NHS
Blood and Transplant

Information for clinicians

Iron deficiency and iron deficiency anaemia

Iron is essential for red blood cell production and iron deficiency is the most common nutritional deficiency worldwide both in developed and developing countries. Iron deficiency (ID) is a progressive process of decreasing iron stores from normal, through stages of depletion, with the eventual consequence being iron deficiency anaemia (IDA). In the UK it is estimated that 3% of men and 8% of women have iron deficiency anaemia, with the prevalence in premenopausal women up to 12% and the prevalence of anaemia in pregnant women up to 23%[1].

Effective: June 2026

Patient Blood Management

Causes of ID and IDA can be multifactorial and may include inadequate dietary intake, impaired absorption, and blood loss. The management of ID requires investigation and correction of the underlying cause in addition to treatment with iron supplementation.

Most patients with IDA do not require transfusion. While acute blood loss is frequently associated with haemodynamic instability and poor oxygen delivery, chronic IDA is not associated with hypovolaemia, and oxygen delivery is facilitated by increases in 2,3-diphosphoglycerate and a shift in oxygen dissociation.

Patients presenting with severe IDA and symptoms of inadequate oxygen delivery, e.g. syncope or chest pain, are likely to require transfusion. If a decision is made to transfuse a patient for IDA with symptoms of inadequate oxygen delivery, a single unit of red cells may be sufficient but should be guided by clinical reassessment, symptoms, and full blood count (FBC). Reassessment of FBC and symptoms should be undertaken after the unit has been transfused. Further increases in haemoglobin concentration (Hb) can be achieved with oral and/or parenteral iron if the patient stabilises and symptoms improve. Recently developed intravenous iron formulations have less allergic reactions reported than earlier preparations.

Avoiding unnecessary red cell transfusions is both beneficial for patients and essential to ensure that supplies meet appropriate demands.

NB: Transfusions given for haematinic deficiencies with no symptoms are reportable to the Serious Hazards of Transfusion UK haemovigilance scheme (SHOT).

Parenteral iron therapy is indicated when there is non-compliance with, or intolerance of, oral iron or proven malabsorption. Several papers report a faster increase in Hb and better replenishment of iron stores when compared with oral therapy. When the degree of anaemia is severe, or time to correct anaemia is limited, parenteral iron should be considered.

Safety data regarding iron (both oral and modern parenteral preparations) versus transfusion supports the initial use of oral iron. Side effects of oral iron include nausea and gastric discomfort.

Key interventions

- Hospitals should have guidelines, education, and resources to support the recognition, detection, and treatment of ID and IDA. Guidelines should include appropriate investigations for the cause of iron deficiency
- Laboratory procedures should be in place to support empowerment of staff to identify and challenge inappropriate transfusion requests for iron deficient patients
- Separate pathways should be in place for elective surgical patients, to allow for pre-operative optimisation, and for anaemia in pregnancy

Patients suspected of having anaemia should have FBC, CRP and haematinics checked (ferritin, TSATS, B12 and folate) to determine the type of deficiency present. The algorithm below can be used to classify cause of anaemia.

Classification and management of anaemia

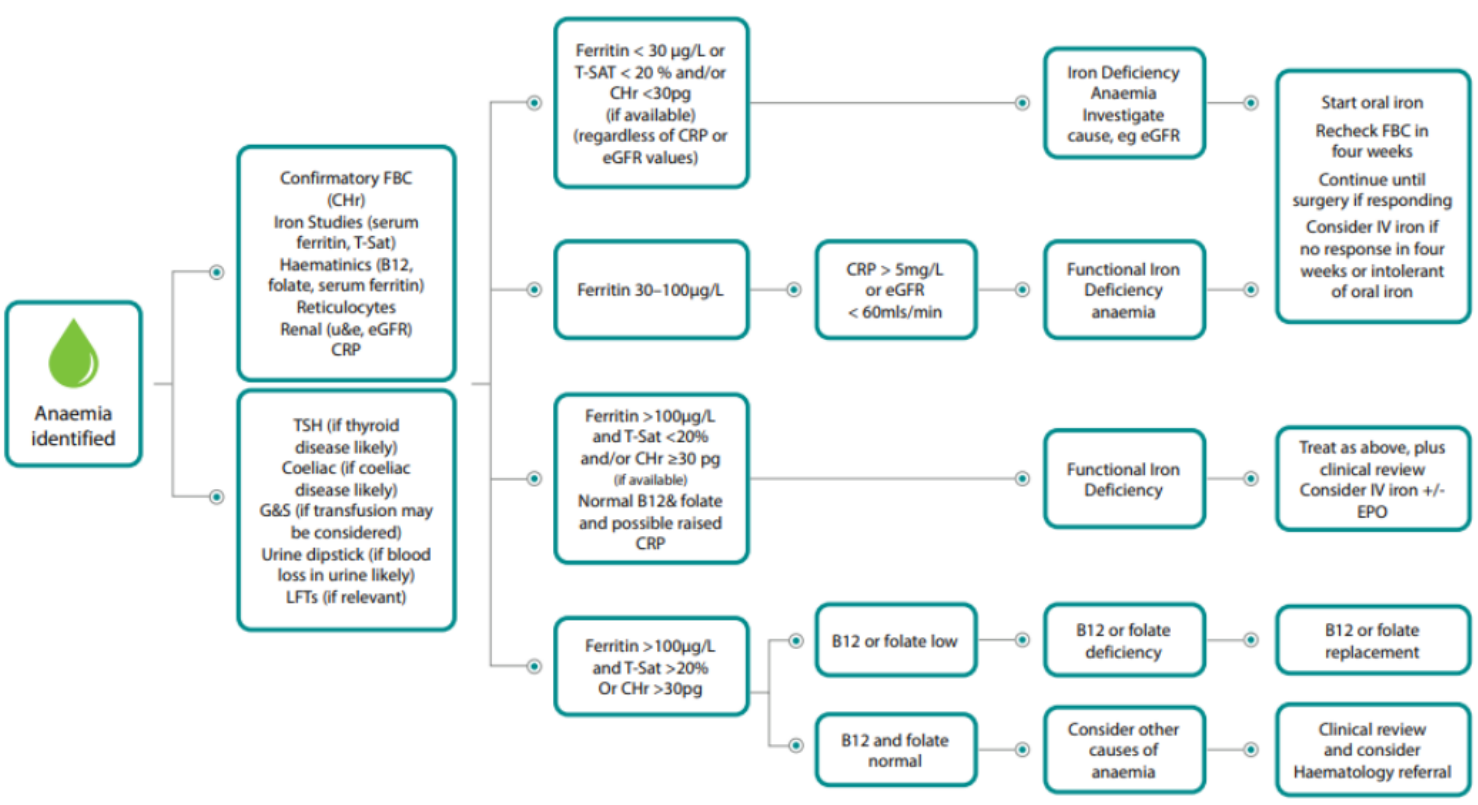

Fig 2: Taken from Centre for Perioperative Care (2025) Guideline for the Management of Anaemia in the Perioperative Pathway[2] pg. 36.

It is important to distinguish iron deficiency from other causes of anaemia

- If iron deficiency is confirmed, further investigations should determine the cause, e.g. GI or gynaecological bleeding, inflammatory conditions, or dietary insufficiency
- Refer to the relevant speciality for further investigation and treatment if indicated
- Discuss dietary advice, e.g. provide NHSBT's 'Iron in your diet' information leaflet, if appropriate

In moderate to severe cases, the therapeutic options are:

Oral iron: daily (40–60 mg) or alternate day (80–100 mg) treatment should be used in patients with ID and no contra-indications. Support with nutritional advice, encourage vitamin C (e.g. orange juice) with meals to help absorption, and avoid tea or coffee within an hour of taking medication

Dosing: An initial once-daily dose regimen of oral iron is recommended, as this may be just as effective as multiple daily dose regimens, with a lower incidence of side-effects and better compliance, reduced if not tolerated to alternate days[3]

Intravenous iron: for patients unable to tolerate, or unresponsive to, oral iron or if there is a need to raise iron levels rapidly

Transfusion: may be required if patients have reached agreed transfusion triggers, become increasingly symptomatic, and/or experience cardiovascular compromise. Underlying iron deficiency should still be rectified

Guidance

NICE Blood Transfusion Guidelines NG24[4]

Intravenous and oral iron

- Offer oral iron before and after surgery to patients with iron deficiency anaemia
- Consider intravenous iron before or after surgery for patients who:
  - ▸ Have IDA and cannot tolerate/absorb oral iron or are unable to adhere to oral iron treatment
  - ▸ Are diagnosed as having functional iron deficiency or
  - ▸ Are diagnosed as having IDA and the interval between the diagnosis of anaemia and surgery is predicted to be too short for oral iron to be effective

WHO guideline on use of ferritin concentrations to assess iron status in individuals and populations
https://apps.who.int/iris/handle/10665/331505

UK guidelines on the management of iron deficiency in pregnancy
https://b-s-h.org.uk/guidelines/guidelines/uk-guidelines-on-the-management-of-iron-deficiency-in-pregnancy/
(A summary of oral and intravenous iron preparations available in the UK is provided in this guideline)

Anaemia in the Perioperative Pathway: Centre for Perioperative Care. 2025
https://cpoc.org.uk/guidelines-and-resources/guidelines/anaemia-perioperative-pathway
(A summary of iron deficiency management in the surgical environment is available in this document)

Identification and management of preoperative anaemia in adults: A British Society for Haematology Guideline update
https://b-s-h.org.uk/guidelines/guidelines/identification-and-management-of-preoperative-anaemia-in-adults-a-british-society-for-haematology-guideline-update
(A summary of iron deficiency management in the surgical environment is available in this document)

Pavord, S., Daru, J., Prasannan, N., Robinson, S., Stanworth, S. & Girling, J. (2020) *UK guidelines on the management of iron deficiency in pregnancy*. British Journal of Haematology, 188, pp. 819–830.

Resources

NHS Blood and Transplant PBM website
https://hospital.blood.co.uk/patient-services/patient-blood-management/

NHS Blood and Transplant Patient Information Leaflets
https://hospital.blood.co.uk/patient-services/patient-blood-management/patient-information-leaflets/

National Institute of Health and Care Excellence Clinical Knowledge Scenarios. Anaemia iron deficiency (2024)
https://cks.nice.org.uk/anaemia-iron-deficiency

Definitions of current SHOT reporting categories and what to report
https://www.shotuk.org/reporting/incident/definitions/

Choosing Wisely UK
https://www.rcpath.org/profession/patient-safety-and-quality-improvement/patient-safety-resources/choosing-wisely/recommendations-for-transfusion-medicine.html

Avoidable, Delay and Under or Over transfusion (ADU) Cumulative Data - Serious Hazards of Transfusion
https://www.shotuk.org/resources/avoidable-delay-and-under-or-overtransfusion-adu-cumulative-data/

The urgent need to implement Patient Blood Management: policy brief
World Health Organisation
https://iris.who.int/server/api/core/bitstreams/22604cec-af50-4791-889b-cc8be95d26c1/content

References

1. National Institute of Health and Care Excellence Clinical Knowledge Scenarios. Anaemia iron deficiency (2024)
   https://cks.nice.org.uk/topics/anaemia-iron-deficiency/

2. Guideline for the Management of Anaemia in the Perioperative Pathway. Centre for Perioperative Care (CPOC) May 2025 (Version 2.1)
   https://cpoc.org.uk/guidelines-and-resources/guidelines/anaemia-perioperative-pathway

3. BNF Treatment summary. Anaemia, iron deficiency (Accessed August 2025)
   https://bnf.nice.org.uk/treatment-summaries/anaemia-iron-deficiency/

4. National Institute for Health and Care Excellence (2015) Blood Transfusion {NG24}
   https://www.nice.org.uk/guidance/ng24

Contact us

We would welcome your feedback and comments on this leaflet. You can contact us:

By post to:

Customer Services, NHS Blood and Transplant

Part Academic Block – Level 2
John Radcliffe Hospital
Headley Way, Headington
Oxford OX3 9BQ

By email to: **PBM.team@nhsbt.nhs.uk**

Or by phone: **01865 381010**

This leaflet was prepared by NHS Blood and Transplant

Individual copies of this leaflet can be obtained by calling **01865 381010**

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