Clinical Guideline

# ANAEMIA: ANTENATAL AND POST NATAL

**SETTING** Maternity and Gynaecology Services

**FOR STAFF** Midwives, Obstetric Staff, Anaesthetic, Gynae Preop and Ward 78 staff

**PATIENTS** Antenatal and postnatal women and gynaecology patients needing iv iron

## Guidance

### Iron Deficiency and Anaemia in Pregnancy

Maternal iron requirements increase in pregnancy because of the requirements of the fetus and placenta and the increase in maternal red cell mass. Iron absorption increases to meet this increased demand.

Iron deficiency in pregnancy has adverse consequences for both mother and fetus (PPH, low birth weight, preterm, delivery, fetal neurodevelopmental impairment). Iron deficiency is a progressive process, in which iron stores fall, from being replete to deplete and finally absent, resulting in iron deficiency anaemia. Iron deficiency is by far the most common cause of anaemia in pregnancy

The aim of this guidance is ensure that pregnant women are adequately managed to improve both maternal and fetal outcome. This not only involves identifying and treating anaemic women but also those who are at risk of iron deficiency or who are iron deficient but not yet anaemic. Treatment will be with oral iron if at all feasible. Treatment with intravenous iron may be necessary if oral iron does not reverse anaemia, or if anaemia is detected too close to delivery for oral treatment to have a significant effect.

Anaemia in pregnancy can have other causes including vitamin B12 and folate deficiency, the presence of a variant haemoglobin or thalassaemia, inflammatory disorders, haemolysis and blood loss.

Diagnosis of anaemia in pregnancy is affected by the physiological changes that occur during pregnancy (red cell mass increases but less than plasma volume increase). International definitions are currently used for the diagnosis of maternal anaemia at different gestations taking into account this dilutional effect.

### Definitions of anaemia used in this guideline (WHO definitions)

| | |
|---|---|
| First trimester | Hb<110 g/L |
| Second and third trimester | Hb<105 g/L |
| Postpartum | Hb<100 g/L |

**Iron deficiency** may be indicated by low ferritin even if haemoglobin levels are normal. Ferritin<30 mcg/L represents significant depletion of iron stores regardless of the Hb result and should trigger management of iron deficiency.

## Antenatal management

See flow diagram (Appendix 1) for management based on blood tests at booking, 28 and 36 weeks- all women will be managed on the same pathway.

All women receive dietary advice. Explain that pregnancy increases iron demand and iron deficiency is associated with risks for mother and developing baby.

If at booking woman is assessed to be at risk of iron deficiency anaemia or have increased need for Hb optimisation: - commence on oral iron once daily dose.

For all other women suggest taking alternate day oral iron (eg Monday, Wednesday and Friday)

## Exclusions for this guideline and indications for referral to haematology

Seek additional specialist advice if the pattern of results or clinical picture seem unclear or you are unsure what course of action you should be taking.

## Oral iron supplementation

Once daily dosing is the recommended for those with risk factors or who would benefit from Hb optimisation **(see flow chart).**

For all other women **or** for women finding it difficult to take their supplement daily use alternate-day dosing. (Monday, Wednesday and Friday).

**Usual advice 1 hour before meals and with a source of vitamin C e.g. orange juice to aid absorption.**

**The initial recommended management is oral Pregaday® once daily.** Pregaday seems to be better tolerated than other iron preparations. Alternatively one of the other preparations listed below could be prescribed. Recommended daily dosage is 40-80mg elemental iron.

- Pregaday® tablets contain Ferrous Fumarate 322mg (100mg elemental iron) and folic acid 350 micrograms
- Ferrous Sulphate 200mg tablets (65mg elemental iron)
- Ferrous Gluconate 300mg tablets (35 mg elemental iron)
- Ferrous Fumarate 322mg tablets (100mg elemental iron)
- Ferrous Fumarate 210mg tablets (68mg elemental iron)
- Ferrous Fumarate syrup 140mg (45mg elemental iron) in 5mls

# Intravenous iron infusions

Intravenous (IV) iron should be considered from the second trimester onwards for women with confirmed iron deficiency anaemia who are intolerant of or do not respond to oral iron.

IV iron should be considered in women who present after 34 weeks gestation with confirmed iron deficiency anaemia and a Hb of <105g/l.

## IV Iron Preparations (see appendices for Ferinject administration advice)

Ferinject is the first line treatment as St Michael's Hospital and Ashcombe.

- Ferinject iv (maximum single dose of 20mg per kg up to 1000mg by intravenous infusion)
- Venofer IV (200mg iron) (repeat doses required as 200mg per infusion only). Consult product literature for dosing information.

**Intravenous Iron Contraindications:-**

- **Contra-indicated in the 1st trimester of pregnancy**
- **Anaemias not attributed to iron deficiency**
- **Previous hypersensitivity to intravenous iron infusion**
- **Evidence of iron overload or disturbances in the utilisation of iron**

**Intravenous Iron Cautions:-**

- **Acute infection or inflammation**
- **Thalassaemia and sickle cell disease**
- **Patients with asthma, eczema or other atopic allergy are potentially more likely to experience allergic reactions and enhanced observations may be indicated.**

## Side effects/reactions

Generally, when side effects do occur, they are mild and settle down on their own.

The most common side effects are temporary and include:

- Headache, feeling sick or vomiting, muscle or joint pain
- Changes in taste (eg. metallic)
- Changes to blood pressure or pulse

## Significant side effects:

**Skin discolouration**

Women should be informed that intravenous iron may cause staining to the skin which although uncommon can be permanent. This can occur if there is extravasation (leakage of blood/fluid from the blood vessel into the surrounding tissue) which can be permanent. Incidence approximately 1 in 100.

**Anaphylaxis - ensure anaphylaxis kits are available when intravenous iron infusions are to take place.**
Treatment of anaphylaxis as per Trust Anaphylaxis guideline
http://nww.avon.nhs.uk/dms/download.aspx?did=21908

## After iv iron infusion

The absorption of oral iron is reduced when administered at the same time as iv iron preparations. Therefore, if required, oral iron therapy should not be started for at least 5 days after the last iv iron infusion. If full replacement dose given there is no need for oral iron supplementation. Reassess ferritin and Hb at 4 weeks post dose.

Prescribe once-daily oral iron supplementation (one tablet each day) to start five days after completion of parenteral iron and continue for three months.

Request the patient's GP to assess iron status at completion of treatment.

Do not repeat Ferritin levels before four weeks after the infusion as this will not have allowed adequate time for iron utilisation and erythropoiesis.

## Intrapartum Care

Women with iron deficiency anaemia with a Hb <100g/l should deliver in an obstetric led unit and have a recommended active management of the third stage.

Check most recent FBC on admission. If Hb <100g/l take blood for FBC and Group & Screen. Risk assess for PPH.

**If Hb < 100g/l on admission to delivery suite**

- Alert obstetric and anaesthetic teams.
- Offer active management of third stage
- Consider IV access (required if Hb<90 g/L)

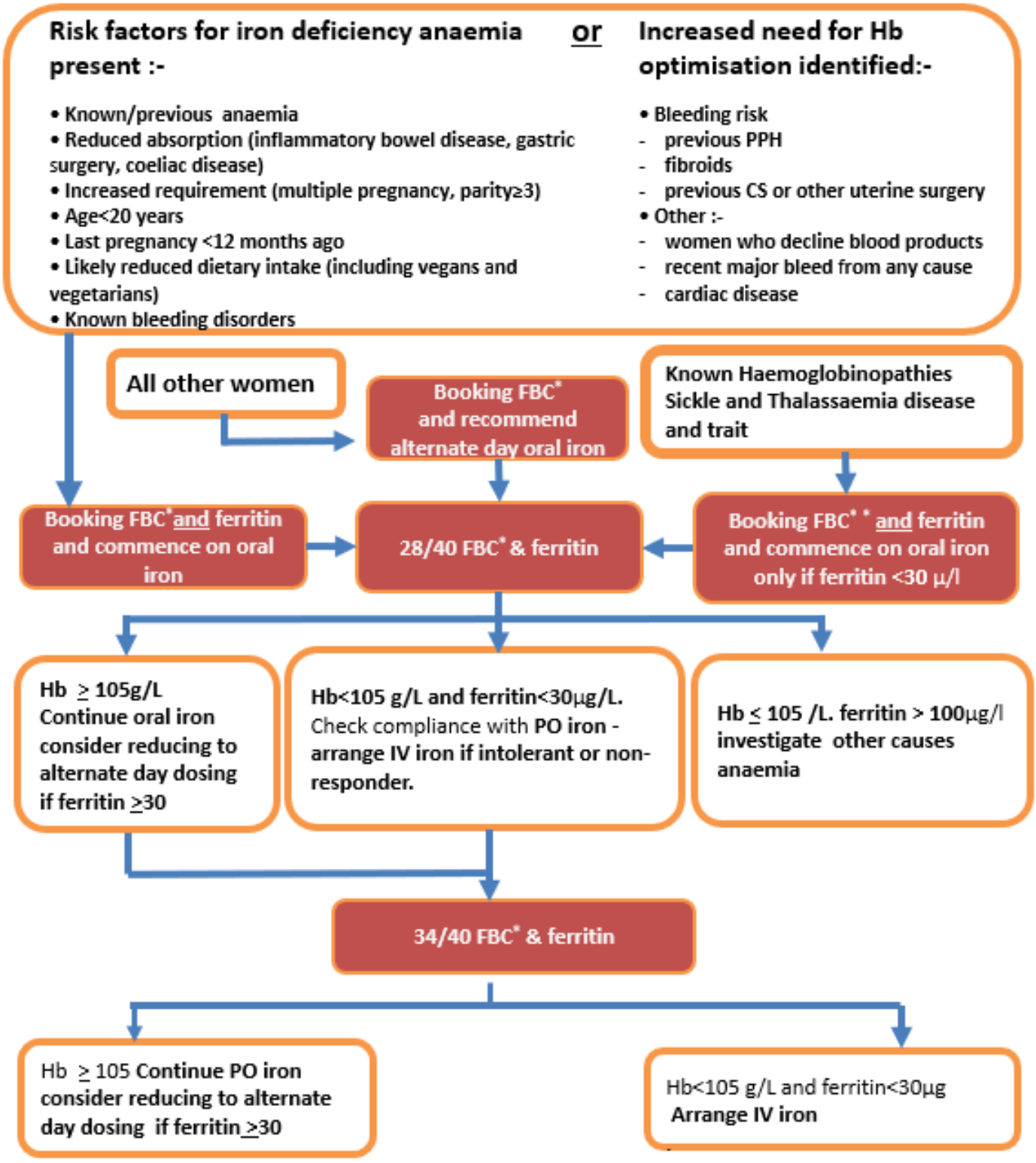
## Postnatal Management

- If Hb <100g/L offer oral iron supplementation for at least 6 weeks and ask GP to review at 6/52 postnatal check. Once daily or alternate day 40 – 80 mg elemental iron per day eg ferrous sulphate 200mg once daily.
- If Hb ≤ 90g/l offer intravenous supplementation
- **Blood transfusion** is only considered in severe cases of anaemia following discussion with the woman and the obstetric team. This should be based on careful evaluation considering oral and parenteral iron as alternatives. For women who are not actively bleeding blood transfusion is not usually recommended unless Hb is <70g/l. Women receiving red cell transfusion should be given full information regarding the indication for and risks of transfusion and alternatives. Consent should be sought and documented in the notes.

| | |
|---|---|
| **REFERENCES** | UK Guidelines on management of iron deficiency anaemia in Pregnancy. British Society for Haematology 2019 BSH Iron deficiency anaemia in pregnancy (last accessed 12/12/21)<br><br>A stain on iron therapy (last accessed 23/03/22) [Aust Prescr. 2020 Oct; 43(5): 160–163]. |
| **RELATED DOCUMENTS AND PAGES** | Patient information leaflet on iv iron<br>http://nww.avon.nhs.uk/dms/download.aspx?did=25568 |
| **AUTHORISING BODY** | Antenatal working party |
| **SAFETY** | Rare risk of anaphylaxis with iv iron – have anaphylaxis kit and resuscitation equipment available |
| **QUERIES AND CONTACT** | Antenatal Matron or Obstetric anaesthetic consultant bleep 3037 |

# Appendix 1

## Pathway 1 **antenatal iron pathway – discuss benefits of avoiding iron deficiency and anaemia with all women**




*Escalate to consultant obstetrician if Hb<90 g/L, **urgently** if symptomatic or Hb<80 g/L + check ferritin B12 and folate

## Appendix 2

| **Obstetrics and Gynaecology dose calculation for Ferinject®** | Name<br><br>Address |
|---|---|
| 1) **Document patient weight**<br>Obstetrics pre-pregnancy (or booking) weight, rounded up to nearest 5 kg<br>Gynae patient's current weight | …… kg |
| 2) **Calculate dose to be administered on first visit**<br>(see simplified Ferinject® Table 1) | …… mg*<br>*single dose of up to 20 mg/kg up to maximum in one visit of 1000 mg<br>*if greater than 1000mg may require second attendance |
| 3) **Prescribe on drug chart** | ☐<br>**NB maximum dose 20mg/kg or 1000mg at one time** |
| 4) **Infusion booked :** | ☐<br>Date: Time:<br>Location: |
| **Name of consultant:** | |
| **Patient information given** | ☐ |
| **Name:**<br>**Signature:** | **Date:**<br>**Designation:** |

## Appendix 3

# Obstetrics and Gynaecology Ferinject® dose calculation and infusion info (tables 1 and 2)

## Table 1. Ferinject® dose to be administered

| Haemoglobin g/l | Patients with body weight 35 - 70 kg | Patients with body weight ≥70 kg |
|---|---|---|
| <100 | 1500mg | 2000 mg |
| 100 to < 140 | 1000 mg | 1500mg |

- **The maximum dose given at one time should not exceed 20mg/kg up to a maximum of 1000mg at one visit**
- For doses > 1000mg give remainder of calculated dosage after 1 week -> do not administer > 1000mg per week)

- Body weight <35 kg: 500 mg should not be exceeded.
- Body weight >35kg but <50kg: The maximum dose given at one time must not exceed 20 mg/kg body weight.

## Table 2. Ferinject® Dilution and Infusion Rate

| Iron Dose * <br> * 1 mL of Ferinject® is equal to 50 mg of iron | # Maximum <br> **Amount of NaCl 0.9%** |
|---|---|
| ≥500 mg to 1000mg <br> (≥10 to 20 mls Ferinject®) | 100ml bag 0.9% sodium chloride <br> (maximum volume 250ml# ) |
| At St Michael's and Ashcombe 500mg or 1g Ferinject® to be given in 100ml NaCl <br> To run in (free flow) over 15-30 mins. | |
| # Note: for stability reasons Ferinject® dilution should not result in final concentration of less than 2 mg iron/mL <br> Ie volume of saline for given amount of iron could be less than shown in table above but not more | |

## Appendix 4

# Obstetrics and Gynaecology Administration of Ferinject ® Proforma

Name

Address

**Check for contraindications - seek senior review if yes to any below:**

| | |
|---|---|
| Previous allergy to ANY parenteral iron preparation | **yes** ☐ **no** ☐ |
| In first trimester | **yes** ☐ **no** ☐ |
| < 7 days since previous iron infusion | **yes** ☐ **no** ☐ |
| Current acute infection | **yes** ☐ **no** ☐ |
| Abnormal liver function | **yes** ☐ **no** ☐ |

**Administration Record** (detailed information for Ferinject ® administration available appendix 5)

Record baseline observations (T/P/BP):-

| | |
|---|---|
| Ensure resuscitation and anaphylaxis equipment available<br>Confirm patient information leaflet information reviewed<br>Confirm aware of rare risk of skin discolouration which can be permanent | ☐<br>☐<br>☐ |
| Pre administration cannula site check :<br>Cannula flushes easily(5-10ml sodium chloride 0.9%) -> no signs extravasation | ☐ |

Prepare and administer infusion at prescribed rate (see table 2)

**If any signs of anaphylaxis follow Resus Council algorithm and call obstetric emergency team 2222**

**If any signs of extravasation discontinue infusion immediately and call for obstetric review***

| | |
|---|---|
| **Post administration cannula site check performed:-** | ☐ |
| signs extravasation/discolouration: | **yes** ☐ **no** ☐ |

Post administration observations (T/P/BP):-

Location and date for repeat bloods to be taken* :

*4 weeks post dose (or post second dose if receiving >1000mg) check Hb and ferritin community midwife or Gynae Pre op team to review results

| | |
|---|---|
| Name and signature: | Date:<br>Designation: |

# Appendix 5

## Obstetrics and Gynaecology Administration of Ferinject®

1. **Equipment required:**
   - IV cannulation equipment
   - Syringe and sterile sodium chloride 0.9% 10 ml ampoule (for flush)
   - Needles for drawing up
   - Ferinject® available ampoule sizes: 20 mL (1000 mg iron)<br>10 mL (500 mg iron)<br>2 mL (100 mg iron)
   - 100 mL or 250 mL bags of sterile sodium chloride 0.9%
   - Administration of Ferinject® Proforma
   - Anaphylaxis and ALS equipment available

2. **Admission Procedure**
   - Check Ferinject® dose (documented on form appendix 3)
   - Check doctor or nurse prescriber has prescribed calculated dose on drug chart
   - Check for any contraindications and request senior review if any present
   - Document baseline observations:- blood pressure, pulse rate, temperature and respiratory rate
   - Check availability of resuscitation equipment (including anaphylaxis box)

3. **Administration**
   - Insert intravenous cannula
   - Flush cannula with 5 - 10 mls sodium chloride 0.9% to ensure correctly sited.
     - **NB Paravenous leakage of Ferinject® causes skin staining and the cannula should be re-sited if it does not flush easily**
   - Dilute the prescribed dose of Ferinject® in sodium chloride 0.9% and calculate rate of infusion as per Appendix 4 Table 2 Ferinject Tables
   - A test dose is **NOT** required
   - Patient should be observed for signs of any adverse reactions.
     - **If any signs of anaphylaxis stop infusion, follow Resus Council algorithm and call obstetric emergency team 2222**
     - **If any signs extravasation occurs at the injection site during intravenous administration, resulting in brown discolouration and irritation of the skin stop the infusion immediately and call for medical review**
   - Flush cannula with 5-10ml sodium chloride before removal
   - Document post administration observations and cannula site check

4. **Discharge**
   - Patient can leave 15 minutes after infusion completed. If ante natal no foetal monitoring is required unless any adverse reactions noted.
   - **Obstetrics**. Arrange with the community midwife for a Hb and ferritin check 4 weeks after total calculated dose administered.
   - **Gynae** arrange check Hb and ferritin 4 weeks after total dose administered
   - File the 'Ferinject® Administration Proforma' in the patient's handheld pregnancy health record or EVOLVE record
   - If further infusion required to complete calculated dose (NB only 1000 mg can be given at one visit) it can be booked 7 days after initial dose