

# EducationSeries

## THE POWER OF IRON (Its critical role in kidney disease)

### Introduction

Why is iron so important in kidney disease? The answer is that iron can help with anemia (a lack of red blood cells), which is a common problem for people with kidney disease.

Anemia can be a significant problem for you as a kidney patient because of the nature of kidney disease.

The kidneys have four basic functions:

- 1) Removing waste products
- 2) Maintaining fluid balance
- 3) Restoring electrolyte and acid/base balance
- 4) Stimulating the release of certain hormones

The dialysis process takes care of the first three functions. The hormone erythropoietin (or "EPO") stimulates your bone marrow to produce red blood cells. Your kidneys are responsible for 90% of erythropoietin (EPO) stimulation. Without EPO there is no red blood cell (RBC) production. Another essential element to red blood cell production is iron. You must have enough iron stored in your body for the EPO to work. The two go hand in hand. You cannot make healthy red blood cells without EPO and iron.

### You need EPO and iron to make red blood cells

A hormone is a chemical substance that acts as a messenger, delivering material from one part of your body to another. Healthy kidneys produce a hormone called erythropoietin, or EPO. This hormone is necessary for your bone marrow to form red blood cells (RBCs).

### Why red blood cells are important to your health and especially your heart

Your red blood cells carry oxygen to all parts of your body. Every living human cell needs oxygen to live. Muscles are made up of millions of cells. An important muscle is the heart. This is why heart conditions can develop or worsen if there are not enough red blood cells (RBCs) to deliver oxygen to the cells of the heart. Oxygen is the fuel for cell survival.

### What causes anemia in people with kidney failure?

There are two common causes of anemia in chronic kidney disease patients:

- 1) Too few red blood cells. This is usually because your kidneys are no longer making the hormone erythropoietin (EPO).
- 2) Too little iron.



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Too little iron may be caused by the following:

- Not enough iron in your diet.
- Your body is not able to absorb enough iron. During regular blood loss, you lose iron. The iron absorbed through diet is not enough to keep up with the demand of new red blood cell production.
- Blood loss. Iron is in the blood that is lost during dialysis and surgery. Some blood is lost during hemodialysis. It's almost impossible to return all your blood after hemodialysis. Some blood remains in the dialyzer and tubing. You may also lose blood from GI (gastrointestinal) bleeding, catheter lines, bleeding from the access site after hemodialysis, surgery, clotted dialyzers and blood lines.
- Erythropoietic stimulating agents (ESA) such as Epogen®, Aranesp® and Procrit®, use up a lot of the iron in your body to make red blood cells (RBCs).

### How your doctor knows when to give you iron

Your doctor knows when to give you iron by reviewing the blood tests you take each month. These tests show how many red blood cells (RBCs) you have and whether there is enough iron in your red blood cells or in storage.

There are blood tests that show how your red blood cells are doing and there are blood tests that show where the iron is in your body and how it is being used.

### What is the role of iron?

- Key ingredient for healthy red blood cell (RBC) production
- Key component of hemoglobin, which carries oxygen

## Glossary

**ANEMIA:** A decrease in the amount of red blood cells that are needed to carry enough oxygen to meet the body's needs.

**CKD:** Chronic Kidney Disease (reduced kidney function).

**EPO:** (Erythropoietin). A hormone produced by the kidneys. It stimulates the bone marrow to produce red blood cells.

**ESA:** Erythropoietin stimulating agent. A drug that replaces the hormone erythropoietin when the kidneys fail to produce it. Examples of ESAs are Epogen®, Aranesp® and Procrit®.

**HORMONE:** A chemical substance that acts as a messenger, delivering material from one part of your body to another.

**RBC:** Red blood cell. Red blood cells are responsible for delivering oxygen throughout the body.

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