1 Purpose
This clinical guideline describes the diagnosis and management of iron deficiency in maternity and gynaecology patients. Anaemia is independently associated with morbidity, increased mortality and adverse perinatal outcomes.

2 Definitions
Iron: divalent cation, metallic element; essential micronutrient involved in oxygen transport within the body and the regulation of cell growth and differentiation.

Iron deficiency: low iron stores (ferritin<15microgram/L) and reduced mean red corpuscular volume (MCV)<80fL) but normal haemoglobin (Hb) concentration; or serum ferritin 15-20microgram/L, plus two of the following: serum iron<10micromol/L; total iron binding capacity>68micromol/L; serum transferrin >3.5g/L or transferrin saturation< 15% (1)

Iron deficiency anaemia: low iron stores, reduced MCV and reduced Hb level.

Abbreviations
FBE – Full blood examination
Hb – Haemoglobin
HMB – Heavy Menstrual Bleeding
IDA – Iron deficiency anaemia
IBD – Inflammatory bowel disease
PPH – Postpartum haemorrhage

3 Responsibilities
All staff involved with the prescribing, dispensing and administration must be aware of this guideline to ensure the safe and appropriate use of iron.

4 Guideline
4.1 Diagnosis of iron deficiency anaemia

Anaemia (2-4): Hb concentration below the reference range for the laboratory performing the test.

Haemoglobin (Hb) level
There is no agreed normal range for haemoglobin (Hb) measurements in pregnant women in Australia. The Hb level associated with optimal maternal and perinatal outcomes is not known, however it is known that anaemia is associated with increased maternal morbidity and poor perinatal outcomes (5).

The RWH laboratory defines the following Hb reference ranges:

<table>
<thead>
<tr>
<th>First trimester</th>
<th>Second trimester</th>
<th>Third trimester</th>
<th>Adult female (non-pregnant)</th>
</tr>
</thead>
<tbody>
<tr>
<td>110-143g/L</td>
<td>100-137g/L</td>
<td>98-137g/L</td>
<td>120-160g/L</td>
</tr>
</tbody>
</table>

Ferritin
- The serum ferritin is the most readily available and useful measure of iron deficiency.
- Ferritin is an acute phase protein and is elevated in inflammation, infection, liver disease and malignancy. In these patients, iron deficiency may be present despite an elevated ferritin.
- Ferritin < 15micrograms/L indicates iron depletion in all stages of pregnancy (4).
- Treatment should be considered before iron deficiency develops when ferritin between 15-30micrograms/L.

4.2 Indications for testing/screening

Pregnancy-screening
All pregnant women have a full blood examination (FBE) in early pregnancy. Women with risk factors for iron deficiency should also have serum ferritin measured.
Guideline

Iron Deficiency – Management in Maternity and Gynaecology Patients

Risk factors for iron deficiency in pregnancy (6):

- Aboriginal and Torres Strait Islander women, adolescents, recent immigrants
- Women with past history of anaemia
- Multiparity≥P3; particular if consecutive pregnancy<1 year following delivery or last birth was complicated by PPH
- Vegetarian, vegan
- Low socioeconomic status.
- High risk of bleeding
- Women who will refuse transfusion or unable to access transfusion e.g. Jehovah’s Witness

All pregnant women have Hb (or FBE) measured at 28 weeks gestation. Those with anaemia or risk factors for iron deficiency should also have serum ferritin measured.

Check Vitamin B12 levels in the following patient groups:

- Life-long vegetarian/vegan diet
- Inflammatory bowel disease.
- Macrocytosis (elevated MCV)

In the majority of maternity patients, the cause of iron deficiency anaemia is inadequate dietary iron intake combined with iron demands of pregnancy and menstruation. If the woman has a history of rectal blood loss or gastrointestinal symptoms, referral to a gastroenterologist may be appropriate.

Gynaecology-screening

All women presenting with excessive menstrual bleeding or abnormal bleeding should have screening for IDA with FBE and serum ferritin.

When iron deficiency anaemia is diagnosed in post-menopausal women, evaluation for benign and malignant gastrointestinal lesions, inflammatory conditions (e.g. inflammatory bowel disease) and peptic ulceration is indicated. Results and need for further follow-up should be communicated to the woman and her General Practitioner.

Surgical patients-screening

In patients undergoing surgery, preoperative anaemia should be identified, evaluated and managed to minimize red cell transfusion.

4.3 Management of iron deficiency

Iron deficiency/ Iron deficiency anaemia in pregnancy

Dietary changes alone are insufficient to manage iron deficiency anaemia in pregnancy and iron therapy is necessary. Referral to a dietician for advice to optimise dietary iron intake and absorption should also be considered.

Iron therapy is recommended for women with iron deficiency anaemia, or those at risk of developing iron deficiency during pregnancy.

The approach to iron therapy including selection of oral or intravenous therapy is outlined in Appendix 1.

Management of postnatal anaemia

FBE should be checked within 48 hours of delivery in all women with an estimated blood loss >500mL and in women with uncorrected anaemia in the antenatal period or symptoms suggestive of postpartum anaemia. Women with Hb<100g/L, who are haemodynamically stable, asymptomatic, or mildly symptomatic, should be offered oral iron supplementation (100-200mg elemental iron daily) for at least 3 months and a repeat FBE and ferritin to ensure Hb and iron stores are replete (4).

In women with moderate postnatal anaemia an iron infusion may be considered.

Management of excessive menstrual bleeding

Menstrual loss, and heavy menstrual bleeding put women at risk of iron deficiency and iron deficiency anaemia
IDA should be treated along with measures to manage the excessive menstrual bleeding.

Parenteral iron treatment has been shown to be effective in the management of iron deficiency /iron deficiency anaemia in women with heavy menstrual bleeding.

Preoperative iron deficiency anaemia may place a patient at increased risk of blood transfusion during surgery and adverse postoperative sequelae.

Treatment of iron deficiency in the gynaecology and preoperative settings (7), refer to Appendix 2.

**Blood transfusion**

Blood transfusion for iron deficiency anaemia is only appropriate in severe anaemia where there are signs of cardiovascular compromise. Blood transfusion does not correct the iron deficit, treatment with iron is also required. Refer to Blood transfusion administration guideline (adult)

### 4.4 Oral iron preparations

Dietary changes alone are insufficient to correct iron deficiency anaemia, oral iron supplementation is necessary. Referral to a dietitian for advice to optimise dietary iron intake and absorption should also be considered. Oral iron supplementation is effective and safe to replace iron. Multivitamins should not be used for the treatment of iron deficiency as they contain insufficient amounts of elemental iron. Oral iron supplements containing 100-200mg elemental iron daily should be recommended (4), see Table 1.

**Table 1: Oral iron supplements available in Australia**

<table>
<thead>
<tr>
<th>BRAND NAME</th>
<th>FORMULATION</th>
<th>ELEMENTAL IRON CONTENT</th>
<th>OTHER ACTIVE INGREDIENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ferro-Gradumet®</td>
<td>325mg ferrous sulfate controlled release tablet</td>
<td>105 mg</td>
<td>Nil</td>
</tr>
<tr>
<td>Ferrograd C®</td>
<td>325mg ferrous sulfate controlled release tablet</td>
<td>105 mg</td>
<td>Ascorbic acid 500mg</td>
</tr>
<tr>
<td>Ferro-f-tab®</td>
<td>310mg ferrous fumarate Tablet</td>
<td>100 mg</td>
<td>Folic acid 350micrograms</td>
</tr>
<tr>
<td>Fefol®</td>
<td>270mg ferrous sulfate controlled release capsule</td>
<td>87.4 mg</td>
<td>Folic acid 300micrograms</td>
</tr>
<tr>
<td>FGF®</td>
<td>250mg ferrous sulfate controlled release tablet</td>
<td>80 mg</td>
<td>Folic acid 300micrograms</td>
</tr>
<tr>
<td>Ferro-tab®</td>
<td>200mg ferrous fumarate Tablet</td>
<td>65.7 mg</td>
<td>Nil</td>
</tr>
<tr>
<td>Ferro-liquid®</td>
<td>30mg/5mL Ferrous sulfate oral liquid</td>
<td>6mg/mL</td>
<td>Nil</td>
</tr>
<tr>
<td>Maltofer Syrup®</td>
<td>185mg/5mL Iron polymaltose complex syrup</td>
<td>50mg/5mL</td>
<td>Ethanol 3.25mg/mL</td>
</tr>
<tr>
<td>Maltofer tablet®</td>
<td>370mg Iron polymaltose complex tablet</td>
<td>100mg</td>
<td>Nil</td>
</tr>
</tbody>
</table>

**Dose instructions:** Take 1 tablet daily of one of the above preparations or 15-30mL of Ferro-liquid®, (ideally 1 hour before or 2 hours after food). GI upset may be reduced by taking the medicine with food, or at night, and by increasing the dose gradually. When a rapid rise in Hb is not required, intermittent dosing (1 tablet 2-3 times per week), or lower doses may reduce GI side-effects.

Commonly reported side effects of iron tablets include constipation, black stools, abdominal discomfort, nausea and vomiting.

Ferro-Gradumet®, Ferro-f-tab® and Ferro-liquid® are the oral iron preparations available at the Women’s.
Response to oral iron

For nausea and epigastric discomfort, iron supplements with lower iron content should be recommended. Slow release and enteric coated forms should be avoided (4).

Following administration of oral iron, haemoglobin level typically increase by 20g/L every 3-4 weeks or 1-2g/L per day (3).

In established anaemic women, the response to oral iron should be assessed within a few weeks after commencing treatment by measuring the Hb. Once the Hb level is in the normal range, replacement should continue for 3 months and until at least 6 weeks postpartum to replenish iron stores (4).

In non-anaemic women repeat Hb and serum ferritin after 8 weeks of treatment to confirm response (4).

4.5 Parenteral iron therapy

Intramuscular iron

Intramuscular iron injections tend to be painful and there is significant risk of permanent skin staining. Administered by the IM route is no safer than the IV route and use of IM iron is generally discouraged.

Intravenous iron

Intravenous iron therapy should be avoided in the first trimester of pregnancy due to risk of hypersensitivity reactions, but can be given in the second trimester onwards and postpartum period in women with iron deficiency anaemia who fail to respond to, or are intolerant of, oral iron (3).

Intravenous iron is considered in the following circumstances:

- Demonstrated intolerance, non-compliance or lack of efficacy with oral iron
- Severe anaemia, to avoid imminent decompensation/transfusion
- Ongoing blood loss that exceeds the capacity of oral iron to meet needs e.g. heavy uterine bleeding
- Women with anticipated significant surgical blood loss likely to require transfusion, e.g. placental adhesive disorders in the maternity setting, resection of major endometriosis or myomectomy in the gynaecology setting
- Moderate-severe postpartum anaemia, where rapid restoration of Hb is required
- Where absorption of oral iron is likely to be impaired
  - Surgery: bariatric
  - Medicines: calcium
  - Concurrent illness: inflammatory states, IBD, renal disease, helicobacter pylori infection

IV iron results in more rapid restoration of Hb and iron stores than oral iron, however levels of Hb are equivalent at 3 months (3).

4.6 Prescribing requirements and restrictions for intravenous iron therapy

- Intravenous iron therapy is NOT to be administered after hours unless it is urgently required.
- For inpatients, prescribe the iron infusion order (either iron polymaltose or iron sucrose) on the medication chart.
- For outpatients and supply upon discharge, the prescriber must write up a prescription for iron carboxymaltose (specify dose in mg of elemental iron) in outpatients (including administration performed at the Emergency department) or prior to patient discharge.
- A patient information leaflet should be provided to the patient along with discussion regarding benefits and potential side effects.
- All iron infusions will be dispensed and supplied by the pharmacy department. Three intravenous iron preparations are available at the Women’s with the following formulary restrictions:
### 4.7 Intravenous iron dose

All dosages should be prescribed in milligram (mg) of elemental iron. There are several methods for calculating the dose of iron required to replete the patient’s total body iron deficit. The simplified method is preferred.

#### Simplified method to calculate cumulative iron doses:

<table>
<thead>
<tr>
<th>Hb (g/L)</th>
<th>Body weight 35 kg to &lt; 70 kg*</th>
<th>Body weight ≥ 70 kg*</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Iron polymaltose</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>≥100</td>
<td>1000mg</td>
<td>1500mg</td>
</tr>
<tr>
<td>70-100</td>
<td>1500mg</td>
<td>2000mg</td>
</tr>
<tr>
<td>&lt;70</td>
<td>2000mg</td>
<td>2000mg</td>
</tr>
<tr>
<td><strong>Iron sucrose (divided doses)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>≥100</td>
<td>1000mg</td>
<td>1500mg</td>
</tr>
<tr>
<td>&lt;100</td>
<td>1500mg</td>
<td>2000mg</td>
</tr>
<tr>
<td><strong>Iron carboxymaltose</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>≥ 100</td>
<td>1,000 mg</td>
<td>1,500 mg*</td>
</tr>
<tr>
<td>&lt; 100</td>
<td>1,500 mg</td>
<td>2,000 mg*</td>
</tr>
</tbody>
</table>

Total body iron deficit according to body weight and Hb:

* Use ideal body weight in overweight patients (pre-pregnancy weight should be used). Ideal body weight calculator: [https://www.amh.net.au/online/misc/idealweightcalculator.php](https://www.amh.net.au/online/misc/idealweightcalculator.php)

**Maximum dose for iron polymaltose is 2000mg per infusion.**

**Maximum dose for iron sucrose is 500mg per infusion.** Give multiple weekly dose until the total iron deficit is reached.

**Maximum dose for iron carboxymaltose is 1000mg per infusion.** A second dose the following week is required if the total body iron deficit exceeds 1000 mg.

Iron infusions should be prescribed on the ‘Non-Analgesic IV Infusion Chart’ MR/90165 (iron polymaltose and iron sucrose infusion should be prescribed on the section for complex infusions with rate changes).
### 4.8 Administration

<table>
<thead>
<tr>
<th>Elemental iron concentration</th>
<th>Iron polymaltose</th>
<th>Iron sucrose (Venofer&lt;sup&gt;®&lt;/sup&gt;)</th>
<th>Iron carboxymaltose (Ferinject&lt;sup&gt;®&lt;/sup&gt;)</th>
</tr>
</thead>
<tbody>
<tr>
<td>50mg/mL</td>
<td>20mg/mL</td>
<td>50mg/mL</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Presentation</th>
<th>100mg/2mL</th>
<th>5mL (100mg) vial</th>
<th>10mL (500mg) vial</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Maximum dose in a single administration</th>
<th>2000mg</th>
<th>500mg</th>
<th>1000mg</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Single rapid infusion doses are capped at 2000mg</th>
<th>IV infusion: Given weekly in divided (500mg) doses until the total iron deficit is reached.</th>
<th>IV infusion: do not exceed 1000mg once a week. A second dose the following week is required if the total body iron deficit exceeds 1000mg</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Rate of administration</th>
<th><strong>Slow protocol</strong></th>
<th>Dilute the dose in at least 100 mL of sodium chloride 0.9%. The maximum concentration is 1 mg/mL.</th>
<th>Dilute doses of 500–1000 mg in a maximum of 250 mL of sodium chloride 0.9% and infuse over 15 minutes.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Infuse at an initial rate of 40 mL/hour for 15 minutes. If tolerated, increase the rate to 120 mL/hour.</td>
<td>Infuse at a rate of 100 mg of iron over at least 15 minutes.</td>
<td>Do not dilute to less than 2mg/mL.</td>
</tr>
<tr>
<td></td>
<td><strong>Rapid protocol</strong></td>
<td>First 20mg of iron sucrose (20mL of diluted solution) should be infused over 15 minutes.</td>
<td>Flush IV cannula with 50mL of 0.9% sodium chloride before and after iron infusion to minimise the risk of extravasations</td>
</tr>
<tr>
<td></td>
<td>For doses up to 1500mg – to be infused over approximately 75 minutes</td>
<td>If no adverse reactions, the remaining dose should be given at a rate of not more than 50mL/15 minutes.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Start the infusion at a rate of 40mL/hour for 15minutes then if tolerated the rate may be increased to 250mL/hour for the remainder of the infusion.</td>
<td>Flush IV cannula with 50mL of 0.9% sodium chloride before and after iron infusion to minimise the risk of extravasations</td>
<td></td>
</tr>
<tr>
<td></td>
<td>For doses above 1500mg and ≤2000mg – to be infused over approximately 105 minutes</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Start the infusion at a rate of 40mL/hour for the first 15 minutes, then if tolerated the rate may be increased up to 166mL/hour for the remainder of the infusion.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Flush IV cannula with 50mL of 0.9% sodium chloride before and</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Flush IV cannula with 50mL of 0.9% sodium chloride before and after iron infusion to minimise the risk of extravasations.
**Iron Deficiency – Management in Maternity and Gynaecology Patients**

<table>
<thead>
<tr>
<th>Test dose required</th>
<th>Yes</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
</table>
| Pre-treatment requirements | Patients with multiple drug allergies may be at higher risk of developing adverse reactions. Premedications should be prescribed for patients who have had a previous reaction to iron. The recommended premeds are:  
- Hydrocortisone 100mg IV and  
- Loratadine 10mg orally. |  |
| Preparation of dose | **Slow protocol**: Dilute the calculated dose (up to 2000mg) in 500mL of sodium chloride 0.9%.  
**Rapid protocol**: Dilute the calculated dose (up to 2000mg) in 250mL of sodium chloride 0.9%. | Dilute 500mg in 500mL of 0.9% sodium chloride | Dilute 1000mg in 100mL of 0.9% sodium chloride |
| Compatible fluids | 0.9% sodium chloride | 0.9% sodium chloride | 0.9% sodium chloride |
| Y-site compatibility | Not recommended. Do not mix with acidic substances or those with a strong reducing effect (may release toxic iron radicals) | No information | No information |
| Risk of anaphylactic reactions* | Uncommon  
1/100 to 1/1000 | rare  
1/10,000  
<1/1000 | rare  
1/10,000  
<1/100 |
| Common adverse reactions | Infrequently  
Flushing, sweating, chills and fever; chest and back pain. | Transient taste perversion, hypotension, fever and shivering, injection site reactions and nausea (0.5-1.5%) | Headache (3.3%)  
Dizziness, hypertension, flushing, nausea, injection/infusion site reactions, alanine aminotransferase increased and hypophosphataemia. |
| Use in pregnancy | Safe to use in 2nd and 3rd trimester of pregnancy | Limited safety information available for use in 1st trimester (8).  
Safe to use in 2nd and 3rd trimester | Avoid use in 1st trimester.  
Safe to use in 2nd and 3rd trimester. |
| Use in breastfeeding | Safe to use. | Safe to use | Safe to use |

- If any adverse reaction occurs, the infusion must be stopped and the duty registrar called for assessment. Consider a MET call/Code Blue as determined by the severity of the adverse reaction.
- *Anaphylaxis should be managed as per the procedure: Anaphylaxis Management of and Adrenaline Standing Orders Procedure.
4.9 Monitoring

- Take baseline vital signs – heart rate (HR), respiratory rate (RR), blood pressure (BP), temperature and oxygen saturation

- Iron polymaltose: during IV infusion monitor the baseline vital signs every 5 minutes during the initial rate and then every 15 minutes during rapid protocol infusions or every 30 minutes during slow protocol infusions.

- Iron sucrose: after initial test dose and then every 30 minutes until completion of the infusion and monitor patient for 30 minutes afterwards (to fulfil discharge criteria and assess patient for potential adverse effects).

- Iron carboxymaltose: Repeat observations at the completion of infusion and monitor patient for 30 minutes afterwards (to fulfil discharge criteria and assess patient for potential adverse effects).

- If no side effects observed then no further monitoring is required.

- If side effects observed, contact treating doctor and monitor patient accordingly.

- Extravasation - Alert to extravasation at all times. Paravenous leakage of IV iron products should be avoided. Take care with placement of the IV cannula and avoid the back of the hand. The cubital fossa is the preferred site. Patients should be instructed to report pain at the IV site during infusion, and the site should be inspected if pain is reported. Leakage may cause long lasting brown discoloration, pain, inflammation, tissue necrosis and sterile abscess. Ice may be applied to cause local vasoconstriction and decrease fluid absorption. Massage of the area should be avoided.

4.10 Precautions

Iron therapy should not be used in the setting of iron overload conditions. Recurrent IV infusions are not generally recommended as the risk of iron toxicity is increased. In patients with recurrent iron deficiency, the cause of iron deficiency anaemia should be addressed.

Oral iron after an iron infusion is not generally required if the total iron deficit has been calculated and adequate IV iron prescribed. If oral iron is required after IV iron infusion, it can be started 5 days after the infusion.

4.11 Follow-up Testing and referral

- The response to iron preparation should be assessed with follow-up testing (FBE).

<table>
<thead>
<tr>
<th>Preparations</th>
<th>Anticipated effects</th>
<th>Follow-up testing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oral iron</td>
<td>2 weeks after starting oral iron, if Hb increase by 1g or more suggest adequate absorption.</td>
<td>2-4 weeks after the commencement of oral treatment</td>
</tr>
<tr>
<td>IV iron</td>
<td>Hb should rise within 2-3 weeks</td>
<td>2-4 weeks after the commencement of IV treatment</td>
</tr>
</tbody>
</table>

- In circumstance where serum ferritin level greater than 100 microgram/L, possible anaemia of chronic disease or inflammation, or other cause, seek advice from haematologist (7).

5 Evaluation, monitoring and reporting of compliance to this guideline

Compliance to this guideline will be monitored, evaluated and reported through monitoring and reporting the following incidents to the Medicine Safety Committee monthly:

- Number, severity and outcome of incidents involving medicines

- Number, severity and outcome of side effects, allergic and anaphylactic reactions.

6 References
Guideline
Iron Deficiency – Management in Maternity and Gynaecology Patients


7 Legislation/Regulations related to this guideline
Not applicable.

8 Appendices
Appendix 1- Management of Iron Deficiency in Pregnancy
Appendix 2 – Management of Iron Deficiency in the Gynaecology and Preoperative Settings

Please ensure that you adhere to the below disclaimer:

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Management of Iron Deficiency in Pregnancy

Hb ≤110g/L

* ferritin level < 10 microgram/L

Suspect cause other than isolated iron deficiency

First trimester

Second trimester

Third trimester

Severe anaemia, need for rapid restoration of iron stores or other indications for IV iron (refer to 4.5)

Inpatients
Iron polymaltose (up to max of 2000mg) per infusion OR Iron sucrose (max 500mg per infusion)

Upon discharge/outpatient clinic
Iron carboxymaltose (max 1000mg per infusion)

If no significant change or drop in Hb

Gestation ≤13 weeks

Gestation >13 weeks

Depending on Hb, give IV iron sucrose if needed

Check F& E and ferritin at 5 weeks postpartum
Appendix 2

Management of Iron Deficiency in the Gynaecology and Perioperative Setting

Treatment of iron deficiency in the gynaecology or preoperative settings

- HBc 120g/L
- Is ferritin <100mg/L?

**Ferritin 30-100microg/L**
- Low risk
  - Minor procedure – expected blood loss unlikely to lead to transfusion
  - Time to procedure >30 days
  - No significant ongoing blood loss

**Ferritin <30microg/L**
- High risk
  - Major procedure – expected blood loss may lead to transfusion
  - Time to procedure <30 days
  - Blood refusal
  - Significant ongoing blood loss

- Oral iron supplementation
- Consider IV iron

**Able to tolerate oral iron?**
- Yes
  - Assess response within 4 to 6 weeks
  - Continue oral iron
- No

**Inpatients**
- Iron polymaltose (up to max of 2000mg) per infusion
OR
- Iron sucrose (max 500mg per infusion)

**Upon discharge/outpatient**
- Iron carboxymaltose (max 1000mg per infuson)

- normal/abnormal
- CRP
- Possible anaemia of chronic disease or inflammation other cause

Seek advice from haematologist

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