

Home Hemodialysis (HHD)



Hemodialysis is a type of treatment for kidney failure (end-stage kidney disease or ESRD). During hemodialysis, blood is removed from your body and filtered through a dialysis machine (dialyzer). The filtered blood is then returned to your body.

Hemodialysis is often done in a hospital or dialysis center. But it may also be done at home. This is called home hemodialysis (HHD). You may wonder if you can handle doing hemodialysis at home. If you choose HHD, you'll be trained to do your dialysis treatment on your own, or with a care partner. You'll be monitored and given support to ensure your safety. Many people find that HHD offers benefits, such as a more flexible treatment schedule and more control over their treatment. The machines used at home are also small enough that they can be taken with you for travel. Read on to learn more about HHD.

First step: Getting an access site

Before doing any type of hemodialysis, you'll first need a way to access your bloodstream (called a vascular access). A permanent access is created using surgery. There are 3 types of vascular access:

- **Arteriovenous (AV) fistula.** This is done by connecting an artery to a vein, often in an arm. Once connected, the vein gets wider and thicker. An AV fistula lasts longer than other types of vascular access. It's also less likely to clot or to get infected, and it offers the highest blood flow for dialysis. For these reasons, it's often the first choice for vascular access.
- **Arteriovenous (AV) graft.** Like a fistula, this connects an artery and a vein under the skin. But a graft uses manmade tubing to do so. A graft can be used for dialysis soon after surgery. But it's more likely to cause problems with blood clots and infections.
- **Catheter.** With this method, a thin tube (catheter) is placed in a vein in your neck or chest. A catheter has a higher risk of infection and blood clots. It also has slower blood flow. It's often used short-term, if you need to start hemodialysis before a fistula or graft is ready to use. But it may be used long-term if other types of access aren't possible.

Training for home hemodialysis

When you decide to do HHD, you and your care partner will receive training from a dialysis care team at your dialysis center. You'll learn how to do hemodialysis safely on your own, including placing the needles in your vascular access. You'll also learn how to handle any problems that may come up. A training program may take anywhere from 3 to 8 weeks. The training team will teach you how to:

- Set up your dialysis machine
- Prevent infection
- Place needles safely into the vascular access site
- Check your pulse, weight, blood pressure, and temperature
- Keep a record of your treatment details for the dialysis center
- Clean your dialysis machine
- Know what to do if your machine alarm goes off
- Safely get rid of used dialysis supplies
- Keep track of all your supplies and order new ones as needed

Even when you're doing hemodialysis at home, you'll still be in regular contact with your dialysis care team. You'll need a monthly checkup and lab tests done at the dialysis center. You'll also meet with your kidney doctor, dietitian, nurse, and social worker.

In between these visits, help is available any time of the day or night. You'll be told how to contact an on-call nurse or technical support person any time you have questions or problems.

Inserting your own needles (self-cannulation)

Each time you have a dialysis treatment, 2 needles must be placed into access sites in your arm. One needle sends your blood to the dialyzer. Then your cleaned blood is sent back to your body through the second needle.

When you do HHD, you or a care provider must insert the needles yourselves (called self-cannulation). Your dialysis care team will teach you how to do this. There are 2 self-cannulation methods: the buttonhole technique or the rope ladder technique. The method you use will depend on the type of vascular access you have, and which method you prefer.

Buttonhole technique

This method is only used with an AV fistula. It can't be used with a graft. With this method, you use the same 2 needle insertion sites for each treatment. (The 2 small holes look like the holes in a button.) After about 10 treatments using sharp needles, scar tissue begins to form around each needle. This creates a tunnel, like a pierced earring hole, that makes it easier to guide the needle into the site. Once the tunnel is formed, you can then use dull needles each time. For this reason, it may be less painful over time. Your dialysis care team will provide full training on this method.

Ladder technique

This method must be used with an AV graft, and it can also be used with a fistula. This method rotates between different sites each time. Because of this, sharp needles must be used to make new holes in your skin and access the graft each time. For each treatment, the 2 holes are moved slightly higher up than the last insertion sites. This is done until you reach the top of the usable area. After that, you start over at the bottom of the "ladder" again. This gives each insertion site enough time to heal. Your dialysis care team will provide full training on this method.

The importance of keeping clean

For either self-cannulation method, it's vital to be extra careful to keep the access area clean and prevent germs (bacteria) from gathering. If a sterile technique isn't used when inserting and removing needles, you can get an infection. Follow your dialysis care team's advice to:

- Practice good handwashing before self-cannulation
- Clean the access area well, using the disinfectant that your center advises
- Always wear a mask and sterile gloves when inserting and removing needles

How often is home hemodialysis done?

One of the benefits of HHD is that it offers you more flexibility than going to a dialysis center for appointments. There are 3 types of HHD schedules:

- **Standard HD.** These treatments are done 3 times a week, for about 3 to 5 hours each time.
- **Daily HD.** These treatments are shorter, lasting 2 to 4 hours. They are done 5 or 7 days a week.
- **Nocturnal (nighttime) HD.** This type of HD is done at night, while you sleep. These treatments are given for about 6 to 8 hours a night. They're done 3 to 6 nights a week. Your provider will advise you on the schedule that's best for you.

There are pros and cons for each type of HHD schedule. In some cases, you can also combine a daily and nocturnal schedule. This will depend on your personal situation. Talk with your healthcare provider about which type of HHD schedule is best for you.

Key tips

It's vital to keep your vascular access site clean and free of any blockages. These guidelines will help you care for yourself at home:

- Wash around your access each day and always keep it clean.
- Take any medicines as directed.
- Follow the special diet for kidney failure that your healthcare provider gave you.
- Don't wear any clothing or jewelry that could put pressure on the access site.
- Don't lie on the access site while sleeping.
- If the access is in your arm, have blood pressure readings and blood samples taken from the other arm.
- Check the access site after dialysis for swelling, bleeding, or signs of infection.
- If you have an AV fistula or graft, check the site regularly to be sure you can always feel the "thrill" (vibration) of blood flowing from artery to vein. Don't put lotions or other products on the access site.
- If you have a catheter, don't do any physical activities that could pull on the catheter.

Call

Call if any of these occur:

- External catheter starts bleeding or opens to air
- Severe weakness, dizziness, fainting, drowsiness, or confusion
- Chest pain or shortness of breath

When to call your healthcare provider

Call your healthcare provider right away if any of these occur:

- The color of the blood in the external tubing changes from bright red to dark red
- You don't feel the "thrill" (vibration) in an AV fistula or graft
- Nausea or vomiting
- Unexpected weight gain or swelling in the legs, ankles, or around the eyes
- You now have less urine output, or none at all
- Fever of 100.4°F (38°C) or higher, or as advised by your healthcare provider

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