Anemia in END-STAGE RENAL DISEASE

AWARENESS / COMMUNICATION / TREATMENT
ANEMIA AND END-STAGE RENAL DISEASE (ESRD), also known as kidney failure, often go hand in hand. Most people with kidney failure who are on dialysis have anemia. Kidney transplant patients are also at higher risk for anemia.

Healthy kidneys help send signals to your bones to make red blood cells, so if your kidneys fail, they may not be able to help your body make the red blood cells it needs.
What is anemia?

Anemia is a condition that happens when there are not enough red blood cells in your body.

Red blood cells carry oxygen through your blood, giving you energy and helping your muscles, bones and organs work properly.

Anemia can make you feel weak and tired because you are not getting the oxygen you need.
Who can get anemia?

Anybody can develop anemia, but it is very common in people with chronic kidney disease (CKD), and especially in those with kidney failure. People may start to have anemia in the early stages of CKD, and anemia usually gets worse as CKD gets worse. The majority of patients on dialysis have anemia, and the risk of anemia is higher in patients with kidney transplants too. Anemia in ESRD is more common if you:

Anemia in CKD is more common if you:

- Have diabetes
- Have heart disease
- Have high blood pressure
- Are African-American
- Are older than 75 years

If you have ESRD, talk to your doctor about getting tested for anemia. There are things you can do to manage the symptoms of anemia that can help you feel better.
What are the symptoms of anemia?

It can be hard to tell whether you have anemia, because it can happen with or without symptoms. Many of the symptoms of anemia can also be caused by other problems. For example, a common symptom of anemia is fatigue (feeling very tired), which can also be caused by dialysis.

The only way to know for sure if you have anemia is to get tested. If you are having symptoms, it is important that you talk to your doctor.

Dizziness, loss of concentration
Feeling dizzy or having difficulty concentrating may be a sign that your brain is not getting enough oxygen.

Pale skin
Paleness is caused by reduced blood flow or a lower number of red blood cells.

Cold intolerance
Sensitivity to the cold may mean there is not enough oxygen being delivered in your blood to your body.

Fatigue or weakness
You may feel very tired and weak easily.

Shortness of breath
Your blood may not have enough red blood cells to deliver oxygen to your muscles. By increasing your breathing rate, your body is trying to bring more oxygen into your body.

Chest pain
Anemia in ESRD can increase your risk of heart problems because the heart has to work harder to provide blood to your body. If you have an unusually fast heart rate or are worried about your heart health, please speak to your doctor.
Causes of anemia in kidney failure:

Patients on dialysis:
The majority of patients on dialysis have anemia. Anemia in dialysis patients is caused by having:

Less erythropoietin (EPO) than normal
All of the cells in your body live for a certain amount of time and then die. Your body is always working to make new cells to replace the ones that have died. Red blood cells live for about 115 days. Your kidneys help your body make red blood cells.

Healthy kidneys make a hormone called erythropoietin (EPO). EPO sends a signal to your body to make more red blood cells. If your kidneys are not working as well as they should or have stopped working, they cannot make enough EPO. Without enough EPO, your body does not know to make enough red blood cells. This means fewer red blood cells are available for carrying oxygen through your body.

Less iron than normal
Iron is a mineral found in many foods, such as meats and leafy greens. Your body uses iron to make red blood cells. A common cause of anemia in people with ESRD is iron deficiency. Iron deficiency means you do not have enough iron in your body. It can be caused by not getting enough iron in your diet. It can also be caused by losing blood, because iron is stored in your red blood cells.

Iron deficiency is more common in people on dialysis. This happens from:

Not eating enough food that has high iron content
Certain iron-rich foods like red meats and beans may be limited in a dialysis diet. If you do not eat enough iron, you may not have as much iron as you need.

Frequent blood draws
Patients with kidney failure may need to have blood tests more often than a healthy person, which can increase the risk of not having enough iron.

Blood loss during dialysis
After a hemodialysis session, a small amount of blood is often left in the dialyzer (dialysis machine). Over time, this amount lost will build up and could lead to not having enough iron.
Patients who have had a kidney transplant:

Patients who have had a kidney transplant are at higher risk for having anemia. Anemia in kidney transplant patients is caused by:

**Less erythropoietin (EPO) than normal**
If you have a kidney transplant, sometimes the new kidney does not work as well as a kidney in a healthy person. If your new kidney is not working as well as it should, it cannot make enough of the EPO hormone, which leads to anemia.

**Less iron than normal**
When you have a kidney transplant, you lose blood during the kidney transplant surgery. You will also have blood tests often to check on the health of your new kidney. Blood loss from the surgery and from frequent blood draws increases your risk of not having enough iron, and getting anemia.

**Immunosuppressant (anti-rejection) medicines**
If you have a kidney transplant, you are required to take medicines that decrease your immune system, called immunosuppressants. These medicines keep your body from attacking the new kidney. Immunosuppressant medicines can have many side effects, including causing anemia.

**Kidney transplant surgery**
The risk of anemia after kidney transplant is higher right after the transplant surgery. This is because the new kidney takes some time before it starts making enough EPO, and because a patient's iron levels are low from losing blood. Over time, the risk for anemia decreases in patients who have had a kidney transplant, as long as their new kidney stays healthy.

**Other kinds of anemia**
There are several kinds of anemia. Anemia caused by having too little EPO or too little iron in your body are the most common in people with ESRD. Talk to your doctor to learn more.
How will I know if I have anemia?

It can be hard to know whether you have anemia, because it can happen with or without symptoms. Also, many of the symptoms of anemia are not obvious, because they can be caused by other health problems. If you are having symptoms, you should talk to your doctor right away.

Even if you are not having symptoms, you should talk to your doctor about anemia if you have kidney failure. Anemia is very common in patients on dialysis, and also happens in patients with a kidney transplant.

The only way to know if you have anemia is to have a blood test, which checks for the amount of hemoglobin in your blood. Hemoglobin is a part of your red blood cells. Figuring out the amount of hemoglobin in your blood can tell your doctor how many red blood cells you have, and whether you have anemia.

It can be **hard to know** whether you have anemia, because it can happen **with or without symptoms**.
How is anemia treated?

Getting your anemia treated may help you feel better. Depending on the cause of your anemia, your doctor may recommend one or more of the following treatments:

**Erythropoiesis-stimulating agents (ESAs)** — ESAs are medicines that work by sending a signal to your body to make more red blood cells. This replaces the function of the EPO hormone that healthy kidneys normally make.
  - ESAs are given by injection (as a shot).

**Iron supplements** — Iron supplements will raise the level of iron in your blood when your iron levels are too low. Depending on how you are treating your kidney failure, you can take your iron supplement in different ways:
  - Iron supplements can be taken orally (as a pill) or given by injection (as a shot). If you are on hemodialysis, you can get the extra iron through the fluid used in your dialysis treatment.

Many patients need to take both ESAs and iron supplements to reach a healthy red blood cell count.

**Red blood cell transfusion** — A red blood cell transfusion is a procedure to increase the number of red blood cells in your body by giving you red blood cells from someone else’s body through an IV. This can temporarily improve your anemia symptoms.
Why should I treat my anemia?

Although the symptoms of anemia may not always be severe, it may be important to treat anemia if you have it. These are some of the benefits of treating anemia:

- Decrease feelings of weakness and dizziness
- Improve concentration
- Have more energy
- Feel more able to exercise
- Decrease your chances of heart problems
  Patients with kidney failure are already at higher risk for heart disease. Anemia makes this risk greater.

Doctors and researchers are working on potential new treatments for anemia. New treatments in development are tested in clinical trials. If you are interested in joining a clinical trial to try an investigational new treatment for anemia, visit ClinicalTrials.gov to learn more.