

National Kidney
Foundation™

Managing Anemia When You Are on Dialysis

Stage 5



What is anemia?

Anemia happens when your red blood cells are in short supply. Red blood cells carry oxygen from your lungs to all parts of your body, giving you the energy you need for your daily activities.

Anemia can cause you to:

- Look pale
- Feel tired
- Have little energy for your daily activities
- Have a poor appetite
- Have trouble sleeping
- Have trouble thinking clearly
- Feel dizzy or have headaches
- Have a rapid heartbeat
- Feel short of breath
- Feel depressed or “down in the dumps”

What are some causes of anemia?

Anemia can be caused by:

- Diseases like kidney disease, liver disease, HIV/AIDS, systemic lupus erythematosus or cancer
- Diseases that harm or destroy your blood cells, such as sickle cell disease
- Blood loss from accidents, surgery, stomach ulcers, kidney or bladder tumors, cancer or polyps in the intestines or other causes
- An infection or inflammation in your body



- Too little iron, vitamin B12 or folic acid in your body

Iron is a mineral that you get from eating foods like liver and leafy, green vegetables. Both vitamin B12 and folic acid are important vitamins that you get from eating foods like eggs, fish and liver. Your body needs these important minerals and vitamins to help make red blood cells.

- A poor diet

You can become anemic if you do not eat healthy foods with enough vitamin B12, folic acid and iron. Your body needs these important vitamins and minerals to help make red blood cells.

Before starting anemia treatment, your doctor will order tests to find the exact cause of your anemia.

Why do people on dialysis get anemia?

Your kidneys make an important hormone called *erythropoietin (EPO)*. Hormones are secretions that your body makes to help your body work and keep you healthy. EPO tells your body to make red blood cells. When you have kidney disease, your kidneys cannot make enough EPO. This causes your red blood cell count to drop and anemia to develop.

Are all people on dialysis at risk for anemia?

Most people with kidney disease will develop anemia. Anemia can happen early in the course of kidney disease and grow worse as kidneys lose their ability to work well and make EPO. Anemia is especially common if you:

- Have diabetes
- Are African American
- Have moderate or severe loss of kidney function (stage 3 or 4)
- Have kidney failure (stage 5)
- Are female

FACT

If you are African American or have diabetes and chronic kidney disease, you are more likely to have anemia and get it at an earlier stage of kidney disease.



How do I know if I have anemia?

Not everyone with anemia has symptoms. If you have kidney disease, you should have a blood test to measure your hemoglobin level at least once per year to check for anemia. Hemoglobin is the part of red blood cells that carries oxygen throughout your body. Your doctor can tell if you have anemia by measuring your hemoglobin. If your hemoglobin level is lower than the normal range (which is 12.0 for women and 13.5 for men), it is likely you have anemia. In that case your doctor will check to find the exact cause of your anemia and develop a treatment plan that is right for you.

TIP

Speak to your doctor if you think you have anemia. Make a list of questions. Write down your symptoms, allergies, medications, previous medical procedures and other health problems. Show the list of symptoms to your doctor. Discuss how you are feeling and ask questions.

How is anemia treated?

If your anemia is due to kidney failure, you will be treated with:

- Drugs called *erythropoiesis-stimulating agents (ESAs)*. ESAs act like the natural hormone EPO, which helps your body to make red blood cells.
- Extra iron. Your body also needs iron to make red blood cells—especially if you are receiving ESAs. Without enough iron, your ESA treatment will not work.

FACT

Not having enough EPO (a hormone made by your kidneys) is the most common cause of anemia in patients with kidney disease. EPO tells your body to make red blood cells. Treatment with an ESA can help when your kidneys no longer make enough EPO.

What is the goal of anemia treatment?

The goal of anemia treatment is to increase your hemoglobin level to at least 11, which is considered to be the lowest level of hemoglobin you need to feel well. As you get closer to or pass this level, you should notice that you have more energy and feel less tired.

How is ESA given?

ESAs can be given to you in the following ways:

- As an injection under the skin. This is called a *subcutaneous injection (SC)*.
- Injected through the blood tubes during dialysis. This is called an *intravenous injection (IV)*.

You and your doctor will decide which method is best for you.

How much ESA will I need?

Your doctor will prescribe enough ESA to increase your hemoglobin gradually to the recommended level. How much ESA you need and how often you receive it depends on:

- Your current hemoglobin level
- How well you respond to treatment with ESA
- The type of ESA you receive

Two different types of ESAs are available—short-acting ESAs and long-lasting ESAs.

Short-acting ESAs are more effective when given subcutaneously (as an injection under the skin) rather than by IV (through the blood tubes during dialysis). Examples of short-acting ESAs are *epoetin alfa* and *epoetin beta*.

Long-lasting ESAs are equally effective regardless of how they are given. *Darbepoetin* is an example of a long-lasting ESA.

- How you receive your ESA—as an injection under the skin (SC) or through the blood tubes during dialysis (IV).

TIP

It's important that you speak to your doctor if you are ever discharged from a hospital. Your doctor may want to modify your anemia treatment plan so that your target hemoglobin level is maintained.

How will my doctor know if I am responding to ESA?

Your doctor will check your hemoglobin level at least monthly. This tells your doctor how well you are doing. Your dose of ESA may need to be changed, depending on how well you respond to your treatment.



Will I need extra iron?

Your body needs iron to make red blood cells. Once you start taking an ESA your body will make more red blood cells, and your body's iron supply will be used up faster. In addition, when you are on hemodialysis, some blood is lost in the dialyzer (artificial kidney), which also reduces the amount of iron in your body. Therefore, you will probably need to take extra iron along with your ESA. Without enough iron, your ESA treatment will not be effective.

FACT

Iron is important in treating anemia. Without enough iron, ESA is wasted and you will not reach your target hemoglobin.

How much iron will I need?

The goal of taking extra iron is to make sure you have enough to reach a hemoglobin of at least 11. Your doctor will decide how much iron you get and how often you get it based on:

- Your hemoglobin level
- Your ESA dose
- Results of your iron tests

How is my iron level tested?

Two important tests can tell if you have enough iron. They are called *transferrin saturation (TSAT)* and *ferritin*. To make sure you have enough iron to reach the recommended hemoglobin:

- Your TSAT should be at least 20%
- Your ferritin should be:
 - Greater than 200 ng/mL (when you are on hemodialysis)
 - Greater than 100 ng/mL (when you are on peritoneal dialysis)

TIP

Ask your doctor or your dialysis care team for the results of your hemoglobin, iron and other important tests. Keep a record of these important lab values. It can help you stay on target. The **Dialysis Lab Log** can help you do this. To obtain a copy, ask your dialysis care team or call the National Kidney Foundation at 800.622.9010.

How often will my iron level be tested?

If you are being treated for anemia with an ESA, your iron should be tested every month until your anemia is under control. If you do not have anemia or if your anemia is under control, your iron level should be checked every three months.



How will iron be given to me?

Iron is most effective when given by IV. IV iron can be injected into the blood tubes during hemodialysis. For patients receiving peritoneal dialysis, iron can be given either by IV or as a pill by mouth.

Can diet help my anemia?

Eating foods that are high in iron, vitamin B12 and folic acid may be helpful for some patients with anemia. Your dietitian can help you plan meals to include foods that are good sources of these vitamins and minerals. Check with your doctor before making any changes in your diet.

How long will I need anemia treatment?

You will probably need treatment for life—even if you have a successful kidney transplant. Unfortunately, even a new kidney may not be able to make all the EPO you need to make enough red blood cells. One reason this happens is because the

immunosuppressive drugs needed after getting a new kidney can affect EPO production. So medication for anemia may still be needed even after a successful transplant.

What if my anemia isn't treated?

If untreated, anemia can cause serious problems. Anemia can make your other health problems worse. A low supply of red blood cells in your body (anemia) can make your heart work harder. This can lead to a type of heart disease called *left ventricular hypertrophy (LVH)*. Unfortunately, many people with kidney disease develop LVH long before they reach kidney failure, and some will even die from it. Early treatment of anemia may help prevent this problem and other serious complications from happening.

FACT

Treating your anemia is important because:

- Your chance of having serious, life-threatening heart problems is lower.
- You will have more energy to do your daily tasks.
- Your quality of life gets better.
- Your ability to exercise improves.

Where can I get more information?

You can speak to your doctor or other members of the health care team, or you can call the National Kidney Foundation for information. To learn more about kidney disease, you may also want to read these free publications from the National Kidney Foundation:

- *About Chronic Kidney Disease: A Guide for Patients and Their Families* (11-50-0160)
- *Diabetes and Chronic Kidney Disease* (11-10-0209)
- *GFR (Glomerular Filtration Rate): A Key to Understanding How Well Your Kidneys Are Working* (11-10-1813)
- *What Everyone Should Know About Kidneys and Kidney Disease* (11-10-0101)
- *You Can Save Your Own Life: Preventing Early Death From Kidney Disease* (11-10-0240)
- *Your Kidneys: Master Chemists of the Body* (11-10-0103)

To obtain a free copy of these booklets or information about other National Kidney Foundation resources, contact your local National Kidney Foundation affiliate, or call the national toll-free number 800.622.9010. Also, visit the Web site of the National Kidney Foundation's Kidney Learning System at www.kidney.org/KLS

NOTES

National Kidney Foundation's Kidney Disease Outcomes Quality Initiative

Did you know that the National Kidney Foundation's Kidney Disease Outcomes Quality Initiative (NKF-KDOQI) develops guidelines that help your doctor and health care team make important decisions about your medical treatment? The information in this booklet is based on the NKF-KDOQI™ recommended guidelines for anemia, and it's very important for you to know.

Stages of Chronic Kidney Disease

There are five stages of chronic kidney disease. They are shown in the table below. Your doctor determines your stage of kidney disease based on the presence of kidney damage and your *glomerular filtration rate (GFR)*, which is a measure of your level of kidney function. Your treatment is based on your stage of kidney disease. Speak to your doctor if you have any questions about your stage of kidney disease or your treatment.

Stages of Kidney Disease

Stage	Description	Glomerular Filtration Rate (GFR)*
1	Kidney damage (e.g., protein in the urine) with normal GFR	90 or above
2	Kidney damage with mild decrease in GFR	60 to 89
3	Moderate decrease in GFR	30 to 59
4	Severe reduction in GFR	15 to 29
5	Kidney failure	Less than 15

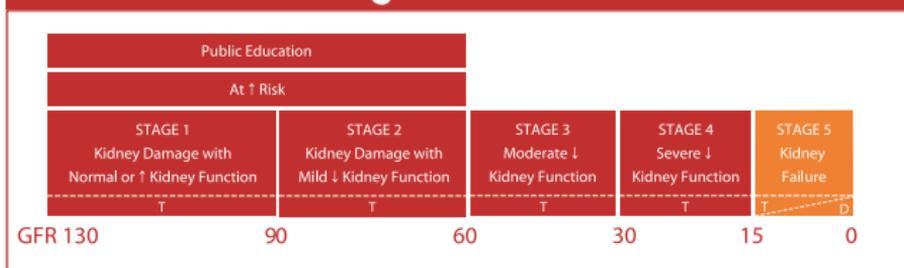
*Your GFR number tells your doctor how much kidney function you have. As chronic kidney disease progresses, your GFR number decreases.

More than 20 million Americans—one in nine adults—have chronic kidney disease, and most don't even know it. More than 20 million others are at increased risk. The National Kidney Foundation, a major voluntary health organization, seeks to prevent kidney and urinary tract diseases, improve the health and well-being of individuals and families affected by these diseases, and increase the availability of all organs for transplantation. Through its 47 affiliates nationwide, the foundation conducts programs in research, professional education, patient and community services, public education and organ donation. The work of the National Kidney Foundation is funded by public donations.

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Education Along the Continuum of Care



Light-shaded boxes indicate the scope of content for this KLS resource.
 GFR = Glomerular Filtration Rate; T = Kidney Transplant; D = Dialysis



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