



NHS Wales Preoperative Anaemia Pathway

*This is a consensus document developed by NHS Wales
Preoperative Anaemia Leads Group & the Blood Health
National Oversight Group (BHNOG)*

1. Aim

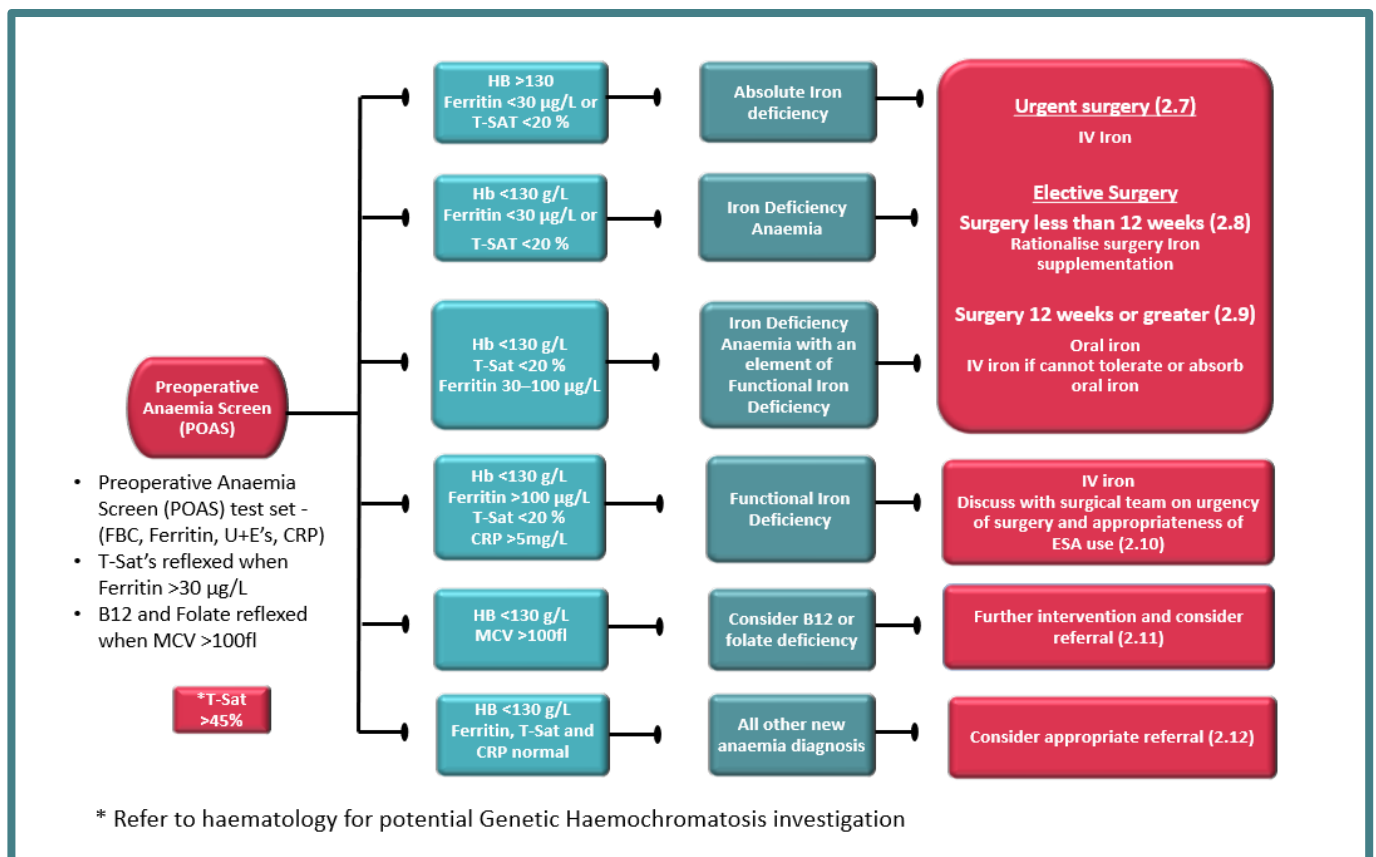
The aim of this pathway is:

- To embed a patient blood management programme for preoperative services across NHS Wales; the first pillar of which is supports detection of iron deficiency and anaemia management.
- To provide a standardised approach to the way in which anaemia is identified, treated and managed in patients presenting for major surgery, as defined by an estimated blood loss of >500ml and/or transfusion risk of >10%.
- To reduce the use of allogeneic blood in patients presenting for surgery with treatable causes of anaemia.
- For those identified as iron deficient, ensure timely and appropriate treatment based on patient clinical needs and timescale to surgery.

2. Pathway

- 2.1. This pathway should be used for all patients 18 years and older, undergoing major surgery as defined by an estimated blood loss of >500ml and/or transfusion risk of >10%.
- 2.2. Screening for anaemia should be undertaken at the earliest opportunity within the surgical pathway to allow maximum time to optimise the patient. The last opportunity to allow rapid identification of patients that would benefit from iron treatment prior to surgery would be the pre-operative assessment (POAC) appointment. This should occur within 12 weeks prior to scheduled date of surgery to ensure there is an up-to-date Haemoglobin.
- 2.3. The optimum anaemia screen includes full blood count (FBC), serum ferritin, transferrin saturation (TSATs), C-reactive protein (CRP), and urea and electrolytes (U&E). B12 and Folate screening should also occur when the Hb < 130g/L and Mean Cell Volume (MCV) is >100fl.
- 2.4. Same day/reflex testing should be performed to support same day treatment where possible. This is supported by the **Preoperative anaemia screen (POAS) Test Set**, which reflex TSATs when Hb is <130g/L **and** serum ferritin is >30µg/l and B12/folate testing when MCV is >100fl. Please refer to section 3 for use of the POAS outside of the inclusion criteria for this pathway. Reflex tests should not be performed on patients having surgeries that have minimal blood loss.
- 2.5. Where anaemia is diagnosed, results of the anaemia screen will guide the patient's treatment and management. This is detailed in Figure 1.
- 2.6. To minimise frequency of appointments, IV iron (when needed) should be administered within the patient's local health board. Where referral to a tertiary centre is required for the purpose of surgery, if time allows the centre where the patient presents for surgical review should take responsibility for ensuring the patient is optimized prior to surgery.

Figure 1. Algorithm for the Classification of Anaemia using Preoperative Anaemia Screen



2.7. Urgent Surgery:

Where iron deficiency (ID) with/without anaemia or anaemia of chronic inflammation with iron deficiency (functional iron deficiency) is identified, IV iron should be administered at the earliest opportunity prior to surgery (Figure 2 Treatment Guidance). Patients with a functional iron deficiency should be treated as iron deficient.

2.8. Elective surgery – less than 12 weeks until scheduled date of surgery:

Where ID with/without anaemia or anaemia of chronic inflammation with iron deficiency (functional iron deficiency) is identified – Investigate cause and where appropriate rationalise date of surgery. When surgery is indicated IV iron should be administered at the earliest opportunity prior to surgery (Figure 2 Treatment Guidance).

2.9. Elective surgery – 12 weeks or more until scheduled date of surgery:

Where ID with/without anaemia or anaemia of chronic inflammation with iron deficiency (functional iron deficiency) is identified – Investigate cause and where appropriate rationalise date of surgery. First-line treatment should be oral iron. IV Iron should be administered in those patients who cannot absorb or tolerate oral iron. (Figure 2 Treatment Guidance).

2.10. Where functional iron deficiency is identified – discuss with surgical team on urgency of surgery and appropriateness of erythropoietin-stimulating agents (ESA) use. (Figure 2).

2.11. Macrocytic anaemias are rarely the cause of severe anaemias and there is no expectation it is fully resolved prior to scheduled surgery date. Patients with macrocytic anaemias should be managed in line with local guidance.

2.12. All other anaemias (iron deficiency/non iron deficiency) of unknown cause, consider malignancy and appropriate referral for investigation. Local pathways should be used to support this.

Figure 2. Treatment Guidance:

Oral Iron
<ul style="list-style-type: none"> • Consider an initial trial of oral iron on low dosage or alternative days to support compliance and tolerance to side effects, in line with manufacturer’s instructions.¹ • Ensure patient is provided with information leaflets (available from the BHNOG Anaemia Toolkit – See link/QR code in Section 4). • Recheck Hb between 6 - 12 weeks after commencing treatment. • If Hb not corrected, alter dose if time allows and patient able to tolerate. If the patient cannot tolerate oral iron or insufficient time to continue optimisation with oral iron, refer to point 2.10 above.¹
IV Iron
<ul style="list-style-type: none"> • Recommend that IV iron is prescribed and given in one sitting to minimise patient visits to the clinical setting. Refer to Summary of Product Characteristics (SmPC)³ for administration guidance. • IV iron should be given as soon as possible or preferably at least 4 weeks prior to surgery. • With urgent surgery, IV iron should be considered until the day prior to surgery to reduce the need for perioperative transfusion. • IV iron should also be given postoperatively. • As part of the consent process, counsel the patients of any side effects (information available in BHNOG Anaemia Toolkit – see link/QR code in Section 4).
Erythropoietin Stimulating Agents (ESAs)/EPO
<ul style="list-style-type: none"> • Dosing and indications to be followed in line with marketing authorisation’s on-label indications.⁴ • Consider use as an alternative to blood transfusion, alongside IV iron/iron replete state, where:^{5, 6} <ol style="list-style-type: none"> a. The patient has anaemia and meets the criteria for blood transfusion but refuses on the grounds of religious beliefs/other reasons. b. Appropriate blood type is not available as the patient has complex red cell antibodies. c. In patients with functional iron deficiency where appropriate.

3. Use of the NHS Wales Preoperative Anaemia Pathway

The POAS test set was built within the national Laboratory Information Management System (LIMS) in agreement with pathology leads across Wales. The use was agreed to be specifically for patients aligned with this pathway. If there is consideration locally to expansion of this testset use, this must be done under local agreement with Pathology (Blood Sciences), to allow impact assessments to be performed.

Patients requiring optimisation for other medical reasons related to anaesthesia or surgery should be driven on a clinical basis by the lead clinician.

4. Anaemia Toolkit

To support use of the pathway, an anaemia toolkit has been developed. The toolkit includes several including patient information leaflets, documentation for managing patients, and information for health care professionals.

The toolkit can be accessed from the BHNOG website, by using the following link or QR code:

<https://bhnog.wales.nhs.uk/perioperative-anaemia-programme/>



5. References

1. Centre for Perioperative Care (CPOC), 2022. Guideline for the Management of Anaemia in the Perioperative Pathway. <https://cpoc.org.uk/sites/cpoc/files/documents/2022-11/CPOC-AnaemiaGuideline2022-Updated-Nov2022.pdf>
2. Royal College of Nursing, 2019. Iron Deficiency and Anaemia in Adults – RCN Guidance for Nursing Practice. <https://www.rcn.org.uk/professional-development/publications/pub-007460>
3. Electronic Medicines Compendium (EMC), 2023. Healthcare Professional (SmPC) <https://www.medicines.org.uk/emc>
4. National Institute for Health and Care Excellence (NICE), 2023. British National Formulary (BNF). <https://bnf.nice.org.uk/>
5. National Institute for Health and Care Excellence (NICE), 2015. Blood Transfusion NG24. <https://www.nice.org.uk/guidance/ng24>
6. Hands K, Daru J, Evans C, Kotze A, Lewis C, Narayan S, et al. Identification and management of preoperative anaemia in adults: A British Society for Haematology Guideline update. *Br J Haematol.* 2024; 00: 1–12.