

If you have any questions or concerns, please ask your care team.

Hemodialysis

The kidneys play an important role in helping your body work. When the kidneys fail, hemodialysis is a treatment that does some of the work of the kidneys. Your kidney care team, which includes your physician, physician assistant (PA) and nurse, will help you learn more about this. This brochure will help you understand:

- What hemodialysis is
- How it can help
- What to expect
- Lifestyle changes
- How to care for yourself

Kidney function

Healthy kidneys:

- Remove waste and extra fluid from the blood
- Manage certain chemicals (hormones) in the blood
- Manage blood pressure

When your kidneys do not work well, blood pressure, waste products and fluids in the body can rise to unsafe levels. Urea and creatinine are examples of waste products. These are normal and come from body functions. Your kidneys remove them from your blood. Some chemicals in your blood, such as potassium and phosphorus, may also rise to dangerous levels if your kidneys cannot remove them.

Hemodialysis takes these wastes and extra fluid out so they do not build up in your body. It also helps manage your blood pressure.

When to start hemodialysis

Kidney failure progresses through stages. Your physician or PA will check your blood tests and tell you when you need to prepare for dialysis. Usually, this happens when your glomerular filtration rate (GFR) falls below 15.

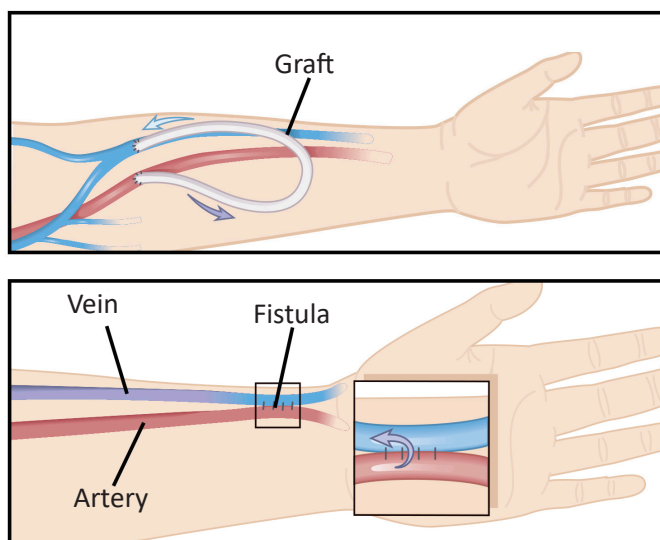
Creatinine is a normal waste product of muscle tissue. Your kidneys filter it out of your blood and it leaves your body in urine. The lab uses the results from the creatinine blood test to calculate the GFR. A low GFR means that the kidney's ability to get rid of creatinine is dropping. Therefore, creatinine is building up in the blood. This is a sign of kidney failure.

Preparing for hemodialysis

Hemodialysis requires access to your blood vessels. For short-term use, you may have a special catheter (soft tube) in a large neck or chest vein. It is connected to the dialysis machine for treatments. In some cases, you may need these types of catheters for a longer time if the care team cannot access your blood vessels through other methods. However, there can be complications with using catheters for dialysis.

For long-term use, you will need a graft or a fistula. A graft is a small plastic tube that connects an artery and vein. A fistula connects an artery and vein to make a bigger blood vessel (Figure 1).

Figure 1. Graft and fistula



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Grafts and fistulas are put in with minor surgery. They are usually put in the arm. It may take several weeks or even a few months to heal before using a graft or fistula. If possible, it is best to have this surgery at least 6 months before you need to start dialysis. This ensures the graft or fistula is ready for dialysis when you need it.

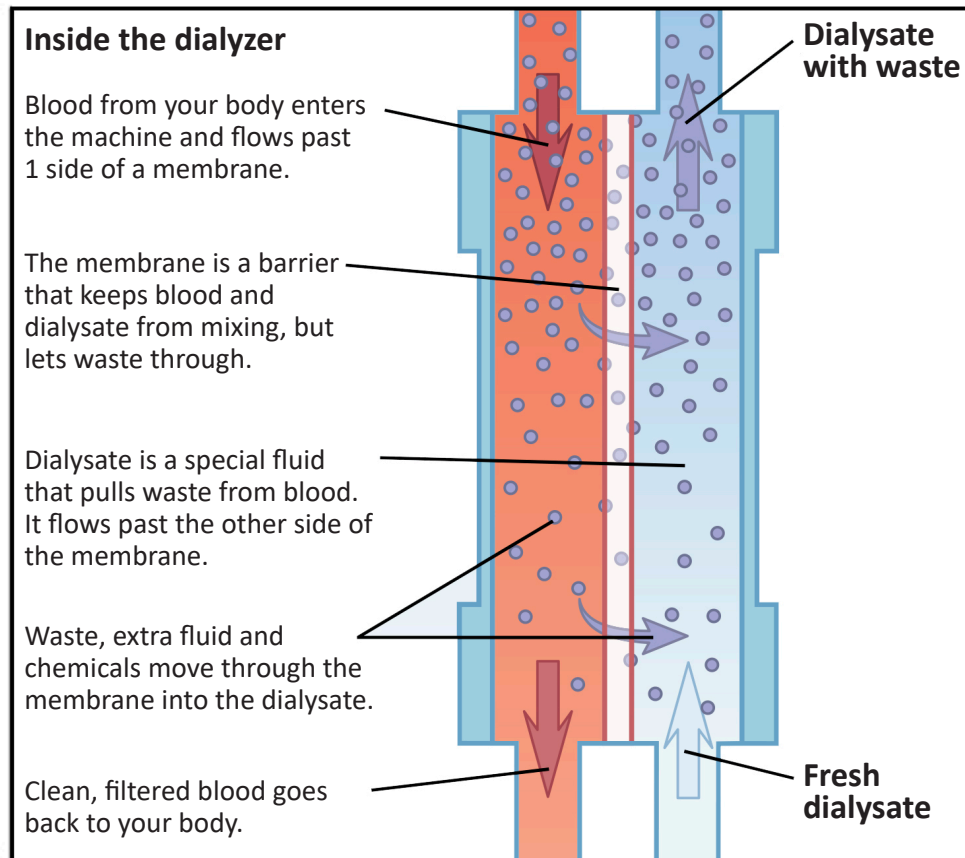
The hemodialysis machine

The hemodialysis machine is sometimes called an artificial kidney. It has a filter (dialyzer) that contains a cleansing solution (dialysate).

For hemodialysis, the dialysis team will put 2 needles into your fistula or graft to access the blood vessels. One goes into the vein; the other goes into the artery. Each is connected to tubes that lead to the dialysis machine. The dialyzer in the machine filters the blood (Figure 2). Blood from the vein passes into the filter where it circulates on 1 side of the filter. A membrane in the filter keeps the blood from mixing with the dialysate. The dialysate is on the other side of the filter. As the blood goes through the filter, wastes and fluid are pulled out from your blood. These pass through the membrane where they are discarded in the dialysate. After the blood is filtered, it goes back to you through the second needle in the artery.

The filter is designed to only let waste and fluid through. Important blood products such as protein and blood cells are not filtered out. The blood is filtered many times during a treatment until it is “clean.”

Figure 2. Inside the dialyzer



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How long and how often dialysis is needed

Dialysis treatment helps:

- You feel better
- Improve your overall well-being
- Prevent or lessen kidney-related health problems that may cause you to go to the hospital

The amount of dialysis you need depends on how well your kidneys work. Treatments are usually 3 times per week. Allow at least 4 hours or longer for each treatment. How much dialysis you need depends on:

- **How long it takes to filter the blood.** This depends on how long it takes for fluid and waste to build up between treatments. Your blood tests show how much waste is building up. The higher the blood levels, the longer it may take to filter out the waste products.

- **Your weight.** The care team will weigh you at the beginning of each treatment. Weight gain since your last treatment may be a sign of fluid buildup in your blood. The more weight you gain between treatments, the more fluid needs to be removed.
- **The type of dialysis machine used for your treatment.**

If your kidney failure is acute (a sudden onset), or if your kidney failure is temporary, you may only need dialysis for a short time. But when kidney disease gets worse over time, kidney failure may be permanent. In this case, you will need treatment for the rest of your life, unless you can get a kidney transplant.

Where to do hemodialysis

You may have dialysis while you in the hospital. After you leave the hospital, you may have dialysis at:

- An outpatient dialysis center in a hospital
- An independent dialysis center (not part of a hospital)
- Home

Your care team can help you choose the best place for your treatments. This may depend on your medical condition, insurance coverage and personal preference.

Home hemodialysis

If home hemodialysis is a good option for you, there are several things you need to think about:

- **A partner.** Both you and your partner must be trained to do dialysis. Your partner can be a family member, friend or home health aide. However, they must be there for you during dialysis. Medicare will not cover the cost of hiring a partner.
- **Training.** Both you and your partner must attend training. You may have to take time off work.
- **Motivation.** Both you and your partner need to follow the training and treatment plan.
- **Clean space.** There must be enough room in a clean area to keep the equipment.
- **Water drainage and electric power.** These must be strong enough to drain the dialysis machine and for the water cleaning process (purification unit).
- **Insurance/Medicare.** Please contact your insurance provider about your coverage for home dialysis. If you have Medicare, it may cover up to 80% of your home dialysis costs. It is the same as for outpatient hemodialysis. It may also cover costs related to minor plumbing or electrical work that is needed for home hemodialysis.

Medications

You will need medications to stay in good health. Most dialysis patients take these:

- **Renal multivitamins.** These are made for those with kidney disease. Other vitamins cannot be used because they have minerals that can cause serious problems.
- **Anti-hypertensives.** These manage high blood pressure.
- **Phosphate binders.** These have calcium and work like a magnet to pull phosphorus out of your food.
- **Antipruritics.** These help to manage itching.

You may also need to take other medications. Know the following information about each medication:

- Name
- Dose – how much to take
- Route – how to take (for example, chew, swallow, dissolve or inject)
- Purpose – why you are taking it
- Side effects – what to watch for and what to tell your physician about

Ask your physician or PA before taking any over-the-counter (non-prescription) medication. Make sure you tell them if you have a new medication prescribed by another physician. It is important that they know what you are taking.

It is important to avoid:

- **Aspirin** – It may increase the risk for bleeding. Do not take aspirin unless your physician tells you to do so.
- **Cough and cold medications** – Many over-the-counter cough and cold medications are dangerous for people on dialysis. Medications such as Nyquil® and Vicks Formula 44® have a lot of potassium. High potassium levels can lead to death. Other medications may cause your blood pressure to rise to unsafe levels.
- **Laxatives** – Many laxatives have magnesium in them, which is hard to take out of blood through dialysis. A high magnesium level may cause serious health problems.

Medications used during dialysis

Your physician and PA will decide what medications you will need during dialysis. They may include:

- **Heparin** keeps the dialyzer and catheters free of blood clots. **Before each treatment**, tell the nurse if you have any of these symptoms, which may mean that you need less heparin:
 - Bruising
 - Pinpoint red spots
 - Bleeding when you brush your teeth
 - Bleeding from your fistula or graft after you leave the dialysis unit
 - A fall since your last treatment

- **Saline** is a fluid that keeps your blood pressure stable.
- **Erythropoietin (Epo)** is a medication to treat anemia (low red blood cell count) caused by chronic renal failure.
- **Iron supplements** treat anemia.
- **Calcijex®** or **Zemplar®** prevents bone disease, which is common among patients with kidney failure.

Caring for your fistula or graft

Once you have a fistula or graft placed, follow these guidelines to keep it working.

Do not let anyone use your arm that has the fistula or graft for these procedures:

- Drawing blood (Only the dialysis staff may do this.)
- Taking your blood pressure
- Doing a finger stick for glucose
- Inserting an IV (into the vein) line

Make sure you:

- Check to feel the “thrill” over the fistula or graft once a day. This is a “rushing” feeling when you place your fingers on the fistula/graft. Call your physician or PA right away if you cannot feel it.
- Wash your fistula or graft with an antibacterial soap once a day.
- Do not put anything tight on your fistula or graft arm such as a watch, elastic band or tight clothing.
- Avoid activities that might hurt your arm, such as football or basketball.

Call your physician or PA right away if you have any signs of infection, such as redness, swelling, drainage or warmth, at the fistula or graft site.

If you have a neck or chest catheter

You may have special catheters (tubes) to access your blood vessels for dialysis. These are usually in place until you have a graft or fistula that is ready to use. You may have this type of catheter in your neck or chest. The staff will give you detailed information about your type of catheter and how to care for it.

Protecting your kidneys

Even if you need dialysis, you probably still have some kidney function left. Help keep your remaining kidney function and avoid unnecessary problems by following these tips:

- Take blood pressure medications as prescribed. Managing your blood pressure helps protect your kidneys from further damage.
- Do not take medications that can cause more kidney damage. These may include certain antibiotics and over-the-counter pain medications such as non-steroidal anti-inflammatory drugs (NSAIDs). NSAIDs include Ibuprofen (Motrin®, Advil®) and naproxen (Aleve®, Naprosyn®).

- Ask your team if taking water pills (diuretics) will help you. They may help prevent extra buildup of salt and water in your body.
- Keep other medical conditions well managed, such as diabetes and high blood pressure.

Diet

You may need to change your diet after you start dialysis. Although you may need to limit some foods, it is still important to get the proper nutrition and calories needed to keep as healthy as possible. A registered dietitian can help you plan a menu and choose the right kinds of foods. Key points include:

- **Follow the salt and fluid guidelines.** Limit your intake of these to what is prescribed for you. Salt intake should be no more than 2,000 milligrams (mg) per day. This is important so that you do not build up too much fluid between dialysis treatments. Having too much fluid in your body can raise your blood pressure or cause other problems. Just taking in more salt alone can still cause too much fluid to build up.
- **Use herbs and spices instead of salt.** Do not add salt to your food at the table or when cooking.
- **Avoid salt substitutes or products containing salt substitutes.** These usually have a lot of potassium, which may be dangerous. Some products labeled low-salt or salt-free may contain salt substitutes.
- **Read food labels.** Check the amount of sodium (salt) and potassium per serving. Choose those that are low.
- **Try not to use canned, processed or frozen foods.** These tend to have more salt, potassium or other ingredients that may affect your health.
- **Eating out.** Ask for meat or fish to be salt free. Ask for gravies, sauces and salad dressings to be served on the side. These often have a lot of salt.
- **Follow potassium and phosphorous guidelines.** Limits may vary and depend on your blood tests. Your physician, nurse or dietitian will talk with you about what foods to avoid.

Lifestyle

It takes time to adjust to the changes that dialysis makes to your life. Once you become used to the dialysis routine, you may feel better. With dialysis and medications, you may feel stronger and less tired. You may even enjoy many of the same activities you did before you had kidney disease.

Regular exercise can help you feel better and make you stronger. To improve the quality of your life, ask your care team what type of exercise program is right for you.

The support of family and friends can make a difference. Continue to do the things you enjoy with loved ones.

Work

You may be able to go back to work after starting on dialysis. Much depends on the physical demands of your job. If you need to do heavy lifting, digging or other types of hard physical labor, those duties may need to change.

Travel

If you want to travel, you will need to:

- Find a dialysis center in the area that you will be traveling to.
- Contact your insurance company to check your coverage at the center.
- Make an appointment at the center several weeks before you travel there.
- Find out what information they will need from you before you get there.

More information

Resources are available to help you and your family adjust to the changes and stresses that living with long-term renal failure can bring. Talk with your care team if you want help with any of the following:

- Anxiety and depression
- Concerns about present and future health
- Impact of illness on family relationships
- Lifestyle changes
- Sexual dysfunction

You may also be able to benefit from other services. Some community services help patients and families with specific problems such as:

- Getting to and from the dialysis unit
- Financial concerns
- Employment issues
- Out-of-town treatments

Insurance coverage

Medicare may cover 80% of home or clinic hemodialysis costs. Other supplemental or private insurance may cover other costs. If you are eligible for Medicaid, it may also help with some of the costs. Check with your state about coverage. A social worker can help you with your insurance options.