Clinical Guidance: Administration of IV Iron for Iron Deficiency Anemia

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Do	• **Screen for iron deficiency and iron deficiency anemia** in patients at risk.[1] • **Use intravenous (IV) iron** when oral iron is not tolerated or ineffective.[Error! Bookmark not defined.] • **Refer to your practice setting's clinical decision support tools, protocols, or guidelines** specific to IV iron administration.[2] • **Monitor IV administration** before, during, and up to 30 minutes after infusion.[2,3] • **Recognize infusion reactions** and know how to **manage** them.[2,4] • **Communicate the symptoms of delayed reactions** to patients and how they should be managed.[Error! Bookmark not defined.]
Stop	• **Stop infusion** and notify physician or nurse practitioner if patient displays **acute symptoms of an infusion reaction**.[5]
Consider	• Consider that the likelihood of **anaphylaxis** or **infusion reactions** with IV iron is **low** but should be weighed against benefits.[6] • Consider **non-sedating antihistamine** (e.g., cetirizine) for minor reactions that do not abate when the infusion is discontinued.[7] • Consider **contraindications, special warnings, and precautions** for each IV preparation.[8]

Background

Iron deficiency anemia is the most common cause of anemia worldwide. It is characterized by inadequate iron stores or availability, leading to compromised red blood cell production and decreased hemoglobin concentration. Iron deficiency can occur without anemia, but prolonged, untreated deficiency results in iron deficiency anemia.[9]

Causes of iron deficiency anemia[10]

- Increased iron requirements (e.g. pregnancy)
- Low iron intake
- Decreased intestinal iron absorption
- Chronic blood loss
- Multiple causes (absolute iron deficiency associated with inflammation)

Signs and symptoms of iron deficiency anemia[7,11]

- Brittle nails
- Chest pain
- Cold hands or feet
- Dizziness
- Dyspnea
- Extreme fatigue
- Headache
- Inflamed tongue
- Pale skin or conjunctiva
- Palpitations
- Pica
- Reduced appetite
- Weakness

Objectives of IV Iron Therapy

The aim of treatment for iron deficiency anemia is to replenish iron stores and support red blood cell production.[1,12] IV iron therapy is provided to optimize hemoglobin levels quickly.[13]

Target Population

Individuals may benefit from the use of IV iron due to:[2]

- Ineffectiveness of or intolerance to oral iron preparations.
- Symptomatic anemia.
- Anticipated inadequate absorption of oral iron (e.g., malabsorption syndrome, certain bariatric surgery procedures).
- Continuous blood loss (e.g., heavy menstrual bleeding, active inflammatory bowel disease).
- Chronic kidney disease or hemodialysis.
- Increased iron demand during pregnancy.
- Certain advanced cancers.
- Time constraints when an increase in hemoglobin or iron repletion for maintaining hemoglobin is required quickly (e.g., preoperatively or prior to labour and delivery).

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Currently Used IV Iron Preparations[2,14,15]

	Lower dose		Higher dose	
Drug	Fe-gluconate[16] (Ferrlecit®)	Fe-sucrose[17] (Venofer®)	Fe-derisomaltose[18] (Monoferric®)	Fe-carboxymaltose[19–21] (Ferinject®)
Stability	Low	Low-moderate	High	High
Max. single dose	125 mg	300 mg	20 mg Fe/Kg	15 mg Fe/Kg
Dilution in 0.9% NaCl	100 mL	250 mL	100 mL–250 mL	50 mL-250 mL
Total replacement dose in single infusion (1–1.5 g)	No, repeated doses needed	No, repeated doses needed	Yes	Yes, with a maximum dose of 1 g
Minimum administration time	30–60 mins	30 mins	≤1000 mg: >20 mins >1000 mg: >30 mins	100 mg-200 mg: 3 mins 200-500 mg: 6 mins > 500-1000 mg: 15 mins
Contraindications	• All anemias not associated with iron deficiency and where there is evidence of iron overload (e.g., hemochromatosis, chronic hemolysis), or iron utilization disorders (e.g., sideroblastic anemia, lead anemia) • Known or suspected hypersensitivity to this drug or any of the excipients • Known serious hypersensitivity to other parenteral iron products • Severe inflammatory diseases of the liver or kidneys	• Evidence of iron overload • Known hypersensitivity to this drug or any of the excipients • Anemia not caused by iron deficiency	• Hypersensitivity to this drug or any of the excipients • Known serious hypersensitivity to other parenteral iron products • Non-iron deficiency anemia (e.g. hemolytic anemia) • Iron overload or disturbances in utilization of iron (e.g. hemochromatosis, hemosiderosis) • Decompensated liver cirrhosis or active hepatitis	• Hypersensitivity to this drug or any of the excipients • Known hypersensitivity to other parenteral iron products • Non-iron deficiency anemia (e.g. other microlytic anemia) • Iron overload or disturbances in utilization of iron (e.g. hemochromatosis, hemosiderosis)
Serious warnings and precautions	• Serious hypersensitivity reactions including life threatening and fatal anaphylaxis/anaphylactoid reactions have been reported in patients receiving intravenous iron products • Patients should be observed for signs and symptoms of hypersensitivity reactions, including monitoring of blood pressure and pulse, during and for at least 30 minutes following each administration of product • Product should only be administered when personnel and therapies are immediately available for the treatment of anaphylaxis and other hypersensitivity reactions • *Fe-derisomaltose* also carries a warning for serious cases of hypotension			

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Practical Considerations: Administration of IV Iron[Err

- Assess the patient:
  - Review/obtain patient medical history, including causes for iron deficiency, allergies, or other medications. Obtain baseline vital signs.
  - Review clinical indications and contraindications.
  - Review recent lab test results (*varies by site and region* – complete blood count, ferritin, transferrin saturation).
- Consult with ordering provider if contraindications or other concerns are identified during patient assessment.
- Only administer IV iron in practice settings with immediate access to emergency resuscitation equipment and clinicians trained in emergency response.
- Use of an electronic infusion device, such as a volumetric pump, is strongly recommended.
- Follow your practice setting clinical decision support tools, protocols, or guidelines specific to IV iron administration (if any).
- Once IV iron therapy is started, oral iron may be discontinued on a case-by-case basis. Clarify with your most responsible practitioner.

MONITORING: BEFORE, DURING, AND UP TO 30 MINUTES AFTER THE END OF IV ADMINISTRATION[Error! Bookmark not defined.,Error! Bookmark not defined.,Error! Bookmark not defined.

- ✓ Vital signs: blood pressure, heart rate, respiratory rate, oxygen saturation, and temperature
- ✓ Infusion rate
- ✓ Injection site irritation
- ✓ Adverse effects *(see next page)*

POST-INFUSION INFORMATION TO COMMUNICATE TO PATIENT[2,3,16–18,21]

- ✓ Patient is required to stay for a 30-minute observation period after the infusion has been completed.
- ✓ Review the main symptoms of a delayed reaction, such as fever, muscle pain, and headache. These symptoms can be treated with acetaminophen, unless contraindicated. Medical attention should be sought if they are not relieved.
- ✓ Communicate any follow-up blood work request, based on physician instructions.[Error! Bookmark not defined.
- ✓ Provide information for patient to take home (e.g., patient education pamphlet, website link).[Error! Bookmark not defined.

IV Iron Adverse Reactions[4,6,15–18,21–26]

IV iron carries a minimal (1:100-250) risk of inducing a minor infusion reaction that can include flushing, urticaria, pruritus, or chest/back pressure. Severe adverse events are exceedingly rare. Some have estimated the rate of anaphylaxis with IV iron to be less than 1 per 250,000 administrations.[Error! Bookmark not defined.

Mild Reactions[Error! Bookmark not defined.

Fishbane reaction:
Self-limited chest/back pain, facial flushing, arthralgias

Infusion reactions – isolated symptoms:
Skin: urticaria, pruritus, periorbital angioedema
Respiratory: dyspnea, wheezing, stridor, cough
Gastrointestinal: nausea, vomiting, pain, diarrhea

Severe Reactions[Error! Bookmark not defined.

Anaphylaxis:
Persistent hypotension or angioedema of tongue/airway, OR involvement of ≥2 organ systems:

- Cardiovascular
- Gastrointestinal
- Respiratory
- Skin

WHAT TO LOOK FOR AND WHEN[Error! Bookmark not defined.

0 minutes:	Extravasation
<5 minutes:	Fishbane reaction Infusion reactions
5-30 minutes:	Infusion reactions Anaphylaxis
24-72 hours:	Flu-like symptoms Myalgia

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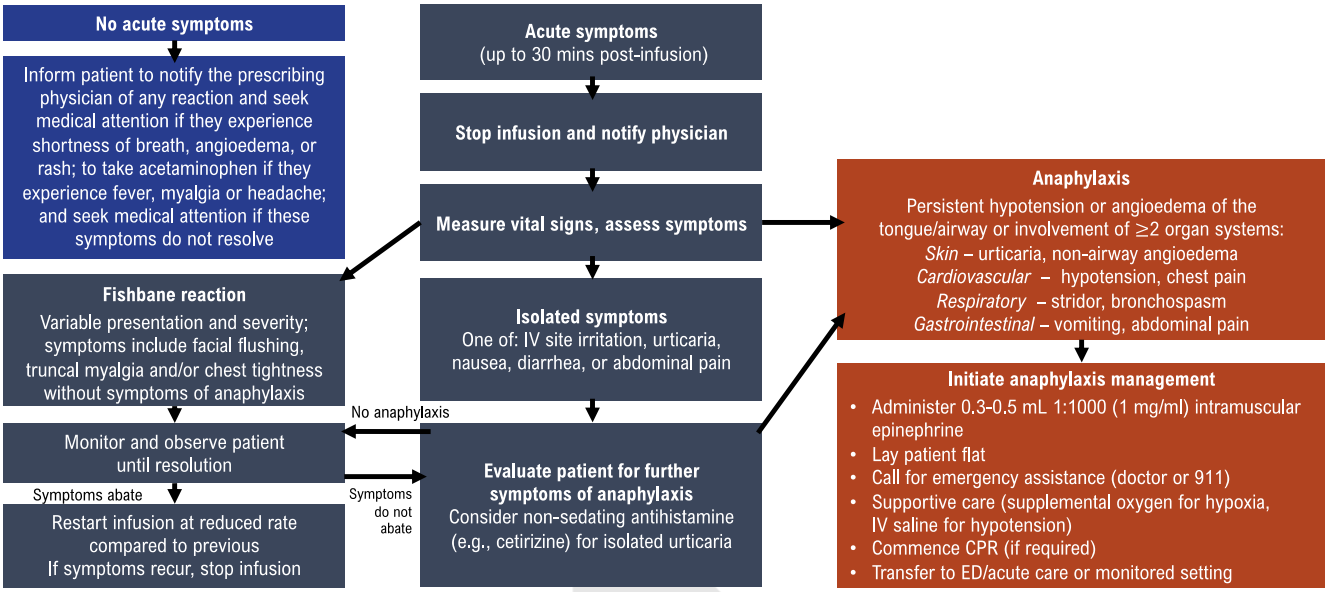
Best Practices: Management of Reaction[4,6,23,26,27]



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