

# Anemia and Chronic Kidney Disease

Stages 1–4



National Kidney  
Foundation®

[www.kidney.org](http://www.kidney.org)

**LOVE YOUR  
KIDNEYS™**

## 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 healthcare team make important decisions about your medical treatment? The information in this booklet is based on the NKF-KDOQI recommended guidelines.

### 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.



## 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 B<sub>12</sub> or folic acid in your body

Iron is a mineral that you get from eating foods like liver



and leafy, green vegetables. Both vitamin B<sub>12</sub> 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 B<sub>12</sub>, 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 with kidney disease 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 with kidney disease 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 get anemia and 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 and other health problems. Show the list of symptoms to your doctor. Discuss how you are feeling and ask questions.

## How is anemia treated?

Your treatment will depend on the exact cause of your anemia. If your anemia is due to kidney disease, you will be treated with:

- Drugs called *erythropoiesis-stimulating agents (ESAs)*

ESAs help your body make red blood cells. ESAs will usually be given to you as an injection under the skin (called a *subcutaneous injection*) in your doctor's office.

- Extra iron

Your body also needs iron to make red blood cells—especially when you are receiving ESAs. Without enough iron, your ESA treatment will not work as well. Iron can be given to you as a pill, or administered directly into a vein in your doctor's office or clinic.

### TIP

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. When your kidneys no longer make enough EPO, treatment with an ESA can help.



## What is the goal of anemia treatment?

The goal of anemia treatment in most cases is to increase your hemoglobin level to be between 11 and 12. As you get closer to this range, you should notice that you have more energy and feel less tired.

### TIP

Speak to your doctor if you are ever discharged from a hospital. Your doctor may want to modify your anemia treatment plan to maintain your target hemoglobin.

## 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

There are different types of ESAs available—short-acting ESAs or long-lasting ESAs. You and your doctor will decide which type is best for you.



## **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. Without extra iron, your ESA treatment will not be effective.

## How much iron will I need?

Your doctor will decide how much iron you need and how often you get it based on your hemoglobin level, ESA dose and the results of your iron tests. The goal of taking extra iron is to make sure you have enough iron to reach a hemoglobin between 11 and 12.

## 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 desired hemoglobin:

- Your TSAT should be at least 20 percent.
- Your ferritin should be at least 100 ng/mL.

## 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.

## Can diet help my anemia?

Eating foods that are high in iron, vitamin B<sub>12</sub> 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.

### FACT

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

## 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

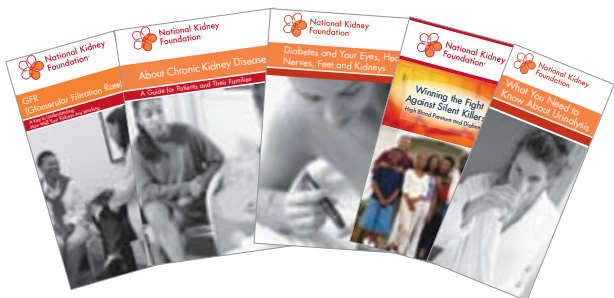
Treating your anemia is important because:

- 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.

### What if I have a 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, treatment for anemia is often necessary even after a successful transplant.

## Where can I get more information?



If you have questions, speak with your healthcare team. They know you and can answer questions about you.

If you want to read more about kidney disease, the National Kidney Foundation has more than 50 other publications that cover many subjects, such as:

- CKD risk factors like hypertension and diabetes
- Complications of chronic kidney disease, such as cardiovascular disease, anemia or bone problems
- Nutrition for CKD patients, with information about carbohydrates, protein, sodium, phosphorus and potassium

- Treating kidney disease early
- Treating kidney failure with transplantation or dialysis.

There are two ways to learn about the many free resources available to you:

- Call the National Kidney Foundation at 800.622.9010.
- Visit the National Kidney Foundation website ([www.kidney.org/store](http://www.kidney.org/store)).

(All publications are free, but there is a limit of five per person.)

Becoming an educated patient is very important to being healthy!



# National Kidney Foundation

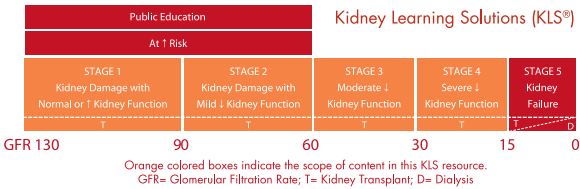
The National Kidney Foundation (NKF) is dedicated to preventing kidney diseases, improving the health and well-being of individuals and families affected by these diseases and increasing the availability of all organs for transplantation.

With local offices nationwide, the NKF provides early detection screenings and other vital patient and community services. The Foundation conducts extensive public and professional education, advocates for patients through legislative action, promotes organ donation and supports kidney research to identify new treatments.

In 2009 NKF launched a groundbreaking multifaceted collaborative initiative to **"END THE WAIT!"** for a kidney transplant in the United States in 10 years by using proven strategies to eliminate barriers to donation and institute best practices across the country.

The NKF relies on individual and corporate donations, foundation and government grants, membership and special events to support its range of programs, services and initiatives.

## A Curriculum for CKD Risk Reduction and Care



National Kidney Foundation\*

Kidney Learning Solutions™

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[www.kidney.org](http://www.kidney.org)



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