Guideline on Management of Preoperative Anaemia

Scope: Management of Preoperative anaemia

Version	Valid from 14/1/25	Review due 14/1/28	Authors: S Lewis, C Laxton, E Cairns, E Diaba, S Thomas

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Version changes		Change of name of I.V Iron	

Management of Preoperative Anaemia

Background

- Anaemia is a serious and treatable condition, occurring in up to 29% of pre-operative patients.
- Preoperative anaemia is an independent risk factor for post-operative morbidity and mortality.
- It is also associated with increased length of hospital stay, admission to Intensive Care and requirement for post-operative non-invasive ventilation.
- Presence of pre-operative anaemia is the strongest predictor of peri-operative blood transfusion, which is an independent risk factor for post-operative morbidity and mortality.
- NICE guidelines state that a full blood count (FBC) should be performed on all patients meeting the following criteria:
  - ✓ Over 65 and a surgical severity score of 2 and over.
  - ✓ Surgical severity score of 3 and over.
  - ✓ eGFR <45 ml/min.
- A FBC should ideally be performed at least 4 weeks before date of surgery.
- NBT defines anaemia as a Haemoglobin (Hb) <130 g/L in males and a Hb <120 g/L in females.
- A Hb <120 g/L in women and <130 g/L in men warrants further investigation in the form of transferrin saturation (TSATS), ferritin, vitamin B_{12} and folate levels.

Management of Iron Deficiency Anaemia

- Iron deficiency anaemia is defined as anaemia with ferritin <30 mcg/L or TSATS <20%.
- It is the cause of pre-operative anaemia in around 33% of cases.
- Presence of new or unexpected iron deficiency should warrant referral back to the patients General Practitioner (GP) for investigation.
- Patients with iron deficiency anaemia should be managed with iron therapy.
- Oral iron therapy takes around four months to replenish iron stores. Intravenous (IV) iron should be prescribed if surgery is within 4 weeks and cannot be delayed.
- If oral iron cannot be tolerated, intravenous iron therapy should be given.

Management of Anaemia of Chronic Disease

- Over fifty percent of cases of pre-operative anaemia are presumed to be due to anaemia of chronic disease (ACD).
- Many patients with ACD have a functional iron deficiency.
- Ferritin is an unreliable marker for anaemia of chronic disease therefore TSATS should be used as a more reliable marker for anaemia in this instance.
- Patients with functional iron deficiency should be managed with intravenous iron therapy, oral iron therapy is likely to be ineffective due to poor iron absorption from the gastrointestinal tract.

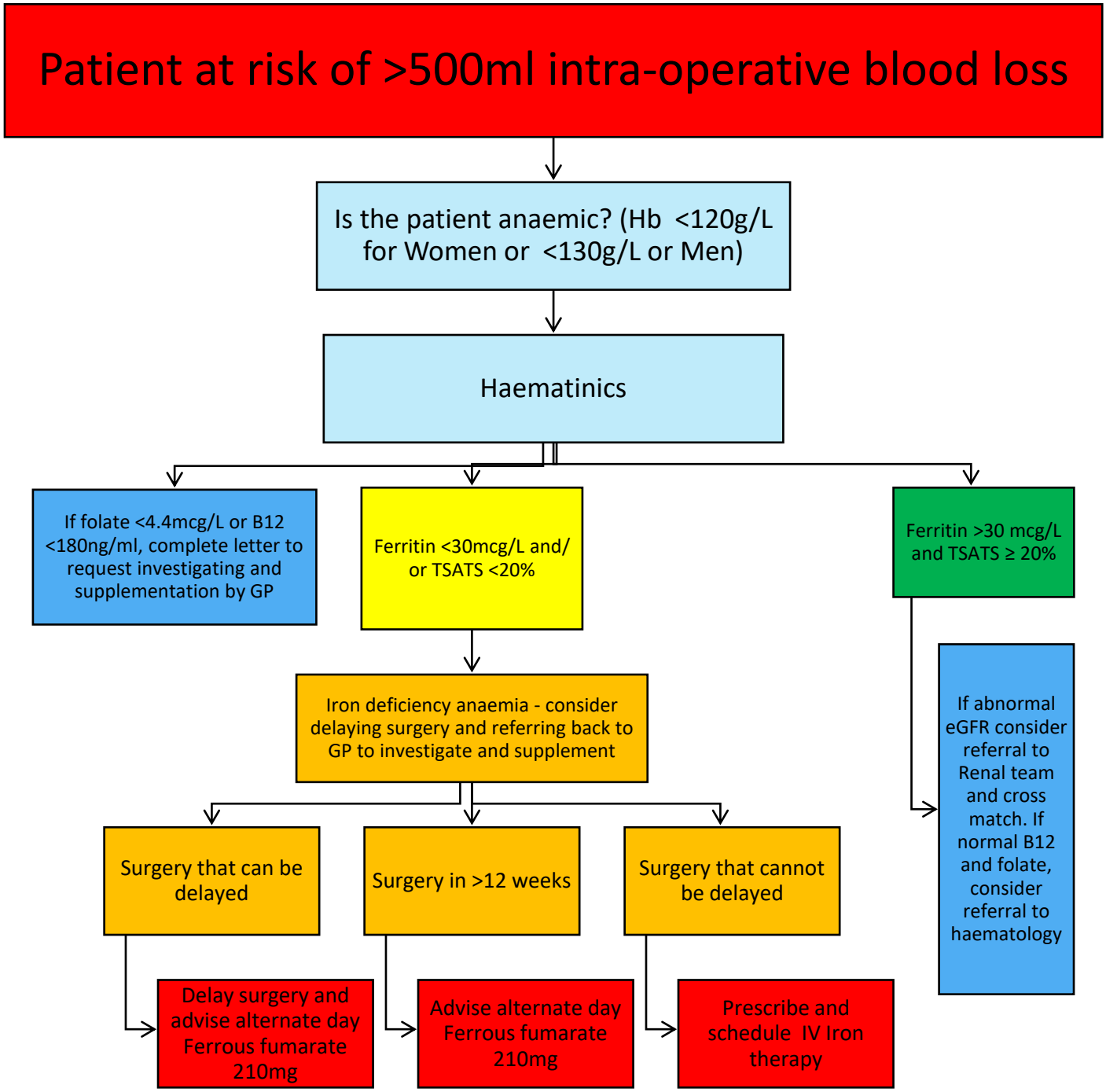
Management of B_{12} and Folate Deficiency

- Up to fifteen percent of cases are due to vitamin B_{12} and folate deficiency.
- Patients with B_{12} and/or folate deficiency should be prescribed appropriate replacement therapy by their GP.

Exclusions

- ✓ Children under the age of 18.
- ✓ Pregnancy.
- ✓ Patients under care of haematology, nephrology or rheumatology.

Figure 1: Treatment Algorithm



IV Iron should be considered if oral iron cannot be tolerated.

Monofer® (Ferric derisomaltose)

Monofer (Ferric Derisomaltose®) is an intravenous iron preparation. It does not require a test dose and has the benefit of a short infusion time of 30 minutes for doses up to 2000mg depending on body weight (maximum weekly dose 20mg iron / kg body weight)

The SPC https://www.medicines.org.uk/emc/medicine/23669/spc lists the following contraindications:

1. **Contra-indications**
   - ✓ Iron overload or disturbances in utilisation of iron (e.g. haemochromatosis, haemosiderosis)
   - ✓ Known serious hypersensitivity to other intravenous iron preparations
   - ✓ Hypersensitivity to Ferric Derisomaltose or any of its excipients listed in section 6.1 of the SPC
   - ✓ Anaemia not due to iron deficiency.
   - ✓ Decompensated liver disease (Ferinject® - ferric carboxymaltose – is not contraindicated and may be given instead).
   - ✓ Intravenous iron given within the last 7 days.

2. **Cautions**
   - ✓ Hepatic or renal impairment. (Avoid if ALT +/- AST >3 times upper limit normal)
   - ✓ Current bacterial infection.
   - ✓ Any hypertensive disorder can induce a hypertensive response.
   - ✓ Risk of anaphylaxis increased in patients with a pre-existing allergic condition.
   - ✓ Avoid in first trimester of pregnancy (oral iron recommended instead)
   - ✓ Avoid in patients with thalassaemia

3. **Interactions**
   - ✓ The absorption of oral iron is reduced when administered concomitantly. **Oral iron therapy should not be started earlier than 5 days after the last injection of Monofer (Ferric Derisomaltose).**
   - ✓ Large doses of parenteral iron (5 ml or more) have been reported to give a brown colour to serum from a blood sample drawn four hours after administration.
   - ✓ Parenteral iron may cause falsely elevated serum bilirubin values and falsely decreased serum calcium values.

4. **Undesirable effects**
   - ✓ Acute, severe anaphylactoid reactions are rare (≥1/10000 to <1/1000). They usually occur within the first few minutes of administration and are generally characterised by the sudden onset of respiratory difficulty and/or cardiovascular collapse.
   - ✓ Less severe manifestations of immediate hypersensitivity are uncommon (≥1/1000 to <1/100) and include urticaria, rashes and itching.
   - ✓ Hypersensitivity 'fishbane' reactions may be characterised by flushing in the face, acute chest and/ or back pain and tightness with dyspnoea. These may mimic the early symptoms of an anaphylactoid/ anaphylactic reaction but will disappear shortly after the infusion is stopped. Typically, they do not reoccur if the infusion is restarted at a lower infusion rate.
   - ✓ In pregnancy, associated foetal bradycardia may occur but is usually transient and a consequence of a hypersensitivity reaction in the mother.
   - ✓ Delayed reactions are characterised by arthralgia, myalgia and sometimes fever. The onset varies from several hours up to four days after administration and may

be severe. Symptoms usually last two to four days and settle spontaneously or following the use of simple analgesics.

✓ Hypophosphataemia, usually occurring 7-14 days after infusion: uncommon (≥1/1000 to <1/100), usually asymptomatic and self-correcting. Much less common than after other iv iron preparations. If symptomatic or sever, this may need replacement. Long term hypophosphataemia from repeated iv iron use may result in osteomalacia and bone fracture.

5. Dose

- **For preoperative optimisation IV iron is administered in only 1 visit.**
- Simplified dosing for Ferric Derisomaltose® is calculated using patient weight and current haemoglobin.

The dosing below takes into account the ability to give only a single dose of up to 20mg/kg in the preoperative clinic setting.

Hb (gL)	35-39kg	40-49Kg	50-59kg	60-69kg	70-79kg	80-89kg	90-99kg	≥ 100kg
Hb <100	500mg	500mg	1,000mg	1,200mg	1,400mg	1,600mg	1,800mg	2,000mg
Hb ≥100	500mg	500mg	1,000mg	1,000mg	1,400mg	1,500mg	1,500mg	1,500mg

- **Actual body weight** should be used for this simplified table, except in obesity (BMI >30)
- **In Obesity (BMI >30)** ideal body weight **(IBW**) should be used

An App such as MDcalc or SOBA can be used to calculate **IBW**

Alternatively:,IBW calculation:

- Male IBW = 50 + (2.3x Ht in inches over 5ft) or = 50 + 0.9 (Ht in cm – 152)
- Female IBW = 45.5 + (2.3 x Ht in inches over 5ft) or = 45.5 x 0.9 (Ht in cm -152)

A Maximum single dose MUST NOT EXCEED 20mg/kg.

The Ganzoni formula is recommended in patients who are likely to require individually adjusted dosing e.g., patients with anorexia nervosa and cachexia. Further information can be found here: https://www.medicines.org.uk/emc/medicine/23669/spc

6. Prescription

Monofer (Ferric Derisomaltose®) must be prescribed by a doctor, using the NBT Monofer (Ferric Derisomaltose®) Patient Specific Direction (PSD) for use in PREOPERATIVE ASSESSMENT

- **The dose should be prescribed as per the above table.**
- **The maximum single dose of Monofer is 20mg iron / kg body weight.**

7. Administration

- Must be administered in an area with available advanced life support (ALS) equipment and drugs to manage anaphylaxis.

- Doses between 500mg and 2000mg must be diluted in 250ml 0.9% sodium chloride and administered intravenously over at least 20 minutes (≤1000mg) or 30 minutes (>1000mgs)
- If a patient has increased hypersensitivity risk e.g., known drug allergies, immune or inflammatory conditions, a longer infusion time is advised.
- Baseline observations need to be recorded.
- Observations are required every 15 minutes from the commencement of the infusion and for 30 minutes after the infusion has finished.
- The infusion must be stopped immediately if there any signs or symptoms of an allergic reaction or if there is any leakage of the infusion into the surrounding tissues.
- Patients may be discharged 30 minutes after completion of the infusion, if no signs of adverse reaction are present.
- Adverse clinical effects must be reported under the yellow card system. In addition, notify the surgical patient blood management team.

References

Centre for Perioperative Care. Guideline for the Management of Anaemia in the Perioperative Pathway September 2022

Ferric Derisomaltose SPC. via Monofer 100mg/ml solution for injection/infusion - Summary of Product Characteristics (SmPC) - (emc) (medicines.org.uk) last accessed 16th March 2023