ferrous sulfate (30% elemental iron)

(**fer**-us **sul**-fate)

Apo-Ferrous Sulfate, ED-IN-SOL, Fe50, Feosol, Feratab, Fer-gen-sol, Fer-In-Sol, Fer-Iron, Fero-Grad, Novoferrosulfa, PMS Ferrous Sulfate, Slow FE

Classification

Therapeutic: antianemics

Pharmacologic: iron supplements

Indications

PO: Treatment & prevention iron deficiency anemia.

Action

An essential mineral found in hemoglobin, myoglobin, and many enzymes. Enters the bloodstream and is transported to the organs of the reticuloendothelial system (liver, spleen, bone marrow) where it becomes part of iron stores. **Therapeutic Effects:** Resolution or prevention of iron deficiency anemia.

Pharmacokinetics

Absorption: Approximately 5–10% of dietary iron is absorbed (up to 30% in deficiency states). Therapeutically administered PO iron is up to 60% absorbed via active and passive transport processes.

Distribution: Remains in the body for many months. Crosses the placenta; enters breast milk.

Protein Binding: ≥90%.

Metabolism and Excretion: Mostly recycled; small daily losses occurring via desquamation, sweat, urine, and bile.

Half-life: .

TIME/ACTION PROFILE (effects on erythropoiesis)

ROUTE	ONSET	PEAK	DURATION
PO	4 days	7–10 days	2–4 mo

Contraindications/Precautions

Contraindicated in: Anemia not due to iron deficiency; Hemochromatosis; Hemosiderosis; Hypersensitivity to iron products.

Use Cautiously in: Peptic ulcer disease; Ulcerative colitis or regional enteritis (condition may be aggravated); Alcoholism; Severe hepatic impairment; Severe renal impairment.

Adverse Reactions/Side Effects

CNS: dizziness, headache, syncope. **GI:** nausea, constipation, dark stools, epigastric pain, GI bleeding, vomiting. **Misc:** temporary staining of teeth (liquid preparations).

Interactions

Drug-Drug: ↓ absorption of **tetracyclines**, **fluoroquinolones bisphosphonates**, **levothyroxine**, **mycofenolate mofetil**, and **penicillamine** (simultaneous administration should be avoided). ↓ absorption of and may ↓ effects of **levodopa** and **methyldopa**. Concurrent administration of **proton pump inhibitors**, **histamine H2 antagonists**, and **cholestyramine** may ↓ absorption of iron. Doses of **ascorbic acid** ≥200 mg may ↑ absorption of iron by up to 30%. **Chloramphenicol** and **vitamin E** may ↓ hematologic response to iron therapy.

Drug-Food: Iron absorption is ↓ 33–50% by concurrent administration of food.

Route/Dosage

Oral iron dosages are expressed as mg of elemental iron. Multiple salt forms exist—see approximate equivalent doses below or consider % elemental iron of each salt for dose conversions.

Approximate Equivalent Doses (mg of iron salt): *Ferrous fumarate*—197; *Ferrous gluconate*—560; *Ferrous sulfate*—324; *Ferrous sulfate, exsiccated*—217.

PO (Adults): *Deficiency*—2–3 mg/kg/day in 2–4 divided doses or 60–100 mg elemental iron twice daily. *Prophylaxis*—60–100 mg elemental iron daily.

PO (Infants and Children): *Severe deficiency*—4–6 mg/kg/day in 3 divided doses. *Mild to moderate deficiency*—3 mg/kg/day in 1–2 divided doses. *Prophylaxis*—1–2 mg/kg/day in 1–2 divided dose (maximum: 15 mg/day).

PO (Neonates , premature): 2–4 mg/kg/day in 1–2 divided doses, maximum of 15 mg/day.

NURSING IMPLICATIONS

Assessment

- Assess nutritional status and dietary history to determine possible cause of anemia and need for patient teaching.

- Assess bowel function for constipation or diarrhea. Notify physician or other health care professional and use appropriate nursing measures should these occur.
- ***Lab Test Considerations:*** Monitor hemoglobin, hematocrit, and reticulocyte values prior to and every 3 wk during the first 2 mo of therapy and periodically thereafter. Serum ferritin and iron levels may also be monitored to assess effectiveness of therapy.
- Occult blood in stools may be obscured by black coloration of iron in stool. Guaiac test results may occasionally be false-positive. Benzidine test results are not affected by iron preparations.
- ***Toxicity and Overdose:*** Early symptoms of overdose include stomach pain, fever, nausea, vomiting (may contain blood), and diarrhea. Late symptoms include bluish lips, fingernails, and palms; drowsiness; weakness; tachycardia; seizures; metabolic acidosis; hepatic injury; and cardiovascular collapse. Patient may appear to recover prior to the onset of late symptoms. Therefore, hospitalization continues for 24 hr after patient becomes asymptomatic to monitor for delayed onset of shock or GI bleeding. Late complications of overdose include intestinal obstruction, pyloric stenosis, and gastric scarring.
- If patient is comatose or seizing, gastric lavage with sodium bicarbonate is performed. Deferoxamine is the antidote. Additional supportive treatments to maintain fluid and electrolyte balance and correction of metabolic acidosis are also indicated.

Potential Nursing Diagnoses

Activity intolerance (Indications)

Implementation

- Discontinue oral iron preparations prior to parenteral administration.
- Oral preparations are most effectively absorbed if administered 1 hr before or 2 hr after meals. If gastric irritation occurs, administer with meals. Take tablets and capsules with a full glass of water or juice. **Do not crush or chew enteric-coated tablets and do not open capsules.**
- Liquid preparations may stain teeth. Dilute in water or fruit juice, full glass (240 mL) for adults and ½ glass (120 mL) for children, and administer with a straw or place drops at back of throat.
- Avoid using antacids, coffee, tea, dairy products, eggs, or whole-grain breads with or within 1 hr after administration of ferrous salts. Iron absorption is decreased by 33% if iron and calcium are given with meals.

Patient/Family Teaching

- Explain purpose of iron therapy to patient.
- Encourage patient to comply with medication regimen. Take missed doses as soon as remembered within 12 hr; otherwise, return to regular dosing schedule. Do not double doses.
- Advise patient that stools may become dark green or black.
- Instruct patient to follow a diet high in iron.
- Discuss with parents the risk of a child overdosing on iron. Medication should be stored in the original childproof container and kept out of reach of children. Do not refer to vitamins as candy. In the event of a suspected overdose, parents should contact poison control center (1–800–222–1222) or emergency medical services (911) immediately.

Evaluation/Desired Outcomes

- Increase in hemoglobin, which may reach normal parameters after 1–2 mo of therapy. May require 3–6 mo for normalization of body iron stores.
- Improvement in or prevention of iron deficiency anemia.

Why was this drug prescribed for your patient?