Local Guideline

Health
Hunter New England
Local Health District

Management of Preoperative Anaemia

Sites where Local Guideline applies	John Hunter Hospital
1. Adults	Yes
2. Children up to 16 years	No
3. Neonates – less than 29 days	No
Target audience	Anaesthetists, Anaesthetic registrars and nursing staff in Perioperative service
Description	

Go to Guideline

Keywords	Anaemia, haemoglobin, perioperative, erythropoietin, iron deficiency, iron infusion
Document registration number	
Replaces existing document?	No

Related Legislation, Australian Standard, NSW Ministry of Health Policy Directive or Guideline, National Safety and Quality Health Service Standard (NSQHSS) and/or other, HNE Health Document, Professional Guideline, Code of Practice or Ethics:

- See References on page 4

Prerequisites (if required)	Patients should be scheduled for elective surgery at the John Hunter Hospital. All medical and nursing staff working in the Pre-Admission Clinic are able to use the guidance provided here.
Local Guideline note	This document reflects what is currently regarded as safe and appropriate practice. This guideline does not replace the need for the application of clinical judgment in respect to each individual patient. If staff believe that the guideline should not apply in a particular clinical situation they must seek advice from their unit manager/delegate and document the variance in the patient's health record. If this document needs to be utilised outside of the John Hunter Hospital please liaise with the local Perioperative and Haematology services to ensure the appropriateness of the information contained within the Guideline and Procedure.
Position responsible for the Local Guideline and authorised by	Director of Perioperative Service
Contact person	Dr Paul Healey
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Date authorised	
This document contains advice on therapeutics	Yes Approval gained from Local Quality Use of Medicines Committee on (insert date)
Issue date	
Review date	Up to 3 years

Note: Over time links in this document may cease working. Where this occurs please source the document in the PPG Directory at: http://ppg.hne.health.nsw.gov.au/

PURPOSE AND RISKS

Preoperative anaemia is common in patients presenting for major surgery across multiple surgical specialties, with an incidence of 20-75%.[1,2] Commonly, it is undiagnosed prior to identification preoperatively.

Preoperative anaemia is associated with:

- Increased morbidity and mortality after surgery[3]
- Higher rates of red blood cell transfusion, with associated increases in morbidity and mortality[3]
- Lower post-operative and discharge haemoglobin levels.[1]

The management of anaemia should be individualised and should take into consideration:

- Cause and severity of anaemia
- Comorbidities (e.g. Heart failure)[4]
- Urgency of surgery
- Likelihood of significant blood loss
- Acceptability and availability of blood products to the patient (e.g. Jehovah's Witnesses, rare blood groups)

This document provides guidance on the investigation and management of anaemia in the Pre-Admission Clinic, prior to surgery.

Risk Category*:* *Clinical Care & Patient Safety*

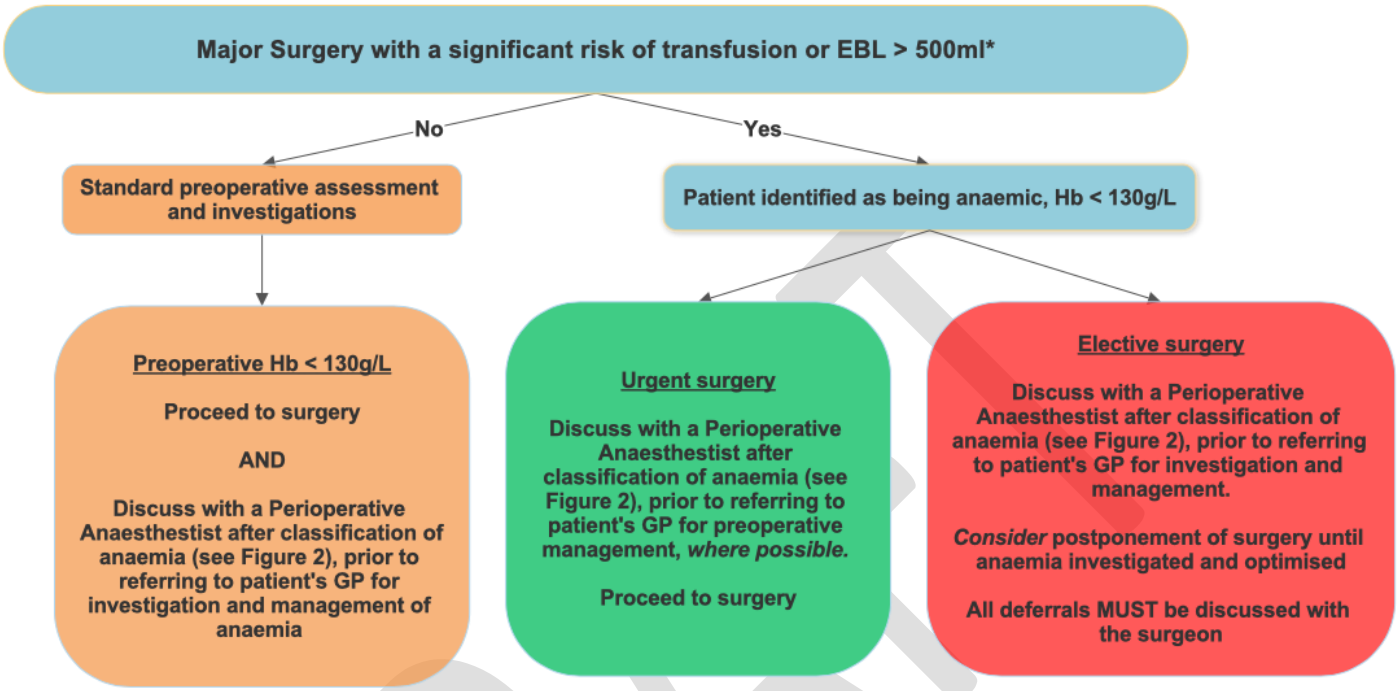
GLOSSARY

Acronym or Term	Definition
Anaemia	Haemoglobin < 130g.L as per WHO definition
ESA	Erythropoiesis stimulating agent
FCM	Ferric carboxymaltose
GI	Gastrointestinal
GP	General practitioner
IV	Intravenous
MCH	Mean corpuscular haemoglobin
MCV	Mean corpuscular volume
PO	Per oral
PPI	Proton pump inhibitor

GUIDELINE

This Guideline does not replace the need for the application of clinical judgment in respect to each individual patient.

Figure 1: Testing for anaemia prior to surgery (Adapted from Munoz et al 2017)[5]

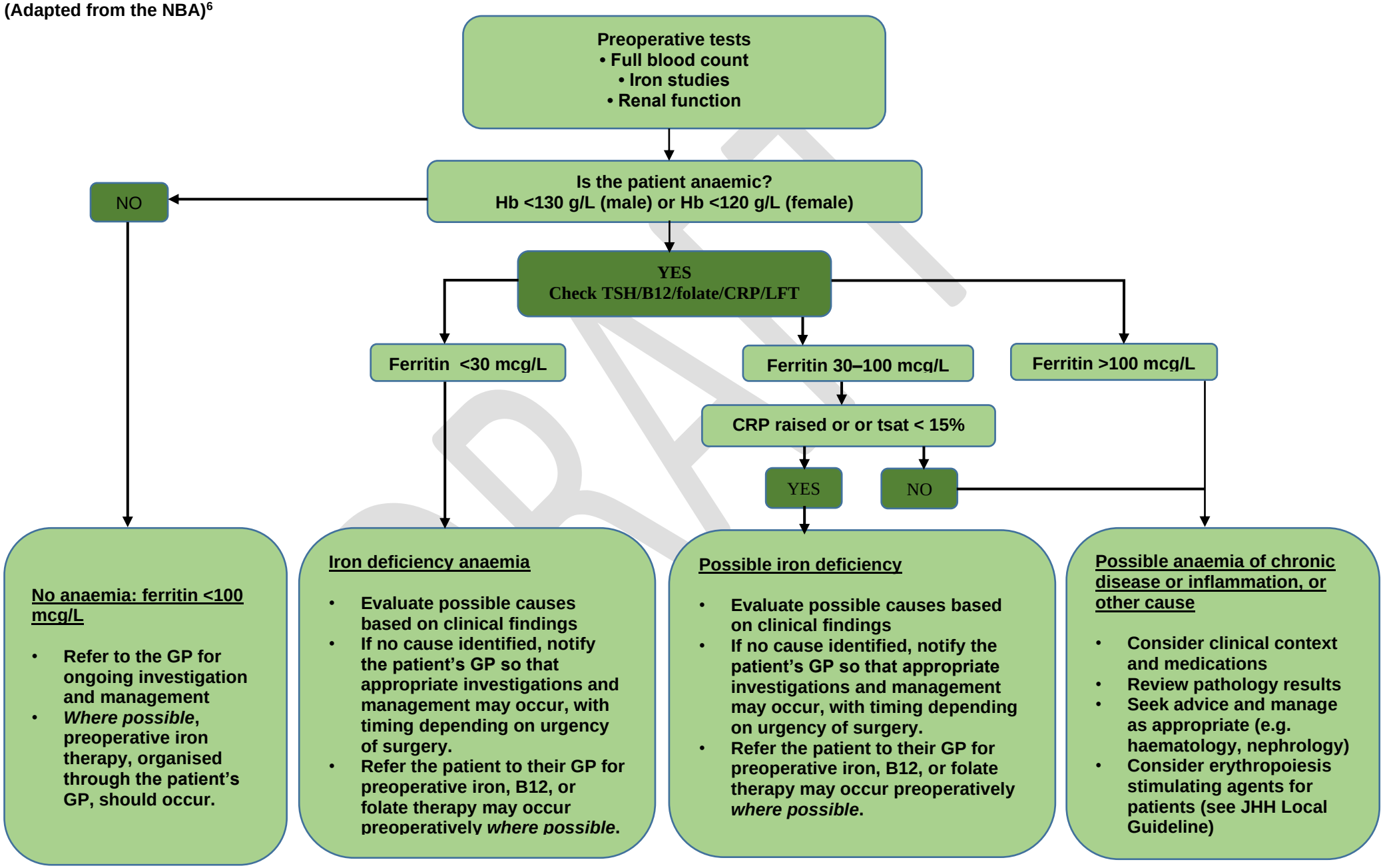


***Major Surgeries with significant bleeding/transfusion risk**

Thoracic, open vascular or EVAR, joint replacement, major urology (nephrectomy, prostatectomy), hysterectomy, gynae-oncology, major head and neck, multi-level spinal, major open general surgery

Nb. Patients with haemoglobin level < 90g/L should receive a detailed review by, or discussion with, a senior perioperative clinician prior to any surgery.

Figure 2 : Preoperative haemoglobin assessment and optimisation before major surgery with significant transfusion risk or expected blood loss >500ml (Adapted from the NBA)[6]



Iron Deficiency

- Iron deficiency is the most common cause of anaemia in surgical patients, although multiple sources may co-exist[5]
- Without a clear physiologic explanation for iron deficiency, patients (especially men and postmenopausal women) should be investigated for occult gastrointestinal blood loss, which may be due to malignancy.
- In an anaemic adult, a ferritin level <15 mcg/L is diagnostic of iron deficiency, and levels between 15–30 mcg/L are highly suggestive.
- Ferritin is elevated in inflammation, infection, liver disease and malignancy. This can result in misleadingly elevated ferritin levels in iron-deficient patients with coexisting systemic illness.
- In the elderly or in patients with inflammation, iron deficiency may still be present with ferritin values up to 60–100 mcg/L.[6]
- While iron deficiency should be corrected preoperatively, where possible, the evidence does not clearly demonstrate a reduction in adverse outcomes, or reduced use of blood products, with optimisation of iron stores preoperatively.[7]
- **See Appendix 1 for guidance on preoperative iron therapy.**

Additionally[6]:

- Consider thalassaemia if MCH or MCV is low and not explained by iron deficiency, or if long standing.
- Check B12/folate if macrocytic blood film or if there are risk factors for deficiency (e.g. decreased intake or absorption), or if anaemia is unexplained.
- Consider blood loss or haemolysis if reticulocyte count is increased.

Postoperative IV Iron Correction

- Consider for patients with documented iron depletion who are unable (due to timing or other logistic issues) to receive IV iron preoperatively.
- Provide a script for Ferric Carboxymaltose 1g to the patient (see Appendix A). The patient can fill the script at any pharmacy. The commercial Pharmacy at JHH usually has stock.
- The procedural anaesthetist should chart the IV Iron, as per the local guideline, to be administered in the PARU. JHH – Ferric carboxymaltose (FerrinjectTM) Injection / Infusion - adult

IMPLEMENTATION, MONITORING COMPLIANCE AND AUDIT

The guideline will be implemented in the Preoperative clinic at the John Hunter Hospital. The guideline will be presented to the Anaesthetic department at departmental education sessions and communicated via email and on departmental websites.

Resources will include the guideline, accompanying presentation and reference materials. The nursing staff in the Preoperative clinic will be provided with education and training at Service meeting and education sessions.

Audit of implementation and outcomes will be conducted and communicated to the Anaesthetic department and Perioperative Service.

APPENDICES

Appendix A – Example prescription for Ferric Carboxymaltose

REFERENCES

1. Munting K.E, Klein A.A. Optimization of pre-operative anaemia in patients before elective major surgery-why, who, when and how? *Anaesthesia*. 2019; 74: 49-57.

2. Warner M, et al. Perioperative Anaemia: Prevention, Diagnosis and Management Throughout the Spectrum Perioperative Care. *Anesth Analg.* 2020 May;130(5):1364-1380. doi: 10.1213/ANE.0000000000004727
3. Musallam K, et al. Preoperative anaemia and postoperative outcomes in non-cardiac surgery: a retrospective cohort study. *Lancet* 2011; 378:1396-407. DOI:10.1016/S01406736(11)61381-0
4. Jancowska E, et al. Effects of intravenous iron therapy in iron-deficient patients with systolic heart failure: a meta-analysis of randomized controlled trials. Eur J Heart Fail 2016 Jul;18(7):786-95. doi: 10.1002/ejhf.473
5. Munoz M, Acheson AG, Auerbach M, et al. International consensus statement on the peri-operative management of anaemia and iron deficiency. Anaesthesia 2017; 72: 233–47.
6. National Blood Authority Australia (2016) : Iron product choice and dose calculation for adults. https://www.blood.gov.au/system/files/documents/Iron%20product%20choice%20and%20dose%20calculation20052016.pdf
7. Richards T, et al. Preoperative intravenous iron to treat anaemia before major abdominal surgery (PREVENTT): a randomised, double-blind, controlled trial. *Lancet*. 2020 Oct 24;396(10259):1353-1361. doi: 10.1016/S0140-6736(20)31539-7.
8. PBM Guidelines: Module 2 Perioperative : https://www.blood.gov.au/pbm-module-2
9. Australian product information : Ferric Carboxymaltose. https://www.ebs.tga.gov.au/ebs/picmi/picmirepository.nsf/pdf?OpenAgent&id=CP-2011-PI-02557-3&d=201912091016933

Useful Links

Patient Blood Management Guidelines: Module 2 Perioperative : https://www.blood.gov.au/pbm-module-2

FEEDBACK

Any feedback on this document should be sent to the Contact Officer listed on the front page.

Appendix A – Example prescription for Ferric Carboxymaltose

NOT VALID FOR SCHEDULE 8 DRUGS

Deliver to Discharge Lounge: ☐ Discharge date: / / Time: am/pm **COLLECT:** ☐

Hospital prescription
JOHN HUNTER HOSPITAL
LOOKOUT ROAD
NEW LAMBTON NSW 2305
PHONE: 0249213635

Provider no. 0012790J

FAMILY NAME	MRN
GIVEN NAME	☐ MALE ☐ FEMALE
D.O.B. ___/___/___	M.O.
ADDRESS	
LOCATION / WARD	
COMPLETE ALL DETAILS OR AFFIX PATIENT LABEL HERE	

Patient's Medicare number

Prescriber to
Print Patient's Name _____

Patient's Weight .....

Pharmaceutical benefits entitlement or DVA number

☐ Safety Net entitlement Card holder ☐ Concessional or dependant, RPBS beneficiary Safety Net concession card holder ☐ PBS ☐ RPBS

	Generic drug name and form	Dose, strength, route, frequency	Qty/ days	Rpt	Approval number (compulsory for S100)
1.	Ferric Carboxymaltose.	1g for IV use	1	0	
2.					
3.					
4.					
5.					
6.					
7.					

Prescriber's Name/Designation: .....

Prescriber number: .....
(compulsory for S100 medications)

Signature: ..... Date: ..... Pager number: .....

I certify that I have received this medication and information on entitlement to free or concessional pharmaceutical benefits is not false or misleading

...../...../..... Date of supply

..... Patient or agent's signature

..... Agent's address

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