Transplant Cardiologists           | Dr. Sharon Chih      | <input type="checkbox"/>                                  |
|                                    | Dr. Ross Davies      | <input type="checkbox"/>                                  |
|                                    | Dr. Mariana Lamacie  | <input type="checkbox"/>                                  |
|                                    | Dr. Lisa Mielniczuk  | <input type="checkbox"/>                                  |
|                                    | Dr. Ellamae Stadnick | <input type="checkbox"/>                                  |
| Transplant Surgeons                | Dr. Munir Boodhwani  | <input type="checkbox"/>                                  |
|                                    | Dr. Vincent Chan     | <input type="checkbox"/>                                  |
|                                    | Dr. David Glineur    | <input type="checkbox"/>                                  |
|                                    | Dr. Marc Ruel        | <input type="checkbox"/>                                  |
|                                    | Dr. Fraser Rubens    | <input type="checkbox"/>                                  |
| Transplant Advanced Practice Nurse | Jackie Grenon        | 613-696-7000, ext. 15172                                  |
| Social Workers                     | Julie Backs          | 613-696-7000, ext. 14785                                  |
|                                    | Holly Pankhurst      | 613-696-7389                                              |
|                                    | Souad El Mansouri    | 613-696-7388                                              |
| After Hours                        | Nursing Coordinator  | 613-696-7000, press 0 and ask for the Nursing Coordinator |
| Psychologist                       | Dr. Heather Tulloch  | <input type="checkbox"/>                                  |

Other health care professionals who may be involved in your care during your hospital stay include the following:

- Nurses from the various units in the hospital
- Surgical advanced practice nurses
- Nursing coordinators
- Physiotherapists
- Registered dietitians
- Pharmacists
- Various medical services

**Trillium Gift of Life Network** is an important member of our team. It is the Ontario provincial organization responsible for the distribution of hearts to patients on the waiting list across Ontario. Trillium Gift of Life Network is where your name, blood group, height, weight and diagnosis will be entered into a database. Once this is done, your name and information becomes part of the heart transplant waiting list for patients across Ontario. Trillium Gift of Life will call us when they have a suitable heart offer for you.



**PLEASE REMEMBER**

Bring your Heart Transplant Guide with you when you are called to the University of Ottawa Heart Institute for your heart transplant.

# THE WAITING PERIOD

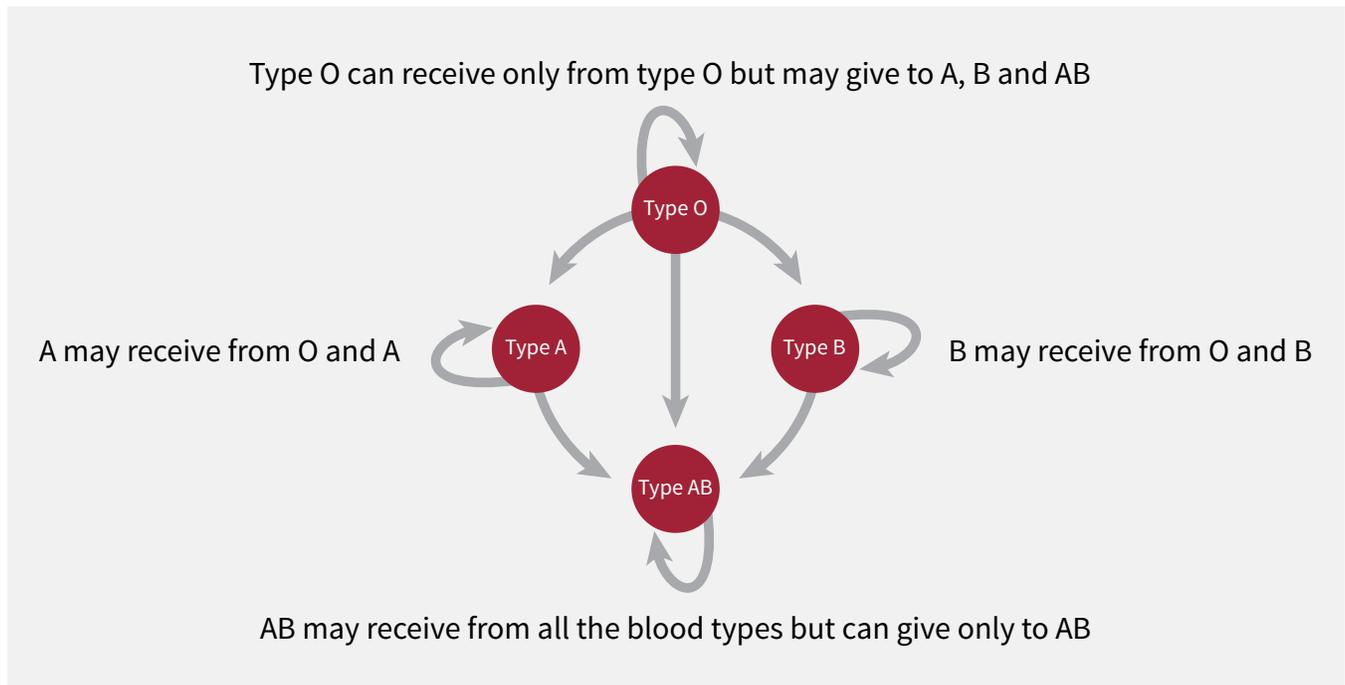
## The Waiting List

Once you have been accepted for transplantation, an active search for a donor heart begins. Your time on the waiting list will be determined by four things:

- Your blood type
- Your body size
- How sick you are
- Antibodies in your blood that could make organ rejection a concern

### BLOOD TYPE

The heart you receive will be matched to you according to your blood type. The following diagram shows which blood types can give to and receive from one another.



Patients who are type O tend to wait longer on the heart transplant wait list. This happens because more patients on the list are type O, and because type O patients can receive only type O hearts.

### BODY SIZE

The size of your body also determines how long you will wait on the list. The donor has to be close to your body size. Most people in the general population are of average size. If you are especially tall or small, you will wait longer than someone who is of average body size.

## STATUS ON THE WAITING LIST

You will be placed on the transplant waiting list according to the following criteria:

**Status 1:** For patients who are waiting at home.

**Status 2:** For patients who are admitted to hospital because their heart failure is not under good control.

**Status 3:** For patients who require an intravenous medication to support their hearts. For patients who need a mechanical device to support their hearts.

**Status 3.5:** For patients who need to be in the intensive care unit and are on two intravenous medications for their hearts.

**Status 4S:** For patients with lots of antibodies in their blood.

**Status 4:** For patients who are in the intensive care unit on life support. Also for patients who have mechanical support devices that have become infected.

The higher you are on the list, the less time you will wait. If you are a status 1 patient waiting at home, you will be on the list longer than someone who is a status 4 patient in a critical care setting. It is hard to predict how long you will wait. Some heart transplant patients wait a few hours while some wait many years.

## ANTIBODIES

You will have blood tests during your workup to determine whether you have antibodies in your blood. Your body forms antibodies when it is exposed to foreign invaders or material including viruses, blood transfusions, previous transplants and, for women, past pregnancies.

When there is a heart offer for you, your antibodies are compared to the donor antigens. If the donor heart has any antigens that match your antibodies, the donor heart cannot be accepted for you. This can cause your wait to be longer.

## While You Wait

Most individuals stay at home while they wait. If you live a long distance from the hospital, you may need to stay in the Ottawa area while you wait. It is important that you be immediately available—within hours—when a donor heart is found. A social worker will help you with planning a temporary location for you and your family.

You will be asked to leave a list of telephone numbers with the transplant advanced practice nurse (APN) so that you can be reached at any time. It is very important that members of the transplant team be able to reach you at any time.

When you are going to be away from home or change your phone number, please inform the transplant APN. Be sure to give the nurse the following information when you know you are leaving home:

- The date you are going away
- The date you will return
- The phone number where you can be reached

You cannot leave the country, go to remote areas or travel long distances if you are on the waiting list. Discuss your travel plans with the transplant APN if you have any questions.

While you are on the list, you may become ill now and then. You should call the transplant APN if you experience any of the following:

- Cold, flu or fever
- Infection that requires antibiotics
- Blood transfusion
- Hospitalization
- Increasing signs and symptoms of heart failure:
  - Increase in your weight (2 pounds in one day or 5 pounds in one week)
  - Decrease in your activity level
  - Increased shortness of breath
  - Swelling in your ankles and legs
  - Decreased urination

If you are hospitalized, let the doctors or nurses know that you are on the waiting list for a heart and ask them to call the Transplant Office or transplant APN. It is important for you to keep the transplant team up to date on your status. This will ensure that you are in the best condition possible for your transplant. Changes in your health may affect your status on the list.

The wait time can be stressful for both you and your family. Waiting for a transplant has been described by both patients and families as if they are putting their lives on hold. Other common feelings include:

- That life is unpredictable
- Difficulty coping at times
- Concern about finances
- Anxiety about what the future holds
- Uncertainty about being able to accomplish life goals
- That life is fragile
- Fear of the transplant process, while knowing it is the only alternative
- For spouses, awareness of the possibility of losing their loved one

These are natural feelings and ones you should talk about with your spouse, a friend or a health care worker. The social worker and transplant APN are there to help you work through these feelings.

## EATING WHILE YOU ARE WAITING FOR YOUR HEART TRANSPLANT

Good nutrition before your heart transplant is important and may help you recover and heal more quickly after your surgery. It is important to make sure that your body is getting the right nutrition at this time. Here are some tips that will help you eat well before your surgery. For more healthy eating tips or to see the calendar of nutrition classes offered at UOHI, please visit [ottawaheart.ca](http://ottawaheart.ca).

- Follow a diet reduced in sodium and a fluid restriction as prescribed by your doctor. For more information on this, ask for a copy of the Heart Failure guide.
- Eat at regular times: Eat breakfast within 1 to 2 hours after waking up. Don't wait too long between your meals. It's harder to make healthy choices when you're hungry.
- Plan healthy snacks: Try whole grain crackers and peanut butter or hummus, a piece of fruit and a few unsalted nuts, or frozen berries and plain Greek yogurt.
- Include protein sources at every meal and snack: Try nut butters on your toast, add canned fish to your salads or chicken to your soups. Cook more meat than you need and freeze the extras. The meat is ready to reheat and add to dishes when you need it.
- Have easy to prepare meals and snacks readily on hand for when you don't feel like cooking, such as granola bars, unsalted nuts, seeds, trail mix, or cheese and crackers. You might want to use a service like Meals on Wheels or ask friends and family to help you with groceries and making your meals.
- Don't be afraid of fat: You need fat for good health and it adds flavor to your cooking. Use plant-based fats such as olive or canola oil.

If your appetite is poor while you are waiting for your heart transplant or you notice that you are losing weight without trying to, tell your physician or the Heart Transplant Advanced Practice Nurse. They can refer you to a registered dietitian.

## RELOCATION AND A DRUG PLAN

If you live far away, you may be asked to move closer to the Heart Institute before your transplant. When you are called to receive a donor heart, you will need to arrive at the hospital within four hours.

If you live more than one hour away from the hospital, you will be asked to move closer to Ottawa for at least two months following your transplant. This is necessary because of the frequent tests needed after the surgery.

The Ontario government has created a fund to help Ontario residents cover some of the cost of relocating to Ottawa. To receive this benefit, you will need to provide proof of your relocation (receipts) to the transplant APN. The APN will submit the information to Trillium Gift of Life. Trillium will cover \$650 per month of your costs during your stay in the Ottawa area. Ask the APN for an information package.

If you have been paying for your medications because you do not have a drug plan, it is recommended that you obtain one. Some of the medications you will take following the transplant are very expensive.

## SOCIAL WORK

Two social workers at the Heart Institute are assigned to work with heart transplant patients and their families. You will be referred to a social worker during your evaluation. This professional will monitor you after your transplant and can help you with information about:

- Temporary accommodations in Ottawa for you and/or your family
- Disability pensions and financial information, if needed
- Community resources and services to support lifestyle changes
- A drug benefit plan
- Monthly parking passes

# THE TRANSPLANT PROCESS

## A Suitable Heart Becomes Available

### WHERE THE DONOR HEART COMES FROM

Your new heart will come from someone who has been declared brain dead and whose family consents to the donation of organs. It is an anonymous gift. Brain death is a permanent condition that usually results from some sort of head trauma or bleeding into the brain. Brain death is diagnosed by many tests and confirmed by two physicians.

### WHEN A MATCHING HEART BECOMES AVAILABLE

You will be contacted by phone when a matching heart becomes available. Do not to eat or drink anything from that time on.

If you are driving, you will be asked how long it will take for you to get to the hospital. If you live a distance away from the hospital, an air ambulance may be arranged for you.



#### **IMPORTANT**

You must come to the hospital as soon as possible.  
Do not drive yourself and do not rush or break any speed limits.

## WHERE TO ENTER THE HEART INSTITUTE

You can enter the Heart Institute through the main entrance at 40 Ruskin Avenue until 9:00 p.m. After 9:00 p.m., you will have to enter the hospital through the ambulance entrance on Melrose Avenue.

If Admitting is open, your spouse, family or friend should go there and provide them with the necessary information. If closed, they can do this the next day.

## PREPARING FOR SURGERY

Once you arrive at the Heart Institute, the following things will happen to prepare for surgery:

- Blood tests will be done.
- A chest X-ray will be taken if a recent one is not available.
- Your chest will be shaved.
- You will shower with a special soap.
- The surgeon, surgical resident and anesthetist will visit you.
- Your implantable cardioverter defibrillator (ICD) will be shut off.

Two surgeons will be involved in your surgery, one to retrieve the heart and one to get you ready to accept the heart. They will work together to decide when to move you to the operating room. They will also do the final check to be sure the donor heart is in good shape for transplantation.

Sometimes the heart must be rejected at the last minute because it has become unsuitable for use. If this happens, your transplant operation will be cancelled. Try not to be discouraged. Another opportunity will come up.

If the heart is accepted and you are taken to the operating room, send your personal belongings home with your family, but make sure to keep your dentures, glasses and hearing aids.

## The Donor Workup

Donors go through a number of tests and assessments during their workup process. They have heart tests and blood work completed as well. Information is also collected from their family and friends. Trillium Gift of Life (TGLN) is the organization for Ontario that prepares the donors for donation.

There are times when a donor does not meet the criteria set by TGLN, but they are felt to still be a good donor. When this occurs the donor organs will be released based on “exceptional distribution” (ExD) criteria.

This can happen for many reasons. Sometimes TGLN was unable to get a complete history from family or friends. The donor may have positive blood cultures or a history of cancer. They may have travelled outside Canada, which could expose them to risk for certain infections. They may have lifestyle behaviors that place them at risk for hepatitis or HIV.

The surgeon will inform you of the ExD heart offer when you are admitted to the hospital for your transplant. They will explain the reason for the ExD and obtain your consent to use the heart. They will review the benefits of accepting the heart versus waiting for another one based on your situation. You will be asked to sign a consent form indicating that you understand and accept the heart.

You have the final decision on whether you want to accept the heart. If you do not decide to accept the organ, this does not affect your listing status. Prior to your surgery, while you are waiting for a heart, review this with your family or friends and talk about whether you would be willing to accept a heart that is offered to you based on this condition. That way, if it does happen, you will have already had some time to think about it, and you will know what you want to do.

### FOLLOW-UP TESTING

You may need follow-up testing after the heart transplant. This may be completed while you are in the hospital or once you are discharged. The follow-up testing will be based on the cause for the donor ExD.

### PROPHYLAXIS

Some donor blood work results are compared to your results to determine where you will need “prophylaxis” so that you do not develop an infection after your transplant. Cytomegalovirus is one of the tests. If either you or the donor is positive for this you will need a medication for the first six months to prevent you from developing this infection. The medication used for this is called valganciclovir and it is very expensive. Make sure it is covered by your drug plan.

# The Heart Transplant Operation

The surgery will last from four to six hours depending on your condition. The operation may take longer if:

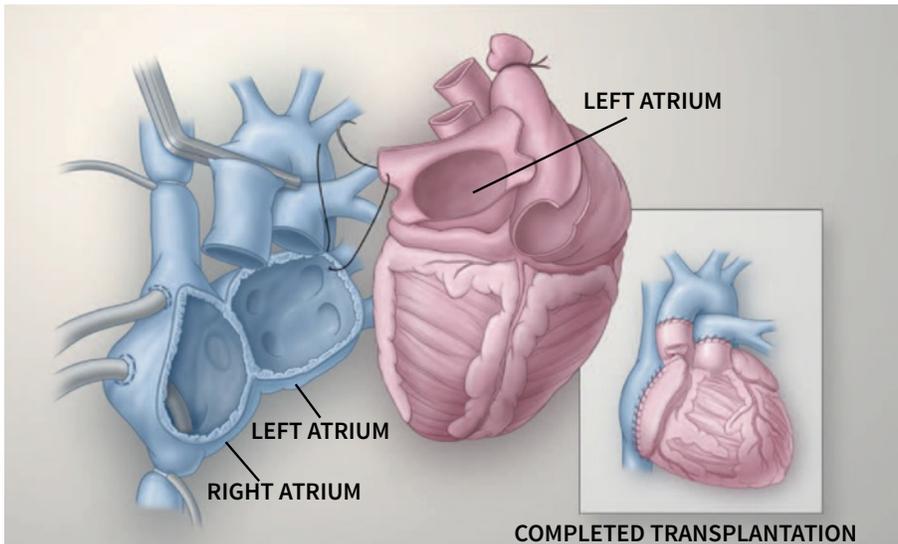
- You have had heart surgery in the past.
- You are on Coumadin®.
- You have a mechanical heart device.

There are two types of heart transplant surgeries. One is called “batrial” and the other “bicaval.”

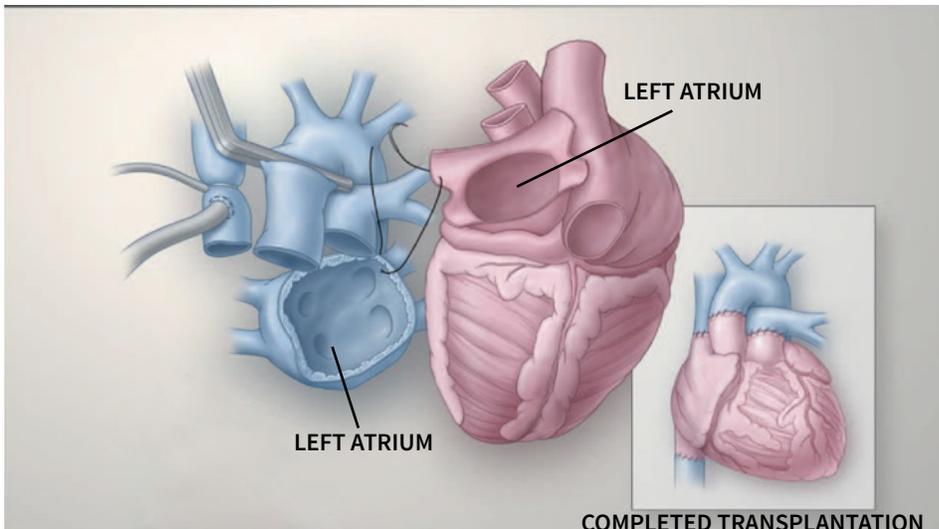
For the batrial technique, the back portions of the right and left atria with a portion of the pulmonary artery and aorta are left intact to serve as connections for the new heart.

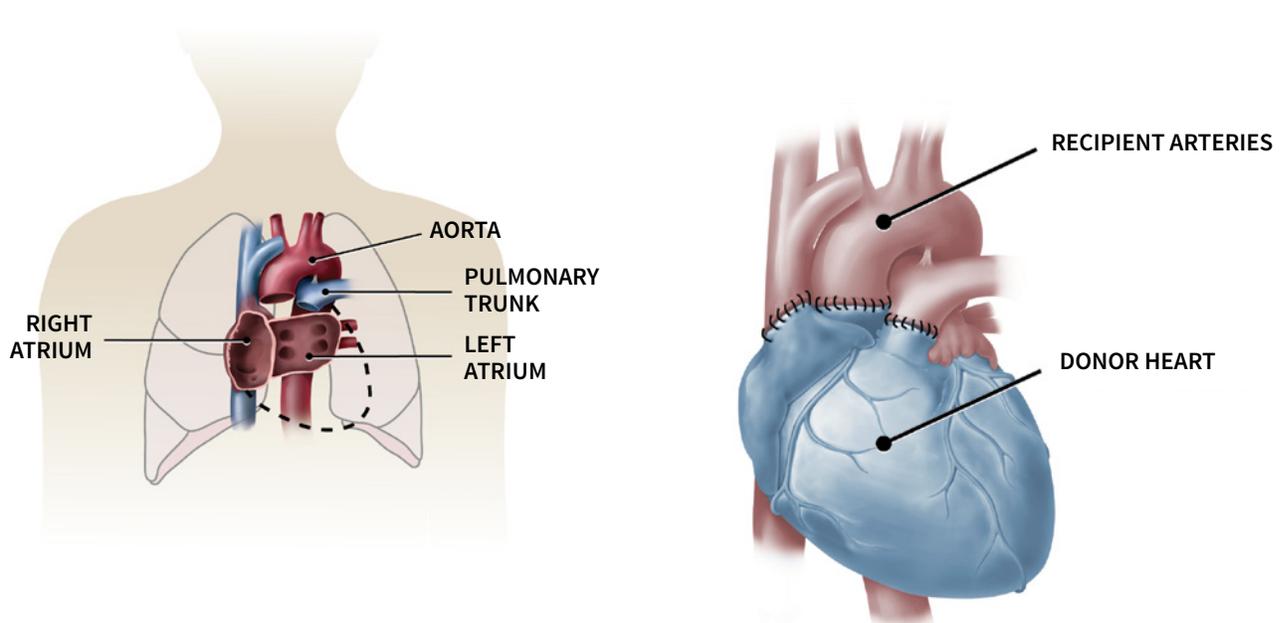
For the bicaval technique, only the back portion of the left atrium along with a portion of the pulmonary artery, aorta and vena cava are left intact to serve as connections for the new heart. The right atrium is completely replaced with the new heart.

## BIATRIAL TECHNIQUE



## BICAVAL TECHNIQUE





### HEART RATE CONTROL AFTER TRANSPLANT

Your heart has many nerve connections to your central nervous system. These help control your heart rate. During a heart transplant, these nerves are cut and do not grow back. This is referred to as a “denervated heart.”

For you, this means your resting heart rate will be around 90 to 110 beats per minute, instead of a slower, more average, 70 to 80 beats per minute. It also means your heart will respond differently to exercise, taking longer to speed up when you start and longer to slow down after you have finished. Therefore, you should warm up and cool down whenever you exercise.

In some cases, the pacemaker centre of the donor heart, called the sinus node, does not work properly after surgery. If this happens, a permanent artificial pacemaker will be inserted before you leave the hospital.

## WHAT YOUR DESIGNATED CONTACT PERSON AND FAMILY CAN EXPECT

### On the day of your surgery:

- Your family can stay with you before you go to the operating room.
- Once you leave to go to the operating room, your family will be expected to remove all your belongings from your room. The length of your stay in the intensive care unit is unpredictable.
- Your designated contact person/family member will be responsible for keeping your other family members informed of your progress.

### During your operation:

- Your designated contact person/your family is welcome to wait in the family lounge on the main floor. Please check in with the volunteers at the desk.

### After your operation:

- Once the surgery is complete, the surgeon will meet with your designated contact person, if he/she is waiting in the family lounge, or telephone him/her. If your contact person chooses to wait at home during the operation, he/she should let the nursing coordinator know.
- Your contact person may come visit you after speaking with the surgeon. This may take some time. You should ask a volunteer to arrange this.
- Your designated contact person will receive two progress calls from the nurse after the operation. One should be between 9:00 p.m. and 10:30 p.m. the evening following your surgery, and the other will be between 9:00 a.m. and 10:30 a.m. the next morning. However, surgery schedules are unpredictable, and these times may vary. The CSICU will provide your contact person with the contact information of the unit you will be staying in.



### PLEASE NOTE

Our privacy policy allows us to share information only with the individuals that you have specifically designated as contacts.

## VISITS FROM FAMILY MEMBERS

When it is time for your family to see you, a volunteer or nursing coordinator will bring them to the Cardiac Surgery Intensive Care Unit (CSICU). Visits should be short and restricted to immediate family.

While you are in the CSICU, your family can visit you for short periods of time (one or two family members at a time). The visiting procedure for the CSICU is as follows:

- Your family should check with the volunteers at the front desk in the main lobby (Ruskin Street entrance). Volunteers are there from 9:00 a.m. to 9:00 p.m.
- The volunteers will call the CSICU to arrange the visit.
- You are only allowed one or two visitors at a time. Special arrangements can be made for visits from children under the age of 12.
- Your visitors may be asked to wait while care is being given to you.
- Before entering, your family members must use the hand washing gel.
- There is no visiting between 6:45 a.m. and 7:45 a.m. and between 6:45 p.m. and 7:45 p.m., while the nurses are giving a patient report.

**Note:** Your family members cannot visit you if they have a cold, fever, diarrhea, cough or any other signs of infection.

After you are transferred out of the CSICU, your family can visit you according to the following guidelines:

- **Visiting Hours:** 10:00 a.m. to 1:00 p.m. and 2:00 p.m. to 8:00 p.m.
- **Rest Period:** 1:00 p.m. to 2:00 p.m. Please do not visit during the rest period.
- Only two visitors at a time at the bedside
- Family members who are ill should stay at home

## PRESS INQUIRIES

A heart transplant is still considered important news in many communities. Information about you and your family is never given out to the media by the University of Ottawa Heart Institute without your knowledge and consent.

## DONOR INFORMATION

To protect the privacy of the donor and their family, donor information is confidential. Both parties are to remain anonymous, but you can communicate with one another through the Trillium Gift of Life Network.

## WRITING TO YOUR DONOR FAMILY

The decision to contact your donor family is a personal choice. There is no time limit on when you should or should not write them. You do not have to write a letter. You can send a card that says “thinking of you” or “thank you for your thoughtfulness.”

Here are some helpful hints for writing your letter:

- Open your letter with “Dear Donor Family”.
- Talk about any hobbies or interests that you have.
- Write about your family, but please do not include names.
- Describe your illness and how you have been doing since your transplant.
- Share what has happened since your transplant (birthdays, graduations, etc.).
- Acknowledge the family and thank them for their gift.

You should not identify yourself in the letter or say where you had your transplant. Once you have completed the letter, give it to the transplant APN. Place your letter or card in an envelope and leave it unsealed. Your letter or card will be forwarded to Trillium Gift of Life, who will then pass it on to the donor family.

Your letter will be appreciated by the donor family members. It will help their healing process by letting them know that their difficult loss has helped another individual. You may or may not hear back from your donor family. Some families find it helpful to write back, while others prefer privacy and chose not to reply.

### **For more information contact:**

Trillium Gift of Life Network  
522 University Avenue, Suite 900  
Toronto, Ontario M5G 1W7

Phone: 416-619-2318

Email: [info@giftoflife.on.ca](mailto:info@giftoflife.on.ca)

Toll-free information line: 1-800-263-2833

## After the Operation

### CARDIAC SURGERY INTENSIVE CARE UNIT (CSICU)

After the surgery, you will be cared for in the CSICU. The number of days you will stay in this unit will depend on:

- Your general condition before the surgery
- Whether there were any complications during the surgery

You will have many tubes attached to you after surgery. The following table explains what they are for and when they can be removed:

| TYPE OF TUBE                                    | DESCRIPTION                                                                                                                                                                                                                                                                                                                    |
|-------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Breathing tube                                  | <ul style="list-style-type: none"><li>• Connected to a ventilator</li><li>• Talking not possible with this tube in place</li><li>• Communicate with the nurse by using your hands. If you are having incision pain, rub your chest with your hand.</li><li>• Removed once your vital signs and blood work are stable</li></ul> |
| Chest tubes                                     | <ul style="list-style-type: none"><li>• Exit your body near the bottom of your chest</li><li>• Drain blood from around your heart and lungs</li><li>• Removed when they are no longer draining</li></ul>                                                                                                                       |
| Special intravenous line in your wrist          | <ul style="list-style-type: none"><li>• Measures your blood pressure</li><li>• Removed when your vital signs are stable</li></ul>                                                                                                                                                                                              |
| Special catheter in your neck                   | <ul style="list-style-type: none"><li>• Measures pressure levels inside your heart</li><li>• Removed when your vital signs are stable</li></ul>                                                                                                                                                                                |
| Two special wires near the bottom of your chest | <ul style="list-style-type: none"><li>• Used to pace your heart, if required</li><li>• Removed the day before you are discharged</li></ul>                                                                                                                                                                                     |
| Catheter in your bladder                        | <ul style="list-style-type: none"><li>• Drains urine from your bladder</li><li>• Makes some patients feel like they have to urinate</li><li>• Removed once you are more active</li></ul>                                                                                                                                       |
| Pain medication intravenous line                | <ul style="list-style-type: none"><li>• Pain medication given on a continuous basis</li><li>• Discontinued once breathing tube is removed</li><li>• Replaced by oral pain medication</li></ul>                                                                                                                                 |

**About pain:**

- If you are having incision pain, it is important that you let your nurse know. He or she has no other way of knowing.
- Your chest incision pain will not be completely gone, but it should not stop you from moving or breathing properly. On a scale from 0 to 10 (10 being the worst pain you can imagine and 0 being none at all), your pain should be around level 3.

A couple of hours after the breathing tube is removed, you will sit up on the side of the bed. The sooner you move, the faster your healing process will be. Remember to support your chest and not to use your arms to move. Physiotherapy will review this with you and your nurses will remind you.

You will not be able to drink right away, because there is a risk of choking. Be patient. Your nurse will give you something to drink when it is safe.

**TRANSFER TO NURSING UNIT H3/H4**

You will be transferred to the ward when your vital signs are stable, most of the lines have been removed and you can move around with the help of one person.

When you are transferred to the ward, you may still have an intravenous line in your neck, pacer wires and a portable heart monitor.

The goals for your care on the unit are to increase your independence by:

- Improving your strength, mobility and coordination
- Getting you more involved in your care by taking your own pills
- Preparing you and your family for discharge through education
- Continuing to watch for changes in your condition

It is important for you to get up and move as soon as possible. Using your arms will prevent you from developing complications such as pneumonia, clots in your legs and constipation.

When you move, it is important for you to remember not to use your arms. This will cause the bones in your chest to rub together and become inflamed. This inflammation can lead to an infection that is particularly dangerous for heart transplant patients.

Your length of stay in the hospital will depend on your condition. You will be discharged once you:

- Have stable vital signs and your incisions are healing well
- Show no sign of infection
- Are mobile and independent
- Can safely take your own medications
- Have completed your discharge training
- Have your home care and other services in place
- Have had one biopsy showing no signs of rejection

Before you are discharged, the transplant APN will review with you and your family information on anti-rejection medications, rejection drugs and infection self-monitoring.

When you are discharged to go home, make sure you have:

- Someone at home with you for the first two weeks. If you do not have anyone to stay with you once you are discharged, please let the social worker or transplant APN know. Arrangements will be made for you.
- A calendar printed from the Transplant Office
- A list of your medications
- Your follow-up appointment with your cardiologist
- Your appointments for your next biopsy and blood work
- Requisitions for your blood work
- Your prescription for cyclosporine, if you are on the drug. Your prescription should be written and brought to the Heart Institute pharmacy the day before discharge. If you live in Ontario, this is where you will pick up your cyclosporine.
- If you were monitored by other divisions (e.g., Infectious Diseases or Endocrinology) find out whether you need a follow-up appointment with them.

## The Return Home

### READJUSTMENT PHASE

You should expect the first three months after your transplant to be a period of major adjustment. During this time, the fear of infection, rejection and drug side effects will subside. It will be at least six months before you feel like your old self again. Try not to be discouraged with your progress.

When you leave the hospital after your surgery, you may feel nervous because you are now in charge of your care. Don't worry, we are just a phone call away. You will also come to realize the need for lifelong monitoring, reconditioning and a possible change in the type of work you do. The support of family and friends is very important during this time.

### EXERCISE

Exercise is very important to your physical and mental well-being. Before discharge, your nurses and physiotherapists will work with you to improve your mobility and coordination, as well as build your strength and endurance.

Usually, by the time you are ready for discharge, you will be able to tolerate a walk around the unit and a climb of two flights of stairs.

After discharge, you will be able to resume normal activities. However, it is important that you maintain an exercise program and that you gradually increase your walking to 20 minutes, both morning and afternoon. The physiotherapist will give you further guidelines in this area.

You should not lift more than 10 pounds for the first six weeks.

**Do not forget you have a “denervated heart,” and you will need longer warm-up and cool-down periods when exercising.**

## REHABILITATION

Once you are discharged, it is recommended that you join the Cardiac Rehabilitation program to help you get your health back on track.

An intake session is usually booked prior to starting physiotherapy. Your physiotherapist can give you the date of your intake session. This session is completed in the Cardiac Rehabilitation Department on the 2nd floor. You will be asked about your past medical history and current medications. There are also some forms that you will have to fill out. The session can take up to three hours.

You have some options when it comes to rehabilitation. It is strongly recommended that you attend a program at a centre so that you can benefit from all of the programs they offer. If you do not live in Ottawa, ask your physiotherapist if there is a program near your home.

You may also be able to work on rehabilitation at home. Speak to your physiotherapist about this.

## DRIVING

Generally, six to eight weeks after your operation, the sternum, or breastbone, is sufficiently healed for you to drive again. However, your cardiologist must assess you and may decide to do further tests to see if it is safe for you to drive. This will be discussed with you during one of your clinic visits.

## SEXUAL ACTIVITY

It is normal during the early part of your recovery to be too tired to think about sex. As you begin to feel better, plan to have sex at a time when you are feeling rested and comfortable. Wait for several hours after you have had a large meal or a lot to drink before having sex.

Sexual relations with your partner requires about the same energy as climbing two flights of stairs. If you can climb two flights of stairs without shortness of breath or chest discomfort, sexual activity can be resumed.

When having sex, make sure you use a position that does not require you to hold yourself up with your arms until your sternum has healed (at least six weeks). Find a position that is comfortable for both you and your partner.

## WEIGHT

You should be aware that weight control is difficult for some post-transplant patients. Your appetite may increase from the effect of your medications. Your weight will be monitored during your outpatient clinic visits. See nutrition section of this booklet for tips on healthy eating.

Keeping your own daily weight record is also recommended as sharp weight increases could indicate issues with fluid retention.

## VISION

The general anaesthetic given to you during your surgery can take time to wear off. This may affect your vision. Do not change your eyeglass prescription right away. Wait a couple of months. If the problem persists, see your eye doctor.

## SMOKING

Do not smoke! Smoking is bad for your new heart. It constricts blood vessels and robs the heart of much needed oxygen by displacing oxygen with carbon monoxide in the blood.

Smoking also damages the delicate lung tissue and can lead to lung infection, not to mention cancer. Because you are taking immunosuppressive medications, you are already at risk for developing lung infections. Smoking will add to this risk.

Second-hand smoke is equally harmful!

## SUN PROTECTION

Because of the medications you are taking, you are at greater risk for skin damage from the sun, which could lead to skin cancer. You must apply sunscreen containing a minimum sun protection factor (SPF) of 25 before going out into the sun. This will provide 97% protection from the sun's rays. If you have a tendency to burn, you should stay out of the sun as much as possible.

## DENTAL CARE

Once you have had your transplant surgery and are on immunosuppressive therapy, it will be more important than ever that you maintain a high standard of oral hygiene. Bacteria in your mouth can enter your bloodstream through your gums and infect your heart.

You can prevent dental complications by:

- Brushing after every meal
- Using dental floss at least once a day
- Cleaning dentures or prostheses after every meal

Regular dental check-ups, every six to 12 months, will also help. Ask your cardiologist whether antibiotics are required before and after your dental appointments.

## RETURN TO WORK

The aim of transplantation is to help you return to work or to your pre-transplant, active status.

When and if you return to work will depend on how well you are recovering and the type of work you do. A vocational counsellor is available through the Rehabilitation Centre to help you.

Sometime within the first six months post-transplant, you may no longer require or may no longer be eligible for disability insurance. Lifelong disability is not expected or guaranteed.

## GET A MEDICAL ALERT BRACELET

You may pick up a form from your nurse or a pharmacist. In an emergency, this bracelet will alert medical personnel that you are a heart transplant recipient and are immunosuppressed.

The following should be engraved on your bracelet:

- Heart transplant
- Antirejection medications
- Any drug allergies

## Outpatient Clinic Visits

### CLINIC VISITS

You will be seen in the Transplant Clinic soon after your discharge from the hospital. Initially, you may be seen monthly or more often and after each heart biopsy. After two years, your visits will be every six months to once a year.

During your clinic visit, the transplant APN and cardiologist will assess you, review your lab work and medications, and inform you about any changes.

The dates for your next appointments will be given to you in the clinic or mailed to you by the Transplant Office.

Please bring a complete list of your medications to your clinic appointment. If you have any questions about your clinic visit, please call the Transplant Office at 613-696-7000, ext. 15468.

### BLOOD WORK

When you are first discharged from the hospital you will need to do weekly blood work for about a month. After that, the transplant APN will tell you how often to do blood work.

Remember to leave 12 hours between your evening dose of anti-rejection medication and your morning blood work. Do not take your medications until after your blood work is done in the morning.

The Heart Institute lab is located on the second floor, near the clinics. It is better to use this lab for blood work but, if that is not possible, it can be done in a community lab. Talk to your transplant APN about which lab is the best to use.

### DIAGNOSTIC TESTS AFTER A HEART TRANSPLANT

Every year you will have the following tests completed for your clinic visits:

- Myoview
- Echocardiogram
- ECG and chest X-ray
- Blood work
- Angiogram (Your cardiologist will decide if you need to have this done.)

# THE IMMUNE RESPONSE

In your body there is a protective mechanism called the immune system. It is the body's defence against infection by foreign invaders such as bacteria and viruses. Through a series of steps called the immune response, the immune system attacks organisms and substances that can invade your body and cause disease. The immune system is made up of cells, tissues and organs. There are two kinds of immunity: innate and adaptive.

Innate immunity is the body's first line of defence and is provided by barriers like:

- Skin
- Tears
- Mucus
- Saliva
- Rapid inflammation of tissues

Adaptive immunity starts after the invader gets past the first line of defence.

Adaptive immunity:

- Is specific, tailoring each response to act on a particular invader
- Has a memory, allowing it to respond more quickly if the same type of invader attacks again
- Can recognize the difference between self and non-self

One of the immune system's functions is to tell the difference between self and non-self. Every cell in your body carries distinctive molecules that distinguish it as being a part of the self that is your body. Your immune system does not attack the cells that carry this "self" marker. The immune system lives peacefully with these cells.

Foreign materials carry "non-self" markers. The donor heart also carries these markers which your immune system will recognize as foreign. Once it is transplanted, an immune response will be triggered and your immune system will attack the donor heart. Immunosuppressive drugs "turn off" your immune response to the transplanted heart without seriously impairing your ability to fight infections. The most common immunosuppressive drugs are cyclosporine, Prograf®, prednisone, and CellCept®.

Your immune system will be most active right after your heart transplant. During that time, you will take higher doses of immunosuppressive drugs. As time goes on, your immune system will be less active and the doses of your medications will be altered. Because your immune system remembers foreign invaders, you will take these medications for the rest of your life.

## Acute Rejection

Even with the right care and medicines, you may still have at least one acute rejection episode. Acute rejection is most likely to happen within the first year after your transplant but can also occur years later. Most rejection episodes are mild and are usually treated successfully with medications while you are at home.

Rejection can occur without your knowing, and it is often found during your regular follow-up tests and routine clinic visits. This is why it is important for you to keep all of your appointments.

You should still be aware of the signs and symptoms of rejection and report them immediately. Treatment is more effective if rejection is caught early:

- Shortness of breath from mild exertion
- Progressive weight gain of about 2 pounds a day with ankle swelling
- Irregular or fast heartbeat
- Loss of energy and appetite
- Flu-like symptoms (fatigue, chills, nausea, aches, fever)

Rejection is an ongoing concern for transplant recipients, so it is extremely important for you to take your medications exactly as prescribed.

### **CARDIAC BIOPSY**

At present, cardiac biopsy is the only reliable means of diagnosing acute rejection. A biopsy can detect rejection before any permanent damage is done to your heart. The schedule for your biopsies will be as follows:

- Weekly for the first four weeks after transplantation
- Every two weeks for the second month
- Then at three months, six months, nine months, 12 months, 18 months and two years
- Two weeks after any acute rejection episode and treatment

Cardiac biopsies are done on an outpatient basis. If your biopsy is scheduled for a Tuesday, it will be in the afternoon. If it is scheduled for a Thursday, it will be in the late morning. You will be sent instructions for the procedure from the Transplant Office.

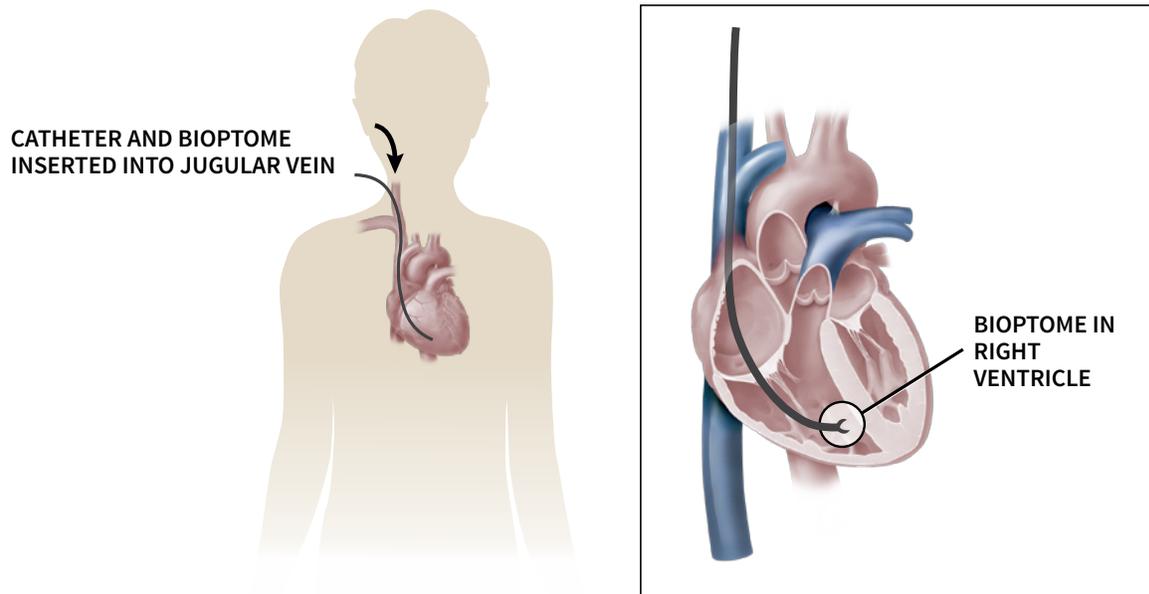
#### **Prior to your biopsy, it is important that you:**

- Have nothing to eat or drink for two hours beforehand
- Contact the Transplant Office for instructions if you are on a blood thinner called Coumadin
- Contact the Transplant Office for instructions if you are on diabetic medications
- Take all other regular medications as prescribed

#### **During the biopsy, you will:**

- Be in a special room with X-ray equipment
- Lie on a hard table and be connected to a heart monitor
- Have green drapes placed around your head, neck and chest
- Be given an injection in your neck to numb the area (this will be the only time you will feel discomfort)
- Have a catheter inserted into the jugular vein in your neck once your neck is fully anesthetized
- Have an instrument called a biptome inserted through this catheter into your heart. The biptome has small jaws on the end that open and close, allowing it to take small tissue samples of your heart. Four to five samples, about 2 millimeters in size, will be taken.

- Possibly feel a few extra beats of your heart. This is normal. You will also feel a slight tugging sensation, but it will not be painful.
- Have pressure and a bandage applied over the puncture site



The specimens are sent to the pathologist for examination, and a preliminary verbal report is given to the transplant APN within 24 hours of the procedure.

Complications from cardiac biopsy are very rare. If they do occur, it is during or immediately after the procedure. Therefore, it is important to report any:

- Chest pain
- Shortness of breath
- Fast or irregular heartbeat

You may be asked to sit in the waiting room for 15 minutes to one hour after the biopsy.

You may remove the bandage after 24 hours. Do not do any heavy lifting for 24 hours after the procedure.

Before you cough or sneeze put pressure on the puncture site with your hand. If the site starts to bleed, apply pressure for 10 minutes. If the bleeding does not stop, you should seek medical attention.

### RESULTS OF THE BIOPSY

The number of rejection cells found in the biopsy samples indicates the level, or grade, of rejection. The categories in the grading system include zero, mild, moderate and severe. The grade of rejection, along with other factors, helps to determine the treatment necessary.

The biopsy results are usually available late the next day. You will receive the results at your clinic appointment. If the biopsy indicates rejection that needs treatment, you will be contacted right away by the transplant APN with instructions. Most episodes can be treated safely with oral medication while you are at home.

The oral medication used to treat rejection is prednisone. You will be given high doses of prednisone for three days and then a reduced dose of 20 milligrams until your next biopsy. If you have diabetes, you should monitor your blood sugar more closely during this anti-rejection therapy and call the physician who takes care of your diabetes if your sugar increases.

Your cardiologist may choose to alter the other immunosuppression medications you are taking to better treat your rejection.

## Other Types of Rejection

### CHRONIC REJECTION

Another type of rejection is called chronic rejection. This occurs when the body slowly and continuously attacks the donor heart. Chronic rejection affects the vessels that supply blood to the heart muscle. Over many years, it will cause a narrowing of these vessels, decreasing the blood supply to the heart muscle and gradually reduce heart function.

Heart transplant patients usually do not get angina, but a small percentage can. If you notice chest pain, with activity or at rest, contact the transplant office. If you are more short of breath with activity but do not have any chest pain, contact the transplant office.

Evidence of chronic rejection may be determined by an angiogram, a cardiac CT scan or a myoview.

### ANTIBODY MEDIATED REJECTION

Antibody mediated rejection is caused by circulating antibodies in your blood. It can occur immediately after your heart transplant or years later.

The symptoms associated with this type of rejection are:

- Shortness of breath from mild exertion
- Progressive weight gain of about 2 pounds a day with ankle swelling
- Irregular or fast heartbeat
- Loss of energy and appetite
- Flu-like symptoms (fatigue, chills, nausea, aches, fever)

A biopsy and blood tests are used to identify this type of rejection.

# IMMUNOSUPPRESSIVE MEDICATIONS

For your body to accept your transplanted heart, it is necessary to suppress the function of your immune system. Doing this will allow your new heart to function properly. The immunosuppressive drugs you will be taking will leave your immune system active enough to fight infection.

The most commonly used drugs to suppress your immune system include Neoral® (cyclosporine), Prograf® (tacrolimus), CellCept® (mycophenolate) and prednisone.

The dosage of your medications will be determined by your transplant cardiologist and will be based on the results of blood tests, biopsies and other factors. Your transplant cardiologist should be the only person who changes the dosage of your medications.

Take all your medications exactly as directed. If you have any questions about your medications, check with the transplant APN, transplant cardiologist or your pharmacist.



## IMPORTANT

Never change your medication dosages on your own.

Notify your transplant physician or APN if you:

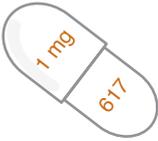
- Have severe or continued nausea, vomiting or diarrhea
- Are experiencing possible side effects or new symptoms from the medications
- Have been prescribed a new medication by a physician or dentist
- Choose to take over-the-counter medication, as some of these drugs may interact with your medications

You should know the names of your medications, how often you take them and what they are for.

It is important to obtain all written prescriptions for your medications at the time of your regularly scheduled appointments with your cardiologist. It is your responsibility to keep track of all remaining refills on your prescriptions and to avoid running out of your medication between appointments.

## Medications

### PROGRAF®/TACROLIMUS — A CALCINEURIN INHIBITOR (CNI)

| Prograf 0.5 mg                                                                    | Prograf 1 mg                                                                      | Prograf 5 mg                                                                        |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Yellow                                                                            | White                                                                             | Pink/red                                                                            |
|  |  |  |
| DIN #02243144                                                                     | DIN #02175991                                                                     | DIN #02175983                                                                       |

#### Purpose

Prograf blocks the action of immune cells that might cause your body to reject your transplanted heart (immunosuppressant). If you are prescribed this medication, you will take it for the rest of your life.

#### How to Take Prograf

It is important to take Prograf at the same time each day, every 12 hours. You can take Prograf with or without food. Do not crush or chew the capsules.

Your dosage of Prograf is determined by the level of the drug in your blood. It is important that you take your evening dose 12 hours before your morning blood test. For example, if you take your evening dose at 8:00 p.m., your blood work should be completed at 8:00 a.m. the next day, before you take your morning dose. This reading of your blood will let your cardiologist know whether to increase or decrease your dosage.

As time progresses, your dosage of Prograf will be changed. A higher dosage is required immediately after the transplant, but as time moves on, it will be decreased. Your Prograf will be adjusted according to your needs by your transplant cardiologist.

#### Side Effects

The following is a list of side effects, which you may or may not experience:

- Decreased resistance to infection
- High blood pressure
- Dizziness, headaches, poor sleep, tremors, seizures
- Ringing in the ears
- Numbness and tingling around the mouth; flushing
- Increased blood sugar levels
- High blood potassium levels
- Constipation, diarrhea, nausea, vomiting, gas, cramps, increased appetite
- Anemia (low blood iron level), increased bruising
- Pins and needles in the hands and feet; increased sensitivity to touch

- Leg cramps, muscle pain, joint pain
- Osteoporosis
- Abnormal kidney function
- Needing to urinate at night, more frequent urination in general
- Unusual dreams, elevated mood or mood fluctuations
- Acne, hair loss, increased sweating, increased risk of skin cancer

### **Storage**

Store your Prograf at room temperature of 15°C to 30°C. Keep your medications away from heat, moisture and direct sunlight, and always keep Prograf out of the reach of small children.

### **Missed Doses**

It is very important that you not miss any doses. If you do miss a dose, take it if it is within two or three hours of the scheduled time. Otherwise, skip the missed dose and go back to your regular schedule.

Do not take two doses at the same time or use any extra medicine to make up a missed dose. If you have a stomach flu and are vomiting, call the transplant APN for advice.

### **Warnings**

- This medicine may cause high blood pressure. Get a blood pressure monitor so that you can check your blood pressure on a regular basis at home.
- Never stop this medication on your own.
- Never allow yourself to run out of Prograf.
- Prograf will make you more sensitive to the sun. You should wear a sunscreen with an SPF of 25 or greater.
- Pregnancy is not recommended when taking this medication. Studies in animals have shown harm to the fetus. No information about how the drug affects a human fetus is available.

### **Foods, Beverages and Supplements to Avoid**

- Grapefruit juice may increase the levels of Prograf in your blood and its toxic effects on your body
- High fat foods will decrease blood Prograf levels
- St. John's wort will decrease the amount of Prograf in your system.
- Avoid cat's claw and echinacea; these will stimulate your immune system.

### **Drug Interactions**

There are many prescription and non-prescription medications that can interact with Prograf, affecting the way the drug works in your body. Make sure your pharmacist knows you are taking Prograf. Call your cardiologist or the transplant APN to find out whether new medications are safe to take with Prograf.

### **Some Important Points**

- Antacids can affect the absorption of Prograf and should be taken at least two hours before or

four hours after Prograf.

- Avoid anti-inflammatory medications, such as ibuprofen (Advil®, Motrin®), Indocin®, Naprosyn® and Diclofenac®
- Avoid the antibiotic erythromycin and any other antibiotics in the same drug family.

### NEORAL®/CYCLOSPORINE – A CALCINEURIN INHIBITOR (CNI)

| Neoral 25 mg                                                                      | Neoral 100 mg                                                                      |
|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
| Grey                                                                              | Grey                                                                               |
|  |  |

#### Purpose

Cyclosporine works by inhibiting the action of blood cells that might cause the rejection of your transplanted heart (immunosuppressant). If you are prescribed this medication, you will be on it for the rest of your life.

#### How to Take Cyclosporine

It is important that you take cyclosporine at the same time each day, every 12 hours. You can take cyclosporine with or without food. Do not crush or chew the capsules.

If you take liquid cyclosporine:

- Measure the dose using the syringe provided with the medication.
- Mix the medication in a glass container only.
- You can mix the drug with milk or juice to make it taste better. If you do, always mix it with the same beverage.
- Do not mix the drug with very cold or hot drinks.
- Stir well and drink it right away. Rinse your glass with more of the mixing beverage and drink what is left to make sure you get all of the remaining medication.

Your dosage of cyclosporine is determined by the level of the drug in your blood. It is important that you take your evening dose 12 hours before your morning blood test. For example, if you take your evening dose at 8:00 p.m., your blood work should be completed at 8:00 a.m. the next day, before you take your morning dose. This reading of your blood will let your cardiologist know whether to increase or decrease your dosage.

As time progresses, your dosage of cyclosporine will be changed. A higher dosage is required immediately after the transplant but, eventually, it will be decreased. Your cyclosporine will be adjusted according to your needs by your transplant cardiologist.

#### Side Effects

The following is a list of side effects, which you may or may not experience:

- Increased risk of infection

- High blood pressure
- Headaches
- Seizures
- Increased fatigue
- Increased hair growth
- Nausea, diarrhea, indigestion
- Swollen and inflamed gums
- Tremors; pins and needles in an arm or leg; muscle contractions; joint and muscle pain
- Increased blood sugar; increased cholesterol
- Abnormal kidney function
- Low blood iron level
- Acne, itchiness, oily skin, increased risk of skin cancer
- Night sweats
- Ringing in the ears

### **Storage**

Store your cyclosporine at controlled room temperature; do not refrigerate. Keep your medications away from heat, moisture and direct sunlight, and always keep cyclosporine away from small children.

Liquid cyclosporine should be used within two months after it has been opened. Keep this medicine in its original foil wrap. Do not store the capsules in your pill box or ask your pharmacist to put it in a blister pack with the rest of your pills.

### **Missed Doses**

It is very important that you not miss any doses. If you do miss a dose, take it if it is within two or three hours of the scheduled time. Otherwise, skip the missed dose and go back to your regular schedule.

Do not take two doses at the same time or use any extra medicine to make up a missed dose. If you have a stomach flu and are vomiting, call the transplant APN for advice.

### **Warnings**

- This medicine may cause high blood pressure. Get a blood pressure monitor so that you can check your blood pressure on a regular basis at home.
- Tell your cardiologist or the transplant APN if you have swollen gums. Brushing and flossing regularly will help you avoid gum problems. Massaging your gums is also helpful. You may need to see your dentist more frequently.
- Never stop this medication on your own.
- Never allow yourself to run out of cyclosporine.
- Cyclosporine will make you more sensitive to the sun. You should wear a sunscreen with an SPF of 25 or greater.
- Pregnancy is not recommended when taking this medication. Studies in animals have shown harm to the fetus. No information about how the drug affects a human fetus is available.

## **Foods, Beverages and Supplements to Avoid**

- Grapefruit juice may increase the levels of cyclosporine in your blood and its toxic effects on your body
- St. John's wort will decrease the amount of cyclosporine in your system.
- Avoid cat's claw and echinacea; these will stimulate your immune system.

## **Drug Interactions**

There are many prescription and non-prescription medications that can interact with cyclosporine, affecting the way the drug works in your body. Make sure your pharmacist knows you are taking cyclosporine. Call your cardiologist or the transplant APN to find out whether new medications are safe to take with cyclosporine.

## **Some Important Points**

- Antacids should be taken two hours before or four hours after cyclosporine.
- Avoid anti-inflammatory medications, such as ibuprofen (Advil®, Motrin®), Indocin® and Naprosyn®.
- Avoid the antibiotic erythromycin and any other antibiotics in the same drug family.

## **MEDICAL PHARMACY**

All Ontario heart transplant patients must obtain their prescriptions for Neoral cyclosporine at the Desjardins Pharmacy at the Civic Campus of The Ottawa Hospital. This medication is not available through community pharmacies. Although Neoral cyclosporine is paid for by the provincial government, a dispensing fee will be charged.

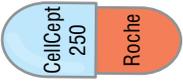
The Medical Pharmacy (613-761-4157), at the Civic Campus of The Ottawa Hospital, provides outpatient services Monday through Friday, 8:00 a.m. to 4:00 p.m. (with the exception of statutory holidays). The Desjardins Pharmacy requires 24 hours' notice to refill prescriptions.

Quebec residents can get their cyclosporine through community pharmacies.

If you are filling a prescription for cyclosporine in another province or country, make sure that you are given the Neoral brand of cyclosporine. There are different brands of cyclosporine. Each is absorbed differently by your body and will result in different blood cyclosporine levels. You can avoid this problem by making sure you always have enough Neoral cyclosporine with you.

All Ontario heart transplant patients must obtain their prescriptions for Neoral® cyclosporine at the Desjardins Pharmacy.

## CELLCEPT®/MYCOPHENOLATE MOFETIL

| CellCept 250 mg                                                                   | CellCept 500 mg                                                                    |
|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
| Orange and blue                                                                   | Pink                                                                               |
|  |  |
| DIN #02192748                                                                     | DIN #02237484                                                                      |

### Purpose

This medicine is used to prevent organ rejection by suppressing your body's immune system. It will be necessary for you to take this medication for the rest of your life.

### How to Take CellCept

CellCept is taken twice a day, once in the morning and once in the evening. It is best to take this medication on an empty stomach, but it may be taken with food. Do not break, crush or chew the tablets. Do not use a pill that is broken.

If you are taking liquid CellCept, measure the liquid dose with the syringe provided by the pharmacy. Do not use a regular household teaspoon to measure the medication. Ask your pharmacist for a medication syringe when you pick up your prescription.

When you are on this medication, your white blood cell count will be monitored. If your white blood cell count drops below 4, the dose of CellCept may be adjusted by your cardiologist. Do not stop or adjust the dosage of this medication unless your cardiologist or the transplant APN tells you to.

As time progresses, the dosage of your CellCept may be increased. This will depend on your white blood cell count and how well you tolerate the medication.

### Side Effects

The following is a list of side effects, which you may or may not experience:

- Increased risk of infection
- Nausea, vomiting, stomach pain, diarrhea, constipation
- Headaches, mild weakness
- High blood pressure
- Swelling in your hands or feet
- Numbness or tingling
- Anxiety, sleep problems, mood changes
- Easy bruising or bleeding
- Muscle and joint pain
- Increased risk of cancer
- Low blood iron level, low white blood cell count, low platelet count
- Increased cholesterol, increased blood sugar
- Abnormal kidney function

## **Storage**

Store your CellCept in its original container at room temperature and away from moisture, heat and direct sunlight. CellCept may be stored in a refrigerator, but do not freeze it. Always keep your medication away from small children.

If using liquid CellCept, throw away any unused medication that is more than 60 days old. Talk to your pharmacist about the proper disposal of your medication.

## **Missed Doses**

It is very important that you not miss any doses. If you do miss a dose, take it if it is within two or three hours of the scheduled time. Otherwise, skip the missed dose and go back to your regular schedule.

Do not take two doses at the same time or use any extra medicine to make up a missed dose. If you have a stomach flu and are vomiting, call the transplant APN for advice.

## **Warnings**

- Avoid inhaling or direct contact with the powder in the capsules or direct contact with the liquid.
- Do not use a pill that is broken. The medicine from the pill can be dangerous if it comes in contact with your eyes, mouth, nose or skin.
- If contact occurs, wash your skin thoroughly with soap and water; rinse your eyes with plain water.
- This medicine may cause high blood pressure. Get a blood pressure monitor so that you can check your blood pressure on a regular basis at home.
- Never stop this medication on your own.
- Never allow yourself to run out of CellCept.
- Pregnancy is not recommended when taking this medication. The use of CellCept during pregnancy is associated with increased risk of miscarriage and birth defects. Women of childbearing years must use contraception. It is recommended that you use two forms of birth control when taking CellCept.
- You should not donate blood while you are taking CellCept.

## **Foods, Beverages and Supplements to Avoid**

None

## **Drug Interactions with CellCept**

- Antacids will decrease the absorption of CellCept and should only be taken two hours before or four hours after CellCept.
- Magnesium supplements may decrease the absorption of CellCept and should be taken either two hours before or four hours after CellCept.
- Questran may decrease the absorption of CellCept.
- Acyclovir (Zovirax®), ganciclovir and valganciclovir can increase the concentrations of these drugs and of CellCept in your blood.

## MYFORTIC®/MYCOPHENOLATE SODIUM

| Myfortic 180 mg                                                                   | Myfortic 360 mg                                                                   |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|
|  |  |
| DIN #02264560                                                                     | DIN #02264579                                                                     |

### Purpose

This medicine is used to prevent organ rejection by suppressing your body's immune system. It will be necessary for you to take this medication for the rest of your life.

### How to Take Myfortic

Myfortic is taken twice a day, once in the morning and once in the evening. It is best to take this medication on an empty stomach, but it may be taken with food. Do not break, crush or chew the tablets. Do not use a pill that is broken.

When you are on this medication, your white blood cell count will be monitored. If your white blood cell count drops below 4, the dose of Myfortic may be adjusted by your cardiologist. Do not stop or adjust this medication unless your cardiologist or the transplant APN tells you to.

As time progresses, the dosage of your Myfortic may be increased. This will depend on your white blood cell count and how well you tolerate the medication.

### Side Effects

The following is a list of side effects, which you may or may not experience:

- Increased risk of infection
- Nausea, vomiting, stomach pain, diarrhea, constipation
- Insomnia, tremors, headaches
- Swelling in your hands or feet
- Elevated creatinine level
- High blood pressure
- Muscle and joint pain
- Increased risk of cancer
- Low blood iron level, low white blood cell count, low platelet count
- Increased cholesterol, increased blood sugar level
- Abnormal kidney function

### Storage

Store your Myfortic at room temperature and away from moisture, heat and direct sunlight. Always keep your medication away from small children.

## **Missed Doses**

It is very important that you not miss any doses. If you do miss a dose, take it if it is within two or three hours of the scheduled time. Otherwise, skip the missed dose and go back to your regular schedule.

Do not take two doses at the same time or use any extra medicine to make up a missed dose. If you have a stomach flu and are vomiting, call the transplant APN for advice.

## **Warnings**

- Do not use a pill that is broken. The medicine from the pill can be dangerous if it comes in contact with your eyes, mouth, nose or skin.
- This medicine may cause high blood pressure. Get a blood pressure monitor so that you can check your blood pressure on a regular basis at home.
- Never stop this medication on your own.
- Never allow yourself to run out of Myfortic.
- Pregnancy is not recommended when taking this medication. The use of Myfortic during pregnancy is associated with increased risk of miscarriage and birth defects. Women of childbearing years must use contraception. It is recommended that you use two forms of birth control when taking Myfortic.
- You should not donate blood while taking Myfortic.

## **Foods, Beverages and Supplements to Avoid**

None

## **Drug Interactions with Myfortic**

- Antacids, such as Maalox, will decrease the absorption of Myfortic and should only be taken two hours before or four hours after Myfortic.
- Cholestyramine may decrease the absorption of CellCept.

## **PREDNISONE**

### **Purpose**

Prednisone is prescribed in low doses to prevent organ rejection. It is prescribed in high doses to treat acute rejection.

### **How to Take Prednisone**

Prednisone is taken once a day. It is best to take the dose with food to prevent stomach upset. Prednisone is supplied in 5 mg tablets. When large doses are required, 50 mg tablets are available.

As time progresses, you may be weaned off prednisone. Do NOT stop or adjust the dosage of this medication unless instructed by the transplant APN or your cardiologist.

### **Side Effects**

The following is a list of side effects, which you may or may not experience:

- Increased risk of infection
- Poor sleep, nervousness
- Headaches
- Mood swings
- Increased appetite, indigestion
- Nausea, vomiting, abdominal distension, irritation of the lining of the stomach (ulcers)
- Hair growth, acne, skin bruising, fragile skin
- Increased blood sugar level (diabetes)
- Decreased potassium level, especially if on a diuretic
- Joint pain, muscle wasting
- Fluid retention, abnormally round face
- Weakening of the bones (osteoporosis)
- Delayed wound healing
- Cataracts

### **Storage**

Store your prednisone at room temperature and away from moisture, heat and direct sunlight. Always keep your medication away from small children.

### **Missed Doses**

It is very important that you not miss any doses. If you do miss a dose, take it as soon as possible, then go back to your regular dosing schedule. If you do not remember until the next day, skip the missed dose entirely.

Do not take two doses at the same time or use any extra medicine to make up the missed dose. If you have a stomach flu and are vomiting, call the transplant APN for advice.

## Warnings

- Do not alter the dosage of this medication unless instructed to do so by your cardiologist.
- Do not suddenly stop this medication. You must be gradually weaned off prednisone.
- If you have diabetes, monitor your blood sugar more frequently (especially with high doses of prednisone), and inform your diabetes doctor of any increases in your blood sugar level.
- If you are experiencing higher levels of anxiety and stress, inform your cardiologist.
- Annual eye exams are important when taking prednisone, because the drug may increase the risk of glaucoma and cataracts.
- This medicine may cause high blood pressure. Get a blood pressure monitor so that you can check your blood pressure on a regular basis at home.
- Take calcium and vitamin D supplements, because prednisone makes your bones fragile and more prone to fractures.
- Prednisone will make you more sensitive to the sun. You should wear a sunscreen with an SPF of 25 or greater.
- Tell your doctor that you are on prednisone before:
  - Any skin tests
  - Any kind of surgery or emergency treatment
  - Treatment for an injury

## Foods, Beverages and Supplements to Avoid

- Alcoholic beverages are not recommended. Alcohol irritates the stomach lining, as does prednisone, putting you at greater risk of developing ulcers.
- Prednisone interferes with calcium absorption. Because caffeine also affects calcium absorption, limit your caffeine intake.
- St. John's wort may decrease prednisone levels.
- Avoid cat's claw and echinacea; these will stimulate your immune system.

## Drug Interactions

- Antacids may decrease the absorption of prednisone and should be taken two hours before or after prednisone.
- Taking diuretics with prednisone may increase the loss of potassium from your body.
- Anti-inflammatory drugs—such as ibuprofen (Advil®, Motrin®), Indocin® and Naprosyn®—may increase the irritation of your stomach when combined with prednisone.
- The anticoagulation (blood-thinning) effects of Coumadin® may be increased with prednisone. It is important to monitor your international normalized ratio (INR).

## A Few Final Notes

- In the summer, wear a sunscreen with an SPF of 25 or greater, because these medications put you at greater risk of developing skin cancer.
- See a dermatologist if you have a suspicious spot on your skin.
- These medications put you at greater risk of infection. See Infection Prevention for the signs and symptoms of an infection and for what to do if you get an infection.

## Other Medications

The medications used to suppress your immune system have side effects that will have to be managed using other medications. These medications are described below.

### ENTERIC COATED ASPIRIN (ENTROPHEN®, NOVASEN®)

Aspirin is prescribed to help prevent the narrowing of the coronary arteries in the transplanted heart. You will take either 325 mg or 81 mg (a baby aspirin tablet) daily.

### NYSTATIN (MYCOSTATIN®)

Nystatin is prescribed to prevent yeast or thrush infections in your mouth. The usual dose of 5 ml is taken four times a day. Swish the medicine around in your mouth and hold it there for as long as possible, gargle and then swallow. You will be discharged from the hospital on this medication, and you will take it for a couple of months until you are on a lower dose of prednisone.

### ANTIHYPERTENSIVES (BLOOD PRESSURE MEDICATION)

It is not unusual to have a problem with high blood pressure after a transplant. Some of the drugs used to treat high blood pressure include:

- Calcium channel blockers, such as Norvasc® and Cardizem®
- ACE inhibitors, such as Coversyl®
- Diuretics, such as Lasix® and Dyazide®

It is helpful to have a blood pressure monitor at home, so that you can check your own blood pressure. The top blood pressure number, or systolic reading, should be around 130. A top number that is more than 140 would need to be treated. The bottom number, or diastolic reading, should be around 80. A number that is more than 95 would need to be treated.

Occasionally, your blood pressure can drop too low when it is treated. The following are possible symptoms of low blood pressure. Let your cardiologist or the transplant APN know if you experience the following after starting the medication:

- Fatigue, lack of energy
- Dizziness and light-headedness when standing up and moving around
- Fainting
- Blurred vision
- Poor concentration
- Nausea
- Cold, clammy, pale skin
- Unusual thirst

To minimize these symptoms, get up slowly, moving gradually from a lying position to a sitting position, and then to a standing position. This will decrease the sudden drop in blood pressure that you will experience if you go directly from lying to standing. If you are taking an ACE inhibitor for your blood pressure, try taking it at bedtime instead of in the morning. If these suggestions do not help decrease your symptoms, call the transplant APN or your cardiologist.

## CHOLESTEROL MEDICATIONS

This group of drugs is used in combination with dietary therapy and exercise to decrease the levels of cholesterol and other fats in your blood. Decreasing cholesterol and fat will help prevent the narrowing of the coronary arteries in the transplanted heart. Cholesterol medications include:

- Lovastatin (Mevacor®)
- Atorvastatin (Lipitor®)
- Pravastatin (Pravachol®)
- Rosuvastatin (Crestor®)
- Simvastatin (Zocor®)
- Ezetimibe (Ezetrol®)
- Fenofibrate (Lipidil Supra®)
- Gemfibrozil (Lopid®)
- Niacin (vitamin B3)

The goal is to have a total cholesterol level less than 4.0, an LDL (bad) cholesterol level less than 2.0, an HDL (good) cholesterol level greater than 1.0 and a triglyceride level less than 1.7.

## ANTIVIRAL MEDICATIONS

You may need to take an antiviral medication after your transplant, or you may need one later on as a result of a viral infection. It would be wise for you to belong to a drug plan, because these drugs can be expensive. These medications include:

- Valganciclovir (Valcyte®) (quote DIN #02245777 to determine if your drug plan covers this medication)
- Acyclovir (Zovirax®)
- Famciclovir (Famvir®)
- Valcyclovir (Valtrex®)

## MEDICATIONS FOR YOUR STOMACH

You will be prescribed a medication to protect your stomach right after your surgery. You may be taking something already and this may be continued. These medications include:

- Omeprazole (Losec®)
- Rabeprazole (Pariet®)
- Pantoprazole (Pantoloc®)
- Esomeprazole (Nexium®)
- Ranitidine (Zantac®)

# Medication Coverage

## PRIVATE PLANS

If you have a private drug plan, you should contact the company to find out how much the “co-pay” is that you will have to cover. For example, your plan may cover 80%, and you have to cover 20%. The hospital pharmacist or your pharmacist can review what your medications will cost you based on your coverage.

You should also find out the yearly limit that you have to pay before your plan will fully cover your medications. Some plans have a \$3,000 limit before they will cover your medications 100%.

## PROVINCIAL PLANS/ODSP

If your medications are covered by your province, you may need a “limited use” or LU number. These will be written on your prescriptions.

Sometimes a special request has to be made to the Ministry to cover certain medications. The transplant APN will take care of this, and the approval will be faxed to your pharmacy.

## GENERIC VERSUS BRAND NAME MEDICATIONS

Prior to changing any of your rejection medications from a “brand name medication” to a “generic medication,” the pharmacy should contact the Transplant Office.

# INFECTION PREVENTION

## General Information

The drugs that you take to prevent the rejection of your heart interfere with the body's ability to fight infection. You will be the most at risk of developing infections during the first six months after your transplant and when you need to be treated for rejection with increased doses of your medications.

Make sure you get enough rest, eat a well-balanced diet and exercise regularly. Maintaining a healthy lifestyle will boost your resistance to infections and help you fight any infections you do get.

You need to be able to balance safe practices with your daily routine. You do not need to live in a plastic bubble. Most germs are acquired either through direct contact—usually with your hands—or by breathing them in (inhalation).

## PREVENTION OF INFECTION SPREAD THROUGH DIRECT CONTACT

Wash your hands (even when gloves are used) with an antimicrobial soap and water:

- Before preparing food and before eating
- Before and after touching wounds—your own or someone else's
- Before touching mucous membranes (e.g., rubbing your eyes or touching the inside of your mouth)
- After touching pets and animals
- After gardening or touching plants or soil
- After changing diapers
- After touching secretions (e.g., saliva) and excretions (e.g., urine)
- After touching items that have been in contact with human or animal feces (e.g., bedpans, bedding, toilets, litter boxes)

Wash cutting boards, dishes, counters, utensils and hands with hot soapy water after contact with raw meat, poultry, seafood, or unwashed fruits or vegetables.

## PREVENTION OF RESPIRATORY INFECTIONS (INFECTION OF THE AIRWAY)

Most respiratory infections are spread through direct contact or inhalation. The following can help reduce your chances of getting a respiratory infection:

### Preventing infection from other people:

- Wash your hands frequently and thoroughly, especially before touching mucous membranes.
- Avoid close contact with anyone who has a cold. If this is impossible, people that are sick should wear surgical masks when near you.
- For the first three to six months after the transplant, avoid crowded places where close contact with sick individuals is possible, such as shopping malls, public transportation and elevators.
- Avoid children who have recently been immunized.
- Avoid tobacco smoke. Smoking and second-hand smoke put you at risk of developing bacterial and viral infections.

- Avoid exposure to people with known active tuberculosis.
- Avoid activities or occupations where exposure to tuberculosis is more likely, such as in prisons, jails, homeless shelters and certain health care settings. Decisions about continuing to work in these environments should be discussed with your cardiologist.

### **Preventing exposure to mould and fungus**

- Do not smoke marijuana. This will expose you to mould spores (*Aspergillus*).
- Avoid construction sites, excavation sites and other dusty environments, because there may be a high concentration of mould spores (*Aspergillus*) in these areas.
- Avoid contact with soil, fertilizer or decaying vegetation (compost heaps), which can harbour mould. Gardening and farming are not recommended for the first year after the transplant, but if this is not possible, masks should be worn.
- Avoid areas such as chicken coops, silos and caves where bird droppings can be found. Fungal spores (*Cryptococcus*, *Histoplasma*, *Coccidioides*) can be spread through bird excrement. Masks should be worn if these areas cannot be avoided.

### **WATER SAFETY**

- If there is a “boil water” advisory in your community, make sure you boil the water for at least one minute. Personal-use filters and/or bottled water may be used instead of boiling your water. Make sure the filter and bottled water are of good quality.
- Avoid water from private and public wells that are not tested regularly for bacteria.
- Do not drink water from a lake or river.
- Avoid swimming in water that is likely to be contaminated with human waste, and avoid swallowing water during swimming.

### **FOOD SAFETY**

- Avoid drinking unpasteurized beverages and eating foods made with unpasteurized milk.
- Do not eat raw or undercooked eggs, including foods containing raw eggs.
- Avoid eating raw or undercooked meat, poultry and fish.
- Avoid all raw or undercooked seafood, and raw seed sprouts.
- Avoid cross-contamination when preparing food. Keep cooked and raw foods separate; use cleaned or separate cutting boards.
- Avoid soft cheeses (feta, Brie, Camembert) and cheese made with unpasteurized milk.
- Fruits and vegetables should be washed well; salad bars are best avoided.
- Hot dogs and turkey franks should be thoroughly cooked.
- Leftovers should be reheated to steaming hot.
- Community picnics and buffet events are best avoided, as food is often left at room temperature for too long.
- For more information on food safety for people with a weakened immune system, please visit <https://www.canada.ca/en/health-canada/services/food-safety-vulnerable-populations/food-safety-people-with-weakened-immune-system.html>

## ANIMAL CONTACT AND PET SAFETY

- Avoid contact with animals that have diarrhea.
- Be careful about what your pet eats and drinks. Do not allow your pet to eat raw meat, garbage or another animal's stool, or to drink water from the toilet bowl.
- Wash your hands carefully after handling pets.
- Avoid cleaning birdcages, litter boxes and animal feces. If this is not possible, disposable gloves and a standard surgical mask should be worn. Cat litter should be changed daily.
- Avoid contact with stray animals; you could get scratched or bitten.
- Avoid animal scratches.
- Avoid contact with reptiles, chicks or ducklings.
- Wear gloves to clean an aquarium.
- Avoid acquiring pets, especially cats that are younger than one year of age.
- Do not let your pet lick your mouth or any open cuts or wounds.
- Avoid exotic pets, such as monkeys and ferrets, and wild animals, such as raccoons, bats and skunks.
- Avoid mosquito bites. Using insect repellent and staying indoors at dawn and dusk can help prevent exposure to the West Nile virus during the mosquito season.
- Cover sandboxes.

## SAFE SEXUAL PRACTICES

When not in a long-term monogamous relationship, always use latex condoms during sexual contact to avoid exposure to sexually transmitted diseases. Avoid exposure to feces during sexual activity.

## TRAVEL SAFETY

Get expert travel advice, including a review of your vaccination status, before you travel to tropical or developing countries. A travel medical consultation should be completed four to six weeks prior to your vacation. Review with the travel medical consultant which vaccines are safe for transplant patients.

### **The following travel clinic is recommended:**

- Tropical Medicine and International Health Clinic, The Ottawa Hospital, General Campus
  - Dr. Anne McCarthy, 613-737-8856

### **While travelling in developing countries, you should:**

- Avoid tap water as well as ice and beverages made with tap water.
- Avoid fresh fruit juices.
- Drink only bottled water or canned beverages.
- Eat only fruits and vegetables that can be peeled.
- Eat steaming hot foods.
- Follow the warnings found in the “Food Safety” section.

Finally, be flexible when planning your travel. By making small changes to your itinerary, you may be able to lower your risk of developing certain infections. Wherever you go, make sure you have travel insurance.

## **WEBSITES WITH TRAVEL INFORMATION**

### **Public Health Agency of Canada**

- [www.phac-aspc.gc.ca/tmp-pmv/index-eng.php](http://www.phac-aspc.gc.ca/tmp-pmv/index-eng.php)

### **Centers for Disease Control and Prevention**

- [wwwnc.cdc.gov/travel](http://wwwnc.cdc.gov/travel)

### **Travel Health Online**

- [www.tripprep.com/scripts/main/default.asp](http://www.tripprep.com/scripts/main/default.asp)
  - Website registration required
  - Reviews required vaccines, travel clinic, travel advisories and other issues

## VACCINATIONS

You and your family should make sure that your vaccinations are up to date. Here are some helpful hints for vaccinations:

- Live vaccinations are not administered to transplant patients. Examples include Sabin oral polio, measles, mumps, rubella, yellow fever and smallpox.
- The inhaled influenza vaccine is a live vaccine and should not be administered to transplant recipients or their family members.
- Discuss the timing of vaccinations after the heart transplant with your cardiologist. The general rule is that vaccinations can resume one year following transplant surgery.
- Sometimes vaccinations given after a transplant do not last as long. The levels (titres) of some vaccines in your blood can be monitored to determine whether they are still high enough.
- Pneumovax, for pneumonia, should be repeated regularly (every three to five years) after transplantation.
- Travel vaccines should be reviewed with your cardiologist or travel medical consultant.

### Vaccinations that are safe and recommended after a transplant:

| VACCINE TYPE    | RECOMMENDED AFTER TRANSPLANT?                                                                                             | MONITOR VACCINE TITRES/LEVELS? |
|-----------------|---------------------------------------------------------------------------------------------------------------------------|--------------------------------|
| Influenza       | Yes                                                                                                                       | No                             |
| Hepatitis B     | Yes                                                                                                                       | Yes                            |
| Hepatitis A     | Yes                                                                                                                       | Yes                            |
| Tetanus         | Yes                                                                                                                       | No                             |
| S. pneumoniae   | Yes. This should be administered before transplantation and repeated every three to five years after initial vaccination. | Yes                            |
| N. meningitidis | Yes. Recommended only for first-year postsecondary students, members of the military or travellers to high-risk areas.    | No                             |
| Rabies          | Yes. Recommended only for exposure or potential exposure resulting from occupation or hobby.                              | No                             |

## Signs and Symptoms of Infection

It is important for you to be able to recognize the signs and symptoms of an infection and to report these as soon as possible to your family physician, cardiologist or transplant APN. The earlier the treatment, the better the outcome will be. Call the transplant APN if you are unsure about your condition and what you should do.

The signs and symptoms of common sites of infections, along with the actions to take, are described in the following table.

| SITES AND CONDITIONS | SIGNS AND SYMPTOMS                                                                                                                                                                                                                                                                                                                                                                                            | ACTIONS                                                                                                                                                                                                                                                                                                                   |
|----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Lungs                | <ul style="list-style-type: none"> <li>• Fever above 38°C with or without chills</li> <li>• Persistent cough</li> <li>• Sputum that is brownish, yellow or green</li> <li>• Chest pain that is aggravated by a cough or deep intake of breath</li> <li>• Shortness of breath</li> <li>• Faster pulse rate</li> <li>• Aches and pains, increased tiredness</li> <li>• Headaches, decreased appetite</li> </ul> | <ul style="list-style-type: none"> <li>• See your family physician</li> <li>• If you are prescribed an antibiotic, check for interactions between the antibiotic and your medication with your pharmacist.</li> <li>• If your pharmacist cannot give you an answer about interactions call the transplant APN.</li> </ul> |
| Sinuses              | <ul style="list-style-type: none"> <li>• Yellow or green mucous</li> <li>• Pain around your eyes and nose</li> <li>• Head pain when bending over</li> </ul>                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                           |

| SITES AND CONDITIONS | SIGNS AND SYMPTOMS                                                                                                                                                              | ACTIONS                                                                                                                                                                                                                                                                                                                                            |
|----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Skin                 | <ul style="list-style-type: none"> <li>• A cut or wound that is red, swollen and warm to the touch</li> <li>• A cut or wound that is draining yellow or green liquid</li> </ul> | <ul style="list-style-type: none"> <li>• Clean any cuts or wounds right away.</li> <li>• See your family physician if an infection is suspected.</li> <li>• Go to the nearest ER if you require stitches.</li> </ul>                                                                                                                               |
| Cold Sores (Mouth)   | <ul style="list-style-type: none"> <li>• Sores on your lips, in your mouth or in your throat</li> <li>• Discomfort when swallowing</li> </ul>                                   | <ul style="list-style-type: none"> <li>• Call the transplant APN or your cardiologist if you notice a cold sore or shingles. Antivirals are needed to treat this.</li> <li>• Antivirals do not interact with your medications, but the dose may need to be adjusted according to your kidney function. Check this with your pharmacist.</li> </ul> |
| Shingles             | <ul style="list-style-type: none"> <li>• A rash with fluid-filled blisters in a straight line on one side of the body, usually on the chest, but possibly anywhere</li> </ul>   | <ul style="list-style-type: none"> <li>• If you are prescribed an antibiotic, check for interactions between the antibiotic and your medication with your pharmacist.</li> <li>• If your pharmacist cannot give you an answer about interactions, call the transplant APN.</li> </ul>                                                              |

| SITES AND CONDITIONS               | SIGNS AND SYMPTOMS                                                                                                                                                                                       | ACTIONS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Stomach and Bowels                 | <ul style="list-style-type: none"> <li>• Diarrhea, nausea or vomiting</li> </ul>                                                                                                                         | <ul style="list-style-type: none"> <li>• Make sure you are able to take your medication and keep it down.</li> <li>• Take Gravol 30 minutes to one hour before your medications are due if you are experiencing nausea and vomiting.</li> <li>• Sip small amounts of fluid throughout the day.</li> <li>• Eat food that is easy on your stomach: bananas, apple sauce, tea biscuits and toast (BRAT diet).</li> <li>• If you are not able to take your medications or keep any fluids down, call the transplant APN or your family physician, or go to the nearest emergency department.</li> </ul> |
| Urinary Tract or Bladder Infection | <ul style="list-style-type: none"> <li>• Burning or stinging when urinating</li> <li>• Frequent urination with little output</li> <li>• Cloudy or foul-smelling urine</li> <li>• Bloody urine</li> </ul> | <ul style="list-style-type: none"> <li>• See your family physician.</li> <li>• If in doubt, call the transplant APN.</li> <li>• If your pharmacist cannot give you an answer about interactions, call the transplant APN.</li> <li>• If you are prescribed an antibiotic, check for interactions between the antibiotic and your medication with your pharmacist.</li> </ul>                                                                                                                                                                                                                        |
| Genital Herpes                     | <ul style="list-style-type: none"> <li>• Painful sores in the genital area</li> </ul>                                                                                                                    | <ul style="list-style-type: none"> <li>• Antivirals do not interact with your medications, but the dose may need to be adjusted according to your kidney function. Check this with your pharmacist.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                      |

# Cytomegalovirus

## ABOUT CYTOMEGALOVIRUS (CMV)

Cytomegalovirus is related to the herpes virus. Eighty to 90% of the adult population has CMV. Most people are infected by the time they are two years old or during their teen years.

Most individuals do not experience any symptoms. Some will have a mononucleosis-like illness. CMV does not cause serious illness or require treatment in the general population. The virus usually stays dormant in our bodies and can be there for many years without causing any problems.

While CMV is not a concern for the general population, it is a concern for a transplant recipient.

## WHAT ARE THE SYMPTOMS OF A CMV INFECTION?

If you notice any of these symptoms, please call your transplant APN right away:

- Fever
- New or increased malaise (general feeling of being unwell and often the first indication of the disease)
- Severe abdominal pain with or without nausea, vomiting and diarrhea
- Low white blood cell count

You can become susceptible to other infections as a result of an infection with the CMV virus.

## TREATMENT/PREVENTION

Based on your results and the donor's results for CMV, you may or may not be given the antiviral medication after your transplant. This medication is called valganciclovir. It is usually given for a number of months after your transplant. It is very expensive, so make sure your drug plan covers it. Once the medication is stopped, your blood will be checked frequently to ensure the virus is not active.

If you develop an infection with CMV, your treatment will depend on your symptoms. If your symptoms are severe, you may be admitted for intravenous treatment which can then be continued at home. After a couple of weeks, you will be switched to a pill.

The length of your treatment will depend on how well you respond to treatment. That is, did your symptoms go away quickly or did they take a long time to get better? Did the viral load of the virus in your blood drop quickly or did it take a long time to decrease?

You will need to do blood work to check the viral load in your blood frequently. You will be provided with the requisition to do this blood work. The transplant APN will review which blood lab you can use to complete this blood work.

# PHYSIOTHERAPY AND REHABILITATION

## Pre-transplant

In the pre-transplant phase, the physiotherapist will be involved in your care with the following goals in mind:

- Assessing your past and present level of function and exercise tolerance.
- Teaching you general principles of exercise and how to self-monitor your response to activity.
- Initiating, when possible, an individualized exercise program that will improve your flexibility, strength and endurance in preparation for your transplant. This may be started in hospital if you remain hospitalized as you wait for your transplant or given as a home program. We know that your exercise capacity is limited pre-transplant, but staying active before transplantation will help with your recovery after surgery.
- Reviewing the post-operative physiotherapy routine and explaining the role of physiotherapy in that phase.

## Post-transplant

In the post-transplant phase, the physiotherapist will first start to work with you in the intensive care area. The main goals of physiotherapy post-transplant are:

- Assisting you in keeping your lungs clear and well expanded. You will be taught to perform deep breathing and coughing exercises. If required, the physiotherapist will use hands-on techniques to assist you with secretion clearance.
- Helping you improve your strength and flexibility. You will be shown specific arm and leg exercises similar to those done in the pre-transplant phase.
- Helping you improve your endurance. This will begin with daily walks that will progressively become longer as your condition improves. Once your program is determined, the nurses will also assist you with your walks. When you are steady on your feet and your condition is stable, you will be expected to do some of the exercise sessions on your own while in hospital. This will help to improve your confidence in exercising independently.
- Reviewing general exercise principles, as they apply to transplant recipients, and the self-monitoring tools introduced in the pre-operative phase.
- Preparing you for discharge. Your physiotherapist will give you a home exercise program and talk to you about cardiac rehabilitation program options.

## Outpatient Cardiac Rehabilitation

It is vital after transplantation that you continue leading a heart-healthy lifestyle. Cardiac rehabilitation programs can help you manage risk factors such as high blood sugar, high blood pressure, elevated cholesterol, weight gain, inactivity and stress.

Cardiac rehabilitation programs usually include specific information and assistance with physical activity, nutrition, stress management, return-to-work counselling and other social and emotional health services to help you develop a plan that is specific to your needs. There is assistance to help you to remain smoke-free, if you need it.

At the University of Ottawa Heart Institute, there are two program options. The primary, on-site program is for participants who are able to come to the Heart Institute twice a week to exercise as part of a group. The case-managed home program is for participants who prefer to exercise at home and receive weekly guidance and answers to questions by phone. No matter which option you choose, you will be encouraged to demonstrate commitment and to set goals and priorities for the lifestyle changes you wish to make.

If you live too far away to use the rehabilitation services of the Heart Institute, your physiotherapist will endeavour to find a cardiac rehabilitation program near you and assist you with the referral process.

## Exercise Guidelines Pre- and Post-Transplant

### EXERCISE COMPONENTS

Once assessed by the physiotherapist, you will be performing various exercises included in the following sections of the Transplant Guide. Your physiotherapist will help you determine which exercises you may start. Your program will progress to include all of the components outlined below. In the pre-transplant phase, only a partial program may be possible.

1. **Warm-up:** General exercises involving lying/sitting/standing, range of movement and strengthening
2. **Aerobic training (peak activity):** Walking, stationary bike, treadmill, light weights
3. **Cool-down:** Slower activity and stretching

Each of the above components is important to any exercise program. The warm-up and cool-down components allow your heart and limbs to adjust to the more strenuous peak activity you perform.

During the warm-up and the cool-down, your heart receives messages from nerves that cause the heart rate to speed up or slow down. A transplanted heart, however, behaves differently. Your new heart relies on special chemicals in your bloodstream called catecholamines. These chemicals allow your heart to respond to exercise, only more slowly than before. For this reason, the warm-up and cool-down components of your exercise program are even more important after transplantation.

# Self-monitoring

You will be taught to use three methods of monitoring your exercise response. You will also be given a log sheet to use as a daily record of your progress.

## 1. Dyspnea Index

The Dyspnea Index measures of shortness of breath by counting out loud from 1 to 15 in eight seconds. The goal is to stay at level 2 or better:

**Level 0:** Can count to 15 without taking a breath in the middle of the sequence

**Level 1:** Must take 1 breath in the middle of the sequence

**Level 2:** Must take 2 breaths

**Level 3:** Must take 3 breaths

**Level 4:** Must take 4 breaths

## 2. Rating of Perceived Exertion (RPE) Scale

This is a numeric scale used to describe the level of effort required to perform a task, activity or exercise. The number you choose should reflect your overall level of effort and fatigue (exertion). There is no right or wrong answer.

For exercise, your rating should be between 12 and 15 on the scale (a moderate to hard exertion).

| Rating of Perceived Exertion (RPE) Scale |                  |
|------------------------------------------|------------------|
| 6                                        | Nothing at all   |
| 7-8                                      | Extremely light  |
| 9                                        | Very light       |
| 10                                       |                  |
| 11                                       | Light            |
| 12                                       |                  |
| 13                                       | Somewhat hard    |
| 14                                       |                  |
| 15                                       | Hard (heavy)     |
| 16                                       |                  |
| 17                                       | Very hard        |
| 18                                       |                  |
| 19                                       | Extremely hard   |
| 20                                       | Maximal exertion |



### 3. Pulse Measurement

- **When:** Take your pulse at rest, during or immediately after peak exercise and at the end of cool-down.
- **Where:** May be taken at the radial artery (palm side and thumb side of your wrist) or at the carotid artery (side of your neck in front of the muscle that runs between the back of your ear and the front of your chest).
- **How:** Count the number of beats you feel in 10 seconds and multiply by six. You must begin counting with zero instead of one. This will tell you the number of times your heart beats in one minute. This is known as your heart rate or pulse.
- **Why:** The guideline to follow, especially when first starting an exercise program post-transplantation, is to limit yourself to 20 to 30 beats over your resting heart rate. This range provides you with a safe limit for exercising your heart and getting a training effect.

Remember, it is important that you feel comfortable during exercise. If you feel light-headed or dizzy, have nausea caused by exercise, have chest pain or new leg pain or have excessive fatigue or shortness of breath, you should stop exercising, rest and contact your health care team before resuming exercise.

### Helpful Physical Activity Tips

**Eating:** It is best to wait an hour after a meal before you exercise. This is because extra energy is required for digestion.

**Pace and intensity:** Exercise at a level that allows you to maintain light conversation during the activity.

**Terrain:** Walk on flat ground initially. If you cannot avoid hills, walk more slowly when going uphill.

**Weather:** Avoid exercising in extreme temperatures. If it is very hot and humid, walk earlier in the morning and later in the evening. If it is extremely cold and windy, it may be best to exercise indoors or during the middle of the day.

**Progression:** If you miss a day of exercise, resume your program at the same level the next day instead of increasing your activity level. If you miss two or more days, reduce the amount of exercise for the next session. If you have been ill, it is best to contact your health care team before resuming your exercise program.

## Home Exercise Program Pre-transplant

If you are sent home to wait for your transplant, you may be able to start a limited exercise program. Your physiotherapist will let you know what would be appropriate to start with at home. It is understood, however, that your condition may change while you wait and your exercise program may have to be adjusted accordingly or even halted. This is why it is important to self-monitor your response to exercise or activity.

### WARM-UP:

### AEROBIC EXERCISE:

### COOL-DOWN:



If you have any questions about your exercise program pre-transplant, please call the number below and leave a message for your physiotherapist.

613-696-7000, ext. 13102

Physiotherapist: \_\_\_\_\_



## Home Exercise Program Post-transplant

Please refer to the exercise guidelines in the pre-transplant phase for further details.

Once you are home, you are expected to continue performing exercise on a daily basis. It is important that you continue to include a warm-up, aerobic training and a cool-down. The physiotherapist has developed a physical activity program for you to complete during your first few weeks at home. This program will progress when you start cardiac rehabilitation according to your abilities and personal activity goals.

### WARM-UP:

### AEROBIC EXERCISE:

### COOL-DOWN:



If you have any questions about your exercise program post-transplant, please call the number below and leave a message for your physiotherapist.

613-696-7000, ext. 13102

Physiotherapist: \_\_\_\_\_

# Physical Activity Log Post-transplant

Target Heart Rate Range: 20 to 30 beats above resting heart rate

| Comments   Symptoms |                     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|---------------------|---------------------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
|                     |                     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Afternoon Exercise  | HR Post             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                     | Cool-down           |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                     | Duration / Distance |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                     | HR During           |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                     | RPE                 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                     | Dyspnea Index       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                     | Warm-up             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Morning Exercise    | HR Pre              |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                     | HR Post             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                     | Cool-down           |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                     | Duration / Distance |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                     | HR During           |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                     | RPE                 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                     | Dyspnea Index       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Date                | Warm-up             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                     | HR Pre              |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

## Sitting Exercises

### Deep Breathing

Place hands on stomach and take a deep breath. Feel hands move out.

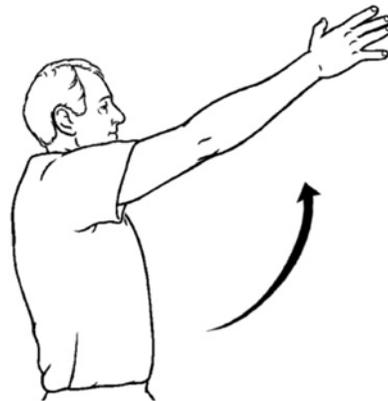
Exhale fully and feel hands move in.  
Repeat deep breaths \_\_\_\_ times.



### Shoulder Flexion

Lift one arm straight up and over your head as far as possible while you inhale.

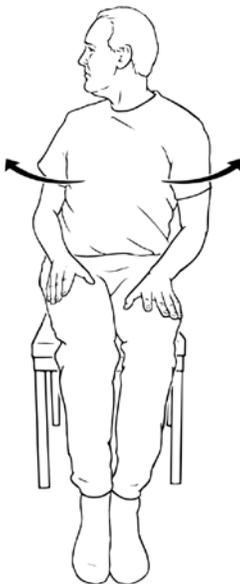
Return arm to your side as you exhale.  
Repeat \_\_\_\_ times with each arm.



### Trunk Rotations

With feet flat, turn upper body as far as possible toward one side. Hold for three seconds. Return to starting position.

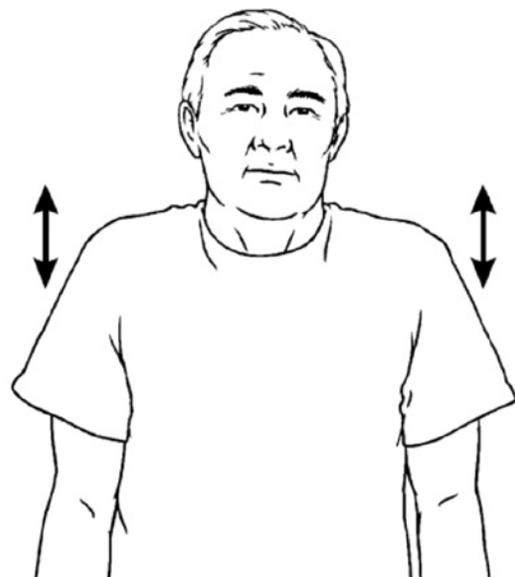
Repeat \_\_\_\_ times to each side.



### Shoulder Exercise

Lift both shoulders up as high as you can, and let them relax down.

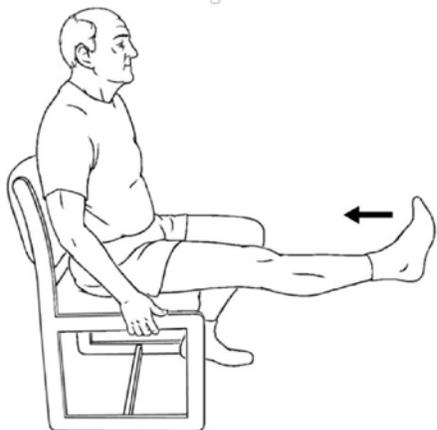
Repeat \_\_\_\_ times.



## Ankle Exercise

Sit with your back straight and hands in your lap or at your sides. Straighten one knee, pulling your toes towards you. You will feel pulling in your calf, and the muscles in your thigh will tighten. Move your ankle back and forth 3 times then lower your leg slowly.

Repeat \_\_\_\_\_ times with each leg.



## Knee Raise

Raise knee up toward your chest, and then lower it to the starting position. Repeat with other knee. Keep alternating right and left.

Repeat \_\_\_\_\_ times.



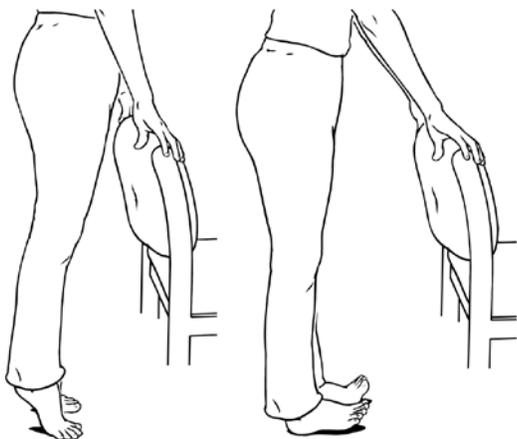
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## Standing Exercises

### Toe Raises

Gently rise up on toes, then roll back on heels.

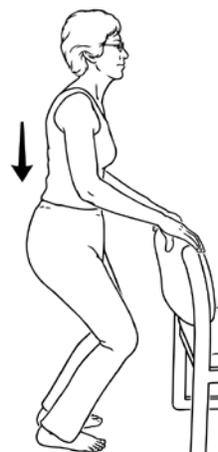
Repeat \_\_\_\_ times.



### Mini Squat

Holding a stable surface for balance, slowly bend knees. Keep both feet on the floor.

Repeat \_\_\_\_ times



### Hip Abduction

Holding a stable surface, move one leg straight out to your side. Return to starting position. Keep back straight and avoid leaning over when bringing your leg out.

Repeat \_\_\_\_ times with each leg.



### Trunk Rotation

With hands on hips and feet slightly apart, turn your upper body as far as possible toward one side. Hold for three seconds.

Return to starting position.

Repeat \_\_\_\_ times to each side.



### Hip/Knee Flexion

Holding a stable surface, raise knee to hip level, then lower knee.

Repeat \_\_\_\_ times with each leg.



### Trunk Lateral Flexion

Stand with feet shoulder width apart, knees soft. Slide arm down side of body toward your knee. Hold for three seconds.

Return to starting position.

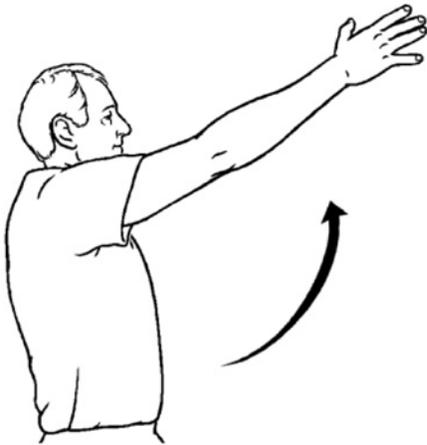
Repeat \_\_\_\_ times to each side



## Shoulder Flexion

Place arms at your sides. Slowly raise one arm straight up and over your head as far as possible while you inhale. Return arm to your side as you exhale.

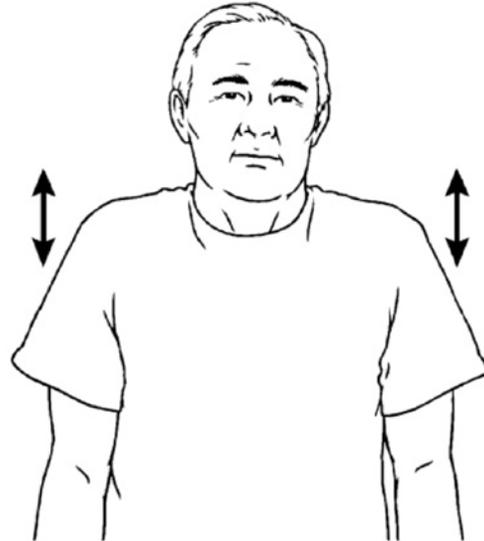
Repeat \_\_\_\_ times with each arm.



## Shoulder Exercise

Lift both shoulders up as high as you can, and let them relax down.

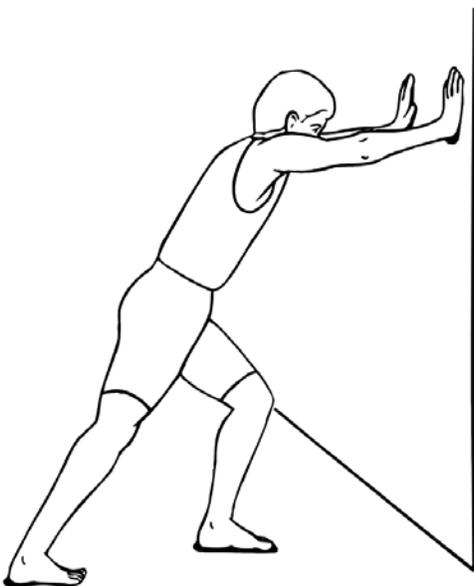
Repeat \_\_\_\_ times.



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## Lower Leg Stretching Exercises

After you walk, we recommend that you stretch your legs. You may support yourself on the wall, but do not put too much weight on your arms.



Keeping back leg straight with heel on floor and toes pointing forward, lean into wall until a stretch is felt in calf.

Hold \_\_\_\_ seconds.

Repeat with other leg.

Repeat \_\_\_\_ times.

Do \_\_\_\_ sessions per day.

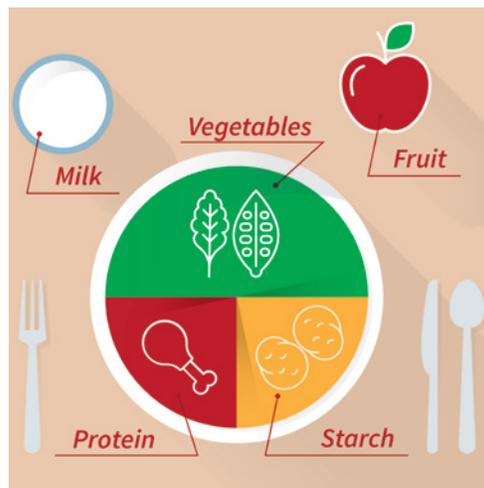
# NUTRITION AFTER YOUR HEART TRANSPLANT

Living a healthy lifestyle is important after your transplant. Making healthy food choices doesn't have to be overwhelming. These tips will get you on your way.

## HOW WHAT YOU EAT AFFECTS YOUR HEART

The food that you eat affects many of the important risk factors associated with heart disease, for example:

- Your blood cholesterol
- Your blood pressure
- Your glucose levels if you have diabetes
- Your risk for another event



## TOP 10 TIPS FOR HEALTHY EATING

Making healthy food choices doesn't have to be overwhelming. These tips will get you on your way.

- 1. Cook at home more often.** Cooking at home makes it easier to avoid processed foods. It can be as simple as scrambled eggs, whole grain toast, tomato and cucumber slices.
- 2. How you eat is as important as what you eat.** Enjoy mealtimes and the food you eat! Don't multitask. Avoid distractions like your computer or TV while you eat. Sit down and enjoy a meal at the table. If you live with others, make family dinner a priority.
- 3. Listen to your body.** Eat when you're hungry and stop when you feel satisfied.
- 4. Eat at regular times.** Eat breakfast within 1 to 2 hours after waking up. Don't wait too long between your meals. It's harder to make healthy choices when you're hungry.
- 5. Plan healthy snacks.** Try whole grain crackers and peanut butter or hummus, a piece of fruit and a few unsalted nuts, or frozen berries and plain yogurt.
- 6. Eat a variety of vegetables and fruit at every meal.** Enjoy brightly coloured whole vegetables and fruit. Fresh or frozen, try them in different ways—raw, roasted, or sautéed.
- 7. Eat whole grains more often.** Switch to brown rice, whole wheat pasta, dark rye bread or oatmeal. Try something new in your soup, salad or casserole like quinoa, bulgur or barley.
- 8. Eat fish at least twice a week.** Trout, salmon, tuna and sardines are some tasty options. Try fresh frozen or canned.
- 9. Include legumes like beans, chickpeas, lentils, nuts and seeds more often.** Add them to salads, soups and grain dishes such as rice, quinoa or couscous. Legumes can replace meat in your meals. Try a vegetarian chili.
- 10. Don't be afraid of fat.** You need fat for good health and it adds flavour to your cooking. Use plant-based fats such as olive or canola oil.

## COOK AT HOME MORE OFTEN

### What is a home cooked meal?

- Meals cooked at home should include at least 3 food groups (Vegetables and fruit, Grain Products, Milk and alternatives, Meat and alternates.)
- Meals cooked at home don't need to be fancy or time consuming.
- Meals can be as simple as a peanut butter and banana sandwich and a glass of milk.
- Use whole, unprocessed foods.

### Why should I cook at home?

- Cooking at home gives you more control over what goes into your food.
- Cooking at home is cheaper than eating pre-made meals or at restaurants.
- Food cooked at home is lower in sodium (salt) fat and sugar.

### Tips to cook more at home

- Cook with your family and friends.
- Try new recipes.
- Cook large batches of soups, stews and casseroles on the weekend and freeze immediately for another day.
- Keep ingredients like canned fish, eggs, frozen vegetables and brown rice in your kitchen for fast easy meals.
- Plan ahead and make a weekly meal plan.

## HOW YOU EAT IS AS IMPORTANT AS WHAT YOU EAT

### How should I eat?

- Sit at the table to eat.
- Don't do other activities while eating.
- Turn off all screens including television, phones, tablets and computers.
- If you live with others take this opportunity to connect with friends and family.
- If you live alone set the table nicely and listen to music.

### Why should I eat at the table?

- Eating while doing other things means you pay less attention to what you eat and may end up eating faster and more food.
- By sitting at the table you will enjoy what you are eating. You will also be more aware of how much and what you are eating.
- Eating with others is a great opportunity to connect with friends and family.

### Tips to start eating at the table

- Start by eating at the table once or twice each week.
- If it's too difficult to eat supper together at the table, start with breakfast.
- At work eat lunch away from your desk.

## LISTEN TO YOUR BODY

### Why should I listen to my body?

- There is no one right way to eat.
- Don't diet. Think about making small changes.
- Choose foods which are nourishing and taste good.
- Eating is about more than just nutrients.
- Eating is social and should be enjoyable.

### How do I listen to my body?

- Listen to your body's cues.  
Eat when you feel hungry.
- Stop eating when you feel full.
- Enjoy the food that you are eating.
- Use all your senses when eating.

### Tips to listen to your body

- Turn off all distractions, such as the TV, computer or tablet.
- Don't rush. Eat slowly and taste the food you are eating.
- Pause during and after your meal to ask yourself how full you are.

## EAT AT REGULAR TIMES

### What are regular meals?

- Eat breakfast within one to two hours after waking up.
- Aim to eat every 4 to 6 hours after breakfast.
- Try not to skip meals.
- If you know it will be longer than 4 to 6 hours between meals plan a snack.

### Why should I eat regular meals?

- Skipping meals leaves you feeling extra hungry. By the time you get to the next meal you might eat too much.
- When you are very hungry it's hard to reach for healthy foods and to eat slowly.

### Tips to eat regular meals

- Start by including breakfast on a daily basis, if you have never eaten breakfast, start by aiming to eat it one or two days/week.
- Set an alarm to remind yourself to eat.
- At work book an appointment in your calendar to avoid interruption.
- Plan your meals in advance; they can be simple.

## PLAN HEALTHY SNACKS

### What is a healthy snack?

- A healthy snack should include at least two food groups (Vegetables and fruit, Grain Products, Milk and Alternates, Meat and Alternates.)
- Keep your serving sizes small.

### Why should I plan healthy snacks?

- Healthy snacking can help you feel full between meals.
- Healthy snacking can help you to keep your energy level up.
- Snack when you are hungry, not because you are bored or stressed.
- Snacking can make it easier to eat enough vegetables and fruits.

### Tips for healthy snacking

- Plan snacks ahead of time.
- Don't snack out of the container, portion it into a bowl.
- Don't eat while driving.
- Don't eat in front of the TV, while reading, while using your phone, computer or tablet.

## EAT A VARIETY OF VEGETABLES AND FRUIT AT EVERY MEAL

### Why should I eat more?

- Eating 7 servings of vegetables and fruit each day may help to reduce your risk of developing heart disease, diabetes, cancer and stroke.
- Eating enough vegetables and fruit can help reduce cholesterol and blood pressure.

### What is a serving of vegetables and fruit?

- A serving of most raw or cooked vegetables is ½ cup.
- A serving of most fruit is ½ cup or 1 small piece of fruit (size of a tennis ball).
- Choose whole vegetables and fruit more often instead of juice.

### Tips to include more vegetables and fruit

- Eat a vegetable or fruit at all meals.
- Have an apple, orange, banana, kiwi or melon for a snack.
- Keep raw, cut up vegetables in the fridge for snacking.
- Move your vegetables and fruit out of the crisper and onto a higher shelf
- Use fresh or frozen vegetables and fruit more often. If you buy canned make sure to look for No Added Salt canned vegetables.
- Roast vegetables and eat them leftover.

## EAT WHOLE GRAINS MORE OFTEN

### What are whole grains?

- Whole grains include the entire seed of the plant.
- Whole grains are higher in fibre, vitamins and minerals.
- They include oatmeal, bulgur, brown or wild rice, barley, quinoa and popcorn.

### Why should I eat more?

- Eating whole grains may help to reduce your risk of heart disease, diabetes, cancer and stroke.
- Oatmeal, barley and psyllium are high in soluble fibre which helps to reduce LDL (lousy) cholesterol.

### Tips to include more whole grains

- Use brown or wild rice instead of white rice.
- Have oatmeal for breakfast or snack a few times each week.
- Add quinoa or barley to salads.
- Use dark rye bread or whole grain bread instead of white bread.
- Use whole grain pasta instead of white (or try half and half).

## EAT FISH AT LEAST TWICE A WEEK

### What fish should I eat?

- Choose fatty fish more often.
- Try salmon, mackerel, pickerel, sardines or trout.
- Aim to eat fish at least twice each week.
- Seafood like oysters, mussels, shrimp, and lobster are also good choices.

### Why should I eat fish?

- Eating fish can help to lower your risk of having more heart problems.
- Fatty fish are high in omega-3 fats which may help to reduce your risk of heart disease.
- Fish is a good source of protein.

### Tips to eat more fish

- Use fresh, frozen or canned fish.
- Use canned salmon to make a sandwich.
- Add canned fish to salads.
- Bake frozen fish for a quick easy weeknight meal.
- Have sardines on toast or whole grain crackers.
- Add fresh or frozen fish to a curry.

## INCLUDE LEGUMES LIKE BEANS. CHICKPEAS. LENTILS. NUTS AND SEEDS MORE OFTEN

### What are legumes?

- Legumes include most beans like chickpeas, kidney beans, black beans and white beans.
- Nuts and seeds will give you many of the same benefits.
- Nuts and seeds make an excellent snack.

### Why should I eat more?

- Eating nuts, seeds, beans and lentils may help to reduce your risk of developing heart disease, diabetes and other chronic diseases.
- Nuts, seeds, beans and lentils may help to reduce your cholesterol and blood pressure.
- Aim to include them at least 4-5 times/week.

### Tips to include more nuts, seeds, bean and lentils

- Add chickpeas to a main course salad.
- Add kidney beans to chili.
- Eat one vegetarian meal once a week.
- Make bean salad and keep it in the fridge for lunches.
- Eat nuts as a snack.
- Add nuts or seeds to your salad.

## DON'T BE AFRAID OF FAT

### Why is fat important?

- Fats play an important role in your body.
- Fats give you energy, and some fatty acids that our bodies can't make.
- Fats are a part of cell walls, hormones and insulate our bodies
- Fats make food taste good and keep you full.

### Which fats should I eat more often?

- Choose unsaturated fats more often.
- Unsaturated fats come from plant sources including nuts, seeds, avocado.
- When cooking use olive oil, or canola oil, more often.
- Make your own salad dressing at home using olive oil or canola oil.
- Eat nuts and seeds as a snack.

### Which fats should I eat less often?

- Trans fats are found mainly in processed foods and cooking more at home will help you to avoid them.
- Choose saturated fats less often. Saturated fats come from animal based products such as red meat and dairy.
- Limit your intake of red meat to once or twice/week.
- Choose lower fat dairy more often.

## A WORD ABOUT SALT

It is recommended that you continue to follow a low-sodium diet of 2000 mg per day. Some points to help you keep your salt intake low include:

- Cook at home more often using fresh ingredients.
- Season your food with fresh or dried herbs, unsalted spices, lemon juice and flavored vinegars. Try premade seasoning blends, such as Mrs. Dash® or McCormick No Added Salt®.
- Avoid adding salt in cooking and at the table.
- Choose processed foods less often, such as deli meats, canned/packaged soups, pickles, soy sauce, salted snack foods, commercial meat coatings, frozen dinners, vegetable juices, canned vegetables and fast foods.
- Read nutrition labels, compare similar items and choose foods with less sodium.

## A WORD ABOUT ALCOHOL

Alcohol consumption should be eliminated or severely restricted after your transplant. Alcoholic drinks can increase the level of triglycerides in your blood. Even more important is the fact that alcohol can harm your liver's function. Cyclosporine and other medications are broken down in the liver. So, for your medications to work properly and safeguard your new heart from rejection, it is important that your liver be healthy and work well.

If you have a history of heavy drinking, you should not drink alcohol. Otherwise, an occasional drink is allowed on special occasions.

Limit alcohol to one serving. One serving equals 45 ml (1.5 oz.) of liquor, 355 ml (12 oz.) of beer or 150 ml (5 oz.) of wine.

Add club soda to wine for a wine spritzer or diet ginger ale to beer for a beer chaser.

## A WORD ABOUT VITAMIN D AND CALCIUM

Prednisone makes your bones fragile and more prone to fractures. The recommended daily intake for calcium is 1200 mg and 600 IU for vitamin D. If you are not a milk drinker, it is recommended that you take a supplement. Please ask your Transplant Advanced Practice Nurse for recommendations.

## A WORD ABOUT DIABETES

High blood glucose (sugar) levels are common after transplant, even if you have no history of hyperglycemia or diabetes because of medications and stress. You may require additional medications to manage your blood sugar. Following the suggestions already mentioned above will help to keep your blood glucose levels within the normal range. Below are some additional tips:

Keeping your blood glucose levels healthy:

- Take your medications as prescribed
- Learn about managing glucose by attending a diabetes education program
- Monitor and keep track of your blood glucose
- Target: blood glucose before meals between 4.0 and 7.0 mmol/L
- Target: blood glucose two hours after meals between 5.0 and 10.0 mmol/L
- Aim to make healthier food choices
- Be active every day and follow your Physical Activity Plan
- Visit to a diabetes specialist regularly

Additional meal planning tips:

- Eat regular meals. Aim to eat every four to six hours. Include a healthy snack if meals are more than four to six hours apart.
- Eat breakfast.
- Limit sugars and sweets such as sugar, regular soft drinks, fruit drinks, desserts, candies, jam, syrup and honey.
- If you are thirsty, drink water or sugar free drinks. Drinking regular soft drinks, sweetened drinks or fruit juices will raise your blood sugar level.

To locate a Community Diabetes Education Program nearest you, contact:

- Champlain Diabetes Regional Coordination Centre (DRCC): [www.champlindrcc.ca](http://www.champlindrcc.ca) (Ottawa and surrounding area)
- Diabète Québec: [www.diabete.qc.ca](http://www.diabete.qc.ca) (province of Quebec)
- Diabetes Ontario: [www.diabetesontario.org](http://www.diabetesontario.org)
- Diabetes Canada: 1-800-BANTING (226-8464) or [diabetes.ca](http://diabetes.ca)

## **WEBSITES ON NUTRITION**

- Dietitians of Canada: [www.dietitians.ca](http://www.dietitians.ca)
- Heart and Stroke Foundation: [www.heartandstroke.ca](http://www.heartandstroke.ca)
- Health Canada: [www.hc-sc.gc.ca](http://www.hc-sc.gc.ca)
- Diabetes Canada: [www.diabetes.ca](http://www.diabetes.ca)
- American Heart Association: [www.americanheart.org](http://www.americanheart.org)
- Unlock Food: <http://www.unlockfood.ca>
- Obesity Canada: <https://obesitycanada.ca/>
- Ottawa Public Health: <http://www.ottawapublichealth.ca>
- Health Canada: Food Safety for People with a Weakened Immune System: <https://www.canada.ca/en/health-canada/services/food-safety-vulnerable-populations/food-safety-people-with-weakened-immune-system.html>

## **WEBSITES FOR RECIPES:**

- Dietitians of Canada: <http://www.cookspiration.com>
- Ricardo: <https://www.ricardocuisine.com/en/recipe-categories/healthy>
- Unlock Food: <http://www.unlockfood.ca/en/recipes>
- Heart and Stroke Foundation: <http://www.heartandstroke.ca/get-healthy/recipes>

## **NUTRITION WORKSHOPS:**

The University of Ottawa Heart Institute offers Heart Healthy Nutrition Workshops throughout the year. For class times, call 613-696-7000, ext. 19641 or view the calendar at [www.ottawaheart.ca](http://www.ottawaheart.ca).

# WHAT ARE THE KEY PRINCIPLES OF OBESITY MANAGEMENT?

*Reproduced with permission from the Canadian Obesity Network (CON)*

1. **Obesity is a chronic condition that requires long-term management.**

Managing excess body weight (obesity) is similar to managing high blood pressure or diabetes—left unmanaged, these conditions get worse and when treatments stop, the problem comes back. This is why weight management strategies have to be realistic and sustainable. Short-term ‘quick-fix’ solutions are not sustainable, which is why weight usually comes back.

2. **Obesity management is more than just reducing numbers on a scale—it’s about improving overall health and well-being over the long term.**

A common belief about obesity is that there is a simple cure (i.e. lose weight).

The problem with this notion is that it does not account for the fact that obesity is a chronic disease. The overall goal of obesity management is the improvement of your health and well-being. The first step is to prevent further weight gain. In addition, even a modest reduction in body weight can lead to significant improvements in health. It’s important to look past the scale, and focus on the big picture of why a change is being made.

3. **An important part of obesity management is identifying and addressing root causes for weight gain and removing roadblocks.**

In the same way that each and every person is different and unique, the reasons behind each individual’s weight gain can be different. Managing obesity is even more difficult when you do not understand the root cause of your weight gain and your road blocks to weight management. Identifying and removing what is holding you back is key to making positive, successful health improvements.

4. **Every individual defines success differently.**

Understanding the reasons why you decided to address your obesity can help you to assess what is important to you and how you will measure success within your long-term plan.

Success may mean having more energy to be active with your friends and family, improving your self-esteem, preventing further weight gain or improving overall health. Whatever your ideal “success” may be, use it to help guide and motivate you.

Take some time to reflect ~ If you or a loved one are thinking about taking steps towards managing obesity, what are the reasons for making this change, and how will you define “success”?

5. **Work towards your “best” weight.**

When setting expectations for a weight management plan, it is important to set realistic and achievable goals that work within a lifestyle that you still enjoy. You shouldn’t stress about counting calories, setting a timeline for specific weight loss, or exercising excessively. Instead, focus on making healthy and enjoyable lifestyle changes that will improve your overall quality of life! Whatever weight you achieve through these changes is considered your “best” weight.

Using the resources offered by CON is a great first step in helping you achieve your goals!

Building an enjoyable, healthy lifestyle ~ If you do not like the way you are living when you are managing your weight, it will be much more difficult to keep it off and to keep yourself from going back to the way you were living before you lost it. Work towards building a healthy lifestyle that you truly enjoy!

# HELPFUL CONTACTS AND LINKS

## Transplant Advocate Association

The Transplant Advocate Association is a non-profit organization whose mission is to provide support, knowledge and encouragement to those who are either pre- or post-organ/tissue transplant. In addition, the Association seeks to inform the public through seminars and presentations about the need and benefits to others of organ donation.

You may find the web page for the Transplant Advocate Association through the following link:  
[www.transplantadvocateassociation.ca](http://www.transplantadvocateassociation.ca)

## Canadian Transplant Association (CTA)

The Canadian Transplant Association was created in 1987 to raise awareness about organ donation and celebrate the success of transplants in saving lives.

It is a non-profit organization comprising transplant recipients, athletes and volunteers dedicated to promoting organ donation through public advocacy and events, including the National Transplant Games and World Transplant Games. It is also a support network, offering programs to help donors and recipients live full lives after transplantation. The CTA has a speaker's bureau in each region in Canada. You may contact the association through its website or toll-free number if you have a request.

The web page for the CTA may be accessed through the following link:  
[www.organ-donation-works.org/english/abo-mission.htm](http://www.organ-donation-works.org/english/abo-mission.htm)

### Contacts for the CTA are as follows:

#### **Dave Smith, President**

Canadian Transplant Association  
11230-72 Avenue  
Edmonton, Alberta T6G 0B5  
Email: [davidsmith@txworks.ca](mailto:davidsmith@txworks.ca)

#### **Neil Folkins, Membership Development**

Canadian Transplant Association  
11649 St. Albert Trail  
Edmonton, Alberta T5M 3L6  
Email: [neilfolkins@txworks.ca](mailto:neilfolkins@txworks.ca)

**Toll free: 1-877-779-5991**

## Links to Other Associations

**American Heart Association** | [www.heart.org](http://www.heart.org)

**Transplant Living** | [www.transplantliving.org](http://www.transplantliving.org)

**Canadian Society of Transplantation** | [www.transplant.ca](http://www.transplant.ca)

**Transplant Recipients International Organization** | [www.trioweb.org](http://www.trioweb.org)

**Heart and Stroke Foundation** | [www.heartandstroke.com](http://www.heartandstroke.com)

**Trillium Gift of Life** | [www.giftoflife.on.ca](http://www.giftoflife.on.ca)

# APPENDIX 1: MEDICATIONS FOR TREATING DIABETES

| TYPE OF MEDICINE                                  | NAMES OF MEDICATION                                                                                                                                                            | HOW MEDICATION WORKS                                                                                                                                                                                                                 | POTENTIAL SIDE EFFECTS                                                                                                                                                                                                     |
|---------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Biguanides                                        | Metformin (Glucophage®)<br>Metformin extended release (Glumetza®)                                                                                                              | <ul style="list-style-type: none"> <li>Helps reduce release of sugar from the liver</li> <li>Makes cells more responsive to insulin so that they can use sugar more efficiently</li> </ul>                                           | <ul style="list-style-type: none"> <li>Nausea, gas, abdominal pain, diarrhea that may subside</li> </ul>                                                                                                                   |
| Sodium-Glucose Cotransporter 2 (SGLT2) Inhibitors | Canagliflozin (Invokana®)<br>Dapagliflozin (Forxiga®)<br>Empagliflozin (Jardiance®)                                                                                            | <ul style="list-style-type: none"> <li>Decreases reabsorption of sugar in the kidneys</li> <li>Promotes sugar loss through the urine</li> <li>Improves cardiovascular health and survival</li> </ul>                                 | <ul style="list-style-type: none"> <li>Bladder infections</li> <li>Vaginal yeast infections</li> <li>Rash / redness to the penis / foreskin</li> <li>Do not take if unable to eat regular meals or drink fluids</li> </ul> |
| Glucagon-Like Peptide-1 (GLP-1) Receptor Agonist  | Albiglutide (Eperzan®)<br>Dulaglutide (Trulicity®)<br>Exenatide (Bydureon®, Byetta®)<br>Liraglutide (Saxenda®, Victoza®)<br>Lixisenatide (Adlyxine®)<br>Semaglutide (Ozempic®) | <ul style="list-style-type: none"> <li>Increases insulin secretion</li> <li>Decreases sugars made by liver</li> <li>Slows stomach emptying</li> <li>Decreases hunger</li> <li>Improves cardiovascular health and survival</li> </ul> | <ul style="list-style-type: none"> <li>Nausea, vomiting, diarrhea</li> <li>Increased heart rate</li> <li>Weight loss</li> <li>Low blood sugar (rare)</li> <li>Pancreatitis (rare)</li> </ul> <p>*Injectible</p>            |

|                                           |                                                                                                                                                                                                       |                                                                                                                                                |                                                                                                                                            |
|-------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|
| Dipeptidyl Peptidase 4 (DPP-4) Inhibitors | <p>Alogliptin (Nesina®)</p> <p>Linagliptin (Trajenta®)</p> <p>Saxagliptin (Onglyza®)</p> <p>Sitagliptin (Januvia®)</p>                                                                                | <ul style="list-style-type: none"> <li>Enhances action of gut hormones that release insulin</li> <li>Decreases sugars made by liver</li> </ul> | <ul style="list-style-type: none"> <li>Runny nose</li> <li>Low blood sugar (rare)</li> <li>Pancreatitis (rare)</li> </ul>                  |
| Insulin Secretagogues                     | <p>Gliclazide (Diamicron®, Diamicron MR®)</p> <p>Glimepiride (Amaryl®)</p> <p>Glipizide (Glucotrol XL®)</p> <p>Glyburide (Diabeta®)</p> <p>Nateglinide (Starlix®)</p> <p>Repaglinide (Gluconorm®)</p> | <ul style="list-style-type: none"> <li>Stimulates the pancreas to make more insulin</li> </ul>                                                 | <ul style="list-style-type: none"> <li>Can cause low blood sugar if a meal is missed or delayed, or if more activity than usual</li> </ul> |
| Thiazolidinediones                        | <p>Pioglitazone (Actos®)</p> <p>Rosiglitazone (Avandia®)</p>                                                                                                                                          | <ul style="list-style-type: none"> <li>Improves insulin sensitivity</li> </ul>                                                                 | <ul style="list-style-type: none"> <li>Swelling due to water retention</li> <li>Heart failure</li> </ul>                                   |

## Types of Insulin

Please note this list is not all inclusive

| TYPE                                   | NAME                                                                                 | ACTION                                                                                                                                                           | NOTES                                                                                                                                           |
|----------------------------------------|--------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|
| Ultra Fast Acting                      | Insulin Aspart (Fiasp®)                                                              | <ul style="list-style-type: none"> <li>Onset: 5 - 7 min</li> <li>Peak: 0.5 - 0.75 hrs</li> <li>Duration: 3 - 5hrs</li> </ul>                                     |                                                                                                                                                 |
| Very Rapid Acting Analogues (Clear)    | Insulin Aspart (Novo Rapid®)                                                         | <ul style="list-style-type: none"> <li>Onset: 10 – 15 min</li> <li>Peak: 1 – 1.5 hrs</li> </ul>                                                                  | <ul style="list-style-type: none"> <li>Meal time insulin to be taken within 15 min of eating</li> <li>May be used in an insulin pump</li> </ul> |
|                                        | Insulin Glulisine (Apidra®)<br>Insulin Lispro 100 units/mL & 200 units/mL (Humalog®) | <ul style="list-style-type: none"> <li>Duration: 3 – 5 hrs</li> </ul>                                                                                            |                                                                                                                                                 |
| Short Acting (Clear)                   | Insulin Regular 100 units/mL (Humulin R®, Novolin ge Toronto®)                       | <ul style="list-style-type: none"> <li>Onset: 30 min</li> <li>Peak: 2 – 3 hrs</li> <li>Duration: 6.5 hrs</li> </ul>                                              | <ul style="list-style-type: none"> <li>Meal time insulin to be taken 30 min before eating</li> </ul>                                            |
|                                        | Insulin Regular 500 units/mL (Entuzity®)                                             |                                                                                                                                                                  |                                                                                                                                                 |
| Intermediate Acting (Cloudy)           | Insulin NPH (Humulin N®, Novolin ge NPH®)                                            | <ul style="list-style-type: none"> <li>Onset: 1 – 3 hrs</li> <li>Peak: 5 – 8 hrs</li> <li>Duration: up to 18 hrs</li> </ul>                                      | <ul style="list-style-type: none"> <li>Used to cover the rise in blood sugar from steroids (e.g. prednisone)</li> </ul>                         |
| Extended Long Acting Analogues (Clear) | Insulin Detemir (Levemir®)                                                           | <ul style="list-style-type: none"> <li>Onset: 90 min</li> </ul>                                                                                                  | <ul style="list-style-type: none"> <li>Should not be mixed with other insulin</li> </ul>                                                        |
|                                        | Insulin Glargine 100 units/mL (Lantus®, Basaglar®)                                   | <ul style="list-style-type: none"> <li>Peak: flat curve</li> </ul>                                                                                               |                                                                                                                                                 |
|                                        | Insulin Glargine 300 units/mL (Toujeo®)                                              | <ul style="list-style-type: none"> <li>Duration: varies from 16 -48 hrs depending on the product</li> </ul>                                                      |                                                                                                                                                 |
| Pre Mixed (Cloudy)                     | Insulin Aspart / Insulin Protamine (Novo Mix 30®)                                    | <ul style="list-style-type: none"> <li>This depends on the mixture.</li> </ul>                                                                                   | <ul style="list-style-type: none"> <li>Should not be mixed with other insulin</li> <li>Taken 15 – 30 min before eating</li> </ul>               |
|                                        | Insulin Lispro / Insulin Protamine (Humalog Mix 25®)                                 | <ul style="list-style-type: none"> <li>A single vial, cartridge or pen contains a fixed ratio of rapid or short acting to intermediate acting insulin</li> </ul> |                                                                                                                                                 |
|                                        | Insulin Regular / Insulin NPH (Humulin 30/70®, Novolin ge 30/70®)                    |                                                                                                                                                                  |                                                                                                                                                 |

# HEART INSTITUTE PATIENT ALUMNI

## WE CAN HELP. WE'VE BEEN THERE.

The Patient Alumni are a diverse community of current and former University of Ottawa Heart Institute patients and their families, friends and caregivers. We gratefully support the Institute by sharing information on advancements in the prevention and treatment of heart disease and by designating funds for projects and services that improve patient comfort and care.

By joining the Alumni, you will become part of a very unique community!

The Heart Institute is the only hospital in Canada that has formed an alumni group to stay in contact with discharged patients and their families. For over 40 years, the Heart Institute has delivered world-class care to thousands of patients. As Alumni members, we wish to stay in touch, stay informed, and contribute to the Institute's quality of care and future success.

## WHY JOIN THE ALUMNI?

Alumni membership is free of charge, thanks to the partnership and financial support of the Heart Institute and its fundraising Foundation.

As an Alumni member, you'll get up-to-date information through our:

- e-letters
- Websites
- Lectures, courses and special events

By joining, you will also be able to share information and experiences with other Alumni members through our unique private social networking site, at <http://community.ottawaheart.ca>

For more information and access to free membership, visit our website, [ottawaheartalumni.ca](http://ottawaheartalumni.ca)

Or contact us at:

**Email:** [alumni@ottawaheart.ca](mailto:alumni@ottawaheart.ca)

**Telephone:** 613-696-7241



UNIVERSITY OF OTTAWA  
**HEART INSTITUTE**  
**INSTITUT DE CARDIOLOGIE**  
DE L'UNIVERSITÉ D'OTTAWA



**PATIENT ALUMNI**  
ASSOCIATION DES  
ANCIENS PATIENTS