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
    - **NO**
      - Elective surgery
      - Classify anaemia and start treatment
      - Postpone surgery until patient no longer anaemic

© 2016 The Authors. Anaesthesia published by John Wiley & Sons Ltd on behalf of Association of Anaesthetists of Great Britain and Ireland. This is an open access article under the terms of the Creative Commons Attribution-NonCommercial-NoDerivs License, which permits use and distribution in any medium, provided the original work is properly cited, the use is non-commercial and no modifications or adaptations are made. Permission obtained to reproduce Figure 3.
Key interventions:

- Perioperative pathways should be developed, covering from when a patient is listed for surgery through to postoperative 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 haematinics (Ferritin, CRP, TSATS, B12, Folate) to identify type of anaemia.

Algorithm for classification of perioperative anaemias


diagram

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

Hb <130g/L
- Iron tests

Altered

Normal

Unknown cause Malignancy Drugs Endocrine Renal

© 2016 The Authors. Anaesthesia published by John Wiley & Sons Ltd on behalf of Association of Anaesthetists of Great Britain and Ireland. This is an open access article under the terms of the Creative Commons Attribution-NonCommercial-NoDerivs License, which permits use and distribution in any medium, provided the original work is properly cited, the use is non-commercial and no modifications or adaptations are made. Permission obtained to reproduce Figure 2.
• 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

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: nhsbt.customerservice@nhsbt.nhs.uk

Or by phone: 01865 381010

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

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

NHS Blood and Transplant
NHS Blood and Transplant is a joint England and Wales Special Health Authority. We provide the blood donation service for England and the organ donation service for the UK. We also provide donated tissues, stem cells and cord blood. We are an essential part of the NHS, saving and improving lives through public donation. NHS Blood and Transplant enables around 5,000 organ transplants a year in the UK and collects around 1.4 million units of blood each year to meet the needs of patients across England.

For more information, visit nhsbt.nhs.uk
Email enquiries@nhsbt.nhs.uk

Effective 01/09/2020
2021 0150