## Iron Salts

Ferrous sulfate is the iron salt formulation of choice for treatment of iron deficiency anemia in otherwise healthy patients, given its general tolerability, effectiveness, and low cost. However, expect a discontinuation rate of as high as 30-40% due to gastrointestinal side effects. In patients with co-morbid conditions associated with inflammation and an increase in hepcidin, ferrous sulfate (as well as other iron salts and, to a great degree, oral iron in general) will be ineffective. An increase in the dose of oral iron in an effort to increase absorption will only result in increased gastrointestinal toxicity. Ferrous sulfate is generally ineffective in the immediate post-surgical setting due to post-surgical inflammation, and may contribute to a prolongation in post-operative ileus.

## Heme Iron

A heme iron polypeptide is commercially available and marketed in the United States as *Proferrin ES* or *Proferrin Forte* (combined with 1 mg of folate and therefore requiring a prescription). This product is made from hemoglobin extracted from cow red blood cells. Data suggest that heme iron is better tolerated and better absorbed than iron salts. However, like other oral iron supplements, bioavailability of the iron moiety is limited in patients with inflammation and elevated hepcidin levels. Heme iron is an excellent alternative to ferrous sulfate in otherwise healthy patients with iron deficiency, who are intolerant to iron salts. It is significantly more expensive.

## Iron Amino Acid Chelates

These iron products consist of a conjugate of ferrous iron with an amino acid, typically glycine. Products marketed in the United States include *Easy Iron, Gentle Iron*, and *Ferrochel* (combined with calcium, vitamin B12, vitamin C, and folate). There are some data suggesting higher bioavailability than iron salts in otherwise healthy, iron deficient patients. The iron amino acid chelates appear less likely to cause gastrointestinal intolerance than the iron salts and represent another (and only modestly more expensive) alternative to ferrous sulfate.

## Carbonyl Iron and Polysaccharide-iron Complex

Carbonyl iron is available in the U.S. as *Feosol with Carbonyl Iron.* This is not an iron salt, but rather microparticles of elemental iron. It requires an acidic environment in the stomach for the microparticles to dissolve and form a hydrochloride salt. It does not appear to offer a significant advantage over ferrous sulfate other than less poisoning potential. *Niferex* is a polysaccharide iron complex consisting of ferric iron complexed to hydrolyzed starch. It is promoted to cause less GI irritation, but the claim is unproven.

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