Management of Anaemia in Pregnancy Guideline

**DEFINITION**

Haemoglobin:  
- <110 g/L in 1st trimester  
- <105 g/L in 2nd and 3rd trimester  
- <100 g/L in postpartum period

- A microcytic hypochromic (low MCV/low MCH/Low MCHC) picture suggests iron deficiency.

- A macrocytic (High MCV) picture suggests either folate, B12 deficiency or both (do haematinics). Normal MCV Range: 80.0 - 100.0 (fl)  
  - Do not commence folic acid or B12 treatment until haematinics are confirmatory when the MCV is high in an anaemic woman  
  - There are other causes of a raised MCV

- A normocytic (normal MCV) may suggest a mixed deficiency (do haematinics)

Most common cause of anaemia in pregnancy is iron deficiency.  
Local audit of women referred for iron transfusion also demonstrated a high incidence of folate deficiency.

At risk groups should be identified at booking e.g. vegetarians, multiparity, previous anaemia and history of menorrhagia or bleeding.

Anaemia can be responsible for an increased susceptibility to infection, disturbance of postpartum emotion and effect neonatal iron stores. It is linked to pre-term labour and low birth weight and possibly to abruption and increased PPH.

Dietary advice should be offered to all pregnant women. The main sources of dietary iron are red meats, fish and poultry as well as green leafy foods such as spinach and kale.

**Management of suspected iron deficiency anaemia**

Oral iron is ideally to be taken on an empty stomach, about one hour before meals. If GI upset can be taken with meals

*We recommend commencing Folic acid 5 mg orally once daily with oral iron (unless there is reason to suspect B12 deficiency)*

Absorption is improved when taken with a source of vitamin C (e.g. orange juice or ascorbic acid). Avoid taking with milk, tea, coffee or antacids.
Oral iron preparations

First line:
- Ferrous Fumarate 210 mg tid for GP prescription
- Ferrous Sulphate 200 mg tid for hospital prescription

If experiencing side effects, reduce dose to once or twice daily or even once on alternate days. Recent evidence supports once daily or alternate day tablets as better absorbed and with better compliance.
Side effects: GI upset, nausea, constipation or diarrhoea. Black stools

Second line:
Ferrous Gluconate 300 mg tid or Paediatric iron i.e. Sytron 5-10 ml tid

Who should not take Iron?

The following conditions are contraindicated or used with caution with this drug. Check with consultant if there are any of the following:

Conditions:
- Iron Metabolism Disorder causing Increased Iron Storage. Haemochromatosis
- Increased Bodily Iron from High Red Blood Cell Destruction
- Haemolytic Anemia
- Ulcer from Stomach Acid, Burning Stomach symptoms
- Ulcerated Colon, Diverticular Disease/Ulcerative colitis
- Conditions requiring Several Blood Transfusions

Allergies/ Interactions:
- Iron Complex: Avoid if known allergy/Iron Analogues: Avoid if known allergy
- Calcium – interaction: reduced absorption/Zinc Oxide interaction: reduced absorption
- Calcium Threonate- Calcium supplement: interaction
- Magnesium Oxide: reduced absorption/Magnesium interaction: reduced absorption
- Levothyroxine – reduced absorption/Methyldopa- reduced antihypertensive effect

Any unusual FBC reports involving MCV/MCH and MCHC should be discussed with medical staff as is out with the scope of this guideline

Anaemia at booking should always be investigated. Unless there is a known medical issue (malabsorption syndrome, chronic illness, haemoglobinopathy, renal/liver disease. This list is not exhaustive)

Ferritin: References range is the same in pregnant and non-pregnant women:
- Ferritin 14-186 ng/mL
At booking check FBC

- **Hb >110**
  - MCV normal
  - No further action

- **Hb <110**
  - MCV <80
  - Once haemoglobinopathy excluded

  Commence oral iron therapy and folic acid
  - Dose can be reduced to once or twice daily if required or consider 2nd line oral iron (ferrous gluconate 300mg BD or sytron 5-10ml BD)

  After 2 weeks check tolerance and compliance

  At 16 weeks or 4 weeks after compliance **recheck FBC +/- haematinics** (ferritin, folate + B12) (additional gold top)

  See Page 5: Reflex Haematinics

At 28 weeks check FBC and G+S

- **Hb <105**
  - Commence oral iron therapy and folic acid 5mg

  30 weeks – check tolerance and compliance
  32 weeks – check tolerance and compliance.
  Repeat FBC +/- haematinics (gold top).

  See Page 5: Reflex Haematinics

- **Hb >105**
  - No further action

**Responding** i.e. rise in Hb by at least 10g/L

Continue with oral iron and folic acid until delivery and at least 6 weeks postpartum.

- **Hb <95 at any point**
  - Refer to a consultant
    - Commence oral iron therapy and Folic Acid 5mg

  In 2 weeks check tolerance and compliance
  In 4 weeks repeat FBC +/- haematinics (gold top)

  See Page 5: Reflex haematinics
When contacting woman to check compliance. This must be documented in Badger including any change to management

**Persistent anaemia with abnormal haematinics**

- Low folate – check compliance. Consider 5 mg two or three times daily if compliant
- Low B12 – ensure normal folate then parenteral B12
- Low ferritin – consider referral for parenteral iron transfusion
  - This must be a consultant decision after careful review
  - See Ferinject Maternity Protocol on at end of this guideline
  - Can be arranged at Maternity DBU
  - This will be supervised/prepared by medical staff

**Persistent anaemia with normal haematinics**

- Consider anaemia of chronic disease
- Consider iron studies (transferrin + serum iron+ transferrin saturation)
- Refer to consultant Haematologist or MOT clinic

**Process for Reflex (Reflex means done automatically only if needed)**

**Haematinics**

See below and Page 5

**Reflex Haematinics Procedure**

This allows haematinics to be done automatically, only if required, following supplementation when repeating FBC. Requires an additional gold top. Done 4 weeks after compliance with oral supplements (iron, folate or B12)

At Repeat FBC: when completing the Green request form

- In addition to Purple top take a Gold top sample
- Clinical details box should state “Anaemia in pregnancy +/- reflex haematinics”
- Use the label below and complete required fields
- The lab has asked that the name of person requesting and their contact number be included in request. Please complete these fields.

**NOTE:**
The lab IT system will automatically decline repeat haematinics if requested within 30 days; even when previously declined for this reason. The IT system just recognises the date of last request, not outcome of last request. Using the label and form as below will allow haematinics to be done after 4 weeks oral therapy
To allow reflex haematinics: Attach this label to request form

Label Template Available is in the Paperclip Attachment

Example

<table>
<thead>
<tr>
<th>Affix label here *Complete these fields</th>
</tr>
</thead>
</table>

Please PID as Maternity Haematinics clinic (MATHAE)

Requestor:

Requestor location:

Requestor contact Number:

TESTS to be requested: FBC and UE
Intravenous iron (Ferinject)  
Management is decided and documented by consultant after careful review

- Should be considered in confirmed iron deficiency in the presence of absolute non-compliance or no response with oral iron and folic acid
- Known malabsorptive syndrome
- Advanced gestation 34 to 38 weeks with high chance of transfusion
- Women declining blood products with mild anemia due to iron deficiency
- Should only be considered from 2nd trimester onwards in most instances
- There is a small risk of anaphylactic reaction. Patient should be informed of potential side effects and trained staff together with facilities to deal with anaphylaxis should be available during administration.
- Contraindicated in history of anaphylaxis, first trimester, active acute or chronic infection and chronic liver disease
- Current IV iron used in pregnancy in NHSL is Ferinject given in a single dose
  - See Maternity Protocol at end of this guideline Page 8
- Intravenous iron treatment can be arranged via the Maternity DBU
  - This must be prescribed, supervised and documented by medical staff with consultant oversight/agreement
  - All cases should be noted in IV iron diary for clinical audit

Folate deficiency
Reference range same in pregnancy: Folate 3.9-268 ng/ml. This is common in the local population and likely to be due to dietary insufficiency. Low levels should be treated with folic acid 5 mg/day. If remains low despite compliance, consider 2 or 3 times daily tablets (5 mg)

B12 deficiency
Reference ranges for Vit B12 (cobalamin) vary in pregnancy: Units pg/mL

<table>
<thead>
<tr>
<th></th>
<th>Non-pregnant Adult</th>
<th>First trimester</th>
<th>Second trimester</th>
<th>Third trimester</th>
</tr>
</thead>
<tbody>
<tr>
<td>B12 level (pg/mL)</td>
<td>197-771</td>
<td>118-438</td>
<td>130-656</td>
<td>99-526</td>
</tr>
</tbody>
</table>

True B12 deficiency is rare in pregnancy although low B12 level is commonly seen with little clinical significance. However, B12 replacement i.e. one single dose of IM Hydroxocobalamin 1 mg can be considered for B12 level <lower limit defined for trimester or patient is started on iron or folic acid when B12 level may fall further and precipitate subacute degeneration of the spinal cord. The latter can cause irreversible neurological deficit.

Full B12 therapy: Hydroxocobalamin 1 mg IM 3 times a week for 2 weeks (BNF)
Postnatal

Usually due to blood loss

Prescribe iron 1-3 times daily (as tolerated) and folic acid 5 mg once daily for 3 months

There is scope for post-natal iron transfusion. This is an area for future training and development in the postnatal setting

References:


UK guidelines on the management of iron deficiency in pregnancy, British Journal of Haematology, 2020, 188, 819-830, Sue Pavord et al on behalf of BSH committee October 2019
https://doi.org/10.1111/bjh.16221


British National Formulary

Last Guideline: Dr A Hung March 2015

New Guideline

Originators: Dr S Maharaj & Obstetric Blood Transfusion Group
Date: March-April 2021
Ratified by: Clinical Effectiveness Maternity Sub Group
Review Date: May 2024

See next pages for Ferinject Maternity Protocol & Anaphylaxis algorithm & Label template
Ferinject® 500mg/10ml vial  (Ferric Carboxymaltose)

Avoid use in the first trimester

INDICATION\(^1,2\) Treatment of iron deficiency when oral preparations are ineffective or cannot be used, or there is a need to deliver iron rapidly.

<table>
<thead>
<tr>
<th>DOSE</th>
<th>DILUENT</th>
<th>ROUTE</th>
<th>TIME</th>
<th>RATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1000mg (20ml)</td>
<td>80ml of Sodium Chloride 0.9%</td>
<td>IV infusion</td>
<td>15 minutes</td>
<td>400ml/hour</td>
</tr>
</tbody>
</table>

Dose should not exceed 20mg/kg - confirm dose with consultant if patient weighs < 50kg.

The total volume to infuse as made up above is 100ml over 15 minutes via Baxter Pump.

The venflon must be flushed to ensure no tissuing as Ferinject® is an irritant and stains tissue

MONITORING\(^1\)
Ferinject® must only be administered under the supervision of staff that are trained to evaluate and treat anaphylactic reactions. Monitor patients for hypersensitivity reactions during each administration and for at least 30 minutes after.

The haemoglobin level should be re-assessed no earlier than 4 weeks post final Ferinject® administration to allow adequate time for erythropoiesis and iron utilisation.

CONTRAINDICATIONS / PRECAUTIONS\(^1,4\)
Risk of hypersensitivity reactions is enhanced in patients with: known allergies; asthma; eczema; immune or inflammatory conditions (e.g. systemic lupus erythematosus, rheumatoid arthritis).

Hypersensitivity reactions can occur even when a previous administration has been tolerated.

DRUG INTERACTIONS\(^1\)
IV iron can reduce the absorption of oral iron. Wait for at least 5 days after infusion of Ferinject® before starting oral iron therapy.

STORAGE / STABILITY\(^1\)
Store at room temperature and protect from light. Use immediately after dilution.

Dilute with sodium chloride 0.9% only. No other diluents should be used, as there is the potential for precipitation.

SIDE EFFECTS\(^1,2\):
Common side effects include: nausea, headache, dizziness, flushing, hypertension, injection site reactions, and transient hypophosphataemia.

For further information see current BNF.

ADDITIONAL INFORMATION
Local audit has demonstrated a high concurrence of folate deficiency. Folic acid 5 mg should be commenced with oral iron therapy and continued after any intravenous iron therapy.

See NHSL Guideline Anaemia in Pregnancy on FirstPort.

REFERENCES
1. [http://www.medicines.org.uk/emc/medicine/24167](http://www.medicines.org.uk/emc/medicine/24167) Ferinject (Vifor Pharma UK) – Last updated 24/06/2020
2. [https://bnf.nice.org.uk/drug/ferric-carboxymaltose.html](https://bnf.nice.org.uk/drug/ferric-carboxymaltose.html) BNF online - Accessed 04/03/2020
Ferinject

Ferinject is special type of iron preparation given through a drip (into a vein, also described as an infusion). Ferinject is sometimes used alongside iron tablets.

Some of the reasons for needing Ferinject are:

- blood tests show you are anaemic and this has not responded to oral iron tablets or the iron tablets have made you feel unwell
- you have significant anaemia after the birth of your baby causing you to feel unwell
- you decided not to have a blood transfusion, for example if you are a Jehovah’s Witness

Your doctor will suggest Ferinject and then discuss this with you.

Using Ferinject instead of blood
Ferinject is not a blood product. Although blood transfusion is safe, there are some risks, including a tiny risk of infection. Ferinject does not have the risks of blood transfusion.

Safety of Ferinject
Ferinject is considered safe to use after the first trimester (three months) of pregnancy and after delivery. Rarely (in under 1% of cases) it can cause allergic reactions. You will therefore be monitored closely before, during and after the infusion.

A rare but significant complication of Ferinject is permanent skin staining or discoloration, which can occur if some of the drug leaks outside the vein during the infusion. To reduce the risk, a flush of water or saline (salt solution) is given into your vein before the Ferinject. Please let the midwife know if you experience any pain or burning in the arm during the infusion.

Very little Ferinject crosses into breast milk so you can safely breastfeed.

Side effects
Potential mild side effects occur in 1 to 10% of patients, including headache, dizziness, rash, nausea and vomiting, abdominal pain, muscle cramps, diarrhoea, constipation, abnormal liver function, flushing, low or high blood pressure and injection site reactions.

Receiving Ferinject
Ferinject can be given at the day obstetric unit.

When you arrive the midwife will take your pulse, blood pressure and temperature. Next the midwife or one of the doctors will put a drip in your arm and start the Ferinject infusion. This usually takes about 15 minutes via the drip.
Afterwards the midwife will check your pulse, blood pressure and temperature again. Usually you can go home 30 minutes after the Ferinject has finished, unless you feel unwell.

Your blood haemoglobin level will be checked before birth if you are still pregnant. If you have already given birth, you may need to take oral iron tablets.

**Oral iron tablets**
You must not take oral iron tablets for 5 days after having Ferinject and you should restart taking the iron tablets after 5 days.

**Suitability of Ferinject**
You should not have Ferinject if you:

- have anaemia caused by deficiencies other than iron deficiency (for example B12 deficiency)
- have ever been told by a doctor that you have “iron overload”
- have ever had an allergic reaction to iron given to you through a drip
- have ever had a problem with your liver, such as liver cirrhosis or hepatitis

**Further information**
If you have any questions after reading this leaflet please let your midwife or doctor know. They will be happy to discuss them with you.
Anaphylaxis algorithm

Anaphylactic reaction?

Airway, Breathing, Circulation, Disability, Exposure

Diagnosis - look for:
- Acute onset of illness
- Life-threatening Airway and/or Breathing and/or Circulation problems
- And usually skin changes

- Call for help
- Lie patient flat
- Raise patient’s legs

Adrenaline

When skills and equipment available:
- Establish airway
- High flow oxygen
- IV fluid challenge
- Chlorphenamine
- Hydrocortisone

Monitor:
- Pulse oximetry
- ECG
- Blood pressure

1 Life-threatening problems:
Airway: swelling, hoarseness, stridor
Breathing: rapid breathing, wheeze, fatigue, cyanosis, SpO₂ < 92%, confusion
Circulation: pale, clammy, low blood pressure, faintness, drowsy/coma

2 Adrenaline (give IM unless experienced with IV adrenaline)
IM doses of 1:1000 adrenaline (repeat after 5 min if no better)
- Adult: 500 micrograms IM (0.5 mL)
- Child more than 12 years: 500 micrograms IM (0.5 mL)
- Child 6-12 years: 300 micrograms IM (0.3 mL)
- Child less than 6 years: 150 micrograms IM (0.15 mL)

Adrenaline IV to be given only by experienced specialists
Titrate: Adults 50 micrograms; Children 1 microgram/kg

3 IV fluid challenge:
Adult - 500 – 1000 mL
Child - crystalloid 20 mL/kg
Stop IV colloid if this might be the cause of anaphylaxis

4 Chlorphenamine (IM or slow IV)
- Adult or child more than 12 years: 10 mg
- Child 6 - 12 years: 5 mg
- Child 6 months to 6 years: 2.5 mg
- Child less than 6 months: 250 micrograms/kg

5 Hydrocortisone (IM or slow IV)
- Adult or child more than 12 years: 200 mg
- Child 6 - 12 years: 100 mg
- Child 6 months to 6 years: 50 mg
- Child less than 6 months: 25 mg

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