TREATMENT OF IRON DEFICIENCY ANEMIA IN NON-DIALYSIS-DEPENDENT CHRONIC KIDNEY DISEASE

Uncertainty exists over the optimal treatment for iron deficiency in CKD patients.[1] The **potential risks of iron supplementation** should be weighed against the **possible benefits of avoiding or limiting blood transfusions**, **erythropoietin stimulating agent (ESA) therapy**, and **anemia-related symptoms**.[1]

Guidelines for Treating Iron Deficiency

	Recommendation for adult patients with CKD and anemia[1]	Goal during supplementation[1]
KDIGO Guidelines	Trial of iron if the TSAT is ≤30% and serum ferritin is ≤500 ng/mL	Remain below TSAT of 30% and ferritin of 500 ng/mL
ERBP Guidelines	Trial of iron if the TSAT is <20% and serum ferritin is <100 ng/mL	

TSAT, transferrin saturation; KDIGO, Kidney Disease: Improving Global Standards; ERBP, European Renal Best Practice

The **NICE (National Institute for Health and Care Excellence) 2015 Guidelines and the Renal Association 2017 Guidelines** have increased the ceiling of ferritin to 800 ng/mL during supplementation.[1]

- **Iron supplementation** is available via the oral or IV route. A trial of iron for 1 to 3 months is recommended in patients with anemia and NDD CKD.[2]
- **Oral iron may be used**, if tolerated, in patients with NDD-CKD.[2]
- IV iron has a safety profile **comparable** to that of oral iron, with more infusion reactions and fewer gastrointestinal side effects.[2]
- **Ferric carboxymaltose** is a newer IV iron preparation given at a dose of 500 mg to 1000mg once or twice per week and is approved for the first-line treatment of adults with NDD-CKD.[2]
- The **benefit of IV iron outweighs the risks in CKD**, and IV iron is preferred in patients with NDD-CKD.[2]

Key Points: Treatments and Modulators[1]

ESA/Exogenous EPO
- Causes pulsatile erythropoiesis and transient high demand for iron
- High doses decrease hepcidin, but side effects can be a problem

Iron
- Overcomes hepcidin-induced blockade of iron release from macrophages
- Decreases EPO resistance

HIF-PHD Inhibitors
- Increase iron uptake
- Increase endogenous EPO release, leading to Inhibition of downstream effects of hepcidin

EPO, erythropoietin; ESA, erythropoietin stimulating agent; PHD, prolyl-hydroxylase domain-containing proteins; HIF, hypoxia-inducable factor

References:

1. Batchelor EK, Kapitsinou P, Pergola PE, et al. Iron Deficiency in Chronic Kidney Disease: Updates on Pathophysiology, Diagnosis, and Treatment. J Am Soc Nephrol. 2020;31(3):456-468. doi: 10.1681/ASN.2019020213. Epub 2020.
2. Gafter-Gvili A, Schechter A, Rozen-Zvi B. Iron Deficiency Anemia in Chronic Kidney Disease. Acta Haematol. 2019;142(1):44-50. doi: 10.1159/000496492. Epub 2019.