



## Why are people with chronic kidney disease (CKD) at risk for iron deficiency?

If you have been diagnosed with chronic kidney disease, commonly known as CKD, your chances of having anaemia increase. Iron deficiency could play a role in this anaemia.

Chronic kidney disease occurs when you have kidney damage or reduced kidney function for more than three months.<sup>1</sup> It can be caused by many factors, such as high blood pressure and diabetes. Your doctor may tell you that you have a particular stage of CKD between stage 1 and stage 5, where 5 is the most serious. The stage of your disease is calculated using a measurement known as the glomerular filtration rate, or GFR. Lower GFR values mean that you have a higher stage of CKD and may require more treatment for your reduced kidney function.

As your stage of CKD becomes more advanced, it becomes more likely that you will also suffer from anaemia. Anaemia occurs when you don't have enough haemoglobin in your red blood cells to carry the normal amount of oxygen around your body. Nearly all patients with CKD stage 5 are anaemic.<sup>2</sup>

If you do become anaemic with your CKD, iron deficiency could be one of the causes. Up to half of people with CKD stages 2-5 have some form of iron deficiency.<sup>3</sup> Iron deficiency in CKD occurs when the supply and demand for iron in your body goes out of balance. This might happen because of:

- *Blood loss (and therefore iron loss) from:*
  - *Frequent blood tests.<sup>4</sup>*
  - *Dialysis, if your condition is this advanced.<sup>4</sup>*
- *Lower iron intake, caused by:*
  - *Eating less foods that are rich in iron.<sup>3</sup>*
  - *Reduced absorption of iron from your food into your blood stream.<sup>5</sup>*

If you have CKD you may also have a type of anaemia called 'anaemia of chronic disease'. The inflammation often associated with the anaemia of chronic disease can lead to iron deficiency due to decreased iron absorption from the GI tract or decreased release from iron stores.<sup>5</sup>

### Treatment with an erythropoiesis-stimulating agent (ESA)

You might also become iron deficient if you are treated with an erythropoiesis-stimulating agent, commonly known as ESA.

One role of your kidneys is to produce the hormone erythropoietin, which stimulates the production of red blood cells in your bone marrow.<sup>5</sup> If you have CKD, your kidneys may not produce enough erythropoietin and you may develop anaemia. You may be given an erythropoiesis-stimulating agent (ESA)<sup>2</sup> to treat your anaemia. Like the erythropoietin that healthy kidneys

make, ESAs signal the bone marrow to produce and increase the number of red blood cells in your body.<sup>5</sup> Since the production of healthy red blood cells requires iron, ESAs can quickly use up the iron stores in your body causing you to become iron deficient.<sup>5</sup> Because of this you may need to be given extra iron so that there is enough iron to make haemoglobin in the new red blood cells.<sup>6</sup>

Treatment of your anaemia and iron deficiency with an ESA and iron (either by mouth or by injection) should help you to feel less tired and generally increase your feeling of well-being. Doctors also treat anaemia as it can contribute to the progression of kidney disease and can increase your risks of heart failure or other cardiovascular problems.<sup>3</sup>

### Iron deficiency and haemodialysis

Both iron deficiency and anaemia are common problems for patients on haemodialysis due to blood loss in the dialysis filter, frequent blood tests, and bleeding at the haemodialysis access site and other sites in the body including the gastrointestinal tract.<sup>4</sup>

If you are on dialysis it is likely that your doctor will be monitoring your iron status but if you are concerned about iron deficiency, your CKD, or your treatment, it is important that you talk to your doctor or dialysis nurse.

## Warning signs of iron deficiency in ckd

One of the main symptoms of iron deficiency is fatigue, a more extreme version of tiredness. If you are experiencing fatigue, you may feel physically and mentally exhausted, and lack energy for a number of days each week, even if you have not been doing any physical activities that are particularly tiring.<sup>7</sup> You may be too exhausted to complete normal daily tasks such as getting dressed or going shopping, and you may often feel too tired to spend time with friends or family.

Fatigue is also a well known symptom of anaemia and CKD,<sup>8</sup> so if you are experiencing fatigue it is important to speak to your doctor so that they can find out what is causing it. Remember that if your fatigue is due to iron deficiency, this can be treated and your doctor can recommend the most suitable treatments for you.

There are also many other signs that may indicate that you have iron deficiency or iron deficiency anaemia. These include:

- *Dizziness,<sup>9</sup> irritability,<sup>10</sup> and difficulty concentrating.<sup>11</sup>*
- *Looking pale.<sup>12</sup>*
- *Shortness of breath and a racing heart.<sup>13</sup>*
- *Sore tongue or dry mouth.<sup>14</sup>*
- *Cold intolerance,<sup>15</sup> or severe headache.<sup>16</sup>*



Use our Symptom Browser to see the complete list of symptoms that iron deficiency can cause and to understand what each of these symptoms involves.

Because there are multiple conditions that can lead to the same symptoms as iron deficiency, it is important that you discuss all of your symptoms with your doctor so that they can determine the most likely causes.

## Talking to your doctor

If you have been diagnosed with CKD it is likely that you will have regular follow up appointments with your doctor to check how you are feeling and to monitor the progress of your symptoms. If you have been feeling fatigued or have any of the symptoms of iron deficiency such as paleness, faintness or a racing heart, you may want to make an extra appointment or speak to your doctor about your symptoms at your next scheduled visit. To get the most out of your visit, think in advance about the information that the doctor might need in order to work out what is causing your symptoms. You should also prepare any questions that you want to ask.

If it turns out that you have iron deficiency, your doctor will be able to recommend the best treatment choice for you. The treatment could be different depending on how iron deficient you are, whether you have anaemia or not, and what treatment you are being given for your CKD.

## References

1. **National Kidney Foundation.** K/DOQI Clinical practice guidelines for chronic kidney disease: Evaluation, classification, and stratification. *Am J Kidney Dis.* 2002;39:S1-S266r.
2. **Babitt JL, Lin HY.** Mechanisms of anemia in CKD. *J Am Soc Nephrol.* 2012;23(10):1631-4.
3. **Mehdi U, Toto RD.** Anemia, diabetes, and chronic kidney disease. *Diabetes Care.* 2009;32(7):1320-6. doi:10.2337/dc08-0779.
4. **Fishbane S, Pollack S, Feldman HI, Joffe MM.** Iron indices in chronic kidney disease in the National Health and Nutritional Examination Survey 1988-2004. *Clin J Am Soc Nephrol.* 2009;4(1):57-61. doi:10.2215/CJN.01670408.
5. **Wittwer I.** Iron deficiency anaemia in chronic kidney disease. *J Ren Care.* 2013;39(3):182-8.
6. **Aapro M, Österborg a, Gascón P, Ludwig H, Beguin Y.** Prevalence and management of cancer-related anaemia, iron deficiency and the specific role of i.v. iron. *Ann Oncol.* 2012;23(8):1954-62. doi:10.1093/annonc/mds112.
7. **Dittner AJ, Wessely SC, Brown RG.** The assessment of fatigue: a practical guide for clinicians and researchers. *J Psychosom Res.* 2004;56(2):157-70.
8. **Macdonald JH, Fearn L, Jibani M, Marcora SM.** Exertional fatigue in patients with CKD. *Am J Kidney Dis.* 2012;60(6):930-9.
9. **Paterson JA, Davis J, Gregory M, et al.** A study on the effects of low haemoglobin on postnatal women. *Midwifery.* 1994;10(2):77-86.
10. **Radlowski EC, Johnson RW.** Perinatal iron deficiency and neurocognitive development. *Front Hum Neurosci.* 2013;7:1-11.
11. **Albacar G, Sans T, Martín-Santos R, et al.** An association between plasma ferritin concentrations measured 48 h after delivery and postpartum depression. *J Affect Disord.* 2011;131:136-42. doi:10.1016/j.jad.2010.11.006.
12. **Stoltzfus R, Edward-Raj A.** Clinical pallor is useful to detect severe anemia in populations where anemia is prevalent and severe. *J Nutr.* 1999;129(May):1675-1681.
13. **Milman N.** Postpartum anemia I: definition, prevalence, causes, and consequences. *Ann Hematol.* 2011;90(11):1247-53. doi:10.1007/s00277-011-1279-z.
14. **Osaki T, Ueta E, Arisawa K, Kitamura Y, Matsugi N.** The pathophysiology of glossal pain in patients with iron deficiency and anemia. *Am J Med Sci.* 1999;318(5):324-9.
15. **World Health Organization.** *Iron deficiency anaemia. Assessment, prevention and control: A guide for programme managers;* 2001:1-114.
16. **Vukovi -Cvetkovi V, Plavec D, Lovrenci -Huzjan A, Galinovi I, Seri V, Demarin V.** Is iron deficiency anemia related to menstrual migraine? Post hoc analysis of an observational study evaluating clinical characteristics of patients with menstrual migraine. *Acta Clin Croat.* 2010;49(4):389-94.

## visit [irondeficiency.com](http://irondeficiency.com) for more information

Vifor Pharma Ltd. Flughofstrasse 61, P.O. Box, CH-8152, Glattbrugg, Switzerland.  
(phone) +41 58 851 80 00 (fax) +41 58 851 80 01 [info@irondeficiency.com](mailto:info@irondeficiency.com)

Vifor Pharma, a company of the Galenica Group, is a world leader in the discovery, development, manufacturing and marketing of pharmaceutical products for the treatment of iron deficiency. The company also offers a diversified portfolio of prescription medicines as well as over-the-counter (OTC) products. Vifor Pharma, headquartered in Zurich, Switzerland, has an increasingly global presence and a broad network of affiliates and partners around the world. For more information about Vifor Pharma and its parent company Galenica, please visit [www.viforpharma.com](http://www.viforpharma.com) and [www.galenica.com](http://www.galenica.com).

This website is intended to provide educational information to an international audience, at the exclusion of US residents. All information contained herein is intended for educational purposes only and should not be used to replace a discussion with a healthcare professional. All decisions regarding patient care must be handled by a healthcare professional, and be made based on the unique needs of each patient. The people shown on pictures on the site are models and are used for illustrative purposes only.