



TRANSPLANT



Transplant



HELPFUL TIP

If you're waiting for a transplant, make sure to follow your treatment plan and do your best to stay healthy. Every year you should have a complete physical exam with your primary care provider; have a flu shot and keep other vaccines up-to-date as needed; and, repeat your transplant blood work and tests as directed so that your transplant file is kept up-to-date.

With advances in kidney transplant methods and **anti-rejection medications**, a kidney transplant is considered the best way to treat kidney failure for many people. A kidney transplant involves surgery to place a healthy kidney from a donor into your body. The new kidney takes over the work of your failed kidneys so that you can live a more normal life. A transplant is considered a treatment and not a cure since you will have to take medication for the rest of your life to prevent your body from rejecting your new kidney. There are two types of kidney transplant:

- Transplant from a living donor
- Transplant from a person who has died suddenly; you may hear the terms “deceased donor”, “cadaveric donor” and “non-living donor”

The transplant work-up

While a transplant may offer the best chance of returning to a more normal life, it is not suitable for everyone. Some factors which may affect your suitability for transplant include: general health; history of heart disease, blood circulation problems or cancer; emotional/psychological factors; obesity; and/or, evidence that a person does not or will not follow the medical treatment suggested.

Before being considered for a kidney transplant, whether live or deceased donor, all potential recipients must undergo a rigorous evaluation to determine if they are suitable transplant candidates. This is a detailed medical assessment that could include doctors' evaluations of the heart, lung, stomach, bladder and blood vessels. Many tests and procedures may be needed to make sure you are healthy enough for the transplant surgery and the medications that are needed to prevent rejection of the kidney. You may also need to see a psychologist or psychiatrist before the transplant surgery to explore your feelings about this treatment. The transplant work-up can take up to a year to complete. The transplant team in your community will give you more information about the necessary steps in your own transplant work-up.

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If blood tests indicate that the recipient and their potential donor do not match, they are called an **incompatible pair**. This means that the donor's blood type is not compatible with the recipient's blood type or the recipient has proteins in his/her blood (known as **antibodies**) that will reject that donor's kidney. However, the potential living donor may still be able to provide a kidney in an indirect way – see below.

Kidney Paired Donation (KPD) program

The Kidney Paired Donation (KPD) program makes it possible for recipients who have a friend or family member willing to donate their kidney but who aren't a match, to donate to another recipient, and the intended recipient obtains a living donor kidney from someone else. The KPD program registry is a secure computer database that contains medical information about incompatible donor-recipient pairs from across Canada, compares their information, and identifies pairs that might be able to exchange donors. Ask your local transplant team if this is an option for you.



More information about the KPD program is available on the Canadian Blood Services web site at organsandtissues.ca.





Although people with kidney disease are encouraged to approach family and friends about their need for a kidney, potential donors must come forward of their own accord. Talk to your doctor if you know of someone who is interested in donating a kidney to you. Potential donors must be carefully tested before they can donate a kidney. This is to determine if they are healthy enough to donate a kidney and to see if the transplant is likely to work. Your transplant team will arrange for the potential donor to have a series of tests.

Other assessments are done by different members of the healthcare team. This may include the transplant nephrologist, transplant surgeon, clinical nurse specialist, nurse practitioner, social worker and transplant coordinator. In some cases, other specialists such as cardiologists, psychologists or psychiatrists will also see the potential donor. Your healthcare team can supply more information to the potential donor about what is involved.

If the kidney is suitable and the donor is healthy, a date is set for the transplant. You and the donor may be admitted to hospital a day before the transplant to allow time for some final tests.

Deceased donor transplant

A transplant from a deceased donor is also called a **non-living** or **cadaveric transplant**. In this type of transplant, a healthy kidney from someone who has died, often as the result of a sudden brain injury, is transplanted into your body. The family of the donor is asked to consent to the organ donation.

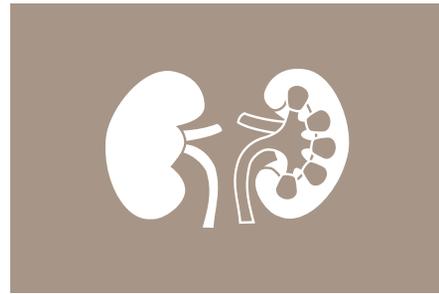
Following a series of tests, you will be put on a transplant waiting list until a kidney is found that is compatible with your body. The length of time you will have to wait is hard to predict because it depends on how hard you are to match and how many kidneys become available.

Transplant programs have an allocation (or matching) system so that distribution of organs is based on fair criteria such as suitable match, amount of time on the waiting list, etc. Ask your transplant team about the specifics in your community.



Anonymity for donors and recipients

In Canada, there is a law to protect the anonymity of both the recipient and deceased donor. Therefore, the identity of the donor cannot be shared with the recipient. However, many programs will forward anonymous cards of thanks from the transplant recipient to the donor's family.



A drainage tube is sometimes placed near the transplanted kidney to remove fluids that build up. In some cases, you may need dialysis following the transplant until the new kidney starts to work.

Your old kidneys are not removed unless they are so large there is no room for the new kidney or they are chronically infected. If you do need surgery to remove your old kidneys, your healthcare team will discuss this with you and the surgery will be carefully planned.

Kidney - pancreas transplant

For people who have kidney failure as a result of Type 1 diabetes (insulin-dependent diabetes) a combined kidney and pancreas transplant can be considered to treat both the kidney failure and diabetes. This procedure is not offered in all centres and is more complicated than a kidney transplant alone. Talk to your doctor for more information about this option.



What is rejection?

After the transplant, many tests are done to make sure your new kidney is working properly and to watch for any signs of **rejection**.

Rejection occurs when the body recognizes that the transplanted kidney is not its own and mobilizes the immune system to fight against it. Rejection can occur at any time after the transplant, but is more common in the early months.

Different medications are used to prevent rejection, either alone, or in combination. These medications work by blocking the activity of the immune system. However, rejection may occur even when these medications are taken faithfully.

You may feel perfectly well in the early stages of rejection. Rejection is usually discovered by routine blood tests and is treated immediately with special short-term medications. Rejection episodes can usually be treated successfully.

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Types of anti-rejection medications

There are three main types of anti-rejection medications and they all have to do with the white blood cells in your immune system. White blood cells do different things. Some white blood cells “read the name tags” on all the things they see in the body. If the name tags show there is something in the body that does not belong, they raise an alarm and send signals to tell the body to make more white blood cells to fight off the “invader”. The invader could be many things: bacteria, a virus, or the organ that was transplanted.

Here are the three main types of anti-rejection medications:

- Medications that make it harder for white blood cells to raise the alarm if they see something that doesn’t belong. Examples: cyclosporine, tacrolimus
- Medications that limit how many new white blood cells your body can make. Examples: azathioprine, mycophenolate, sirolimus
- Medications that make it harder for your white blood cells to talk to each other. Example: prednisone

Many transplant recipients take two, three or four anti-rejection medications. Your transplant team will choose the best ones for you. It’s extremely important to take them *exactly as ordered* to make sure you get the best benefits while trying to avoid serious side effects.



In this handbook, we’ve used the generic name of the medication rather than the brand name because there are often several brands available. Towards the back of this handbook, there is a chart showing examples of brand names.



Antithymocyte globulin and basiliximab

Antithymocyte globulin and basiliximab are antibodies that block the function of the immune cells, which are responsible for rejecting a transplanted kidney. Some patients receive several doses of these medications, given intravenously, at the time of the transplant.

In the first two or three days of receiving antithymocyte globulin, people may feel like they have the flu (fever, chills, nausea, headache). These effects generally go away. Medications such as acetaminophen, prednisone and diphenhydramine may be given to help with these side effects.

Side effects

All medications, even vitamins, herbs and natural products, can have side effects. Just because a side effect is possible with a medication, it does not mean that everyone will have it.

Most people can take anti-rejection medications without any problems. If you notice a side effect or feel different than normal, let your transplant team know so they can help you with it. *It's important for them to know how you are feeling before you take steps to feel better on your own.*

An important possible side effect that can happen with all anti-rejection medications is an increased risk of infection.

- You may need to take antibiotics to prevent serious lung infections.
- You may need to take antiviral medications to prevent serious viral infections.
- Wash your hands often and thoroughly with regular soap and water.
- Avoid being around people who are sick.



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Below is a chart that shows some of the possible side effects from taking various anti-rejection medications. There are also *other* side effects that are not listed below. If you have other side effects or concerns, talk to your transplant team and pharmacist.

Common anti-rejection medications and some of the possible side effects (not a complete list)

	AZATHIOPRINE	CYCLOSPORINE	MYCOPHENOLATE	PREDNISONE	SIROLIMUS	TACROLIMUS
Increased risk of infection	x	x	x	x	x	x
Stomach upset, nausea, heartburn, loose stool, diarrhea			x			
Tremor			x			x
High blood pressure		x				x
High cholesterol		x			x	x
Hair growth		x				
Hair loss						x
Increased cancer risk (skin cancer and lymphoma)	x	x	x	x	x	x
Increased risk of high blood sugar or diabetes*				x		x
Low blood cell count	x		x		x	
Increased appetite and weight gain**				x		
Increased ankle swelling or edema				x		
Skin changes (thinner, acne, slow wound healing)				x	x	
Mood changes				x		
Bruising				x		

* If you have diabetes, make sure to check your blood sugar often, and make a plan with your diabetes team to adjust your diabetes medication after your transplant.

** Make sure to meet with the dietitian to discuss the foods you can and should eat after the transplant.



Important guidelines about medications and your transplant

Interaction with other medications, remedies and foods

Many of the medications you take to keep your transplant healthy will be negatively affected by certain foods and other medications. This includes other prescription medications, over-the-counter drugs and treatments, and herbal remedies.

Here are some examples of how your anti-rejection medications (especially cyclosporine, tacrolimus and sirolimus) interact with many other commonly used medications and some foods.

- Some pills, including St. John's wort, can make cyclosporine and tacrolimus ineffective (useless). This can cause damage to, or the loss of, your transplant.
- Erythromycin and clarithromycin (antibiotics often used for sore throats) can make cyclosporine and tacrolimus levels increase high enough to cause kidney damage, if not carefully watched.
- As stated earlier, you should avoid grapefruit, grapefruit juice and certain types of oranges (Seville oranges). These foods may cause an increase in the level of cyclosporine, tacrolimus and sirolimus in your blood.

Your transplant team keeps an up-to-date list of all the medications you take. You should check with your transplant team *before* taking any new medication, even if it's prescribed for you by another doctor, or is an over-the-counter pill or herbal remedy. Your team will make sure the new medication, over-the-counter pill or herbal remedy is safe for you.

When any doctor or pharmacist prescribes a medication or other treatment for you, always make sure they have considered your transplanted kidney and the other medications you're taking.

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See the online version of

**Book One:
Living with reduced
kidney function,
Chapter Four:
Managing your
medications for kidney
health** for more tips
on managing your
medications: kidney.ca.

Taking anti-rejection medications

It's very important to take all of your anti-rejection medications and at the correct times of the day, as determined by your transplant team. Missing doses and taking doses too late can let your immune system start to attack your transplant. You might not feel any different and your blood tests may look fine to start with. The damage can build up and you may lose your transplant later.



If it's hard to remember to take your transplant medications, talk to your transplant team about making the schedule easier. Using alarms or smart phone apps can help. You may also want to ask your pharmacist about using a bubble pack for your medications.

If you are having side effects from your transplant medications, talk to your transplant team about ways to help you feel better.



Keep an adequate supply of medications

Make sure to always have a supply of your anti-rejection medications so that you never run out. You should usually allow at least one week when reordering from the pharmacy.

Make sure to talk to your transplant team about coverage of anti-rejection medications. Sometimes the medications can *only* come from the transplant hospital and sometimes they come from your local pharmacy. You may be responsible for paying for your anti-rejection medications and they can be very expensive. Your transplant team can work with you and your insurance plan to sort out medication coverage.



TRAVEL TIP

If you travel after your transplant, bring an extra supply of medication in case your travel plans change. Always keep your medication in the original containers with labels that come from the pharmacy. Carry your medication with you in your carry-on bag.

Living well with a kidney transplant

It is important to get plenty of rest after a transplant. You may tire easily as a result of the operation and your stay in the hospital. Your energy will return however, and you will find you need less rest. After you have recovered from the transplant operation and are used to taking your anti-rejection medications, you'll find yourself returning to a more normal lifestyle. While you'll have to take medications every day and visit a transplant clinic regularly, you won't need dialysis anymore.

Stay active

Walking is the best exercise at first. You can also do light housework, but avoid any heavy lifting for at least two months following the transplant. After the recovery period you should aim for 30 minutes of exercise each day. Try brisk walking, cycling, swimming, tennis or gentle aerobics. Talk to your doctor before doing any strenuous exercise.

See **Chapter Eight:**

Living well with kidney failure for more information about travel-related topics.



Follow a healthy diet

Here are some guidelines to help you follow a heart-healthy diet that can help reduce your risk of heart disease:

- Aim for at least five servings of fruits and vegetables each day.
- Eat a wide variety of raw and sometimes cooked vegetables and fruit. Include dark green leafy vegetables like spinach, chard, and kale. Include colourful vegetables like beets, tomatoes and sweet peppers.
- Include fatty fish (salmon, mackerel, anchovy, sardines) regularly.
- Snack on nuts and seeds (almonds, hazelnuts, walnuts, pumpkin seeds).
- Use olive oil in your cooking.
- Include whole grain breads, pasta and brown rice.
- Include low-fat dairy products like yogurt and cheese.

While a heart-healthy diet may include having an occasional glass of wine or beer, the effect of alcohol on a transplanted kidney is not really known. It is best to limit alcohol. If you have any questions, speak with your doctor or dietitian about how much alcohol is safe for you to consume.



HEART-HEALTHY DIET

If you want to learn more about a heart-healthy diet, talk to your doctor or dietitian about DASH (Dietary Approaches to Stop Hypertension) or the Mediterranean diet.

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Calcium and phosphorus

As long as your new kidney is working well, the levels of calcium and phosphorus in your body will return to normal. After your transplant, it is no longer necessary to restrict phosphorus or to take phosphate binders. In fact, it is important to consume an adequate amount of these minerals. The main sources of these minerals are milk and milk products.

Cholesterol and fat

You may develop an elevated **cholesterol** level after your transplant. Anti-rejection medications may contribute to this. You can lower your cholesterol level by losing weight, making healthy food choices and staying active and by reducing the saturated fat in your diet. You may need to take prescription medication if changes in your diet do not lower your cholesterol level.

Fluid and sodium

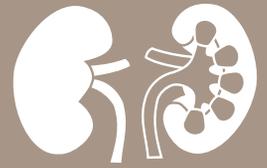
You do not need to restrict your fluid intake as long as your new kidney is working well. In fact, it is important to drink a lot of fluids for your new kidney to work well. Anti-rejection medications may increase your blood pressure after a transplant. To help lower your blood pressure, you may need to continue to limit the amount of sodium in your diet.

Potassium

Anti-rejection medications sometimes increase the potassium level in the blood. Therefore, you may need to limit your potassium intake after your transplant. Your dietitian can help you make lower potassium food choices.

Protein

For the first two months following a transplant, you will need slightly more protein in your diet. Protein is necessary to repair tissue and help the healing process after transplant surgery. After the first two months, you can return to a moderate intake of protein.



General recommendations for good health after a transplant

- Wear a Medical ID bracelet that identifies you as the recipient of a kidney transplant.
- Avoid prolonged exposure to the sun. Anti-rejection medications can make your skin more susceptible to sun damage and skin cancer. If you do spend time in the sun, apply a good sunscreen first, preferably one labelled SPF 45 or more (and reapply as needed). Wear a hat and clothing which blocks the sun.
- Wash your hands regularly to help avoid infections.
- Prepare, cook, serve and store food in a safe manner. Also, since you are immunosuppressed (your immune system is weakened due to the anti-rejection medications you are taking), do not eat raw meat, fish, poultry, eggs and raw cheese since these foods could contain bacteria that could make you ill.
- Report fevers, sore throat, cold, flu, or unusual bleeding to your doctor.
- *Avoid over-the-counter medications or herbal remedies.* Many contain substances which can harm your new kidney or which might interfere with other medications you are taking.
- Inform your transplant team or pharmacist of any medications prescribed by other doctors.

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FOOD SAFETY

For more information about food safety, especially for people with weakened or vulnerable immune systems, visit healthy Canadians.gc.ca

