

Being a living kidney donor

*Information provided by:
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Adult Kidney Program*

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What do kidneys do?

We are normally born with two kidneys - one on either side of the spine just under the lower ribs. They are shaped like kidney beans and are about the size of a fist.

Some of us are born with only one kidney and can go through life without even knowing this, because a healthy kidney can increase its workload and do the work of two kidneys.

Kidneys are vital organs and maintain our body in perfect balance by producing urine. Kidneys do the following:

1. remove wastes from the body by filtering the blood
2. control the salt and fluid levels by removing the excess or retaining what our body needs
3. help control blood pressure
4. produce a hormone which stimulates red blood cell production

Kidneys can fail for a number of reasons. Sometimes this happens suddenly and the kidneys do not recover and sometimes they fail gradually over months or years. Some common diseases that damage the kidneys are diabetes, uncontrolled high blood pressure, and glomerulonephritis (diseases that damage the filters in the kidney).

How can kidney failure be treated?

Severe kidney failure must be treated with either dialysis or with a kidney transplant to keep people alive and healthy.

There are two types of dialysis; **hemodialysis** and **peritoneal dialysis**.

Hemodialysis is a treatment that passes the patient's blood into an artificial kidney (called a filter), which cleanses the blood. The cleansed blood is then returned to the patient. Patients generally require four hours of treatment, three times per week. This is often done in a dialysis unit in a hospital and can sometimes be done at home.

Peritoneal dialysis is a treatment where the blood is cleansed using special dialysis fluids put into the belly (peritoneum) through a catheter or tube.

The fluid is left in the belly for several hours during which time the waste products, extra water, and salts from the body move into the special fluid. This is then drained into a bag and more fresh fluid is put in. This is done at home every day with a machine at night or by changing the fluid several times a day.

People can live on dialysis as long as they stay healthy. There is no 'time-limit' to how long this may be. However people who are on dialysis often do not live as long as healthy people and may not have the same quality of life.

Kidney transplant is another treatment for some people with kidney failure and may improve the quality of life and the length of life.

What Types of kidney transplants are there?

Kidney transplants come from 2 types of donors; deceased donors and living donors.

Deceased donors are previously healthy people who have died from a severe brain injury that has led to complete brain death (e.g. due to an accident or a stroke). These people can become organ donors because their hearts still beat and keep their organs healthy for a short time after their brains have died. However, once the heart stops, people can no longer be organ donors although they can still donate some tissues (e.g. bone, corneas).

People waiting for a transplant from a deceased donor can expect to wait several years due to a shortage of kidneys for transplant. In 2005, people who received a kidney transplant from a deceased donor in Manitoba waited an average of more than 4 years on dialysis. Some people may wait considerably longer than this, and some people may wait and never receive a kidney from a deceased donor.

Living donors are healthy people who choose to donate a kidney to someone they know. A major advantage of living donor transplants is that they can be done much sooner than the time it takes for someone to receive a kidney from a deceased donor. Sometimes living donor transplants can be done before someone even needs dialysis. People with kidney failure tend to stay healthier the sooner they get a kidney transplant and come off dialysis.

Kidney transplants offer people a chance for a better quality of life and a longer length of life. The average transplant from a deceased donor may keep someone alive and off dialysis for 15 years. The average transplant from a living donor may keep someone off dialysis for over 20 years. There are no guarantees how long a transplant may last however. Some may fail immediately and some may last a lifetime. When transplants fail, people are able to go back onto dialysis and may even receive another transplant if they are still healthy.

Who can be a living kidney donor?

Living kidney donors are people who want to help someone they care about. They can be blood relatives or people from outside the family (e.g. spouses and long-standing friends).

Living donors must have a compatible blood group with the recipient. This table outlines which blood groups can donate to a given recipient.

BLOOD TYPE COMPATIBILITY

Blood Type O: is the "universal donor". This means that a donor who is blood type O can give to any recipient blood type.

Blood Type A: a donor who is blood type A can only donate to an A or an AB recipient blood type.

Blood Type B: a donor who is blood type B can only donate to a B or an AB recipient blood type.

Blood Type AB: is the "universal recipient". This means that all donors can donate to a recipient with blood type AB. A donor who is blood type AB can only donate to a recipient with blood type AB.

It is not necessary for the donor and recipient to have the same Rh (rhesus) factor + or -.

Living donors have to be healthy in order to keep the risk of donating a kidney as low as possible. All potential living donors are carefully evaluated to ensure they are healthy enough to donate. The donor evaluation process is outlined in the following section.

What testing do living donors go through?

The purpose of the donor evaluation is to ensure that the donor and recipient are compatible and to make sure that donation is safe for the donor. This is done with blood and urine tests, x-rays, and evaluation by transplant coordinators and doctors.

Testing is done in a *stepwise* fashion, so that if the first tests show that the donor and recipient are not compatible or that the donor is not medically suitable, no further testing is necessary.

If a potential donor starts the evaluation process, information shared between the potential donor and the Transplant Program is confidential. Test results will not be discussed with the recipient or any family members unless the potential donor gives their permission to do so.

A potential donor should understand that they will be going through many tests. There is always the chance that these tests will find something wrong that the potential donor was previously not aware of. This may cause some concern or anxiety. If a serious problem is detected it may also affect the potential donor in other ways (e.g. obtaining insurance in the future).

✓ Step 1: Transplant Coordinator Screening Interview

If someone is interested in donating a kidney, an initial screening interview will be carried out over the phone or in person. A potential donor must be at least 18 years of age. There is no upper age limit for donors but donors must be in excellent health. Common reasons for potential donors not being accepted include a history of kidney stones, high blood pressure, or diabetes.

✓ Step 2: Transplant Nephrologist Information Session

An interview is scheduled with one of the kidney specialists in the Transplant Program. This doctor is responsible for informing the potential

donor of the risks of donating a kidney and will also supervise the testing if the potential donor chooses to proceed. The risks of donating a kidney will be discussed, as will the benefits of a live donor transplant for the recipient. The potential donor will have the opportunity to ask the doctor any questions they may have.

✓ Step 3: Compatibility Testing

It is critical to determine whether the potential donor and the recipient are compatible. Some problems with compatibility may rule somebody out as a donor. The most important compatibilities are all determined by blood testing. The tests are:

- Blood typing
- Crossmatching
- Tissue typing

Blood typing is done first since the donor and the recipient must be blood type compatible as already discussed. Because this test is so important and sometimes rules potential donors out, it is usually done before the evaluation process ever starts.

If the donor and the recipient are blood type compatible, a **crossmatch** will be performed. This test identifies if the recipient has antibodies in their blood that will attack the donated kidney as soon as it is transplanted. If the crossmatch is positive, the transplant sometimes cannot be done. A negative crossmatch means there is no antibody reaction and the donor evaluation can proceed. One week before the transplant, a repeat crossmatch is done to make sure the result has remained negative.

Tissue typing identifies genetic markers found on many cells of the body including the kidney. These markers are called *HLA* (human leukocyte antigens). The recipient's immune system can recognize differences in these markers and this can contribute to rejection of the kidney over time. The lab tests 6 different HLA markers. A donor may match from 0 to 6 out of these markers. Matching is helpful for the recipient because a better-matched kidney (e.g. 6 out of 6) tends to last longer than a less well-matched kidney (e.g. 0 out of 6). However, 0 matched kidney transplants are done and may still last many years.

✓ Step 4: Lab and X-ray studies

These are done to ensure that the potential donor is in excellent health and to ensure that their future health will not be at risk from donating a kidney. This involves:

- Blood pressure readings
- Screening for diabetes
- Screening for infections including hepatitis, TB, and HIV
- Urine tests including two 24-hour urine collections
- Chest x-ray
- Electrocardiogram (ECG)
- Ultrasound of the abdomen

The transplant coordinator and nephrologist review all tests. If any results are unclear, additional tests may be required.

✓ Step 5: Independent Physician Assessment

A Psychiatrist or other physician independent of the Transplant Program will meet with the potential donor and review their reasons to donate and their understanding of the risks. This doctor will also be interested in how the potential donor will cope with donating a kidney including the possibility of the transplant not being successful.

✓ Step 6: CT angiogram

A CT scan is usually the final test required for the donor evaluation. This test takes detailed pictures of the blood vessels supplying and draining the kidneys. It involves an intravenous injection of dye, usually through an arm vein, and lying inside a circular machine that takes X-rays of the internal organs. There is a small risk of an allergic reaction to the dye. Very rarely these can be serious or life threatening.

This test may determine which kidney will be used for donation. The left kidney is usually preferred since the left kidney vein is longer and easier to use in surgery. Most kidneys receive blood from a single artery. However, about 1 in 5 people have kidneys that receive blood from two or more arteries. Having a kidney with two or more arteries is normal but may make it difficult to use such a kidney for transplant. If a potential donor has one kidney with a single artery and one kidney with two or more arteries, then

the kidney with the single artery is preferred. Sometimes the CT scan shows that the blood vessel connections are complicated on both kidneys and neither kidney can safely be used for a transplant.

✓ Step 7: Final review

All of the tests and information obtained during the evaluation process will be carefully reviewed. Donation can proceed only if all the tests and medical examinations indicate that it would be a safe procedure. If there are concerns that donating a kidney puts the donor at too high a risk, donation will not be possible.

How is the surgery done?

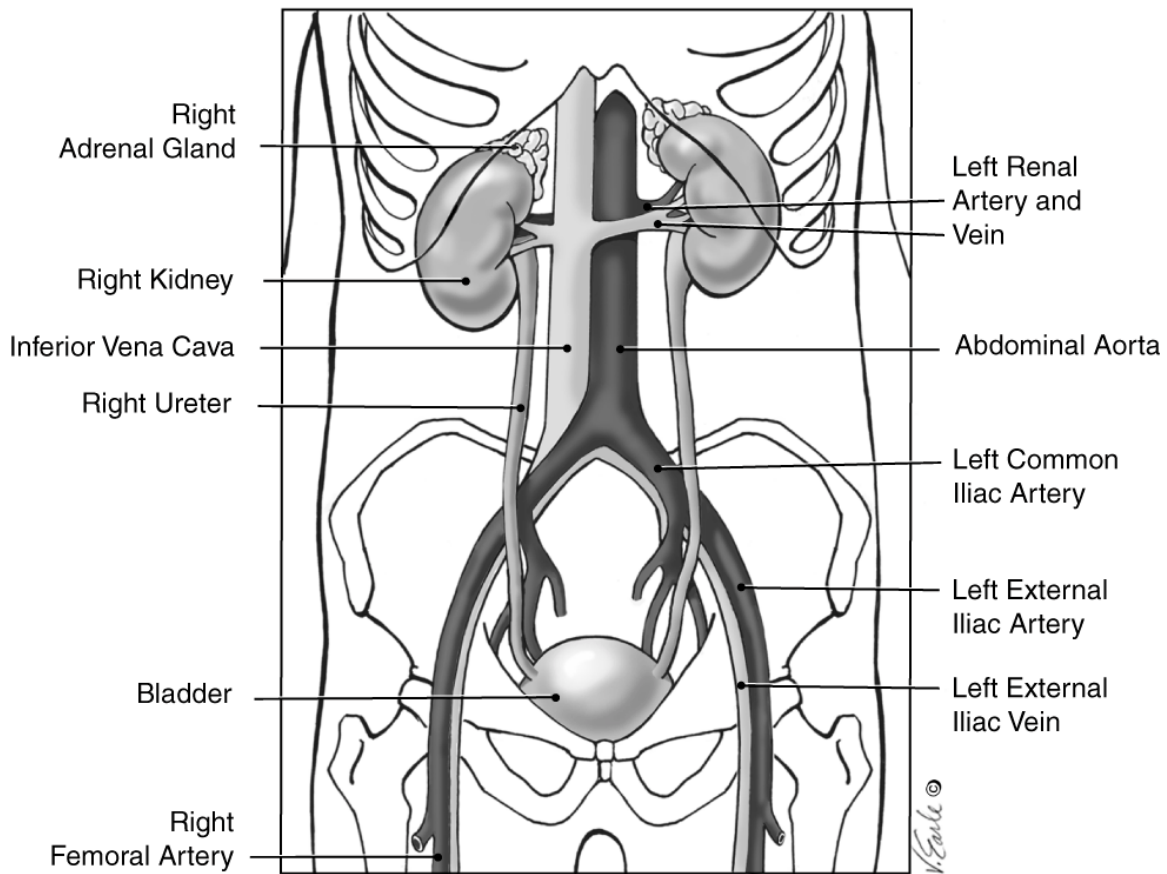
The kidney transplant surgery is not booked until the donor and recipient have finished all their tests and been found healthy enough to proceed.

The surgeon will see the donor once the transplant has been booked. The donor will also see an anaesthetist who is responsible for giving the general anesthetic and monitoring vital signs during the operation. They will discuss the surgical procedure with the donor as well as the recovery and risks. These visits are usually done 1 week prior to the surgery in Winnipeg. Some final blood tests, including a repeat crossmatch, are done at this visit.

The Operation (Donor Nephrectomy)

The day before surgery the donor comes to the hospital for a quick check-up and has an intravenous (IV) inserted into a vein in their hand. Early the next morning, the donor comes to the hospital and is taken to the operating room area. After the donor is asleep, a catheter is placed in their bladder to drain the urine. This catheter is removed on the second or third day after surgery.

The kidney is usually removed through an incision in the back and flank area. The incision is usually six to nine inches long, depending on the size of the donor. The kidney, along with the artery, vein and ureter (the tube that drains urine), are removed. The cut ends of the artery, vein and ureter remaining in the donor are tied off with sutures. Absorbable sutures are used to sew the muscles of the flank back together. The surgery takes approximately 2 hours.



Most donors are in pain after surgery. Donors are given narcotic pain medications to help with this and may also receive an epidural catheter in their back (a small tube that delivers pain medication around the spine).

The nurses usually have donors sitting up the first night and usually have them walking the next day. Most donors start eating food the next day and are ready to go home 3 days after surgery. Once at home, donors have some continuing pain and stiffness that may require more pain medications.

It is very important to avoid straining the stomach and flank muscles during the healing period as they are vulnerable to stretching and may develop permanent weakness (flank bulge). Donors are encouraged to walk and do light activities as soon as they are able. There should be no heavy exercising, stretching, or heavy physical labour for eight weeks. Many donors start

driving around ten days after hospital discharge. Some return to work three to four weeks after surgery if the job does not involve much physical activity, however, most people go back to work between six and eight weeks. If all goes well a donor should be able to resume all their normal previous activities in time.

What are the risks of donating a kidney?

The risks can be divided into the risks of the surgery and the long-term risks of living with one kidney.

Surgical risks:

Surgical complications are seen in less than 5% of donors (1 out of 20). These can be minor or potentially more serious. Below is a list of the surgical complications seen.

<i>Risk of Surgical Complications</i>	
Heart Attack / Cardiac Arrest	<0.02%
Pulmonary Embolism (blood clot traveling to the lung)	<0.1%
Venous Thrombosis (blood clot) in the leg(s)	<0.5%
Bleeding requiring a blood transfusion	<0.5%
Injury to bowel, spleen, liver, pancreas	<0.5%
Pneumothorax (collapse of the lung)	1%-2%
Post-operative pneumonia	1%-2%
Post-operative urinary tract infection	1%-2%
Post-operative wound infection	2%-5%
Post-operative flank "bulge"	5%-15%
Areas of skin numbness around incision	Common
<i>Other Risks</i>	
Post-operative pain for 1-3 weeks	Universal
Post-operative nausea for 24-48 hours	Very common
Post-operative constipation for 1-2 weeks	Very common
<i>Risk of Anesthetic Complications</i>	
Injury to teeth or throat	<1%
Adverse reaction to anaesthetic	<1%

There is a risk of death when donating a kidney. The reported death rate is approximately 1 in 3,000 surgeries (0.03%). These deaths may be due to heart attacks or blood clots in the legs that release and travel to the lungs.

Long-term risks:

A number of studies have followed kidney donors many years after they have donated. In general, donors are very healthy individuals and remain healthier than the general population in the future. A donor's overall kidney function may be slightly reduced but is still normal because the remaining kidney will increase the amount of work it does.

Some donors develop high blood pressure as they get older. It is common to develop high blood pressure with age, but high blood pressure may happen slightly more often in donors than it would if they had not donated a kidney. High blood pressure may require medications to control and can lead to heart disease and kidney disease if it is not treated.

Some donors develop small amounts of protein in the urine over time. This protein is not associated with any long-term kidney problems. Donors do not appear to be at higher risk of developing serious kidney problems or kidney failure than people with 2 kidneys.

It is recommended that donors get **regular follow-up** of their blood pressure and kidney function once a year to make sure everything is fine and to identify any abnormalities early on should they occur. Your family doctor can do this and the staff in the Transplant Program is happy to do this for you as well.

There are no special restrictions for donors. No medication is required after donation other than painkillers shortly after surgery. Donors are encouraged to be physically active and this includes returning to recreational activities such as skiing, snowboarding, running, soccer, hockey, rugby etc. although it may be advisable to wear protective gear for contact sports. There are a few activities that may be considered high risk for someone with one kidney including skydiving, boxing, competitive martial arts and highly competitive or professional contact sports. Life insurance and disability insurance rates are not affected for donors as long as the donor's overall kidney function is still normal. If you have any concerns regarding activity or future career plans, please discuss them with the Transplant Program.

DONOR CONSIDERATIONS

The decision to donate a kidney to a family member or friend is a very personal decision. There is no right or wrong choice. In some cases, it is difficult for a recipient to ask someone to donate or to accept the offer of a kidney from a potential donor. On the other hand, a potential recipient or others may place pressure on the donor to proceed with the testing. It is important that the donor and recipient maintain good communication throughout the process. The Transplant Program is available to assist in any way if the donor or recipient are experiencing frustrations or difficulties. The decision has to be one that is best for the donor and the Transplant Program is committed to supporting the donor throughout the decision making process.

Information shared between the donor and the Transplant Program is confidential. Test results will not be discussed with the recipient or any family members unless the potential donor gives their permission to do so.

Thank you for your interest in donating a kidney. If you have any questions or concerns, we will be pleased to discuss them with you.