

Multi-Organ Transplant Program

Living Kidney Donation



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This handbook provides information about the Living Kidney Donation Program at London Health Sciences Centre.

Living kidney donation offers many advantages to improve the quality of life for your loved one with kidney failure. This booklet will give you information about functions of the kidney, dialysis, and transplantation as well as the donation process.



London Health Sciences Centre
Multi-Organ Transplant Program

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Cover photo: Jackie donated a kidney to her brother, Clive.

Contents

Overview	Page 1
Treatment Options	Page 2-4
Where to Start	Page 5-8
Next Stage of Testing	Page 9-10
Reasons for Decline	Page 11
Making a Decision	Page 11
Surgical Process	Page 12-15
Life After Donation	Page 16
Other Ways You Can Help	Page 17

Appendix 1:	LHSC Contact Information & Additional Resources
Appendix 2:	A Healthy Kidney Donor has a Healthy Weight - Links and Resources
Appendix 3:	Instructions for 24-Hour Urine Collection
Appendix 4:	Instructions for Computerized Tomography (CT) Angiogram
Appendix 5:	Nuclear Medicine Scan - Isotope GFR and Renogram
Appendix 6:	Instructions for Renal Biopsy
Appendix 7:	Instructions for Renal Angiogram
Appendix 8:	Letter to Family Doctors



Overview

The incidence of kidney failure is continuing to increase, and it is now estimated that almost 2 million Canadians have chronic kidney disease. Each day, about 12 Canadians learn that their kidneys have failed, and that they need either dialysis or a transplant to survive.

For medically suitable patients, kidney transplantation is often the preferred treatment. Patients with a well functioning transplanted kidney generally live longer, have more energy and are able to return to a more normal lifestyle with no fluid restriction or need for dialysis.

What does the kidney do?

The kidneys are the master chemists of the body. Normally you have two kidneys, one on either side of your spine under your lower ribs. They are reddish brown in colour and shaped like kidney beans. Each kidney is about the size of a clenched fist.

The main job of the kidneys is to remove waste products from the blood and return the clean blood back to the body. A healthy kidney provides the following functions:

- regulates water
- removes waste from the body
- balances chemicals in the body
- regulates the building of bones
- regulates blood pressure
- controls the production of red blood cells

Why do kidneys fail?

There are many causes of kidney failure. Slow and progressive deterioration of kidney function is called chronic kidney failure. It is usually not reversible. Chronic kidney failure occurs when the tiny filters in the kidney (nephrons) that remove wastes stop working. Damage to the nephrons can be caused by conditions such as diabetes or high blood pressure. When kidneys fail, wastes and fluids accumulate in the body and the patient requires dialysis treatment or a kidney transplant.



Treatment Options

Treatment options for chronic kidney disease

There is no cure for chronic kidney disease. In the early stages, proper food choices, medications and good blood pressure control may be required to slow the damage to the kidneys. However, once the kidneys are functioning at less than 10-20% of their normal rate, either dialysis or transplantation is needed for the patient to stay alive. This period is called end-stage renal disease (ESRD).

What is dialysis?

Dialysis is a way to clean the blood by removing wastes and excess water. There are two types: hemodialysis and peritoneal dialysis.

Hemodialysis

During hemodialysis, the blood is removed from the body and is passed through an artificial kidney machine. The artificial kidney cleans the blood in almost the same way that healthy kidneys do. This treatment is performed usually three times a week although it can be performed daily. It can take between three and five hours each time. Hemodialysis can be done in a hospital dialysis unit, in a self-care centre (with some assistance from the staff), or at home with the aid of a partner.

Peritoneal dialysis

Peritoneal dialysis works similarly to hemodialysis, but the blood is cleaned inside the body rather than through an artificial kidney. The abdomen or “belly” has a peritoneal cavity lined by a thin membrane called the peritoneum, which surrounds the intestine and other internal organs. In peritoneal dialysis, the peritoneal cavity is filled with a special dialysis fluid. Excess water and waste pass through the peritoneum into the dialysis fluid. This fluid is then drained from the body and discarded. The process is repeated four to five times a day (continuous ambulatory peritoneal dialysis, CAPD) or a machine called an automatic cycler can perform exchanges while sleeping. In most cases, this treatment can be performed without assistance, at home or at work. Peritoneal dialysis is sometimes done in a hospital, but more often, people are trained to do this independently at home.

What is a kidney transplant?

A kidney transplant is another treatment option for people with ESRD. It is now widely considered to be the best way to treat kidney failure; however, it is not suitable for everyone. For medically suitable patients, kidney transplantation is the preferred treatment. Patients with a well functioning transplanted kidney generally live longer, have more energy and are able to return to a more normal lifestyle with no fluid restriction or need for dialysis. Because of these excellent results, the demand for transplantation continues to increase.

A kidney transplant is an operation where a healthy donated kidney is transplanted into a person (the recipient). The new kidney is able to do the functions almost as well as two healthy ones. The donated kidney may come from a living person (living donor) or from a person who has died suddenly (deceased donor).

Transplant options for the recipient

Deceased donor

Many families make the generous decision to donate a loved one's organs when they die. However, less than 3% of all Canadians who die are suitable organ donors. Unfortunately, there have never been enough donated organs, yet the number of patients waiting for transplantation continues to rise. Patients can wait between two and seven years, or even longer, for a transplant kidney to become available. Deceased donor kidneys are assessed carefully to ensure they are healthy enough to be transplanted and will not transfer infectious diseases.

Living donor

Living donation offers many advantages for the kidney recipient, including a reduced waiting time for transplant and a significantly reduced storage time. The living donor kidney does not need to be stored or transported a distance. These advantages usually result in a higher success rate. A living donor may be a better genetic match to the recipient. The waiting time to assess a living donor and plan a surgery is about three to six months, although this timing can be variable depending on the work-up process; sometimes, a transplant can be done so the patient does not have to begin dialysis. This option is only available if you have a living donor. Living donation permits patients and their donors the opportunity to plan the transplant around their personal and professional obligations.

Transplant surgery

The transplant operation takes three to four hours. The transplant recipient remains in hospital for about seven days following the surgery. After the transplant, recipients need to take anti-rejection medication every day to prevent the immune system from rejecting the kidney. Regular blood tests are needed to watch for health of the kidney and any signs of rejection.

Success

Recipients generally do very well following transplantation with success rates greater than 90% for kidney transplants. Kidneys from deceased donors often last on average 10 to 12 years, and kidneys from living donors 12 to 20 years. Of course, these times will vary among patients. Our longest-surviving kidney recipient is still well 32 years after her deceased donor transplant.

Living kidney donation

About living kidney donation

Giving the gift of improved health to another person can be a very positive experience. In Canada, living donor transplants now exceed the number of transplants performed from deceased donors. As a result, there are more organs available for transplantation.

The first successful living donor transplant was performed in Boston in 1954 between 23-year-old identical twins, Ronald and Richard Harrick. Since that landmark procedure, living kidney transplantation has continued to improve the quality of life for thousands of individuals with kidney disease. Although transplantation – from either a living or a deceased donor – is not a cure for kidney disease, it may prolong and enhance a person's quality of life.

Advantages of living kidney donation

Living kidney donation provides a viable alternative to waiting for a deceased donor organ to become available. There are many advantages to living donation.

- **Time to plan**

Living donors are carefully screened prior to donation. The superior quality of a kidney provided by a living donor is also enhanced because surgery can be scheduled when both the donor and recipient are in the best health possible. In addition, the time between the removal of the kidney and transplantation is usually fairly short, which often improves the function and the survival of the transplanted kidney.

- **Less waiting**

The length of time it takes for an organ to become available is significantly reduced when the organ comes from a living donor versus a deceased donor. This is also an advantage for other recipients on the transplant waiting list who do not have a living donor since their wait for a deceased donor kidney may be shortened. Living donation surgery can occur within 6 months of a living donor being identified.

- **A feeling of satisfaction**

Patients who have received a new kidney often feel as if they have received a new lease on life. Having helped someone improve their quality of life can be very rewarding for the donor.

- **Avoidance of dialysis**

With living donor kidney transplantation, it is possible to have surgery much earlier in the course of the disease, even before dialysis is required.



Where to Start

Who can donate?

A living donor is most often a close family member, such as a parent, child, brother or sister (related). A donor can also be a more distant family member, spouse, friend or co-worker (non-related).

Living donors must be older than 18 and in good general health without any evidence of significant high blood pressure, diabetes, cancer, kidney disease, heart disease or infectious diseases. Gender and race are not factors in determining who can donate.

Research information about donation

If you are interested in living kidney donation, make an informed decision by getting as much information about donation and transplantation. Reading this booklet is one way. Speaking with the Living Kidney Donor Coordinator at LHSC at 519-685-8500 ext 32331 or contacting the Trillium Gift of Life Network (www.giftoflife.on.ca) is another. Additional resources are found in Appendix 1.

Find out your blood type

If you don't know your blood type, talk to your family physician and have a blood test done. If you are a blood donor, your blood donor card is acceptable. The Living Donor Coordinator can also help you arrange this testing.

Talk to the potential recipient

Discuss your offer with the potential recipient to make sure that he or she is willing to consider you as a donor. Be aware that not all people with kidney failure decide to have a transplant or consider taking a kidney from a living donor. If the potential recipient decides not to accept your offer, that decision should be respected. Their decline does not in any way take away from your generous offer.

Confirm blood type compatibility

Contact the London Health Sciences Centre's Living Kidney Donation Program at 519-685-8500 ext 32331 to determine blood type compatibility. Speak to the Living Donor Coordinator about your desire to consider kidney donation and she will help you find out more information about whether you are a suitable match with your recipient. The Living Donor Coordinator will also provide information on the donation process and ask you questions about your general health.

Note: Positives and negatives attached to the blood type are not important in transplant

If you have blood type:	You can donate to someone with blood type:
O	O, A, B, or AB
A	A or AB
B	B or AB
AB	AB

Medical history

If the donor and recipient have compatible blood types, the donor undergoes a medical history questionnaire, which can be done in person or over the telephone with the Coordinator. This health screening may identify obvious reasons that would exclude you from donating, such as severe high blood pressure, kidney disease, cancer, heart disease or diabetes. Smoking cessation or weight loss may be recommended prior to proceeding. If you require weight loss, please refer to Appendix 2, A Healthy Kidney Donor has a Healthy Weight. Women can have a pregnancy following donation, but they should not be pregnant at the time of testing or surgery. The recommended waiting time after donation would be 6–12 months. You should ensure that your physician knows that you have only a solitary kidney so he/she can follow you closely during your pregnancy.

Some preliminary lab tests, such as urine and blood tests, may be requested to ensure you are healthy in order to proceed to the next stage of testing.

Tissue typing

A blood test determines your genetic makeup by testing for “human leukocyte antigens” or HLA. HLA is a protein molecule on the surface of cells that stimulates an immune response and can lead to rejection. HLA genes come in pairs. One copy of each pair comes from our mother and the other from our father.

A close HLA match is optimal, but families should also consider other factors in deciding who could be a donor. These issues include sick coverage for time off work, financial issues and other responsibilities. Not having a match does not prevent a successful transplant; other factors, including excellent new drugs for rejection, play a role.

Cross matching

This important blood test, performed only at transplant centres, determines if the recipient has a reaction to the donor. White blood cells from the donor are mixed with blood from the recipient in a laboratory setting. If the donor’s white blood cells are attacked and killed, this is known as a “positive” cross match and indicates that the donor and recipient are not compatible. If the cross match is negative, then the donor can proceed to further medical testing. A negative cross match does not mean that rejection will not occur, but it is less likely. This testing requires a scheduled appointment at the London Health Sciences Centre usually Monday through Wednesday with blood drawn in the blood-taking lab before 9 a.m. The results of this testing can be as long as two weeks. This testing is repeated again two weeks prior to the scheduled surgery date to ensure there have been no changes in immune response.

Ensuring donor health

Health of the kidneys

Health of the kidneys is determined by a number of tests.

- Urine tests
 - Spot samples of urine are obtained to determine if there is blood, glucose or protein in the urine
 - 24-hour urine collection for “creatinine clearance” compares the urine and blood measurements of creatinine (a measure of kidney function) to ensure that your kidneys are functioning adequately. See Appendix 3, [Instructions for 24-Hour Urine Collection](#).
- Ultrasound
 - Ultrasound tests use sound waves to visualize the kidneys. This test can determine if there are issues such as a single kidney, cysts, or kidney stones.
- Computed Tomography (CT) angiography (CT scan)
 - CT scan, a more detailed x-ray, can give more in-depth information about the structure of the kidney and blood vessels. See Appendix 4, [Instructions for CT Angiogram](#).

Sometimes

- Nuclear Medicine Scan - Isotope GFR
 - Nuclear scans can be used to give more detailed information about the function of the kidney and how much function comes from each kidney. See Appendix 5, [Nuclear Medicine Scan - Isotope GFR and Renogram](#).

Rarely

- Kidney Biopsy
 - Kidney biopsy is rarely done in the assessment of living donors. However, if there is some question of the health status of the kidney, this test is performed to allow close examination of the kidney structure. See Appendix 6, [Instructions for Renal Biopsy](#).
- Renal Angiogram
 - Renal angiogram may be required to determine the status of the kidney arteries. See Appendix 7, [Instructions for Renal Angiogram](#).

General health

- Blood tests
 - Blood tests are done to ensure that kidney function is good and that electrolytes and blood sugars are normal levels. Blood sugar testing involves obtaining a blood sample first thing in the morning before you drink or eat anything and then two hours after a meal. Blood tests are also collected to determine if you have been exposed to any viruses that could be passed on to the recipient. Two of the viruses that we check for are the HIV virus that can cause AIDS and the hepatitis virus.
- Chest x-ray
 - This x-ray shows if there are problems such as lung disease or an enlarged heart.
- Electrocardiogram (ECG)
 - An ECG records the electrical activity of the heart muscle to look for problems or signs of a previous heart attack. Electrodes are placed on the chest while you lie flat. This test only takes a few minutes and is not painful.



Next Stage of Testing

These appointments give the donation team an opportunity to review your case to determine if you will be able to function for the rest of your life with only one kidney. Also, this is an opportunity for you to get more information about living donation. The donation team is comprised of transplant specialists who are your advocates.

Donor Nephrologist

The Nephrologist is a physician who specializes in kidney donation and will speak to you regarding the risks and benefits of being a kidney donor. This appointment will involve a health history and physical examination.

Surgeon

The Surgeon is a physician who performs the living donation surgery and will speak to you regarding the surgical process and risks involved. This appointment will involve a health history and physical examination.

Social Worker

The Social Worker meets with the donor to conduct a psychosocial assessment. She provides counselling to ensure a potential donor has all the information necessary to make an informed voluntary choice and is not doing so because of guilt, obligation, coercion or monetary gain.

Living Donor Coordinator

The Living Donor Coordinator is a nurse who provides the potential donor with information regarding living donation, the risks and benefits, the evaluation process, and options for the recipient. The Coordinator is the main contact person throughout the process.

Issues to consider

As a kidney donor, there is evidence that living with just one kidney will likely have little impact on your health because the remaining kidney enlarges after surgery to do the work previously done by two kidneys. This may take up to one year. Despite this, living donors need to be informed of the potential physical and psychological risks involved before consenting to donate a kidney.

Short-term considerations

The short-term risks involved in living kidney donation are directly related to the surgical procedure itself, and they are common to any major surgery.

- Allergic reactions to anaesthesia (<2%); usually avoided through careful screening of the donor's allergies prior to surgery.
- Blood clots (<2%) where clots that form in the legs can travel to the lungs. Getting out of bed and walking around as much as possible helps avoid this. Donors will also be given a pair of tight (compression) stockings to wear, which keeps the blood flowing and prevents blood from clotting.

- Minor infection of the surgical wound, bladder infection and respiratory secretion build-up are possibilities in less than 10% of patients, and these can usually be easily treated with antibiotics, deep breathing and coughing exercises.
- While a remote possibility, as with any major surgery there may even be a risk of death. This risk is very low at 0.03% or three persons in every 10,000 procedures.
- All patients experience some pain and discomfort after an operation. Pain management will ensure you are as comfortable as possible.

Long-term considerations

The long-term medical risks faced by living kidney donors remain uncertain; however, based on a detailed review of published studies, the following can be said:

- Living donors generally live normal lives following donation of one of their kidneys. Studies indicate that, on average, blood pressure may increase 5 mm Hg above the natural increase that occurs with normal aging. This increase may occur over many years. Donors may have an increased risk of developing extra protein in their urine but the significance of this finding in otherwise healthy people remains unknown. There have been rare cases of kidney failure after kidney donation, but generally the risk after donation is the same as the general population, which is 1/1000. In those cases of reduced kidney function or kidney failure after donation, it is unclear whether donating a kidney is a contributing factor. A small number of donors may have developed kidney problems even if they had not donated a kidney. In one study it appears that living kidney donors live longer than the general population perhaps likely because of the excellent health of the donor.
- Donors are required to have yearly blood pressure checks, blood work and urine tests. Following surgery, rough contact sports that may damage the remaining kidney should be avoided. However, it is important to maintain a healthy lifestyle with good nutrition and fitness after donation.
- Sometimes, donors feel pressured to donate by family members or disappointment if, in the rare case, the donated kidney does not function. Most donors feel very satisfied with the decision to donate and also report a higher quality of life, which may be related to a greater sense of self-worth following donation.
- Donors may have a number of appointments in addition to time off work for the surgical procedure and recovery. This could be a financial consideration for you. Donors may qualify for short-term disability and employment insurance to assist with these concerns. The medical appointments and surgical stay are covered through OHIP. For out-of-country donors, these medical costs are billed to the recipient's OHIP. Unfortunately, the program is unable to pay for travel, meals, accommodation or any other costs associated with donation. Financial issues can be discussed with the staff of Living Donation Program. Sometimes, community groups are willing to help or families choose to arrange fundraising events.
- Another issue to consider is insurance coverage after donation. There are reports of different practices among insurance companies regarding coverage. During your work-up, if an underlying illness is discovered, an insurance company **may** increase your rates. You might want to investigate this prior to donation.



Reasons for Decline

Reasons why you may be declined as a kidney donor

You may not be able to donate a kidney if...

- Your blood type is not compatible with the recipient's blood type.
- The cross match test is positive, which means that the recipient would reject your kidney.
- The assessment indicates that you are not in excellent health. You need to be in excellent health for both you and your recipient's sake.
- There is a technical reason that would put you at risk for surgery. For example, there may be an unusual blood supply to the kidney, which would make it too difficult for the surgeon to remove the kidney. For this reason, we would not put you at risk by doing the surgery.

When you have your heart set on donating a kidney to the recipient, it can be very sad to be told that you are unable to donate. Remember, this is for your health and the health of the recipient. The donation team would be happy to discuss the reasons for not being able to donate and answer any questions you may have.



Making a Decision

Making a decision

If you are medically suitable to donate, the ultimate decision to donate a kidney is up to you. Information and support can be provided through this decision-making process by the Living Donor Coordinator, Social Worker and medical team members as well as through family members. Donors are free to change their mind at any time during the evaluation process.

If you choose not to donate, the donation team will support you in your decision and help you communicate your decision to the potential recipient. The reasons for your decision will remain confidential.

If you choose to donate, the donation and transplantation teams will work together to decide the best date for surgery recognizing both the donor and recipient preferences and health status.



Surgical Process

Planning a date

Once the decision is made to proceed with living kidney donation, the date for surgery will be discussed between the donation and transplant teams. At London Health Sciences Centre, we are able to book an O.R. three days per month for living donor transplant surgery.

Surgical preparation

Both donor and recipient are seen at London Health Sciences Centre two weeks prior to the planned surgical date. These final visits allow for repeat cross matching, review of medical history, physical examination and consent as well as a pre-admission clinic visit. At the Pre-Admission Clinic, blood and urine testing will be done. We will discuss pain control after surgery and how to care for yourself when you go home. The day before surgery, you will be asked to have clear fluids only and nothing to eat or drink after midnight the night before your surgery. This includes chewing gum.

Day of surgery

Both donor and recipient are asked to report to the Surgical Preparation Unit for 6:00 a.m. on the morning of surgery. You will have your blood pressure, temperature, and pulse checked and an intravenous started. You will also meet the Anaesthetist who will be giving you the medications to put you to sleep for the surgery. Living donation and transplant is an elective procedure. If health concerns were identified the morning of surgery, the procedure may be cancelled or postponed. In very rare cases, the surgical team is required to perform a deceased donor transplant, which takes priority. In this case your planned living donor surgery would be postponed or rescheduled. While very inconvenient, if your loved one was waiting for a deceased donor transplant, we hope that you would understand this very rare occurrence. Your family can wait for you in the waiting room outside the operating room where the doctor will come to discuss the outcome of your surgery. You will wake up in the Post Anaesthetic Care Unit (PACU) and will stay there until you are transferred to your room on the surgical floor.

Surgical procedure

Nephrectomy is the Latin term for “removal of a kidney”. In most cases, the left kidney is removed for donation, because the vessels are longer.

- **Open Nephrectomy.** An incision is made generally on the side of the abdomen along the bottom of the lower rib. The kidney is carefully disconnected from its blood supply, the veins and arteries are clamped off and the kidney is lifted out, flushed with saline and placed in a preservation solution ready for transplantation into the recipient. This surgery takes about 3 hours.

- **Laparoscopic Nephrectomy.** This is a newer procedure that is done at our centre. Laparoscopic nephrectomy is less invasive than open nephrectomy because only a few small incisions are made in the abdomen. A small camera is inserted through one of the incisions and the surgery is performed while watching a video monitor. The surgeon inserts special instruments through the incisions to detach the kidney, which is removed through a small incision below the naval. It is then flushed with a cold solution to help preserve it, and it is readied for transplantation into the recipient. This surgery takes about three to four hours. In rare cases, the surgeon may need to convert the laparoscopic incision to an open one to safely remove the kidney.

Post-surgical recovery

Day of surgery: Following surgery, a nurse will check your blood pressure, temperature, breathing, urine output and abdominal dressing frequently for the first 24 hours. You will be encouraged to do leg exercises to prevent blood clots. Your TED stockings and Pneumatic compression stockings will stay on for the same reason.

You will be encouraged to do deep breathing and coughing exercises to prevent a collection of fluid in your lungs. The intravenous (IV) in your arm will be used to give you medications and IV fluids. You will be encouraged to use your Patient Controlled Analgesia (PCA) pump for pain. The PCA is a special pain control system that is hooked up to the IV and allows pain medication to be given. You control when pain medication is given by pressing a button. The anaesthetist sets limits on how much medicine you can have in an hour. You will be able to take a few ice chips or small sips of water. A catheter, a soft rubber tube with a small balloon will have been inserted in your bladder to continuously drain urine from the bladder. You may receive oxygen for a short time. You will be monitored to see when the oxygen can be stopped.

Postoperative Day 1: Your blood will be drawn in the morning and your vital signs checked periodically. Your activity will progress from sitting in a chair to walking in the hallway. Your diet will progress from clear fluids to creamy fluids and then to a light meal by the end of the day. Your surgeon will remove your dressing. The healing of your incision will be checked until you are discharged. You will be helped to sponge bath and the nurse will help you clean around your catheter.

Postoperative Day 2: If you are on a PCA pain pump, it will be stopped today and you will be given pills for your pain. You will be walking several times today in the hallway. Your diet will be a regular diet today, as long as you are passing gas rectally.

At LHSC, our focus is not only your care and treatment while in hospital, but also your discharge from hospital. A discharge policy is in place to ensure that patients who no longer need acute care services are discharged in order to accommodate other patients who require admission. The involvement and cooperation of patients and families in discharge planning not only helps to meet their needs, but also balances the use of precious health care resources.

Postoperative Day 3: In most cases, you will be discharged from the hospital today. You will be able to bathe, dress and care for yourself. Your family doctor will receive a letter with some recommendations about your ongoing care (Appendix 8).

Discharge instructions

Incision care: About one week after surgery, your incision should be well healed. The small steri-strip bandages may be starting to peel off. Trim the excess ends and let them fall off on their own. You may shower but no tub baths. Gently clean your incision with soap and water. Rinse and carefully pat dry.

Activity: For four to six weeks after your surgery, or as directed by your surgeon avoid lifting anything heavier than ten pounds. Do not shovel, rake or vacuum. Gradually increase your activity. It is normal to get tired easily because your body is using a lot of energy to heal itself. Listen to your body. Return to work as recommended by your surgeon usually after four to eight weeks, sometimes as long as twelve weeks if heavy lifting is involved.

Pain medication: We recommend that you take pain medication regularly for the first week or two following the surgery so that you are comfortable. These pain medications will be tailored to your individual pain tolerance. These medications can be constipating. Your surgeon may prescribe a stool softener to take with your pain medication to prevent constipation.

Diet: A well-balanced diet will help with your recovery. Eat small meals more often and have protein with each meal. Protein helps your body heal. Protein can be found in meat, poultry, legumes (e.g. chick peas, lentils), peanut butter, eggs and milk products. Drink six to eight glasses of fluid per day (not including coffee, tea or cola). Having a lot to drink may help you to avoid constipation.

Notify your family doctor or surgeon if you have the following symptoms

- Swelling or cramping in your stomach
- Constipation or diarrhea
- Your incision, or the skin around it, becomes red, swollen or extremely painful
- You have increased drainage from your incision
- There is a bad odour from your incision
- Your incision separates at the skin line
- If you have a temperature over 38°C or 100.4°F
- You have blood in your urine or dark or foul-smelling urine
- You have back pain or leg pain (do not massage your calves)

Your donated kidney

The recipient's surgery will happen immediately after your surgery. The Surgeon will take your kidney and insert it into the recipient. In most cases, the transplanted kidney starts working right away and puts out urine. In some cases, the kidney can be somewhat sluggish because of the handling and requires watchful waiting or even dialysis. If your recipient agrees, the transplant team will keep you posted on the outcome. In rare cases, the kidney may not function. Although extremely disappointing for both the donor and the recipient, this does not in any way minimize the generous gift you have given to your loved one. Your donation team will be there to support you through the process regardless of the outcome.

Post-surgical follow-up

The Surgeon sees the donor usually two to three weeks after surgery. The rest of the donor team – Living Donor Coordinator and Social Worker – are in touch with the patient generally by phone in the first week following the surgery and also at the return visit.

Blood and urine samples are often done at this time to ensure the donor's remaining kidney is functioning well. Ongoing follow-up is arranged with the Surgeon for the end of the first year and/or the donation Nephrologist. If you live at a distance, the yearly follow-up may be managed by your family physician. It is essential that you receive life-long follow-up care with blood pressure checks and urine and blood samples to maintain long-term health.



Life After Donation

As previously discussed, we anticipate your life with one kidney will be normal but there are some health promotion activities that we encourage you to consider.

- Do some aerobic exercise for at least 30 minutes on four days of the week. You should avoid rough contact sports that may damage the remaining kidney.
- Ideal body weight should be maintained and weight loss strategies should use a multi-disciplinary approach. High protein diets or other body-building substances should be discouraged because they may contribute to injury of the kidney.
- Avoid long-term use of nonsteroidal anti-inflammatory drugs (i.e., ibuprofen, Motrin, Advil) because these types of drugs are associated with kidney damage and high blood pressure.
- Alcohol consumption should be limited to two drinks or fewer per day. Weekly intake should not exceed 14 standard drinks for men and nine standard drinks for women.
- A reduced fat, low-cholesterol diet, which emphasizes fruits, vegetables and low-fat dairy products as well as maintains an adequate intake of potassium, magnesium, and calcium, should be followed.
- Salt intake should be minimal.
- Kidney donors are informed that they must stop smoking for their lifetime prior to donation. Smoking cessation is strongly recommended to help prevent heart, lung and kidney disease.

The living donation team would like you to have the following tests on a yearly basis with results sent to us at LHSC. These tests can be arranged either through your family doctor or the Living Donation Program.

- **three blood pressure measurements**
- **blood for creatinine**
- **urine for microalbumin/creatinine ratio**



Other Ways You Can Help

There are many ways that you can help the recipient besides donating a kidney.

If the recipient does not have a living donor, they can still go on the waiting list for a deceased donor kidney transplant. The recipient will need someone to offer support while hospitalized for the kidney transplant. Following discharge, you can provide rides to and from the hospital for clinic appointments; help with groceries and housework; and provide company to help them pass the time. These are some of the tasks that you would not be able to do if you were the donor, as you would be undergoing your own recovery process.

You can still help people awaiting a deceased donation transplant by registering your wishes to be an organ donor. To register, contact Trillium Gift of Life Network at 1-800-263-2833 or download the consent form from www.giftoflife.on.ca. Make sure you speak to the your family about your decision to donate.

Appendix 1

Contact Information

Living Donation Team	Telephone Number (Area Code 519)
Diane Smith - Living Donor Coordinator	685-8500 x32331
Dr. P. Luke - Surgeon	685-8500 x33180
Dr. D. Quan - Surgeon	685-8500 x33355
Dr. A. Garg - Living Donor Nephrologist	685-8500 x58066
Dr. A. Sener - Surgeon	685-8500 x33352
Kelly Thomas - Social Worker	685-8500 x32484
Prescription Centre	663-3231
MOTU Inpatient (Transplant Unit)	685-8500 x33015
Outpatient Urology Clinic	685-8500 x36744
Outpatient Nephrology Clinic	685-8500 x33346

Additional Resources

Multi-Organ Transplant Program, LHSC	www.lhsc.on.ca/About_Us/MOTP/
London Health Sciences Centre	www.lhsc.on.ca
Trillium Gift of Life Network	www.giftoflife.on.ca
Kidney Foundation of Canada, Ontario Branch	www.kidney.on.ca
Kidney Foundation of Canada, National Branch	www.kidney.ca

Appendix 2

A Healthy Kidney Donor has a Healthy Weight

Thank you for considering kidney donation. The gift of organ donation is greatly needed and your donation can mean the world of difference for your transplant recipient and his/her family.

Why should I lose weight?

A person who is overweight has a greater risk of complications during and after surgery:

- difficulty removing the kidney means a longer operating time and possible damage to the kidney structure
- slow wound healing, possible hernia
- excess weight may be harmful to the remaining kidney
- a person's BMI (Body Mass Index) should be in the "normal weight" category (see next page)

Who should I talk to about weight loss?

- Always consult your physician before undertaking a weight-loss program.
- Consult a dietitian for information and guidance.
- Consider seeing a certified, trained health professional. This could be somebody at your local Health Unit, a weight-loss company (i.e. Weight Watchers), a gym (i.e. Good Life Fitness) or a private practice.

I want to lose weight on my own!

- If you don't need the extra motivation of a program or a professional to lose weight then you must gather the correct information so you can make informed, educated decisions on how to go about losing weight properly.
- Canada's Food Guide to Healthy Eating is recommended. Visit Health Canada online (www.hc-sc.gc.ca) for more information about nutrition and physical activity.

How do I choose a weight-loss program?

Gather as much information as you can before deciding to join a program. Providers of weight-loss programs should be able to answer these questions:

- What does the weight-loss program consist of?
- What are the staff qualifications?
- Does the product or program carry any risks?
- How much does the program cost?
- What results do participants typically have?

What is “healthy” weight loss?

Experts agree that the best way to reach a healthy weight is to follow a sensible eating plan and engage in regular physical activity. Weight-loss programs should encourage healthy behaviours that help you lose weight and that you can maintain over time.

What is BMI?

BMI (Body Mass Index) is your weight (in kilograms) divided by your height (in meters) squared.

$$\text{BMI} = \text{weight (kg)} / \text{height (m)}^2$$

BMI is an equation that health professionals use to evaluate weight and health risks associated with weight (i.e. diabetes with overweight individuals, osteoporosis with underweight individuals)

Classification	BMI Category (kg/m ²)	Risk of developing health problems
Underweight	< 18.5	Increased
Normal Weight	18.5 - 24.9	Least
Overweight	25.0 - 29.9	Increased
Obese class I	30.0 - 34.9	High
Obese class II	35.0 - 39.9	Very high
Obese class III	>= 40.0	Extremely high

Safe and effective weight-loss programs should include:

- healthy eating plans that reduce calories but do not rule out specific foods or food groups
- adequate water consumption with smaller, more frequent meals
- regular physical activity and/or exercise instruction
- tips on healthy behaviour changes that also consider your cultural needs
- slow and steady weight loss of about ¾ to 2 pounds per week and not more than 3 pounds per week (weight loss may be faster at the start of a program)
- medical care if you are planning to lose weight by following a special formula diet, such as a very low-calorie diet
- a plan to keep the weight off after you have lost it

Resources:

Health Canada Online

www.hc-sc.gc.ca

Canada's Food Guide (Health Canada)

www.hc-sc.gc.ca/fn-an/food-guide-aliment/index-eng.php

Physical Activity Guide (Public Health Agency of Canada)

www.phac-aspc.gc.ca/pau-uap/paguide/

National Institute of Diabetes & Digestive & Kidney Diseases (NIDDK)

www2.niddk.nih.gov/

BMI Nomogram (Health Canada)

www.hc-sc.gc.ca/fn-an/nutrition/weights-poids/guide-ld-adult/bmi_chart_java_graph_imc_java-eng.php

Appendix 3

Instructions for 24-Hour Urine Collection

As part of your assessment as a living kidney donor, we have asked you to collect your urine on two 24-hour occasions. The directions for collecting your urine are as follows:

Please note that you will need to obtain a 24-hour urine bottle from the laboratory to start this test. Please take the requisition to the lab to ensure that you receive the correct bottle for this type of testing.

Select a time in the morning to begin the procedure. At this time, empty your bladder and discard the urine. Immediately record the date and time on the label to indicate the beginning of the collection. From this point onward, ALL urine must be saved in this container. The next morning, empty your bladder and save this urine. Print the date and time of this last collection on the label. If a sample is missed, you will have to start the collection over.

After you have completed the 24-hour urine collection, you must take the urine to the laboratory and give a blood sample. This blood sample should be done within a very short time (less than 6 hours) from the end of the urine collection. The laboratory will calculate the test results using both the urine and blood samples.

Please record your height and weight on the requisition as well.

Collections should be done approximately one week apart.

Collection should be done on a day when the lab will be open the next day because you will need to give a blood sample.

Please Note:

Collect urine in another container and pour it into the collection bottle. This bottle may contain a preservative that can cause burns if splashed on the skin. The specimen should be **REFRIGERATED** during collection and until it is brought to the laboratory.

Appendix 4

Instructions for Computerized Tomography (CT) Angiogram

I have arranged your renal Computerized Tomography (CT) angiogram to be done in the Radiology (X-Ray) Department on the 2nd floor at University Hospital, London Health Sciences Centre.

Your angiogram is scheduled for:

Date: _____

Please report to Patient Registration on the main floor to be registered into the hospital.

Please report to the Radiology Department located on the 2nd floor.

Please do not eat or drink for four hours prior to the test. On arriving in the X-Ray Department, you will be met by a technologist who will ask you some questions, and will arrange for you to see the doctor performing the test before it is done.

The CT is a special x-ray test looking at the kidney's blood vessels. It is done by injecting contrast (x-ray dye) into the IV, followed by taking cross-section pictures through the body. Contrast materials are clear fluids which, when injected into your body, cast a shadow on the

x-ray film. This lets the radiologist see the blood vessels in your kidney. Radiologic contrast materials have been used for many years. Experience has shown that they are very safe and well tolerated by most people. When contrast material is injected into your blood vessels, you may feel a warm sensation, tingling in your arm, or a funny taste in your mouth. You may even feel like you need to pass urine. This is normal. Sometimes contrast material may cause an upset stomach. This is why we ask you not to have a meal immediately before the study. Occasionally, people may develop skin rashes, itching or hives, which usually go away without treatment. In rare cases, some patients may become faint, develop problems with the heart, or have difficulty breathing. Usually these reactions respond to treatment. Vary rarely, reactions can be more serious or even fatal. The frequency of serious reactions to contrast material is about the same as reactions to penicillin. The radiologist can treat most reactions to contrast material if you experience any.

Appendix 5

Nuclear Medicine Scan – Isotope GFR and Renogram

The following appointment has been arranged for you to have a nuclear scan as requested by Dr. Garg. This scan is able to determine the total function of each kidney and the function from each individual kidney. This test is used if there is question about the total clearance from both kidneys or if there is a difference in kidney size.

Your nuclear scan is booked for:

Date: _____

Time: _____

Location: London Health Sciences Centre, University Hospital
Nuclear Medicine Department (3rd floor)

Preparation

1. There is no preparation for this test.

Day of procedure

1. Please report to Patient Registration in the main lobby by 8:00.
2. Please go directly to the Nuclear Medicine Department on the third floor.
3. A saline lock (an intravenous) will be inserted in your hand. A dye will be injected through the IV and will be monitored through pictures and blood sampling.
4. The physician will review the results of your testing with you once the formal report has been obtained.

Appendix 6

Instructions for Renal Biopsy

Dr. Amit Garg wants to perform a renal biopsy to assess your kidney function. Robin Youngren, Dr. Garg's secretary, will be calling to arrange the appointment. For your reference, their office number is 519-685-8500 x 58066. The procedure will be done at Victoria Hospital, London Health Sciences Centre, located at the corner of Commissioners Road and Wellington Road.

The following instructions may be useful to you.

Preparation

1. Please do not have anything to eat or drink after midnight prior to the procedure.
2. **Do not take Aspirin or Aspirin-like anti-inflammatory drugs for at least one week prior to the procedure. It is okay to take Tylenol or acetaminophen. Please check with your coordinator or physician in charge of the angiogram if you have any questions.**
3. You will need to have blood work drawn to check for clotting times (INR and PTT).
4. You will need to have someone with you to drive you home after the procedure and stay with you for the night of the procedure.

Day of Biopsy

1. Please report to Patient Registration.
2. You will then be directed to the Radiology Department.
3. You will be in the Radiology Department where the procedure will be performed.
4. A saline lock (an intravenous) will be inserted in your hand in case we need to give you any medications. Your blood pressure and pulse will be measured before the procedure.
5. After your biopsy, you will spend at least six hours of bed rest in the Medicine Day Unit.

Your blood pressure and urine output will be monitored. A blood sample will be drawn to check your hemoglobin. A light lunch will be provided.

Post Biopsy

1. The physician will review the results of your biopsy with you once the formal report is obtained. This report usually takes between one and two weeks.
2. The night of the biopsy you will need someone to stay with you in the unlikely event that there is an issue following the procedure.
3. For two to three days after the biopsy you should be off work and activities should be low-key. If you do heavy lifting, you will be off work for as long as a week.

Appendix 7

Instructions for Renal Angiogram

I have tentatively arranged your renal angiogram to be done in the Radiology (X-Ray) Department on the 2nd floor at University Hospital, London Health Sciences Centre. However, if we have any concerns with the investigations to date, we may cancel or postpone your angiogram. Your angiogram is scheduled for:

Date:

7:00am Please report to Patient Registration on the main floor to be registered into the hospital.

8:00am Please report to the Radiology Department located on the 2nd floor.

On arriving in the X-Ray department, you will be met by a technologist who will ask you some questions, and will arrange for you to see the doctor performing the test before it is done. The angiogram is a test looking at the kidney's blood vessels, and is done by injecting x-ray dye into the blood vessels while the x-rays are photographing them. The dye is injected through a small tube, which is placed into your arteries through the top of your leg. The top of your leg is "frozen" with local anaesthetic first so you do not feel the procedure being done. After the test, the tube is removed and pressure is applied to the leg to prevent bleeding. You are kept lying still the remainder of the day to make certain no further bleeding occurs.

You will be in the hospital most of the day, as there is recovery period of 0-6 hours following the procedure, when a nurse will look after you.

You will not be able to drive yourself home that day, and therefore should have an adult accompany you.

If you live more than 30 miles from London, you must stay in London overnight following the procedure, so that help is immediately available in case of the rare possibility of any problems following the angiogram. Either way, you must have an adult stay with you that night.

PREPARATION

1. You may have ample fluids the morning of the test, but we ask that you do not have breakfast.
2. Do not take Aspirin or Aspirin-like anti-inflammatory drugs for at least one week prior to the procedure. It is okay to take Tylenol or Acetaminophen. Please check with your coordinator or physician in charge of the angiogram if you have any questions.
3. You will need to have someone with you to drive you home after the procedure.

All tests in which tubes are placed in parts of the body carry a small risk. The main risks of this test are bleeding and dislodgement of a clot from the inside of the blood vessel. These problems are infrequent, and usually can be treated well. The x-ray dye can also cause allergic reaction; if you have had allergies previously, you should let us know.

Appendix 8

Renal Transplant Program
339 Windermere Road, PO Box 5339
London, Ontario, Canada N6A 5A5
(519) 685-8500 ext 35778
(519) 663-3141 FAX
www.lhsc.on.ca

Date

Dr. XXXX
Address
Address
Address

Dear Dr. XXXX,

RE: Patient's Name
DOB: xxxx/xx/xx

Your patient has recently been discharged from London Health Sciences Centre following renal donation for transplantation. You will be receiving a discharge summary from our surgeon outlining details for your patient.

Patients do extremely well post donation and we anticipate your patient will be in this category. A recent literature review we conducted on the long-term implications of donation suggests that on average:

1. Blood pressure may increase 5 mmHg after donating a kidney above the natural increase that occurs with normal aging. This increase may occur over many years.
2. Kidney function (glomerular filtration rate) after donation usually results in a GFR of approximately 70% of pre-donation function. There are subsequent reductions in kidney function anticipated with normal aging. Cases of kidney failure after living donation have been reported but the risk of this event remains the same as the general population which is one in a 1000.
3. Donors have an increased risk of developing micro-albuminuria but the significance of this finding in otherwise healthy people remains unknown.

For patients with a solitary kidney, early recognition of renal calculi or infection is warranted. Patients who become pregnant following donation should have renal function and blood pressure monitoring through their pregnancy.

We wonder if we could ask you to arrange for the patient to have the following tests on a yearly basis with copies of the results sent to the Living Donor Program for our records. If you have concerns with these test results, we would be happy to arrange for the patient to be seen in our nephrology clinic.

Three blood pressure measurements

Serum creatinine

Urine for microalbumin/creatinine ratio

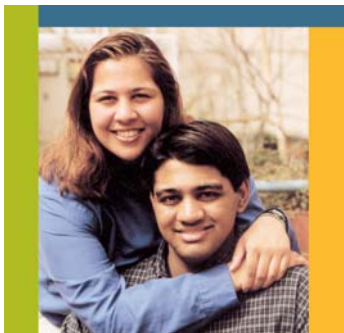
It is prudent to counsel and follow all donors on modifiable risk factors that prevent hypertension, kidney disease and future cardiovascular disease. These are some general recommendations for the kidney donor:

- Avoid long-term use of Nonsteroidal anti-inflammatory drugs because these types of drugs have an association with renal insufficiency and hypertension.
- Ideal body weight should be maintained and weight loss strategies should use a multi-disciplinary approach. High protein diets or the use of protein supplements for body-building should be discouraged because they may contribute to renal hyper filtration injury.
- Kidney donors are informed prior to donation that they must have complete cessation of smoking for their lifetime. Smoking cessation is strongly recommended to prevent renal vascular disease which may contribute to potential chronic renal failure.
- Aerobic exercise for at least 30 minutes on 4 days of the week. Patients should avoid rough contact sports that may damage the remaining kidney.
- A reduced fat, low cholesterol diet that emphasizes fruits, vegetables and low fat dairy products and maintains an adequate intake of potassium, magnesium, and calcium should be followed as per Health Canada guidelines.
- Salt intake should be restricted to less than 100 mmol/day in normotensive individuals.
- Alcohol consumption should be limited to 2 drinks or fewer per day and weekly intake should not exceed 14 standard drinks for men and 9 standard drinks for women.

Thank you for involving us in the care of your patient who has generously made the gift of donation. Please feel free to contact us if you have any concerns.

Yours truly,

Diane Smith
Nurse Case Manager
Living Donor Program



Living Kidney Donation