



## **Kidney failure: Choosing a treatment that is right for you**

Your kidneys filter wastes from your blood and regulate other bodily functions. When your kidneys fail, treatment is needed to replace the work your kidneys normally perform. Developing kidney failure means you have some decisions to make about your treatment. Once you decide to receive treatment, your choices include hemodialysis, which requires a machine used to filter your blood outside your body; peritoneal dialysis, which uses the lining of your abdomen to filter your blood inside the body; or kidney transplantation, in which a new kidney is placed in your body.

Each treatment has advantages and disadvantages. Your choice of treatment will have a big impact on your lifestyle, such as being able to keep a job if you are working. You are the only one who can decide what means most to you. Reading this information is a good way to learn about your options so you can make an informed choice. If you find that your choice is not a good fit for your life, you can change treatments. With the help of your health care team, family, and friends, you can lead a full and active life.

In rare circumstances, patients may choose to forgo all forms of kidney replacement therapy and elect to pursue conservative therapies with palliative care only.

### **When Your Kidneys Fail**

<https://thevirtualnephrologist.com/specialties/dialysis/>

Healthy kidneys clean your blood by removing excess fluid, minerals, and wastes. They also produce hormones that keep your bones strong and your blood healthy. When your kidneys fail, harmful wastes build up in your body, your blood pressure may rise, and your body may retain excess fluid and not produce enough red blood cells. When this happens, you need treatment to replace the work of your failed kidneys.

## **Treatment Choice: Hemodialysis**

Hemodialysis cleans and filters your blood using a machine to temporarily rid your body of harmful wastes, extra salt, and extra water. Hemodialysis helps control blood pressure and helps your body keep the proper balance of important elements such as potassium, sodium, calcium, and bicarbonate.

Dialysis can be used to replace some of the functions of your kidneys. Diet regulation, medications, and fluid limits are often needed as well. Your diet, fluid intake, and the number of medications you need will depend on which treatment you choose.

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### **How Does Hemodialysis Work?**

Hemodialysis uses a special filter called a dialyzer that functions as an artificial kidney to clean your blood. The dialyzer is a canister connected to the hemodialysis machine.

During treatment, your blood travels through tubes into the dialyzer, which filters out wastes, extra salts and sodium, and extra water. Then, the cleaned blood flows through another set of tubes back into your body. The hemodialysis machine monitors blood flow and removes wastes from the dialyzer. Hemodialysis is usually done three times a week. Each treatment lasts from three to five or more hours. During treatment, you can read, write, sleep, talk, or watch TV.

<https://www.youtube.com/watch?v=j2EQRM-ZyKA>

### **Getting Ready**

Several months before your first hemodialysis treatment, an access to your bloodstream will need to be created. You may need to stay overnight in the hospital, but many patients have their access created on an outpatient basis. This access provides an efficient way for blood to be carried from your body to the dialyzer and back without causing discomfort. The two main types of access are a fistula and a graft.

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#### **----Arteriovenous fistula (the best choice)**

A surgeon makes a fistula by using your own blood vessels; an artery is connected directly to a vein, usually in your forearm. The increased blood flow causes the vein grow larger and stronger so it can be used for repeated needle insertions. This kind of access is the preferred type. It may take several months to mature and be ready for use.

#### **----Graft**

A graft connects an artery to a vein by using a synthetic tube. It does not need to develop as a fistula does, so it can be used sooner after the placement. However, a graft is more likely to have problems with infection and clotting.

#### **----Catheter for temporary access**

Before dialysis, needles are placed into the access to draw out the blood.

If your kidney disease has progressed quickly, you may not have time to develop a permanent vascular access before you start the hemodialysis treatments. You may need to use a catheter — a small, soft tube inserted into a vein in your neck, chest, or leg near the groin — as a temporary access. Some people use a catheter for long-term access as well. Catheters that will be needed for more than about three weeks are designed to be placed under the skin to increase comfort and reduce complications.

### **Who Performs the Hemodialysis?**

Hemodialysis is most often done in a dialysis center by patient care technicians, (PCT) who are supervised by nurses.

If you choose in-center treatment, you will have a fixed time slot three times per week (Monday, Wednesday, and Friday or Tuesday, Thursday, and Saturday). If you do not get the time slot you want at first, you can ask to be placed on a waiting list for the time slot you prefer. For a special event, you may be able to trade times with someone else. You will want to plan the dialysis schedule if you work or have children to care for.

Some centers offer in-center nocturnal dialysis. This treatment is done for a longer period at night, while you sleep at the center. Getting more dialysis means fewer dietary and fluid limits, and this treatment leaves your days free for work, child care, hobbies, or other activities.

You can also choose to learn how to do your own hemodialysis treatments at home. When you are the only patient, it is possible to do longer or more frequent dialysis, which comes closer to replacing the steady work that healthy kidneys do. Daily home hemodialysis (DHHD) is done five to seven days per week for two to three hours at a time, and you set the schedule. If your health plan will pay for more than three treatments, you might do the short treatments in the mornings or evenings.

Nocturnal home hemodialysis (NHHD) is done three to six nights per week while you sleep. Either DHHD or NHHD will allow for a more normal diet and fluid intake, with fewer blood pressure and other medications.



Most programs involve people undergoing hemodialysis at home by having a trained partner in the home while the treatments are being performed. Learning to do home hemodialysis is like learning to drive a car — it takes a few weeks and is scary at first, but then it becomes routine. The dialysis center provides the machine and training, as well as 24-hour support if you have a question or problem. New machines for home dialysis are smaller and easier to use than in-center ones.

You have a choice of dialysis centers, and most towns have more than one center to choose from. You can visit a center to see if it has the treatments you want or the time slot you need. Some centers will let you use a laptop or cell phone or have visitors, and others will not.

If you choose in-center treatment, you may want the center to be close to your home to reduce your travel time.

If you do a home treatment, once you are trained you only need to visit the center once a month. Therefore, the center can be as far away as you are willing to travel once a month.

### **Possible Complications**

Vascular access problems are the most common reasons for hospitalization among people on hemodialysis. Common problems include infection, blockage from clotting, and poor blood flow. These problems can cause your treatments to stop working. Subsequently, you may need to undergo repeated surgeries in order to get a properly functioning access.

Other problems can be caused by rapid changes in your body's water and chemical balance during treatment. Muscle cramps and hypotension — a sudden drop in blood pressure — are two common side effects. Hypotension can make you feel weak, dizzy, or sick to your stomach.

You'll probably need a few months to adjust to hemodialysis. Side effects often can be treated quickly and easily, so you should always report them to your doctor and dialysis staff. You can avoid many side effects if you follow a proper diet, limit your liquid intake, and take your medications as directed.

### **Diet for hemodialysis**

Hemodialysis and a proper diet help reduce the wastes that build up in your blood. A dietitian is available at all dialysis centers to help you plan meals according to your doctor's orders. When choosing foods, remember to:

- (1) Eat balanced amounts of high-protein foods such as meat, chicken and fish.
- (2) Control the amount of potassium you eat. Potassium is a mineral found in salt substitutes; some fruits, such as bananas and oranges; vegetables; chocolate; and nuts. ***Too much potassium can be dangerous to your heart.***
- (3) Limit how much you drink. When your kidneys are not working, water builds up quickly in your body. Too much liquid can cause your tissues to swell and can lead to high blood pressure, heart problems, and cramps and low blood pressure during dialysis.



- (4) Avoid salt. Salty foods make you thirsty and make your body hold water.
- (5) Limit foods such as milk, cheese, nuts, dried beans, and dark colas. These foods contain large amounts of the mineral phosphorus. Too much phosphorus in your blood causes calcium to be pulled from your bones, which causes them to become weak and brittle, which can result in arthritis. To prevent bone problems, your doctor may give you special medicine called phosphate binders, which you must take with meals every day as directed.

### **Pros and Cons**

Each person responds differently to similar situations. A negative factor for one person may be a positive one for another.

A list of the general advantages and disadvantages of in-center and home hemodialysis is shown below.

#### **In-center Hemodialysis**

##### **Pros**

- + Facilities are widely available.
- + Trained professionals are with you at all times.
- + You can get to know other patients.
- + You do not have to have a partner or keep equipment in your home.

##### **Cons**

- Treatments are scheduled by the center and are relatively fixed.
- You must travel to the dialysis center for treatment.
- This treatment plan requires the strictest diet and fluid limits of all.
- You will need to take — and pay for — more medications.
- You may have more frequent ups and downs in how you feel day-to-day.
- It may take a few hours to feel better after a treatment.

#### **Home Hemodialysis**

##### **Pros**

- + You can do it anytime you choose — but you must still do it as often as your doctor orders.
- + You do not have to travel to a dialysis center.
- + You gain a sense of independence and control over your treatments and life.
- + Newer machines require less space.
- + You will have 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 take new portable machines along on car trips, in campers, or on airplanes.
- + You can spend more time with your loved ones.



## Cons

- You must have a partner.
- Helping with treatments may be stressful to your family.
- 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 to complete training.
- You will need to learn how to insert the dialysis needles into the dialysis access.
- Daily and nocturnal home hemodialysis are not yet offered at all locations.

## Working with Your Health Care Team

Questions you may want to ask:

- Is hemodialysis the best treatment choice for me? Why?
- If I'm treated at a dialysis center, can I go to the center of my choice?
- What should I look for in 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 my partner and me?

- What kind of dialysis vascular access is best for me?
- As a hemodialysis patient, will I be able to keep working? Can I have treatments at night?
- How much should I exercise?
- Who will be on my health care team? How can these people help me?
- With whom 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

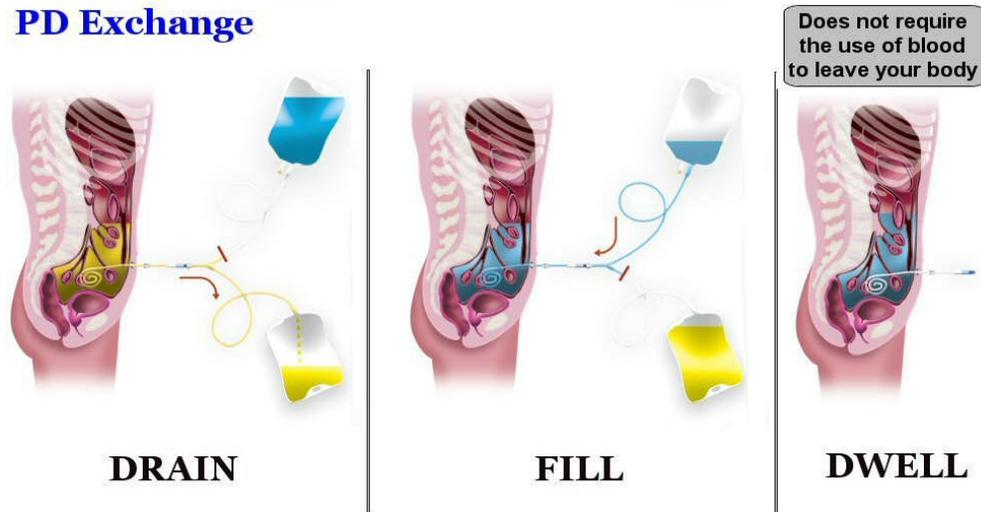
A mixture of minerals and sugar (dextrose) dissolved in water, called dialysis solution, travels through a catheter into your abdomen. The sugar draws wastes, chemicals, and extra water from the tiny blood vessels in your peritoneal membrane into the dialysis solution. After several hours, the used solution is drained from your abdomen through the tube, taking the wastes from your blood with it. Then, your abdomen is refilled with fresh dialysis solution, and the cycle is repeated. The process of draining and refilling is called an exchange. There is



another type of sugar called icodextrin that is now being used in special conditions where it is difficult to draw out the extra fluid.

<https://www.youtube.com/watch?v=7dvwY-KzWoU>

## PD Exchange



### Getting Ready

Before your first treatment, a surgeon will implant a catheter into your abdomen. The catheter tends to work better if there is adequate time — usually 3–6 weeks — for the insertion site to heal. Planning your dialysis access can improve treatment success. This catheter stays there permanently to help transport the dialysis solution to and from your abdomen.

### Types of Peritoneal Dialysis

Four types of peritoneal dialysis are available.

#### □ (1) Continuous Ambulatory Peritoneal Dialysis (CAPD)

CAPD does not require a machine and can be done in any clean, well-lit place. With CAPD, your blood is always being cleaned. The dialysis solution passes from a plastic bag through the catheter and into your abdomen, where it stays for several hours with the catheter sealed. The time period that dialysis solution is in your abdomen is called the dwell time. Next, you drain the dialysis solution into an empty bag for disposal. You then refill your abdomen with fresh dialysis solution so the cleaning process can begin again. With CAPD, the dialysis solution stays in your abdomen for a dwell time of four to six hours or more. The process of draining the used dialysis solution and replacing it with fresh solution takes about 30–40 minutes. Most people change the dialysis solution at least four times a day and sleep with solution in their abdomens at night. With CAPD, it is not necessary to wake up to perform the dialysis tasks during the night.

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### □ (2) Continuous Cycler-assisted Peritoneal Dialysis (CCPD)

CCPD uses a machine called a cycler to fill and empty your abdomen three to five times during the night while you sleep. In the morning, you begin one exchange with a dwell time that lasts the entire day. You may do an additional exchange in the middle of the afternoon without the cycler to increase the amount of waste removed and to reduce the amount of fluid left behind in your body.

### □ (3) Combination of CAPD and CCPD

If your peritoneum filters wastes slowly, or you are a large person, you may need a combination of CAPD and CCPD to get the right dialysis dose. For example, some people use a cycler at night but also perform one exchange during the day. Others do four exchanges during the day and use a mini cycler to perform one or more exchanges during the night. You'll work with your health care team to determine the best schedule for you.

### □ (4) Intermittent Peritoneal Dialysis (IPD)

Intermittent exchanges that is used mostly in the hospital in the setting of acute kidney failure

## Who Performs Peritoneal Dialysis

Both types of peritoneal dialysis are usually performed by the patient without help from a partner. CAPD is a form of self-treatment that does not require a machine. However, with CCPD, you need a machine to drain and refill your abdomen.

## Possible Complications

The most common problem with peritoneal dialysis is peritonitis, a serious abdominal infection. This infection can occur if the opening where the catheter enters your body becomes infected or if contamination occurs as the catheter is connected or disconnected from the bags. Peritonitis requires antibiotic treatment by your doctor or nephrologist.

To avoid peritonitis, you must be careful to follow procedures exactly and learn to recognize the early signs of peritonitis, which include fever, unusual color, or cloudiness of the used fluid, and redness or pain around the catheter. Report these signs to your doctor or nurse immediately so that peritonitis can be treated quickly to avoid additional problems.

## 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 have more of each, compared with the in-center hemodialysis diet.
- (2) You must eat more protein.
- (3) You may have different restrictions on potassium. You may even need to eat high-potassium foods.



- (4) You may need to cut back on the number of calories you eat because there are calories in the dialysis fluid that may cause you to gain weight.
- (5) Your doctor and a dietitian who specializes in helping people with kidney failure will be able to help you plan your meals.

### Pros and Cons

Each type of peritoneal dialysis has advantages and disadvantages.

#### CAPD

##### Pros

- + You can do it alone.
- + You can do it at times you choose as long as you perform the required number of exchanges each day.
- + You can do it in many locations.
- + You don't need a machine.
- + You won't have the ups and downs that many patients on hemodialysis feel.
- + You don't need to travel to a center three times a week.

##### Cons

- It can disrupt your daily schedule.
- It is a continuous treatment, and all exchanges must be performed seven days a week.

#### CCPD

##### Pros

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

##### Cons

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

### Working with Your Health Care Team

- Questions you may want to ask:
- Is peritoneal dialysis the best treatment choice for me? Why? If yes, which type is best?
- How long will it take me to learn how to do peritoneal dialysis?
- What does peritoneal dialysis feel like?
- How will peritoneal dialysis affect my blood pressure?
- How will I know if I have peritonitis? How is it treated?
- As a peritoneal dialysis patient, will I be able to continue working?
- How much should I exercise?
- Where do I store supplies?
- How often do I see my doctor?
- Who will be on my health care team? How can these people help me?
- Whom do I contact with problems?

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- With whom can I talk about finances, sexuality, or family concerns?
- How/where can I talk with other people who have faced this decision?

### **Dialysis is Not a Cure**

Hemodialysis and peritoneal dialysis are treatments that help to 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 now living longer than ever, over the years, kidney disease can cause problems such as heart disease, bone disease, arthritis, nerve damage, infertility, and malnutrition. These problems will not go away with dialysis, but doctors now have new and better ways to prevent or treat them. You should discuss these complications and their treatments with your doctor.

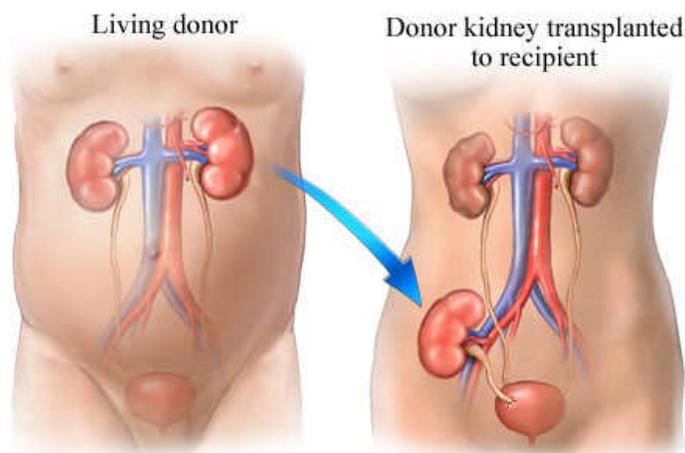
## **Treatment Choice: Kidney Transplantation**

### **Purpose**

Kidney transplantation is the surgical transfer of a healthy kidney from another person into your body. The donated kidney does enough of the work that your two failed kidneys used to do to keep you healthy and symptom-free.

### **How Kidney Transplantation Works**

A surgeon places the new kidney inside your lower abdomen and connects the artery and vein of the new kidney to your artery and vein. Your blood flows through the donated kidney, which makes urine, just like your own kidneys did when they were healthy. The new kidney usually starts working right away or may require a few weeks before it will start to make urine. Unless your own kidneys are causing infections or high blood pressure, they are left in place.



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## **Getting Ready**

The transplantation process has many steps. First, talk with your doctor because transplantation may not be an appropriate option for everyone. You could have a condition that would make transplantation dangerous or unlikely to succeed.

You may receive a kidney from a deceased donor — a person who has recently died — or from a living donor. A living donor may be related or unrelated — usually a spouse or a friend. If you do not have a living donor, you are placed on a waiting list for a deceased donor kidney. The wait for a deceased donor kidney can be several years.

The transplant team considers three factors in matching kidneys with potential recipients. These factors help predict whether your body's immune system will accept the new kidney or reject it.

### **(1) Blood type**

Your blood type (A, B, AB, or O) must be compatible with the donor's.

Blood type is the most important 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 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 problems with matching.

### **(3) Cross-matching antigens**

The last 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 see if there's a reaction. If no reaction occurs, the result is called a negative cross-match, and the transplant operation can proceed.

## **The Amount of Time Required for a Kidney Transplantation**

How long you will have to wait for a kidney varies. Because there are not enough deceased donors for every person who needs a transplant, you will be placed on a waiting list. However, if a voluntary donor gives you a kidney, the transplant can be scheduled as soon as you are both ready. Avoiding the long wait is a major advantage of live donation.

The surgery takes three to four hours. The usual hospital stay is about a week. After you leave the hospital, you'll have regular follow-up visits.

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



About 85–90% of transplants from deceased donors remain functional one year after the surgery. Transplants from living relatives often work better than transplants from unrelated or deceased donors because they are usually a closer match.

### **Possible Complications**

Transplantation is the closest thing to a cure. However, no matter how good the match, your body may reject your new kidney. A common cause of rejection is not taking the medication as prescribed.

Your doctor will give you medicines called immunosuppressants to help prevent your body's immune system from attacking the new kidney, a process called rejection. You'll need to take immunosuppressants every day for as long as the transplanted kidney is functioning. Sometimes, however, even these medicines cannot stop your body from rejecting the new kidney. If this happens, you'll go back to some form of dialysis and possibly wait for another transplant.

Immunosuppressants weaken your immune system, which can lead to infections. Some medicines may also change your appearance. Your face may get fuller; you may gain weight, or develop acne or facial hair. Not all patients have these problems though, and diet and makeup can help.

Immunosuppressants work by diminishing the ability of immune cells to function. In some patients, over long periods of time, this diminished immunity can increase the risk of developing certain cancers. Some immunosuppressants can cause cataracts, diabetes, excess stomach acid, high blood pressure, and bone disease. When used over time, these drugs also may cause liver or kidney damage in a few patients.

### **Diet for Kidney Transplantation**

Diet for transplant patients is less limited than it is for dialysis patients, although you may still have to cut back on some foods. Your diet will probably change as your medicines, blood test values, weight, and blood pressure change.

You may need to count calories. Your medicine may give you a bigger appetite and cause you to gain weight.

You may have to eat foods with less salt. Your medications may cause your body to retain sodium, leading to high blood pressure.



## Pros and Cons

Kidney transplantation has advantages and disadvantages. See the list below.

### Kidney Transplantation

#### Pros

- + A transplanted kidney functions like a normal kidney.
- + You may feel healthier and “more normal.”
- + You have fewer dietary restrictions.
- + You will not need dialysis.
- + Patients who successfully go through the selection process have a higher chance of living a longer life.

#### Cons

- Kidney transplantation requires major surgery.
- You may need to wait for a donor.
- Your body may reject the new kidney, so one transplant may not last a lifetime.
- You'll need to take immunosuppressant medications, which may cause complications.

### Working with your Health Care Team

Questions you may want to ask:

- Is transplantation the best treatment choice for me? Why?
- What are my chances of having a successful transplant?
- How do I find out whether a family member or friend can donate?
- What are the risks to a family member or friend who donates?
- If a family member or friend does not donate, how do I get placed on a waiting list for a kidney? How long will I have to wait?
- What are the symptoms of a kidney rejection?
- How long does a transplant work?
- What are the side effects of immunosuppressants?
- Who will be on my health care team? How can these people help me?
- With whom can I talk about finances, sexuality, or family concerns?
- How or where can I talk with other people who have faced this decision?



## **Treatment Choice: Refusing or Withdrawing from Treatment**

For many people, dialysis and transplantation not only extend life but also improve quality of life. For others who have 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. You may want to speak with your spouse, family, religious counselor, or social worker as you make this decision.**

If you refuse or withdraw from dialysis treatments, you may live for a few days or for several weeks, depending on your health and your remaining kidney function. Your doctor can give you medicines to make you more comfortable during this time. You may start or resume your treatments if you change your mind after refusing dialysis.

Even if you are satisfied with your quality of life on dialysis, you should think about the circumstances that might make you want to stop dialysis treatments. At some point in a medical crisis, you might lose the ability to express your wishes to your doctor. An advance directive is a statement or document in which you give instructions either to withhold treatment or to provide it, depending on your wishes and the specific circumstances.

An advance directive may be a living will, a document that details the conditions under which you would want to refuse treatment. You may state that you want your health care team to use all available means to sustain your life, or you may direct that you be withdrawn from dialysis if you become permanently unresponsive or fall into a coma. In addition to dialysis, other life-sustaining treatments you may choose or refuse include the following:

- Cardiopulmonary resuscitation (CPR)
- Tube feedings
- Mechanical or artificial respiration
- Antibiotics
- Surgery
- Blood transfusions

Another form of advance directive is called a durable power of attorney for health care decisions or a health care proxy. In this type of advance directive, you assign a person to make health care decisions for you if you become unable to make them yourself.

Make sure the person you name understands your values and is willing to follow through on your instructions.