

# UNDERSTANDING IRON AND CHRONIC KIDNEY DISEASE





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## WHAT IS CHRONIC KIDNEY DISEASE (CKD)?

When someone has CKD, it means that their kidney function has slowed down. These changes usually take place over time.

There are a variety of diseases or conditions that can lead to CKD. Two of these are diabetes and high blood pressure. A lot of people have those diseases and are at risk for CKD. Other diseases present at birth can cause CKD. Among them are Polycystic Kidney Disease, Alport Syndrome, Fabry disease among others.

There are five stages of CKD. The stages show how well the kidneys are doing their job. Your healthcare provider can do a blood test to see what stage you are in. In Stage 1, there is very little kidney damage. By Stage 5, the kidneys will have lost most of their function. Even though complications due to CKD, such as anemia, can start as early as CKD stage 3, more serious symptoms of anemia usually become more noticeable in CKD stage 5. Ask your healthcare provider to check your blood to see if you have any signs of anemia and/or low levels of iron. If the kidneys continue to lose function, most people will have signs of anemia. Some

may begin to feel the effects of anemia.

## WHAT IS ANEMIA?

Our blood is made up of mainly red blood cells, white blood cells and platelets. When a person has anemia, it means that they have fewer red blood cells than normal and may not have enough iron. Why is that important? Red blood cells carry oxygen throughout the body. Organs and tissues need oxygen to function and stay healthy. So, fewer red blood cells cause low oxygen and low oxygen makes us feel weak and tired.

## WHAT DOES CKD HAVE TO DO WITH ANEMIA?

The kidneys make a hormone called erythropoietin (er-wreath-ro-po-i-tin). Often it is called EPO for short. EPO coupled with iron makes red blood cells in the bone marrow. CKD affects the amount of EPO that the kidneys make. As kidney function gets worse, in the later stages of CKD, the ability for the kidneys to produce EPO decreases. Patients whose kidneys are not making enough EPO will need an erythropoietin stimulating agent (ESA) therapy prescribed by their physician. Like naturally produced EPO, this ESA therapy will also need iron to make red blood cells.

Dialysis patients can lose blood during dialysis treatments as well as due to more frequent blood testing. Not receiving enough ESA therapy and having a low iron level (not replacing that lost iron) is the main reason dialysis patients suffer from anemia.



## **DOES ANEMIA EFFECT HOW I FEEL?**

If you have anemia, you may have a variety of symptoms.

The symptoms may be a lot like those for other diseases. This can make it hard to tell if the way you feel is just due to anemia. Here are some ways people say they feel when they have anemia.

- I never have enough energy
- I feel weak
- I feel tired
- It's hard to concentrate, I feel like I have "brain fog"
- It feels like my heart is beating too fast
- Sometimes my heart skips beats
- I get short of breath
- I am having headaches
- I am not sleeping very well
- My appetite does not seem to be as good as it once was
- My hands and feet won't stay warm
- I may feel dizzy
- I sometimes feel sad or "down in the dumps"
- It's hard to do everyday tasks like make a sandwich or walk up stairs

Some people don't have any symptoms at first. However, as anemia gets worse, a person may start having more and more of these symptoms.

## How can I find out if I have anemia?

If you have any or many of these symptoms it may be because:

- Your body is not naturally producing enough EPO;
- If you are prescribed an ESA therapy, you may not be getting enough ESA therapy;
- Your iron levels may be low;
- You may not be getting enough dialysis; or
- You may have an infection or inflammation.

So whether you are on dialysis or not, a thorough check-up is recommended.

If you have any of the symptoms of anemia, tell the healthcare professional who is doing your check-up. Your check-up should include:

- Questions to find out how you are feeling right now
- Current health history
- Past health history
- Medication review
- Physical exam
- Urine test if indicated
- Blood tests

The complete blood count or CBC is the main test that tells if a person has anemia.

The CBC also measures:

- The levels of the different cells in your blood
- The number, type, size and shape of the cells in your blood

Two of the red blood cell tests are:

- **Hemoglobin (Hgb)** is part of the blood cell that contains the iron that takes oxygen to tissues and organs.
- **Hematocrit (Hct)** tells how many cells are in a certain amount of blood. This can be used to tell if the number of red cells in the blood is too low, just right or too high.

### Target hemoglobin value:

The optimal target Hgb level for patients with CKD is not well defined or “one size fits all”. In patients with CKD on dialysis or not on dialysis, anemia treatment should be individualized. A patient’s target Hgb level should be determined based on a discussion between the patient and their physician as to what is best for him/her and how he/she feels and can function on a daily basis at various Hgb levels.

For most CKD patients not on dialysis, who are anemic and are on ESA therapy, Hgb levels

should be maintained between 10-11.5 g/dL using the lowest ESA dose. The U.S. Food and Drug Administration (FDA) approved label on ESAs states that, for patients with CKD who are not on dialysis, one should consider ESA treatment only when the Hb level is <10 g/dL and reduce or stop the ESA dose if the Hgb level exceeds 10 g/dL.

In most dialysis patients who are anemic and are treated with an ESA therapy, Hgb levels should be maintained between 10 -11.5 g/dL, using the lowest ESA dose.

Other blood tests are done to check how much iron is in the body. Those tests are:

- **Serum iron** – level of iron circulating in the blood
- **Serum ferritin** – amount of iron stored in the body and inflammation
- **Transferrin saturation or TSAT** – amount of iron that is bound to transferrin and can be used to make red blood cells

Based on the results of these tests, your healthcare provider may decide that you need to have more iron.

But before deciding to give iron, they may do additional tests including:

- Kidney function if indicated
- Vitamin B12 level
- Folic acid level
- Changes in the blood related to other diseases

## HOW IS LOW IRON TREATED?

If the iron level is low, the first step in treating anemia is to raise the iron level. How and where this is done may depend on the level of kidney function. The approaches are different for those with CKD not doing dialysis than those doing dialysis. The type of dialysis and the place where it is done may play a part too.

### Patients with CKD not on dialysis:

Your healthcare provider should check iron levels and if low, will likely prescribe oral iron pills (iron pills take by the mouth). If iron pills do not increase your iron level, you may need intravenous iron (iron shot in the vein). If your Hgb is still low after iron shots, you may need an ESA therapy to replace your body's natural production of EPO. ESA shots are like a person taking insulin shots for diabetes. Your healthcare provider should routinely check your Hgb and

iron levels to adjust iron and ESA doses as needed.

### Patients with CKD on peritoneal dialysis or home hemodialysis:

Similar to patients with CKD who are not on dialysis, home dialysis patients should regularly have their Hgb and iron levels checked. If a home dialysis patient has low iron levels, they should start an iron therapy and if Hgb remains low, they should be started on an ESA therapy.

### Patients with CKD on hemodialysis:

Hemodialysis patients tend to lose more iron and have low iron levels. This is due to blood loss during hemodialysis because of waste during dialysis treatment as well as due to more frequent blood testing. Most, if not all, of patients on hemodialysis require iron treatment, usually given intravenously, in the machine.

**More recently a new therapy has been approved by the FDA and has become available for patients on hemodialysis. The new iron therapy is**

mixed into a patient's dialysis fluid (dialysate) and delivered during treatment. This dialysate iron therapy does not require iron to be given intravenously, so no needles are involved.

Be sure to ask your healthcare provider about all available iron therapies and discuss which treatment is best for you.

## CAN I GET IRON FROM FOOD?

There are foods rich in iron. Some are not kidney-friendly. If you have a dietitian, ask them about the foods you can eat. If you don't have access to a dietitian, ask your healthcare provider to help you with this. But you should know that iron just from food will not be enough to give you the amount of iron you need.



# QUESTIONS ABOUT IRON YOU MAY WANT TO ASK YOUR HEALTHCARE TEAM

1. What tests are done to check my iron level?

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2. What do my iron tests show?

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3. Do the tests show that I need an iron therapy?

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4. How do you decide what type of iron therapy I need to take?

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5. Can I use iron pills?

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6. If I can't take pills, how will iron be given to me?

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7. Can I get the iron during my dialysis treatments?

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8. How will I get iron if I am on hemodialysis?

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9. How will I get iron if I am on a home dialysis therapy?

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10. How will I get iron if I am not on dialysis?

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11. Are there side effects from iron therapies?

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12. Can I get too much iron?

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13. How long will I have to take iron therapy?

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14. How often will you check my iron level?

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15. Will you go over the test results with me?

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## SUMMARY

- The body needs iron to make hemoglobin so the red blood cells in the blood can carry oxygen to tissues and organs.
- Low iron is a factor in the anemia of chronic kidney disease. You may need to take an erythropoietin stimulating agent (ESA) therapy if your body is not producing enough natural erythropoietin (EPO). Your healthcare provider will look at the whole picture and work with you to develop the best approach to optimal care.
- There are different types of iron medications and preparations.
- Iron pills don't work well for patients on dialysis or with advanced CKD.
- The decision for what type of iron is used in a dialysis clinic is made by the dialysis care team.
- The dose of iron, how it's given to you and how often it is prescribed is based on what the patient needs.
- Most hemodialysis patients will get iron therapy during their dialysis treatments.
- Patients doing home dialysis and those with advanced CKD may get iron via a shot or an IV.
- Iron from kidney-friendly foods may help but won't be enough to treat a low iron level and anemia.

To learn more about anemia, read the AAKP Understanding Anemia of Chronic Kidney Disease brochure by visiting [www.aakp.org](http://www.aakp.org) or calling (800) 749-2257 to request a copy.



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