



Kidney Failure

Choosing A Treatment Option that is Right for You

Healthy kidneys play a crucial role in cleaning your blood by removing wastes and excess fluid, and regulating your minerals and electrolytes. Additionally, they produce hormones that contribute to strong bones and healthy blood. However, in the event of kidney failure, harmful wastes start accumulating in your body, your blood pressure may rise, and your body may retain excessive fluid and a decrease in red blood cells production. In such instances, it is vital to seek treatment to replace the functions of your failed kidneys.

If you are facing kidney failure, you will have to make important decisions regarding your treatment options. Your options for treatment include hemodialysis, which involves a machine to filter your blood outside of your body; peritoneal dialysis, which makes use of the lining of your abdomen to filter your blood inside your body; or kidney transplantation, which involves receiving a new kidney to be placed surgically into your body.

Each treatment option has its own set of advantages and disadvantages, which means that choosing any treatment will have a big impact on your lifestyle, including your ability to work.

Ultimately, the decision about which treatment option to pursue rests with you, as you are the only one who can determine what is the most important for you.

By reading this information, you can become informed about your options and make an informed decision. It is important to remember that if you find that your

chosen treatment is not the right fit for your lifestyle, you can always make a change.

With the support of your health care team, friends and family, you can lead a full and active life.

In rare cases, some patients may choose to forgo all forms of kidney replacement therapy and instead opt for conservative therapies with palliative care only.

When Your Kidneys Fail, what's next?



Treatment Choice: Hemodialysis

Hemodialysis is a medical procedure that utilizes a machine to effectively cleanse and filter your blood, eliminating harmful wastes, excess salt, and additional fluids. By undergoing hemodialysis, you can maintain your blood pressure and achieve a balanced level of essential elements like potassium, sodium, calcium, and bicarbonate.



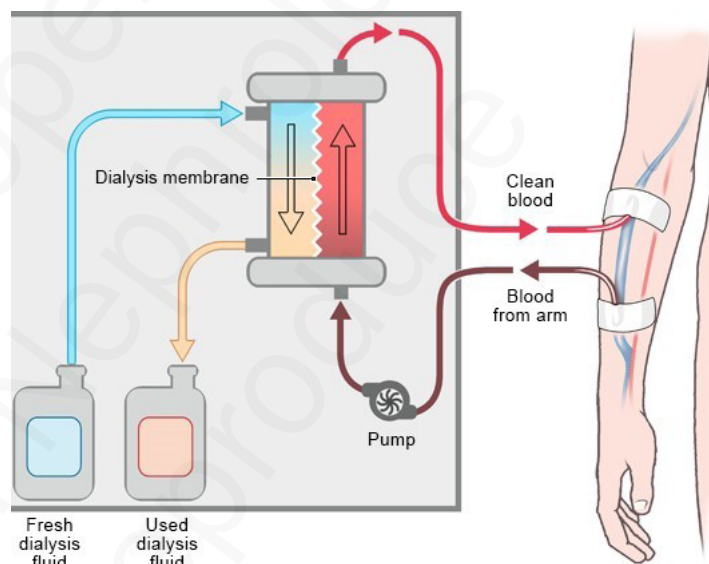
In case of kidney failure, hemodialysis serves as a reliable means of replacing some of the functions of your kidneys. However, additional measures such as dietary regulations, fluid intake limits and medications may also be required. The specifics of your dietary needs, fluid intake, and medication requirements will depend on the treatment option you choose, in consultation with your healthcare provider.

How Does Hemodialysis Work?

Hemodialysis involves the use of a specialized filter called a dialyzer, which acts as an artificial kidney to clean your blood. The dialyzer is a cylinder connected to the hemodialysis machine.

During the hemodialysis treatment, your blood transported through a series of tubes and

into the dialyzer, where it is cleansed of waste products, excess salts and additional water. The purified blood is then directed back into the body through another set of tubes. The hemodialysis machine continuously monitors the blood flow and eliminate waste products from the dialyzer.



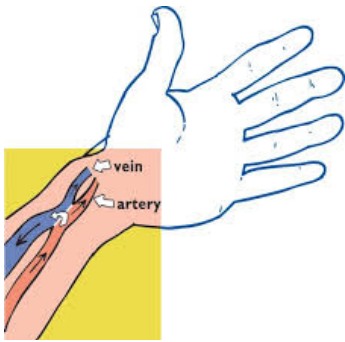
Typically, hemodialysis is carried out three times a week, each session lasting from three to five hours or more. During the treatment, you are free to read, write, sleep, talk, or watch TV, making it relatively a comfortable experience.

Getting Ready... Preparing for Hemodialysis

In the months leading to your first hemodialysis treatment, an access to your bloodstream will need to be created. This surgical procedure may require a hospital stay overnight, but many patients may undergo the procedure as outpatient. This access is crucial in allowing for the efficient transportation of blood to and from the dialyzer, without causing any discomfort. There are two primary types of access available: a fistula and a graft.

Arteriovenous fistula, AVF

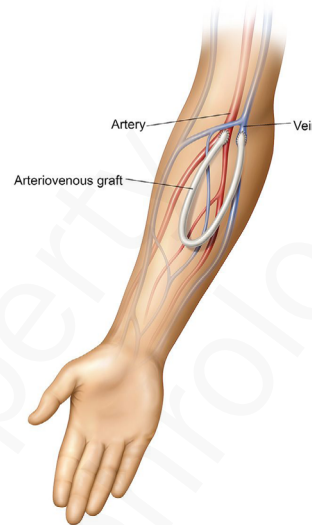
The BEST CHOICE



A surgeon creates this by utilizing your own blood vessels, connecting an artery directly to a vein, typically in your forearm. The increased blood flow causes the vein to grow larger and

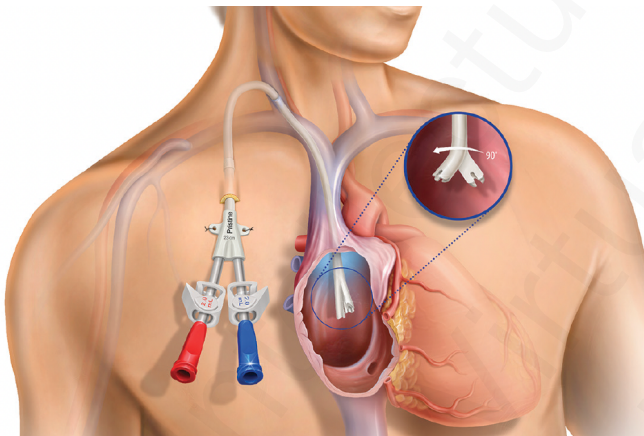
stronger, making it suitable for repeated needle insertions. Although this kind of access is the best option, it may take several months to mature and become ready for use.

Arteriovenous Graft, AVG



A graft is a synthetic tube that connects an artery to a vein, unlike an AV fistula, it does not require the same time to develop, so it can be used sooner after the placement. However, a graft is more likely to have problems with infection and clotting.

Hemodialysis Catheter for temporary access, Permacath



If your kidney disease has progressed rapidly, you may not have enough time to establish a permanent vascular access before starting hemodialysis treatment. In this case, you may need to use a temporary catheter, a small, soft tube inserted into a vein in your neck, chest. Some people use a catheter as a long-term access. However, catheters that will be needed for more than two weeks are designed to be placed under the skin to improve comfort and reduce complications.

Who Performs the Hemodialysis Treatment?

Hemodialysis is typically performed at a dialysis center by patient care technicians (PCT) who work under the supervision of nurses.

If you opt for in-center treatment, you will have a set time slot three times a week usually on Monday, Wednesday, and Friday or Tuesday, Thursday, and Saturday. In case you do not get the desired time slot initially, you can request to be put on a waiting list for the preferred time. Additionally, you may be able to switch time with another patient for a special event.

Some centers offer in-center nocturnal hemodialysis, which involves a longer treatment period during the night while you sleep at the center.

The treatment allows for more dialysis, resulting in fewer dietary and fluid restrictions, and it frees up your days for work, child care, hobbies, or other activities.

You also have the option to learn how to perform hemodialysis treatments at home. When you are

Diet for Hemodialysis

Hemodialysis along with a proper diet, can help reduce the accumulation of wastes in your blood. A dietitian is available at all dialysis centers to assist you in planning meals according to your doctor's orders. When selecting foods, Keep in mind:

1. Eat balanced amounts of high-protein foods such as meat, chicken and fish.
2. Control your intake of potassium. This mineral is found in salt substitutes, some fruits (such as bananas and oranges), some vegetables, chocolate, and nuts. Consuming too much potassium can be dangerous to your heart.
3. Limit your fluids intake. When your kidneys are not functioning, fluids can quickly accumulate in your body causing your tissue swelling and potentially leading to high blood pressure, heart problems, cramps, and low blood pressure during hemodialysis.
4. Avoid salty foods, which can make you thirsty and lead to fluid retention in your body.
5. Restrict your intake of foods such as milk, cheese, nuts, dried beans, and dark colas, as they contain large amounts of phosphorus. Too much phosphorus in your blood causes calcium to be pulled from your bones, resulting in weakened and brittle, which may lead to arthritis. To avoid bone problems, your doctor may prescribe special medications called phosphate binders, which you must take with meals every day as directed.

Advantages and Disadvantages for Different Hemodialysis Modalities

Each person responds differently to similar situations, so what may be a negative factor for one person could be a positive one for another.

Below is a list of the general advantages and disadvantages of in-center and home hemodialysis.

In-center Hemodialysis	
ADVANTAGES	DISADVANTAGES
<ul style="list-style-type: none"> + Dialysis facilities are widely available. + Trained professionals are available to help you at all times. + You can interact and socialize with other patients. + You do not need a partner to help you with treatment, and you don't need to keep equipment at home. 	<ul style="list-style-type: none"> - Treatments schedules are predetermined by the center and are relatively inflexible. - You need to travel to the dialysis center for treatment. - This treatment modality requires the strictest diet and fluid limits. - You will need to take and pay for more medications. - You may experience more frequent ups and downs in how you feel on a day-to-day basis. - It may take a few hours to feel better after a hemodialysis treatment.

Home Hemodialysis

ADVANTAGES

- + You can do it whenever you choose, but as often as your doctor orders.
- + You don't have to travel to a dialysis center.
- + You'll feel more independent and in control of your treatments and life.
- + New portable machines require less space and may go on travel.
- + You'll experience fewer ups and downs in how you feel day-to-day.
- + Home hemodialysis is more work-friendly than in-center treatment.
- + Your diet and fluids will be much closer to normal.
- + You can spend more time with your loved ones.
- + Better cardiovascular outcomes, better quality of life, and better survival.

DISADVANTAGES

- You must have a partner to help you.
- Your family may feel stressed helping you with treatments.
- You and your partner need training.
- You need space for storing the machine and supplies at home.
- You may need to take a leave of absence from work for training.
- You'll need to learn how to insert the dialysis needles into the hemodialysis access.
- Daily and nocturnal home hemodialysis are not yet offered at all locations.

Working with Your Health Care Team

Here are some questions you may want to ask:

- Is hemodialysis the best treatment choice for me? Why?
- Can I choose the dialysis center I want to go to?
- What should I consider when choosing a dialysis center?
- Will my kidney doctor see me at the dialysis center?
- What does hemodialysis feel like?
- What is self-care dialysis?
- Is home hemodialysis available in my area? How long does it take to learn? Who will train me and my partner?
- which type of hemodialysis access is best for me?
- Can I continue to work while on hemodialysis? Can I have treatments at night?
- How much exercise should I do?
- Who will be on my health care team? How can they help me?
- Who can I talk about finances, sexuality, or family concerns?
- How/where can I talk with other people who have faced this decision?

Treatment Choice: **Peritoneal Dialysis**

Peritoneal dialysis is another form of dialysis that removes wastes, chemicals, and extra water from your body. This type of dialysis uses the lining of your abdomen to filter your blood. This lining is called the peritoneal membrane and acts as the artificial kidney.

How **Peritoneal Dialysis** Works

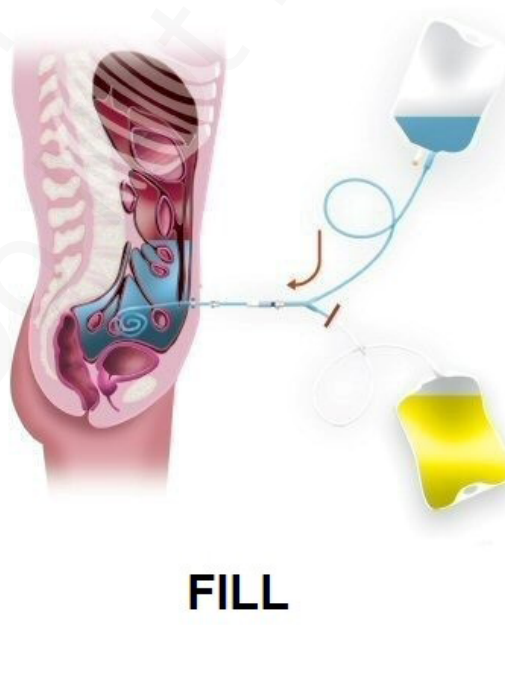
A solution of minerals and sugar (dextrose) dissolved in water, called dialysis solution, is transported through a catheter into your abdomen. The sugar concentration in the dialysis solution draws out the excess water, wastes, and chemicals from the tiny blood vessels in your peritoneal membrane. After several hours, this solution is drained out of your abdomen through the tube, the peritoneal dialysis catheter (PD catheter), taking the wastes from your blood with it. The process is repeated by refilling your abdomen with fresh dialysis solution, and this cycle is called an exchange. There is another type of sugar called icodextrin, is now being used in special conditions where removing excess fluid is challenging.



Peritoneal Dialysis "PD" exchanges



DRAIN



FILL



DWELL

Does not require the use of blood to leave your body

Getting Ready

Before your first treatment, a surgeon will implant a catheter into your abdomen.

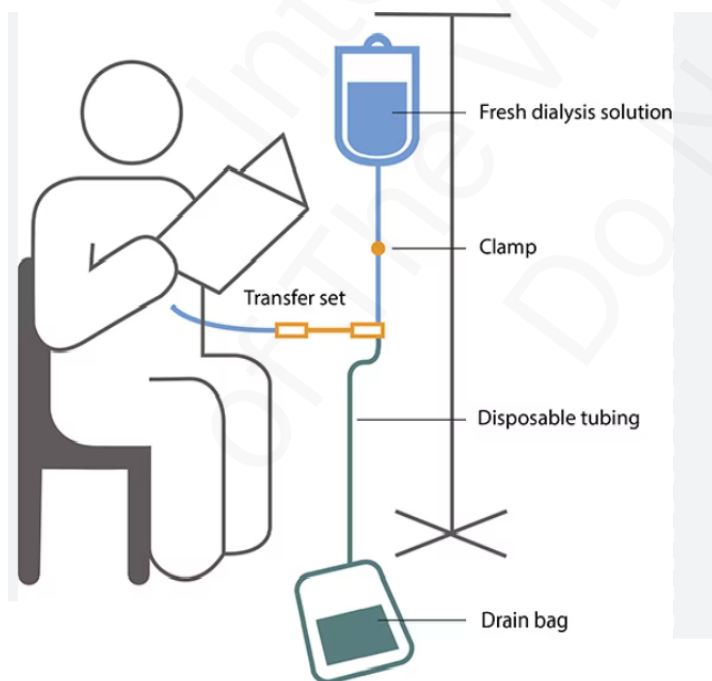
It is important to allow adequate time, usually 3–6 weeks, for the insertion site to heal. Planning your dialysis access can improve treatment success. This catheter is permanent to help transport the dialysis solution to and from your abdomen during treatment.

Types of Peritoneal Dialysis

There are four types of peritoneal dialysis available.

(1) Continuous Ambulatory Peritoneal Dialysis (CAPD)

CAPD is a form of peritoneal dialysis that does not require a machine and can be done in any clean, well-lit place. During CAPD, your blood is continuously being cleaned using a dialysis solution that passes from a plastic bag through the peritoneal dialysis catheter into your



abdomen, where it stays for several hours with the catheter sealed.

(2) Continuous Cyclor-assisted Peritoneal Dialysis (CCPD) (the ideal type)

CCPD utilizes a machine known as THE CYCLER, that fills and empties your abdomen three to five times while you sleep at night. In the morning, you begin a single exchange that remains in your abdomen the whole day. Additionally, you may perform another exchange in the middle of the afternoon without the cyclor to enhance the waste removal and to reduce the leftover fluid in your body.

(3) Combination of CAPD and CCPD

If your peritoneum filters the wastes slowly, or if you are a large person, you may require a combination of CAPD and CCPD to achieve the adequate dialysis dose. For instance, some individuals may use a cyclor at night and perform one exchange during the day. Others may do four exchanges during the day and use a mini cyclor to perform one or more exchanges during the night. Your health care team will collaborate with you to determine the optimal routine.

(4) Intermittent Peritoneal Dialysis (IPD)

Intermittent exchanges are mostly used in the hospital setting for acute kidney failure.

Who Performs Peritoneal Dialysis?

Both types of peritoneal dialysis, CAPD and CCPD, are usually performed by the patient without assistance from a partner.

CAPD is a type of self-treatment that does not require a machine. On the other hand, with CCPD, a machine is needed to drain and refill your abdomen.

Possible Complications of Peritoneal Dialysis

Peritonitis, a serious abdominal infection, is the most common problem associated with peritoneal dialysis. This infection can occur if the opening where the catheter enters your body becomes infected, or if contamination occurs during the connection or disconnection of the catheter from the bags. Peritonitis treatment requires antibiotic prescribed by your nephrologist.

To prevent peritonitis, it is crucial to strictly follow the procedures and learn to recognize the early signs of peritonitis, such as fever, unusual color or cloudiness of the drained peritoneal dialysis fluid, and redness or pain around the catheter. If you notice any of these signs, notify your doctor or nurse right away so that they can quickly treat the peritonitis to avoid further complications.

Diet for Peritoneal Dialysis

A peritoneal dialysis diet is slightly different from an in-center hemodialysis diet.

1. You will still need to limit salt and liquids, but you may be able to consume more of each compared to the in-center hemodialysis diet.
2. You must consume more protein.
3. You may have different restrictions on potassium. You may even need to consume high-potassium foods.
4. You may need to reduce the number of calories you consume because there are calories in the dialysis fluid that may cause weight gain.
5. Your doctor and a dietitian who specializes in helping people with kidney failure will be able to assist you in planning your meals.

Advantages and Disadvantages of Different Type of Peritoneal Dialysis

Each type of peritoneal dialysis has advantages and disadvantages.

CAPD	
ADVANTAGES	DISADVANTAGES
<ul style="list-style-type: none"> + You can do it alone. + You can perform the required number of exchanges each day at times you choose. + You can do it in many locations. + You don't need a machine. + You won't experience the ups and downs that many patients on hemodialysis feel. + You don't need to travel to a dialysis center three times a week. 	<ul style="list-style-type: none"> - It may disrupt your daily schedule. - It is a continuous treatment, and all exchanges must be performed seven days a week.

CCPD

ADVANTAGES

- + You can do it at night, mainly while you sleep.
- + You are free from performing exchanges during the day.

DISADVANTAGES

- You need a machine.
- Your movement at night is limited by your connection to the cyclor.

Working with Your Health Care Team

Questions you may want to ask:

- Is peritoneal dialysis the best treatment choice for me? If yes, which type is best and why?
- How long will it take me to learn how to perform peritoneal dialysis?
- What does peritoneal dialysis feel like?
- How will peritoneal dialysis affect my blood pressure?
- How will I know if I have peritonitis, and how is it treated?
- As a peritoneal dialysis patient, will I be able to continue working?
- How much exercise should I engage in?
- Where do I store my supplies?
- How often will I see my doctor?
- Who will be on my health care team, and how can they help me?
- Whom should I contact with problems?
- Who can I talk about finances, sexuality, or family concerns?
- How and where can I communicate with other people who have faced this decision?

Dialysis is Not a Cure

Hemodialysis and peritoneal dialysis are treatments that help replace the functions of your kidneys. These treatments help you feel better and live longer, but they do not cure kidney failure. Although patients with kidney failure are living longer than ever before, kidney disease can cause problems such as heart disease, bone disease, arthritis, nerve damage, infertility, and malnutrition over time. These problems will not go away with dialysis, but doctors now have new and improved ways to prevent or treat them. You

should discuss these complications and their treatments with your doctor.



Treatment Choice: **Kidney Transplantation**

Purpose

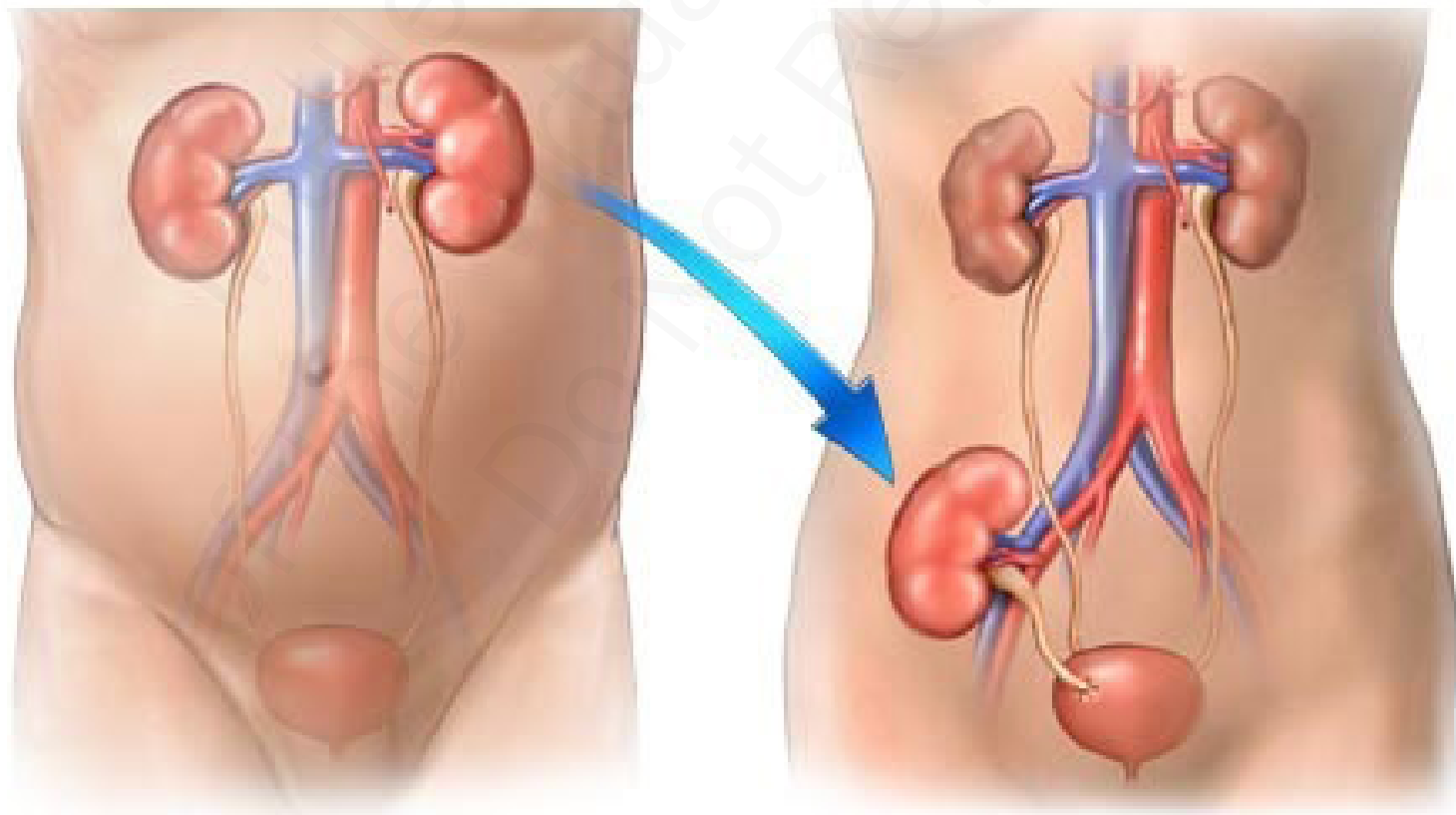
Kidney transplantation is the surgical procedure in which a healthy kidney from another person is transplanted into your body. The donated kidney is able to perform enough of the work that your two failed kidneys used to do, which helps to keep you healthy and symptom-free.

How Kidney Transplantation Works

During a kidney transplantation, a surgeon places the new kidney inside your lower abdomen and connects its artery and vein to your own artery and vein. Your blood then flows through the donated kidney, which functions like your own healthy kidneys did in the past, producing urine. The new kidney usually starts working right away, or it may take a few weeks before it begins to produce urine. Unless your own kidneys are causing infections or high blood pressure, they are left in place.

DONOR

RECIPIENT

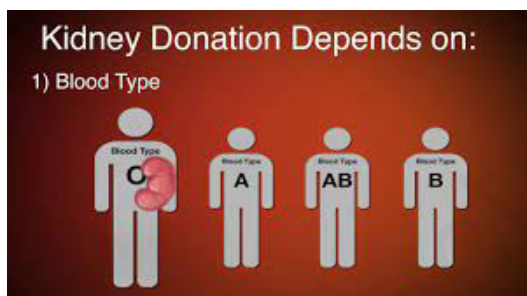
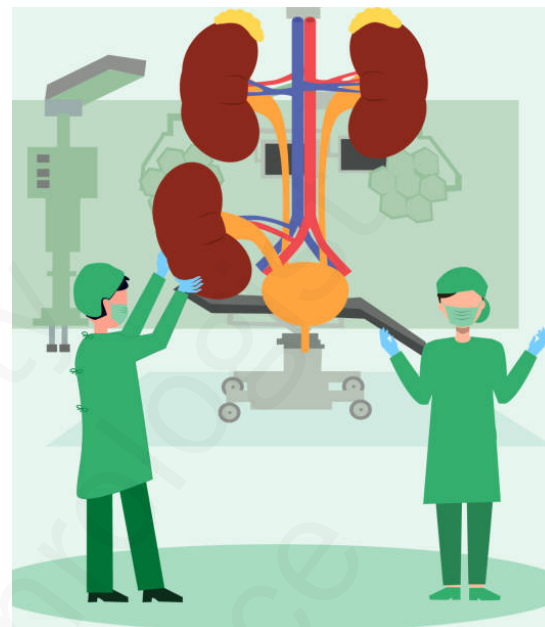


Getting Ready

The kidney transplantation process involves several steps. First, it is important to talk with your doctor to determine if transplantation is a suitable option for you. There may be certain conditions that make transplantation unsafe or unlikely to succeed.

You can receive a kidney from either a deceased donor or a living donor, who can be a related or unrelated person, such as a spouse or a friend. In case you don't have a living donor, you may have to wait on a waiting list for a deceased donor kidney. The wait for a deceased donor kidney can take several years.

The transplant team considers three factors while matching kidneys with potential recipients, which can help predict if the new kidney will be accepted or rejected by your body's immune system.



Recipient	Blood donor			
	O	A	B	AB
O	✓	✗	✗	✗
A	✓	✓	✗	✗
B	✓	✗	✓	✗
AB	✓	✓	✓	✓

(1) Blood type

Your blood type (A, B, AB, or O) must be compatible with the donor's blood type. Blood type is the most crucial matching factor.

(2) Human leukocyte antigens (HLAs)

Your cells carry six important HLAs, three inherited from each parent. Family members are more likely to have a complete match. You may still receive a kidney even if the HLAs are not a complete match as long as your blood type is compatible with the organ donor's, and other tests show no matching problems.

(3) Cross-matching antigens

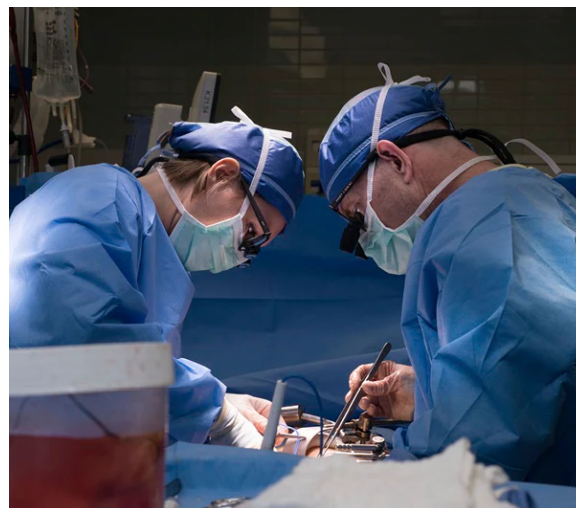
The final test before transplanting an organ is the cross-match. A small sample of your blood will be mixed with a sample of the organ donor's blood in a tube to check if there's a reaction. If no response occurs, the result is called a negative cross-match, and the transplant operation can proceed.

The Amount of Time Required for a Kidney Transplantation

The amount of time will have to wait for a kidney transplant varies. Due to the shortage of deceased donors, you will be placed on a waiting list. However, if a voluntary donor donates a kidney to you, the transplant can be scheduled as soon as you are both ready. Avoiding the long wait is a significant benefit of live donation.

The surgery typically takes three to four hours, and the usual hospital stay is around a week. After leaving the hospital, you will need to have regular follow-up visits.

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In a living donation, the donor will likely stay in the hospital for the same amount of time. However, a new technique for removing a kidney for donation uses a smaller incision, making it possible for the donor to leave the hospital in two to three days.

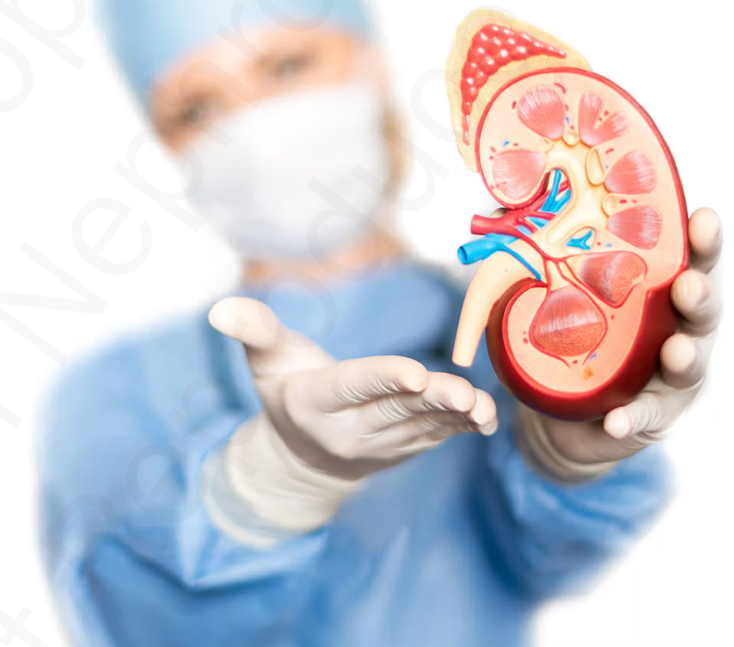
Approximately 85–90% of transplants from deceased donors remain functional one year after the surgery. Transplants from living relatives usually have a higher success rate than transplants from unrelated or deceased donors because they are typically a closer match.

Possible Complications of kidney transplant

Transplantation is the closest thing to a cure for kidney failure. However, even if the match is good, your body may still reject your new kidney. One common cause of rejection is not following medication instructions as prescribed.

Your doctor will prescribe immunosuppressants to help prevent your body's immune system from attacking the new kidney, which is known as rejection. You will need to take these medications daily for as long as the transplanted kidney is functioning. However, in some cases, even immunosuppressant may not stop the body from rejecting the new kidney. If this happens, you may need to go back to some form of dialysis and wait for another transplant.

Although immunosuppressants are effective in preventing rejection, they weaken your immune system, which can increase your risk of infections. Some medications may also cause physical changes, such as facial swelling, weight gain, acne or facial hair growth. However, not all patients experience these side effects, and some can be managed with diet and makeup.



Immunosuppressants work by reducing the function of immune cells, which can increase the risk of developing certain types of cancers. Some immunosuppressants can also cause cataracts, diabetes, excess stomach acid, high blood pressure, and bone disease. With prolonged use, these drugs can also damage the liver or kidneys in some patients.

Diet for Kidney Transplantation

The diet for transplant patients is generally less restrictive than that for dialysis patients, although you may still have to limit certain foods. As your medications, blood test results, weight, and blood pressure change, it may be necessary to make adjustment to your diet. You may need to monitor your calorie intake, as some

of your medications may increase your appetite and cause weight gain.

Your diet may also need to be lower in salt, as certain medications may cause your body to retain sodium, which can lead to high blood pressure.

Advantages and Disadvantages of Kidney Transplant

Kidney Transplant

ADVANTAGES

- A transplanted kidney functions like a normal kidney, which can make you feel healthier and “more normal.”
- You may have fewer dietary restrictions compared to being on dialysis.
- You will no longer need dialysis.
- Patients who successfully undergo the selection process have a higher chance of living a longer life.

DISADVANTAGES

- Kidney transplantation is a major surgery that carries some risk.
- There may be a waiting period for a donor.
- There is a risk of kidney rejection, which means that this transplanted kidney may not last a lifetime.
- You'll need to take immunosuppressant medications, which may cause complications.

Working with Your Health Care Team

Here are some of the questions you may want to ask:

- Is kidney transplantation the best treatment choice for me? Why?
- What are my chances of a successful transplant?
- How can I find out if a family member or friend is eligible to donate?
- What are the potential risks for the live donor?
- If no one in my family or friends can donate, how do I get placed on a waiting list for a kidney? How long is the waiting time?
- What are the symptoms and signs of kidney rejection?
- For how long does a transplant typically function?
- What are the side effects of immunosuppressant medications?
- Who will be a part of my healthcare team, and how can they support me?
- Who can I talk to about financial, sexuality, or family concerns related to transplant?
- Where can I find support groups or talk to other people who have faced the same decision?

Treatment Choice: Refusing or Withdrawing from Treatment

For many individuals, both dialysis and transplantation not only extend their lives, but also improve their quality of life. However, for those who suffer from serious ailments in addition to kidney failure, dialysis may seem like a burden that only prolongs suffering.



You have the right to refuse or withdraw from dialysis. It may be helpful to discuss your decision with your spouse, family, religious counselor, or social worker.

If you choose to refuse or withdraw from dialysis treatments, your remaining life span will depend on your overall health and remaining kidney function. Your doctor can prescribe medications to make you more comfortable during this time. You have the option to start or resume your treatments if you change your mind.

Even if you are currently satisfied with the quality of life you have on dialysis, it is important to consider the circumstances that may lead you to want to stop your dialysis treatments. In the event of a medical crisis, you may lose the ability to express your wishes to your doctor. This is where an advance directive comes in. An advance directive is a document that states your instructions regarding whether or not you want treatment to be withheld or provided in specific circumstances based on your wishes.

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An advance directive can take the form of a living will, which is a document that outlines the specific conditions under which you would want to refuse treatment.

You have the option to either request that your health care team use all available means to sustain your life, or to direct them to withdraw you from dialysis if you become permanently unresponsive or fall into a coma. Additionally, aside from dialysis, there are other life-sustaining treatments that you may choose to either accept or decline, such as:

Cardiopulmonary resuscitation (CPR), tube feedings, mechanical or artificial ventilation, antibiotics, surgery or blood transfusions.



Another type of advance directive is a durable power of attorney for health care decisions or a health care proxy. With this document, you assign a person to make health care decisions on your behalf if you become unable to make them yourself.

It is important to ensure that the person you name understands your values and is willing to follow through on your instructions.