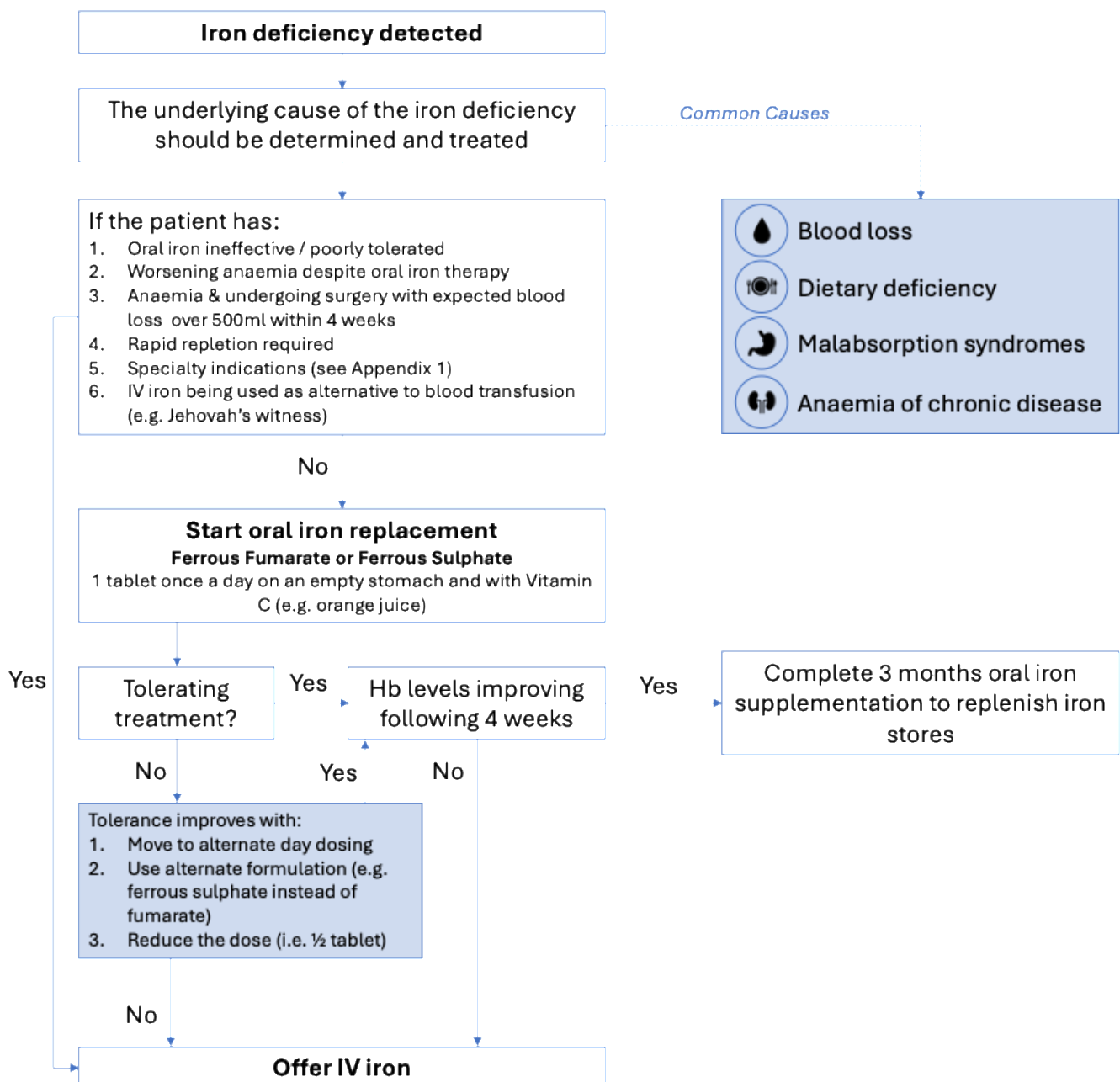


This Medicines Information Leaflet is produced locally to optimise the use of medicines by encouraging prescribing that is safe, clinically appropriate and cost-effective to the NHS.

Iron Replacement

Assessment & Management of Iron Deficiency



Contents

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Definitions

Condition	Definition	Clinical Features / comments
Depletion of iron stores	• ↓Ferritin	• Nil
Iron deficiency	• Ferritin less than 30 mcg/L • ↓Transferrin saturation, Ret-Hb NB: Different thresholds used in guidance for heart failure, renal, oncology – see appendix.	• Common: Fatigue, dyspnoea, headaches, palpitations, light-headedness, worsening angina, limb claudication, brain fog, reduced performance at work or hair loss. • Less common: Itch, tongue pain, angular stomatitis, pica, restless legs, koilonychia, mood disorder.
Iron deficiency anaemia (IDA)	As per iron deficiency, plus Hb under threshold: • 130g/L: adult men • 120g/L: non-pregnant women	Late feature of iron deficiency NB: Threshold of 130g/L also used for pre-operative assessment of nonpregnant women
Functional iron deficiency	• Ferritin & CRP often raised • Transferrin saturation less than 16% • ↓Ret-Hb, Hb	Chronic inflammatory states sequester iron & reduce iron absorption/transport

NB: Serum iron is not useful for assessment of total body iron stores.

Management

- Confirm iron deficiency with iron studies and assess for vitamin B12 & folate deficiency.
- Identify and treat underlying cause, but don't delay treatment.
- If no clear cause identified:
 - Test tissue transglutaminase antibody levels
 - Urinalysis (for microscopic haematuria)
 - Consider OGD/colonoscopy
- Specialty Specific Guidelines are detailed in [appendix](#).

Oral Iron Replacement (Preferred)

Recommended regimens	Ferrous Fumarate 210mg (70mg iron) OR Ferrous Sulphate 200mg (65mg iron) Daily (or alternate days); see flowchart for administration details
Alternatives	Ferrous fumarate syrup 140mg/5ml (45mg/5ml iron) is also available. Non-formulary preparations available on case-by-case basis
Not recommended	Over-the-counter (OTC) supplements; these do not contain sufficient iron & may contain ingredients that reduce absorption.

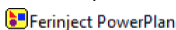
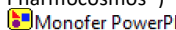
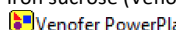
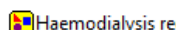
Common or important interactions:

Reduced absorption of drug	- Tetracyclines - Quinolones - Bisphosphonates - Zinc
Reduced absorption of iron	- Zinc or magnesium salts (for example in antacids). - Calcium (for example in milk and dairy products). - Tannins (for example in tea, coffee, and cocoa). - Phytates (present in cereal grains, legumes, nuts, and seeds).
Interactions	- Methyldopa — the antihypertensive effect can be reduced. - Levodopa — the bioavailability may be reduced. - Levothyroxine — the effects of levothyroxine may be reduced. - Penicillamine — the absorption reduced up to 66%.

Intravenous Iron

Administration

- Refer to [Medusa Guidelines](#) for details on how to prepare IV iron for infusion.
- Administer in-hours only.
- To avoid overdose, a maximum of one dose will be supplied by Pharmacy at any one time.

Preparation	Doses	Administration
Ferric carboxymaltose (Ferinject®) - Preferred/First line 	500mg 1g	- Infusion: 20mg/kg (maximum 1g). - Administer over 15 minutes - Follow up doses should be given 1 week later.
Ferric derisomaltose (Ferric Derisomaltose Pharmocosmos®) 	500mg 1g 1.5g 2g	- Infusion: 20mg/kg (maximum 2g; typically 1g). - Administer over 15 minutes (30m if dose is greater than 1g) - Follow up doses should be given 1 week later. NB: Used only in patients who experience hypophosphataemia with Ferinject®.
Iron sucrose (Venofer®) 	100mg 200mg	- Infusion: Up to 200mg - Administer over 30 minutes NB: May be administered up to 3x/week
Ferric derisomaltose (Diafer®) Renal only 	200mg	Maximum weekly dose of 1g Used only for patients receiving in-centre haemodialysis. Can be administered as a bolus or into the venous limb of the dialyser.

Contraindications & Cautions

Contraindication	Caution
- Allergic to IV iron preparations - Iron overload syndrome - Pregnant patients in the first trimester - Children less than 14 years. - Venofer® is contraindicated for patients with atopy (asthma, eczema, hayfever).	- Liver dysfunction - Low phosphate (occurs with Ferinject® more than Ferric derisomaltose) - Active infection, unless clinically improving (Patients with chronic infection may have suppressed erythropoiesis). - Ferinject® and Ferric Derisomaltose Pharmocosmos® are cautioned in patients with atopy.

Monitoring

During infusion	- Blood pressure: before, during & after administration - Vascular access: monitor for irritation/extravasation - After infusion: monitor for 10-15 minutes (30 mins for Ferric derisomaltose)
To assess effect	- Hb: 4-6 weeks after last dose. Target is a Hb increase of ~20g/L. - Iron indices will be elevated after IV iron for 4 weeks.
Other	Serum phosphate: Low phosphate reported with Ferinject®, less so with other formulations. Monitor phosphate in patients with risk factors for hypophosphataemia or who receive multiple administrations.

Adverse Drug Reactions

- See [BNF](#) for details.
- True anaphylaxis is rare. Infusion reactions to IV iron are common and can usually be managed by stopping and slowing the infusion rate.

Extravasation injury & skin discolouration:

- Extravasation of any IV iron preparation can cause pain, inflammation, tissue necrosis and permanent brown skin discoloration.
 - It is important to warn the patient that extravasation of IV iron can lead to permanent skin discolouration.
 - Management:
 - Stop & disconnect infusion (note how much is remaining).
 - Aspirate the cannula with a 10ml syringe and record volume removed (may be none)
 - Remove the cannula
 - Mark the affected area
 - Elevate the limb. Avoid pressure at site of extravasation
 - Administer analgesia as required
 - Inform medical team (For injuries involving Venofer® [pH 10.5-11.1] application of a cold pack is advised and plastics team referral should be considered)
 - Provide extravasation leaflet to the patient. Explain that intravenous iron may cause permanent discoloration of the skin at the site of extravasation.
 - If the patient consents, the rest of the infusion can be given via a different cannula/line
- See full [extravasation guideline](#) including specific advice about when to seek advice from a plastic surgeon.

References:

- 1 World Health Organisation. Haemoglobin concentrations for the diagnosis of anaemia and assessment of severity. (2011).
- 2 Fletcher, A., Forbes, A., Svenson, N. & Wayne Thomas, D. Guideline for the laboratory diagnosis of iron deficiency in adults (excluding pregnancy) and children. *British Journal of Haematology* **196**, 523-529 (2022). <https://doi.org/10.1111/bjh.17900>
- 3 Kotze, A. *et al.* British Committee for Standards in Haematology Guidelines on the Identification and Management of Pre-Operative Anaemia. *Br J Haematol* **171**, 322-331 (2015). <https://doi.org/10.1111/bjh.13623>
- 4 Snook, J. *et al.* British Society of Gastroenterology guidelines for the management of iron deficiency anaemia in adults. *Gut* **70**, 2030-2051 (2021). <https://doi.org/10.1136/gutjnl-2021-325210>
- 5 National Institute for Health and Care Excellence. *Anaemia - iron deficiency*, <<https://cks.nice.org.uk/topics/anaemia-iron-deficiency/prescribing-information/drug-interactions/>> (2023).
- 6 Medicines and Healthcare products Regulatory Agency. *Ferric carboxymaltose (Ferinject): risk of symptomatic hypophosphataemia leading to osteomalacia and fractures*, <<https://www.gov.uk/drug-safety-update/ferric-carboxymaltose-ferinject-risk-of-symptomatic-hypophosphataemia-leading-to-osteomalacia-and-fractures>> (2020).
- 7 Pavord, S. *et al.* UK guidelines on the management of iron deficiency in pregnancy. *Br J Haematol* **188**, 819-830 (2020). <https://doi.org/10.1111/bjh.16221>

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Appendix: Specialty Specific Guidelines

Specialty	Patient group	Guideline
Cardiology (Heart Failure)	Symptomatic with left ventricular ejection fraction (LVEF) less than 50%, with TSAT less than 20% and Hb less than or equal to 150. Can also be considered if LVEF greater than or equal to 50% with TSAT less than 20%.	Local: None National/International: European Society of Cardiology 2023 Focused Update of the 2021 ESC Guidelines for Heart Failure 1st line: IV iron
Renal (Chronic kidney disease)	<u>Non-HD (use Ferinject):</u> - Ferritin less than 100mcg/L (not on ESA) or less than 200mcg/L (on ESA) - TSAT less than 20% - Ret-He less than 29 <u>HD (use Diafer or Venofer 200 mg every 2 weeks):</u> - Aim for Ferritin 200-700mcg/L Other tests are not routinely done	Local: Intravenous iron for the treatment of renal anaemia in CKD non-HD patients Intravenous Iron in Haemodialysis Management of Intravenous Iron in Home HD Patients 1st line: IV iron
Critical Care	Can be used as part of a strategy for total transfusion avoidance (i.e. patients who refuse RBC transfusion) Ferritin usually not helpful to diagnose iron deficiency.	Local: None National/International: European Society of Intensive Care Medicine
GI	Inflammatory bowel disease: IV iron is 1st line , particularly in active disease. Other patient group: Oral iron is 1st line	Local: None National/International: British Gastroenterology Society
Maternity	Symptoms: lethargy, lactation failure, postpartum depression. May also have implications for neonatal iron stores. Target haemoglobin ⁷ : - Pregnant: Hb less than 110g/L - Postpartum: less than 100g/L	Local: Available here NB: IV iron is contra-indicated in the first trimester.
Oncology	Regardless of haemoglobin, at least one of: - Ferritin less than 100 mcg/L - Transferrin saturation less than 20%	Local: Available Here 1st line: IV iron
Peri-operative		Local: Available here
GI Surgery	Surgery to stomach or small bowel (Patients at higher risk of oral iron failure due to malabsorption)	1st line: Oral iron Assess vitamin B12/folate.
Patients declining RBC transfusion	e.g. Jehovah's Witnesses Can be used as part of a total transfusion avoidance strategy.	Local: Available here (NB: does not specifically mention IV iron).