Pre-operative optimisation of iron deficiency anaemia

Iron deficiency anaemia (IDA) accounts for up to 75% of pre-operative anaemia cases. Even mild anaemia is an independent risk factor for post-operative morbidity and mortality and is associated with increased post-operative risks including prolonged recovery time and length of stay, transfusion of blood components and the associated risks of transfusion. Additionally, transfusions given for iron deficiency may indicate inappropriate use of blood.

Pre-optimisation of patients with IDA prior to surgery can reduce these risks, reduce transfusion requirements and improve patient outcomes.

Perioperative pathways should be developed to identify and optimise these patients through the surgical process with the considerations below.
Who
All patients undergoing surgery with expected blood loss >500ml

What
Identification & treatment of anaemia
Check Hb
Reflex testing of haematinics if <130g/L
Identify type of anaemia
Optimise as per protocol

Why
Independent risk factor for post-op morbidity and mortality
Reduce risks and unnecessary transfusion
Improved patient outcomes
Guideline compliance (NICE NG24 NICE QS138 CCG10)

When
Investigation should start as soon as listed for surgery
Treatment commenced whilst on waiting list
Potential for primary care involvement

How
Develop peri-operative pathways to identify and treat iron deficiency
Pathways should cover from listing to post surgery
Algorithm for the management of surgical patients

Listed for surgery

Transfusion risk > 10% and/or estimated blood loss > 500 ml?

- **NO**
  - Standard pre-operative evaluation
  - Proceed to surgery

- **YES**
  - Laboratory work-up request
  - Pre-operative Hb < 130 g/L?
    - **NO**
      - Is there haematinic deficiency?
      - NO
        - Proceed to surgery
      - YES
        - Prescribe supplements
        - Proceed to surgery
    - **YES**
      - Non-elective surgery
      - Classify anaemia and start treatment
      - Proceed to surgery
      - Elective surgery
      - Classify anaemia and start treatment
      - Postpone surgery until patient no longer anaemic

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Key interventions:

- Perioperative pathways should be developed, covering from when a patient is listed for surgery through to post-operative discharge
- Encourage collaboration between anaesthetic, surgical and, if possible, primary care teams. Engage with finance, audit, quality improvement teams and commissioning groups to support pathway development
- Aim to diagnose and treat as early as possible
- An initial Hb should be checked as soon as listed for surgery
- If results of initial Hb <130g/L (all sexes) check haematicins (Ferritin, CRP, TSATS, B12, Folate) to identify type of anaemia

Algorithm for classification of perioperative anaemias

- Hb <130g/L
- Iron tests
  - Ferritin <30µg/L
    - Iron deficiency anaemia
  - Ferritin 30-100µg/L + transferrin saturation <20% or C-reactive protein >5mg/L
    - Anaemia of chronic inflammation with iron deficiency
  - Ferritin >100µg/L transferrin saturation <20% or C-reactive protein >5mg/L
    - Anaemia of chronic inflammation
  - Vitamin B12 Folate
    - Megaloblastic anaemia
    - Other anaemias
      - Unknown cause
      - Malignancy
      - Drugs
      - Endocrine
      - Renal

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• Serum ferritin level < 30 µg/L is the most sensitive and specific test used for the identification of absolute iron deficiency. However, in the presence of inflammation (C-reactive protein > 5 mg/L) and/or transferrin saturation < 20%, a serum ferritin level < 100 µg/L is indicative of iron deficiency.

• For iron deficient patients, with or without anaemia, where surgery is scheduled 6-8 weeks after diagnosis, oral iron replacements should be given, preferably by the GP. Daily (40–60 mg) or alternate-day (80–100 mg) treatment with oral iron and nutritional advice should be initiated immediately in patients with iron deficiency and no contra-indications.

• Intravenous iron should be used if surgery is planned less than 6 weeks after the diagnosis or for patients unable to tolerate, or not responsive to, oral iron. Treat as per local protocol.

• Consider postponing surgery to allow correction of treatable anaemia.

**NB:** it is still good clinical practice to treat all pre-operative surgical patients with IDA, even if only minor blood loss is expected. However surgery can proceed for patients undergoing more minor surgical procedures while anaemia evaluation and treatment is ongoing.

Based on the International consensus statement of perioperative management of anaemia and iron deficiency ¹.

### Guidance

**NICE Blood Transfusion Guidelines NG24³**

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 iron deficiency anaemia and cannot tolerate or absorb oral iron, or are unable to adhere to oral iron treatment
  - are diagnosed with functional iron deficiency
  - are diagnosed with iron deficiency anaemia, and the interval between the diagnosis of anaemia and surgery is predicted to be too short for oral iron to be effective

**NICE Quality Statements⁴**

**QS1** - People with iron deficiency anaemia who are having surgery are offered iron supplementation before and after surgery.

**CQUIN CCG10**  

**CQUIN for 2020/21**

**Description**  
Ensure that 60% of major elective blood loss surgery patients are treated in line with the NICE Guideline NG24

**Numerator**  
All admissions where the following actions were applied within the 6-week period prior to the procedure:

• Haemoglobin (Hb) measured; and,
• If anaemia present, have serum ferritin level tested; and,
• If diagnosed with iron deficiency anaemia offered appropriate iron treatment (oral and/or IV iron)
Resources
Perioperative Quality Improvement Programme https://pqip.org.uk/pages/0
ISBT guidance https://www.isbtweb.org/working-parties/clinical-transfusion/3-pre-operative-optimisation-of-haemoglobin
NBTC guidelines http://www.transfusionguidelines.org.uk/uk-transfusion-committees/national-blood-transfusion-committee/patient-blood-management
QIST Anaemia https://qist.org.uk/
The Anaemia Community https://anaemia.org.uk/

References

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This leaflet was prepared by NHS Blood and Transplant in collaboration with the National Blood Transfusion Committee. Further supplies can be obtained by accessing https://hospital.nhsbtleaflets.co.uk

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