

Iron deficiency and iron deficiency anemia in pregnancy

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1 Iron deficiency and iron deficiency anemia are common during pregnancy and are associated with adverse outcomes

Prenatal iron deficiency occurs in over 30% of pregnancies in Canada.¹ It has been linked with low birth weight, small for gestational age size, preterm birth, need for blood transfusion for the mother, postpartum hemorrhage^{2,3} and long-term neurocognitive effects in childhood.⁴

Table 1: Oral and parenteral iron preparations*

| Generic name | Brand name | Daily or alternate day dosing | Dose, mg | Elemental iron, mg/tab | Daily estimated cost, \$† |
|-----------------------------|---------------------|--|----------|---|---------------------------|
| Oral iron‡ | | | | | |
| Ferrous gluconate | Floradix, Floravit | 1 to 2 tabs | 300 | 35 | 0.10 |
| Ferrous sulfate | Ferodan, Ferrotrate | 1 tab | 300 | 60 | 0.20 |
| Ferrous fumarate | Palafer, EuroFer | 1 tab | 300 | 100 | 0.25 |
| Ferrous bisglycinate | Ferrochel, CanPrev | 1 tab | 25 | 25 | 0.30 |
| Polysaccharide iron complex | Feramax | 1 tab | 150 | 150 | 0.75 |
| Heme iron polypeptide | OptiFerA, Proferrin | 2 to 3 tabs | 398 | 11 | 2.40 |
| Parenteral iron | | | | | |
| Iron sucrose | Venofer | 200–300 mg in a single dose over 2 hours | | Total iron replacement dose based on Ganzoni formula§ | 375 |
| Ferric derisomaltose¶ | Monoferric | 500–1500 mg in a single dose over 30 to 60 minutes | | Total iron replacement dose based on Ganzoni formula§ | 450–900 |

*List does not include all available formulations.

†Cost will vary depending on geographic location and place of purchase; costs determined by Dr. Nastaran Ostad, Perinatal Pharmacist, Sinai Health System (personal communication, 2021).

‡To maximize absorption, patients should take oral iron with vitamin C (250–500 mg) or a citrus drink such as orange juice, on an empty stomach if tolerated (can try taking before bed to decrease stomach upset), 1 hour before or 2 hours after calcium, proton pump inhibitors, antacids, thyroxine, tea, coffee, milk, soy, eggs.⁸

§Ganzoni formula (to calculate the total amount of parenteral iron to be replaced, which can then be divided into several doses based on individual product monographs for maximum per single dose): total iron dose (mg) = weight (kg) × [target hemoglobin – actual hemoglobin (g/dL)] × 2.4 + iron stores (mg) [where iron stores for adults should consist of 500 mg]; to convert hemoglobin in g/L to g/dL, divide by 10.

¶Not yet approved for use in pregnancy; studies including pregnant and breastfeeding women are ongoing.

2 Symptoms are often dismissed as normal during pregnancy

Symptoms include fatigue, weakness, dizziness, irritability, decreased stamina, hair loss and dyspnea, all of which are often attributed to the physiologic changes of pregnancy. Consequently, many patients are untreated, which increases maternal, fetal and neonatal health risks.^{3,5}

3 Ferritin and hemoglobin should be routinely assessed at the initial and 28-week prenatal visits⁵

Ferritin < 30 ug/L is diagnostic for iron deficiency. Higher ferritin values in patients with inflammation or infection do not exclude iron deficiency.⁵ Anemia during pregnancy is diagnosed when the patient's hemoglobin level is < 110 g/L⁶ (with some suggesting hemoglobin < 105 g/L in the second trimester);² postpartum, it is diagnosed at hemoglobin levels < 100 g/L.⁵

4 Oral iron is the first-line treatment for iron deficiency

Oral ferrous iron medications should contain 40–100 mg of elemental iron^{5,7} and be taken daily or every other day to mitigate adverse effects (Table 1).⁵ Enteric-coated or sustained-release products are not as well absorbed (i.e., onset of action is distal to the duodenum).⁵ Response to oral iron should be evaluated by measuring the hemoglobin level 2–4 weeks after treatment begins.^{5,7} Treatment should continue for 3 months after the hemoglobin level normalizes, and until 6 weeks postpartum, even if this exceeds 3 months.^{5,7}

5 Parenteral iron is safe and effective from the second trimester onward

Parenteral iron rapidly achieves the target hemoglobin with few adverse effects, and should be considered after the first trimester when there is⁷ intolerance to oral therapy, or a poor response

(hemoglobin increase of < 10 g/L 2 weeks after starting treatment or < 20 g/L after 4 weeks). It should also be considered for patients with moderate-to-severe iron deficiency anemia (hemoglobin < 80 g/L) or if iron deficiency anemia occurs within 4–6 weeks of anticipated delivery. A hematologist should be consulted if the patient has a hemoglobinopathy, such as thalassemia or sickle cell disease.

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