A guide to the peri-operative management of anaemia and iron deficiency in surgery

- Throughout surgical practice, there has been an increased emphasis on speed to operation, which may mean that potential opportunities to optimise patients prior to surgery are overlooked.¹

- Despite the existence of guidelines, misconceptions remain regarding prevalence, consequences, diagnosis and treatment of anaemia and iron deficiency in adult surgical patients.¹

- NICE issued a Quality Standard for blood transfusion, which included a Quality Statement regarding iron supplementation and advised that patients should have their haemoglobin levels checked at least 2 weeks before surgery.²

- In accordance with the Quality Statement for iron supplementation, Quality Measures state that local arrangements must be implemented to ensure that patients with identified iron-deficiency anaemia who are having surgery are offered iron supplementation prior to and following surgery.²

- To address misconceptions and to provide practical guidance on how these guidelines can be introduced into clinical practice, an international consensus statement was published by a group of key opinion leaders from across Europe.¹ Within this consensus, these experts provide a series of best-practice and evidence-based statements and management algorithms on optimal patient care in the pre-, peri- and post-operative treatment period.¹

This consensus provides expert, independent, collective guidance and a pragmatic clinical pathway for the treatment of peri-operative iron deficiency and anaemia in adult surgical patients¹

¹Pharmacosmos provided logistical support and funding to allow the expert panel to meet. Pharmacosmos had no influence over the content of the publication.
Diagnosis of iron deficiency in patients listed for surgery

- Pre-operative anaemia is recognised as being associated with increased postoperative morbidity, mortality and transfusion need. Uncorrected pre-operative anaemia is therefore a risk factor for poor surgical outcomes.
- Treatment of iron deficiency anaemia may reduce blood transfusion requirements and length of hospital stay.
- Guidance from the international consensus is that physicians should consider pre-operative anaemia and iron deficiency as an indication for peri-operative care with iron supplementation.

The presence of anaemia should be investigated in all surgical procedures where there is an expected moderate-to-high blood loss (>500 ml).

Serum ferritin level <30 µg/l is the most sensitive (92%) and specific (98%) cut-off level for the identification of true iron deficiency.

When treating anaemia pre-operatively, the threshold haemoglobin concentration to trigger the need for treatment should be <130 g/l in both sexes to minimise the risk of transfusion-associated unfavourable outcomes.

Diagnosis and management of peri-operative anaemia in surgical patients

Adul patient listed for surgery

- Transfusion risk ≥10% and/or estimated blood loss >500 ml?
  - YES: Proceed to surgery
  - NO: Postpone surgery until patient no longer anaemic

- Pre-operative Hb <130 g/l?
  - YES: Start treatment
  - NO: Investigate other causes of anaemia

- Ferritin 30–100 µg/l + TSAT <20% or CRP >5 mg/l?
  - YES: Start treatment
  - NO: Investigate other causes of anaemia

- Ferritin >100 µg/l + TSAT <20% or CRP >5 mg/l?
  - YES: Start treatment
  - NO: Investigate other causes of anaemia

Elective surgery?

- YES: Start treatment
- NO: Proceed to surgery

CRP: C-reactive protein; TSAT: Transferrin saturation
Pre-operative correction of iron deficiency and iron deficiency anaemia

- Treatment of iron deficiency and iron deficiency anaemia should start as early as possible in the pre-operative period
- Intravenous iron is considered efficacious and well-tolerated and should be used as a front-line therapy in patients who do not respond to oral iron or are not able to tolerate it
- Intravenous iron is recommended if surgery is planned for <6 weeks after the diagnosis of iron deficiency
- Administration of IV iron 1 day before or even on the day of surgery can improve post-operative haemoglobin recovery, even in non-anaemic patients with iron deficiency

Management algorithm for patients with iron deficiency anaemia

Interval before surgery >6 weeks?

- NO
  - Consider IV iron

  Patient tolerant of oral iron?

- YES
  - Oral iron with nutritional advice is recommended 40–60 mg daily OR 80–100 mg alternate days*

  Measure Hb level ≥4 weeks before surgery

  Hb increased and patient tolerant of oral iron?

- YES
  - Continue oral iron

- NO
  - Consider IV iron

Interval before surgery ≥4 weeks?

- NO
  - Consider IV iron

  Non-anaemic patient undergoing surgery with high risk of developing severe post-operative anaemia

  Patient tolerant of oral iron?

- YES
  - Treat with oral iron

  Consider IV iron

- NO

Management algorithm for patients with iron deficiency without anaemia

Non-anaemic patient undergoing surgery with high risk of developing severe post-operative anaemia

Interval before surgery ≥24 weeks?

- NO
  - Consider IV iron

  Patient tolerant of oral iron?

- YES
  - Treat with oral iron

  Consider IV iron

- NO

Recommendation from NICE

Services and systems should be put in place to offer iron supplementation before and after surgery to people with iron deficiency anaemia

*Dose depends on elemental iron concentration of available iron formulation

Adapted from Munoz M et al.
Monofer® (ferric derisomaltose) prescribing information

▼ This medicinal product is subject to additional monitoring, and healthcare professionals are asked to report any suspected adverse reaction

Note: Before prescribing please read full Summary of Product Characteristics. Pharmaceutical form: Ferric derisomaltose is a dark brown, non-transparent solution for injection/infusion. Presentations: Monofer® is indicated in patients ≥18 years for treatment of iron deficiency when oral iron preparations are ineffective or cannot be used or when there is a need to deliver iron rapidly. The diagnosis must be based on laboratory tests. Administration: Each IV iron administration is associated with a risk of a hypersensitivity reaction. Thus, to minimise risk, the number of single IV iron administrations should be kept to a minimum. The iron need can be determined using either the Simplified Table, or the Ganzoni formula, or a fixed dose of 1,000 mg can be given to patients ≥50 kg body weight followed by re-evaluation for further iron need, please consult full Summary of Product Characteristics. Monofer® may be administered as an IV bolus injection of up to 500 mg at an administration rate of up to 250 mg iron/min; or as an up to 20 mg iron/kg body weight infusion. If the iron need exceeds 20 mg iron/kg body weight, the dose must be split into two administrations with an interval of at least one week. It is recommended whenever possible to give 20 mg iron/kg body weight in the first administration. Dependent on clinical judgement the second administration could await follow-up laboratory tests. Doses up to 1,000 mg must be administered over >15 minutes; doses above 1,000 mg must be administered over ≥30 minutes. In case of infusion, Monofer® should be infused undiluted or diluted in 0.9% sodium chloride. For stability, Monofer® should not be diluted to concentrations less than 1 mg iron/ml and never diluted in more than 500 ml. Contraindications: Non-iron deficiency anaemia, iron overload or disturbances in utilisation of iron, hypersensitivity to iron preparations are ineffective or cannot be used or when there is a need to deliver iron rapidly. The diagnosis must be based on laboratory tests. Administration: Each IV iron administration is associated with a risk of a hypersensitivity reaction. Thus, to minimise risk, the number of single IV iron administrations should be kept to a minimum. The iron need can be determined using either the Simplified Table, or the Ganzoni formula, or a fixed dose of 1,000 mg can be given to patients ≥50 kg body weight followed by re-evaluation for further iron need, please consult full Summary of Product Characteristics. Monofer® may be administered as an IV bolus injection of up to 500 mg at an administration rate of up to 250 mg iron/min; or as an up to 20 mg iron/kg body weight infusion. If the iron need exceeds 20 mg iron/kg body weight, the dose must be split into two administrations with an interval of at least one week. It is recommended whenever possible to give 20 mg iron/kg body weight in the first administration. Dependent on clinical judgement the second administration could await follow-up laboratory tests. Doses up to 1,000 mg must be administered over >15 minutes; doses above 1,000 mg must be administered over ≥30 minutes. In case of infusion, Monofer® should be infused undiluted or diluted in 0.9% sodium chloride. For stability, Monofer® should not be diluted to concentrations less than 1 mg iron/ml and never diluted in more than 500 ml. Contraindications: Non-iron deficiency anaemia, iron overload or disturbances in utilisation of iron, hypersensitivity to any of the ingredients, decompensated liver disease, or known serious hypersensitivity to other parenteral iron products.

Adverse events should be reported. Reporting forms and information can be found at https://yellowcard.mhra.gov.uk. Adverse events should also be reported to Pharmacosmos UK Ltd.

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We are the UK subsidiary of Pharmacosmos, an independent pharmaceutical company based in Denmark. We specialise in Iron Deficiency management and help Healthcare Professionals in Iron Therapy.

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