Aneurin Bevan University Health Board

Management of Iron Deficiency Anaemia in Pregnancy

N.B. Staff should be discouraged from printing this document. This is to avoid the risk of out-of-date printed versions of the document. The Intranet should be referred to for the current version of the document.

Status: Issue 4 Rev 1 | Issue date: 09-02-2023
Approved by: Maternity Clinical Effectiveness Forum | Review by date: 09-02-2026
Owner: Maternity Services | ABUHB/F&T/0625

Contents:

Introduction

This document is a clinical guideline designed to support safe and effective practice.

Scope of guideline

This policy applies to all members of staff including midwives, Obstetric medical staff and nursing staff on the early pregnancy assessment unit and gynaecology ward.

This guideline is cross referenced to Standard for Healthcare Services 7

Aims

To provide support for clinical decision making

Objectives

The objective of this document is to ensure consistent high quality care

Roles and Responsibilities

The Gynaecology and maternity staff are responsible for the execution of this guideline.

Training

Staff is expected to access appropriate training where provided. Training needs will be identified through appraisal and clinical supervision. Training compliance is recorded within the directorate.

APPENDIX 1 MANAGEMENT OF ANAEMIA IN PREGNANCY

1. BACKGROUND

- Anaemia is defined as Hb value less than 2 standard deviations below the mean value for a healthy matched population.

  The definition of anaemia in pregnancy is Hb levels of:
- <110g/l in the first trimester
- <105 g/l in the second and third trimesters
- <100 g/l in the postpartum period.
  (British Committee for Standards in Haematology 2011)

- Anaemia is the commonest medical disorder in pregnancy. Pregnancy causes 2-3-fold increase requirement of Iron and 10-20 fold increase in requirement in folate.

- Iron deficiency is the commonest cause of anaemia in pregnancy. It causes maternal morbidity by increased susceptibility to infections, poor work capacity and performance and disturbances of postpartum cognition and emotions. It is associated with poor foetal iron stores, developmental disorders and has possible links with autism and schizophrenia in the child's later life. Low iron levels increase the risk of low birth weight, preterm birth and postpartum haemorrhage.

- Where iron supplementation is not effective alternative causes of anaemia should be considered including: B12 or folate deficiency, thalassemia, inflammatory disorders, haemolysis and blood loss.

2. CLINICAL FEATURES

- Anaemia in pregnancy is often asymptomatic and may be diagnosed on routine screening.

- Women may present with tiredness, dizziness, fainting irritability, poor concentration and lethargy and in these circumstances, haemoglobin should be tested.

- Storage iron is depleted before a fall in Hb and as iron is an essential element in all cells, symptoms of iron deficiency may occur even without anaemia: These include fatigue, irritability, poor concentration and hair loss.

- Signs of anaemia **can** occur in the absence of a low Hb. In this instance it would be diagnosed by a full blood count with a reduced MCV (Mean Cell Volume) and MCHC (Mean Corpuscular Haemaglobin Concentration).

3. SCREENING

- Full blood count should be assessed at booking and at 28 weeks.

- Intrapartum blood loss of more than 10%, haemoglobin level should be checked within 48 hours.

- Pregnant women should be assessed for their risk of having or developing iron deficiency, and for their risk of any anaemia or blood loss causing significant harm.

- Some pregnant women are at higher risk of iron deficiency and should be treated empirically with oral iron:
  - vegan/vegetarian diet
  - teenagers
  - prior existing anaemia
  - multiple pregnancy
  - pregnancy interval <12 months
  - > para 3
  - recent clinically significant bleeding

- Some women are at increased risk should anaemia occur and should have ferritin levels tested even in the absence of a low haemoglobin so that they can be optimally managed before anaemia occurs:
  - Jehovah witnesses
  - Women at increased risk of obstetric bleeding
  - Women with complex blood compatibilities
-

4. DIAGNOSIS

- Iron deficiency anaemia presents with low Hb, reduced MCV and MCHC.

- Serum ferritin should be routinely checked first with patients with haemoglobinopathy.

- Serum ferritin is the most useful and easily available parameter for assessing iron deficiency. They are a measure of longer-term iron

levels and are not influenced by recent ingestion of iron Levels below 15 µ/l are diagnostic of established iron deficiency. A level below 30 µ/l in pregnancy should prompt treatment because pregnancy can falsely elevate the reading.

- Women with a normal Hb but a low MCV should have their ferritin checked and if ferritin is <30µ/l, oral iron should be commenced.

5. TREATMENT (SEE FLOW CHART)

A trial of oral iron should be considered as the first line for anaemia, providing haemoglobinopathy has been excluded. An increase in Hb must be demonstrated at 2 weeks, otherwise further tests are required.

6. DIETARY ADVICE

- All women should be counselled regarding diet in pregnancy including detail of iron rich foods sources and factors that might inhibit or promote iron absorption.

- Foods rich in iron such as red meat, fish, poultry.

Factors Influencing the Absorption of Iron

Factors that **inhibit** iron absorption	Factors that **enhance** iron absorption
Foods rich in calcium	Haem iron
Tannins in tea	Ferrous iron
Phytates in cereals	Ascorbic Acid

7. ORAL IRON

- Dietary changes alone are insufficient to correct establish iron deficiency and iron supplements are necessary.
- Ferrous iron salts are the preparation of choice.

- **Our first line treatment is Ferrous Sulphate 200mg once daily.**
- 40-80mg of elemental iron is the maximum amount that can be absorbed daily. The absorption of iron in the GI tract causes further inhibition of iron absorption for 24 hours. Therefore, giving iron more frequently or at greater dose only increases side effects and does not improve anaemia.
-

Dose and elemental iron content per tablet

Preparation	Dose per tablet	Elemental iron
Ferrous Fumerate	210mg	68mg
Ferrous Gluconate	300mg	35mg
Ferrous Sulphate	200mg	65mg
Pregaday		100mg

- Women should be counselled how to take oral iron supplements correctly. To maximise absorption iron should be taken in the morning, on an empty stomach, 1 hour before meals, with a source of vitamin C such as orange juice to maximise absorption. Other medications or antacids should not be taken at the same time.

- If the ferritin is <30µ - 200mg ferrous sulphate should be offered once daily.

- For women who experience side effects a preparation with a low elemental iron level should be trialled.

8. FOLLOW UP

- Repeat Hb is required 2 weeks after commencing treatment for established anaemia, to assess response to treatment and ensure compliance and correct administration.

- Once the Hb is in the normal range, replacement should continue for three months and at least 6 weeks postpartum to replenish iron stores.

- If response to oral iron replacement is poor, concomitant causes which may be contributing to the anaemia, such as folate deficiency or anaemia of chronic disease need to be excluded. Consultant referral is required.

- Postnatal women with a Hb <100g/l should be offered Ferrous Sulphate 200mg once daily for 3 months and be offered a repeat FBC and ferritin to ensure Hb normalises, and iron stores are replete.

9. PARENTERAL IRON THERAPY

- Parenteral iron should be considered from the second trimester onwards and during the third trimester in women with confirmed iron deficiency who fail to respond or are intolerant of oral iron.

- Consider Ferinject if Hb at 36weeks <=105g/dl and planned operative delivery/ risk of PPH.'

- Consider parenteral iron therapy if Haemoglobin level is less than 80g/l.

- The dose of parenteral iron should be calculated on pre-pregnancy weight, aiming for a target Hb of 110g/l.

- See Ferinject guideline.

- Blood transfusion should be avoided in women with Hb >70g/l, consider parenteral iron.

10. CARE IN LABOUR

- Women with a Hb<85g/l are regarded as high risk and should be advised to deliver on the obstetric led unit.

- On admission in labour, IV access should be obtained and bloods taken for FBC and G&S.

- Active management of the third stage of labour is advised.

- Use cell saver if having a caesarean section.

11. REFERENCES

1. **Ramsey M, James D, Steer P, et al.** Normal values in pregnancy. *2nd ed. London: WB Saunders 2000*

2. Pavord S et al. UK guidelines on the management of iron deficiency anaemia in pregnancy.

3. *British Journal of Haemotology 2020; 188 (6).* **https://doi.org/10.1111/bjh.16221**

4. **Beard JL, Hendricks MK, Perez EM, Murray-Kolb LE, Berg A, Vernon-Feagans L, Irlam J, Isaacs W, Sive A, Tomlinson M.** Maternal iron deficiency anemia affects postpartum emotions and cognition. *Journal of Nutrition 2005; 135:267-272.*

5. **Breymann C.** Iron supplementation during pregnancy. Fetal and Maternal Medicine Review 2002; 13:1–29.

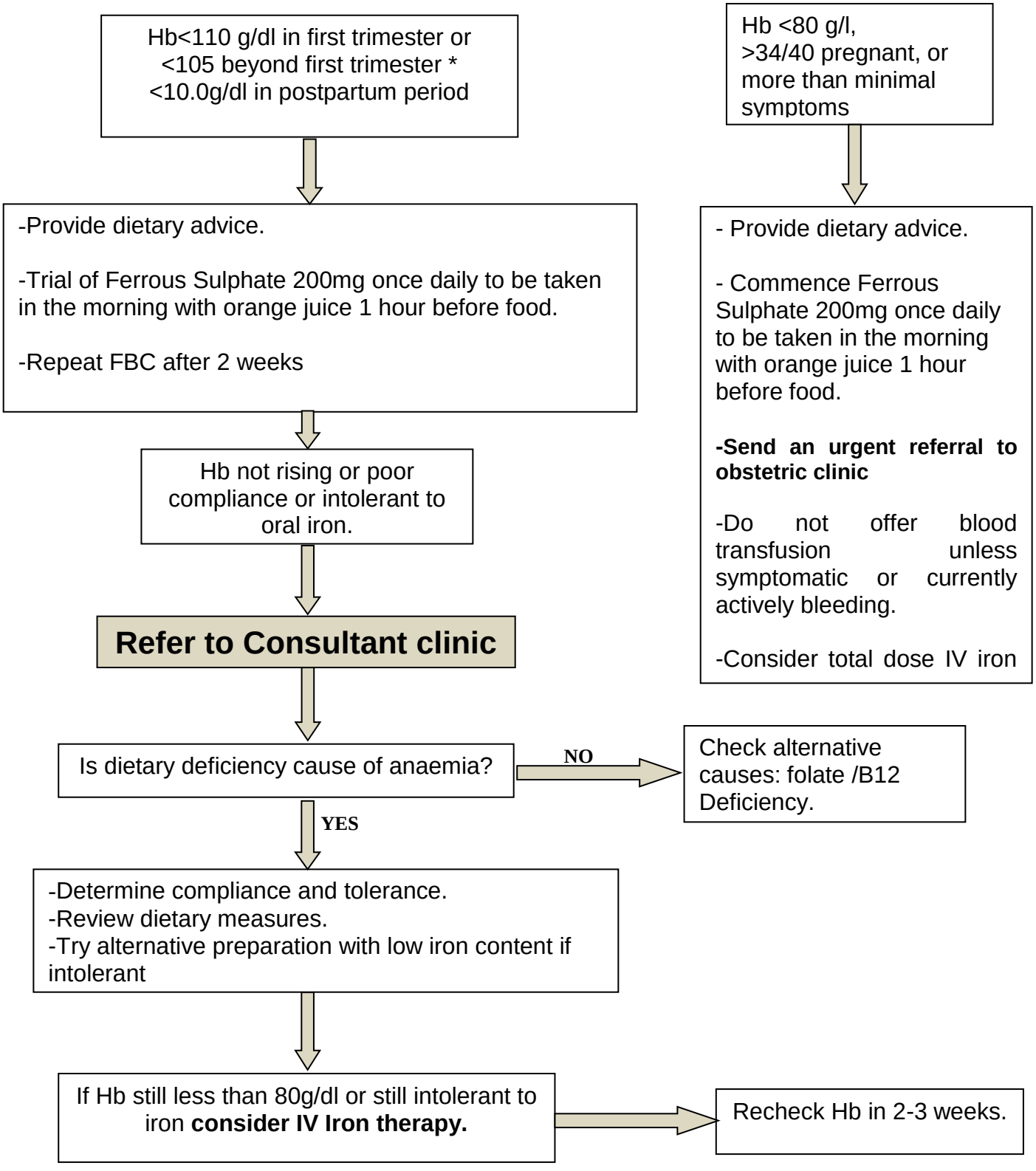
6. **Royal College of Obstetricians and Gynaecologists.** Blood Transfusions in Obstetrics. *RCOG Green-top guideline 47 2015.*

7. The Obstetric Haematology Manual, 2010

8. South West RTC Management of Anaemia in Pregnancy, April 2014

9. ANAEMIA IN PREGNANCY FLOW CHART

(Check Hb at booking and at 28 weeks)



Ferinject® (ferric carboxymaltose) administration guideline for elective LSCS and perinatal anaemia

Indications

- **Persistent iron deficiency anaemia following failed treatment with oral iron**
- **Severe perinatal anaemia (Hb ≤ 80g/l)**
- **Antenatal anaemia (Hb ≤ 105g/l) prior to elective LSCS**

Contraindications

- **Previous reaction to intravenous iron**
- **1st trimester of pregnancy**
- **Anaemia of alternative cause – i.e. B12 deficiency, Thalassaemia (measure haematinics)**
- **Cirrhosis or evidence of 'iron overload' i.e. porphyria cutanea tarda, haemochromatosis**

- Give patient information leaflet
- Take observations – temperature, pulse, blood pressure, O2 SATs
- Insert intravenous cannula and flush with NaCl 0.9%
- Prescribe Ferinject®
- **Max 1000mg per week** (patients must return to complete their course)
- **Do not** dilute to less than 2mg/ml

< 70kg
1500mg

Hb ≤105g/l AND weight <70kg

- 1000mg Ferinject® diluted in 250ml NaCl 0.9%
- Infuse over **at least** 15 minutes
- **One week later**, dilute 500mg Ferinject® in 100ml NaCL 0.9%
- Infuse over **at least** 6 minutes

>70kg
2000mg

Hb ≤ 105g/l AND weight > 70kg

- 1000mg Ferinject® diluted in 250ml NaCl 0.9%
- Infuse over **at least** 15 minutes
- **Repeat** after one week

After the infusion:

- Monitor Observations every 15 minutes
- Ensure patient is monitored for 30 minutes after infusion for signs of delayed hypersensitivity
- No oral iron should be taken following treatment with IV iron

Stop infusion immediately if:

- signs of cannula leak (call for assistance)
- signs of hypersensitivity – rash, wheeze, tachycardia, falling BP < 90/40mmHg (call 2222) declaring peri-arrest)

Ferinject® is a Ferric Carboxymaltose infusion, which can be used as second line treatment when oral iron therapy is deemed inappropriate or has failed. This may be due to malabsorption, poor tolerance, unacceptable side effects or where there is a need to correct iron deficiency and ensuing anaemia urgently

ON ADMISSION FOR INFUSION

- Once the decision has been made to administer Ferinject discuss with DAU for date and time of infusion
- Parameters needed are booking weight, height, current Hb and target Hb.
- Perform and record maternal observations pulse, BP & RR and fetal heart with pinnard/sonicaid)

Perform and record maternal observations BP pulse and RR and fetal heart with pinnard or sonicaid post infusion

Observe for effects for 30 minutes

COMPLICATIONS

- Anaphylaxis
- Hypotension – ensure that BP does not drop significantly. Stop infusion and contact senior staff if significant.
- Risk of skin staining stop infusion

ANAPHYLAXIS: (STOP infusion)

- Call for senior help (staff to fast bleep anaesthetist & obstetric registrar)
- ABC
- Give IM adrenaline 0.5ml 1:1,000 and repeat if necessary
- Cardiac Arrest dial 2222

If Mild Reaction:

- STOP infusion. DO NOT restart
- 200mg IV hydrocortisone
- Discuss further management with registrar / Consultant

Avoid Use

Patients should be advised not to use the oral Iron 24 hours pre infusion and 5 days post infusion.

Reference

www.emimedicine.com
www.resus.org.uk

Resuscitation Council (UK)

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 [1]
- And usually skin changes

- **Call for help**
- Lie patient flat
- Raise patient's legs

Adrenaline [2]

When skills and equipment available:
- Establish airway
- High flow oxygen
- IV fluid challenge [3]
- Chlorphenamine [4]
- Hydrocortisone [5]

Monitor:
- Pulse oximetry
- ECG
- Blood pressure

1 Life-threatening problems:

Airway:	swelling, hoarseness, stridor
Breathing:	rapid breathing, wheeze, fatigue, cyanosis, SpO_2 < 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)	5 Hydrocortisone (IM or slow IV)
Adult or child more than 12 years	10 mg	200 mg
Child 6 - 12 years	5 mg	100 mg
Child 6 months to 6 years	2.5 mg	50 mg
Child less than 6 months	250 micrograms/kg	25 mg

March 2008

5th Floor, Tavistock House North, Tavistock Square, London WC1H 9HR
Telephone (020) 7388-4678 • Fax (020) 7383-0773 • Email enquiries@resus.org.uk
www.resus.org.uk • Registered Charity No. 286360

Ferinject - Information for patients

Ferinject is a medicine we use to boost your iron levels. It is given by injection or through a drip into the vein. It boosts your body's own production of red blood cells over time, and therefore does not carry some of the *rare* risks associated with a blood transfusion (such as infection).

Certain situations can cause your haemoglobin levels or 'blood count' to drop.

- Increased iron requirement of pregnancy
- Blood loss associated with delivery of your baby.

A low blood count (anaemia) can have detrimental effects on the health of you and your baby and increase your chances of needing a blood transfusion during or after delivery.

We recommend Ferinject if:

- You are pregnant, blood tests show that you are anaemic (< 105g/l) *and*
  - you have either not responded to oral iron *or*
  - have insufficient time for the oral iron course (your delivery date is soon) *or*
  - you have decided you do *not* want to have a blood transfusion should you bleed during the delivery of your baby e.g. Jehovah's Witness.

- You have a significant anaemia (low blood count) following the delivery of your baby.

Safety

Ferinject is considered safe after the first three months of pregnancy (first trimester), and after you have delivered your baby.
Because only very tiny quantities pass into the breast milk, it is safe to breast feed.

A rare, but permanent complication can be skin staining or discoloration – which happens if some of the drug leaks out of the vein during the infusion. To reduce this risk, the cannula (plastic straw) put into your vein is first flushed with saline (salt solution) to check it is working well.

Tell the person giving the medicine immediately if you experience any burning, discomfort or swelling at the site of the injection / cannula or in the arm itself.

Side Effects

Common (may affect up to 1 in 10 people)

- Headache, dizziness, raised blood pressure, hot flushing, nausea and injection site reactions.
- Transient lowering of blood phosphate levels

Uncommon (may affect up to 1 in 100 people)

- Sensitive skin and numbness, fast heart rate, low blood pressure, difficulty breathing, taste disturbances, vomiting, indigestion, wind, abdominal pains, constipation, hives, redness, rash, aches and pains, fever, fluid accumulation brown discoloration of the skin.

Rare (may affect up to 1 in 1000 people)

- Allergic reactions, shivering, feeling unwell, loss of consciousness

Procedure

We can give Ferinject in DAU/ triage, on the obstetric wards and delivery suite.
Your midwife will first check your observations (blood pressure, pulse, temperature), and a cannula will be inserted into a vein - usually in your arm or the back of your hand.

Your observations will be checked afterwards and if feeling well, you can go home once the cannula has been removed – 30 minutes after the infusion has finished.

We will check your haemoglobin levels again after about 2 weeks. Some people need a further dose if still pregnant.

Cautions and contraindications

You should not receive Ferinject if:

- you have an anaemia caused by other deficiencies (e.g. folate or B12 deficiency)
- you have previously been told you have 'iron overload'
- you have had a previous allergic reaction to iron
- you have liver cirrhosis or hepatitis

Do not take oral iron tablets after receiving Ferinject

Questions

If you have any questions please contact your midwife, who will be able to arrange discussion with the doctors looking after you.

FERINJECT CONSENT FORM

Your doctor has recommended that you receive a Ferinject infusion because your blood test shows that you are anaemic (lack of iron in the blood). Ferinject is used where you have not responded to iron tablets, or the iron tablets made you feel unwell. You may have one or more infusions depending on your iron levels.

Ferinject (also known as Ferric Carboxymaltose) is an iron preparation that is mixed with sodium chloride and given intravenously. It is given both antenatally and postnatally. As with all medications, there are possible side effects. Common side effects (affecting 1 in 10 people) may include headache, dizziness, feeling hot, high blood pressure and nausea. Uncommon side effects (affecting 1 in 100 people) may include numbness, tingling skin, high heart rate, low blood pressure, vomiting, stomach pain, itching, skin rash and muscle pain. Very rarely someone may experience feeling faint, loss of consciousness, swelling of the face, mouth and throat and difficulty breathing. This is known as anaphylaxis and is thought to affect 1 in 1000 people.

Despite our best efforts, Ferinject can sometimes leak into the surrounding area of your vein, this can cause irritation of the skin and potentially long-lasting brown discolouration at the site of administration. It is very important to let your midwife know if you feel any pain or discomfort during the infusion.

With your consent, a midwife or doctor will insert a cannula into your arm or hand so that you can receive this medication. Your midwife will take your observations and listen to your baby (if you are pregnant) before starting your infusion. The infusion can take anywhere between 6-15mins depending on the dose of Ferinject you have been prescribed. Your midwife will also monitor the cannula site for any signs of complications.

I …….. consent to a Ferinject infusion after reading the information provided above.

Signature ……

Date …… Doctors Signature ……..

Please place this consent form into patient's case notes.

Can I help myself?

There are several things you can do to help yourself. These include:

A good balanced diet is essential to make sure you receive enough iron. Foods high in easily absorbed iron are red meat, fish, and poultry. For vegetarians, lentils, fortified cereals and green leafy vegetables eg spinach are all good sources. Vitamin C helps absorption but other foods and drinks may reduce absorption; tea, coffee and calcium containing foods (milk and dairy products). To give you the best chance of absorbing iron, we recommend you try and avoid these at the time of taking iron tablets

Talk to your doctor, or midwife if you think you have any of the symptoms of anaemia listed in this leaflet

Always discuss any alternative medicine, herbal preparation or over the counter treatments for anaemia with a healthcare professional before taking them.

Antenatal anaemia - the facts for expectant mothers

ABUHB

Drs Daniel Helme and Ellie Morgan

GIG CYMRU NHS WALES
Bwrdd Iechyd Prifysgol Aneurin Bevan University Health Board

What is Anaemia in pregnancy?

- Anaemia is either not having enough Haemoglobin (in red blood cells) to take oxygen around the body, or having red blood cells that don't work properly.
- Haemoglobin levels normally drop in pregnancy, below a certain level is defined as anaemia.
- The commonest cause of anaemia is iron deficiency due increased iron requirements of pregnancy
- If you have any of the following risk factors, we recommend a ferritin blood test to check your iron stores
    - Previous anaemia or bleeding history
    - 3 or more children
    - Twin pregnancy
    - Recent pregnancy (within 1 year)
    - Vegetarian or vegan diet
    - If you are less than 18yrs old

Why is it a problem?

Anaemia in pregnancy can cause:

Mother

- Heavy bleeding after delivery
- Need for blood transfusion
- Susceptibility to infection
- Impaired work capacity
- Emotional disturbance

Baby

- Premature delivery
- Low birth-weight
- Developmental problems.

How can it be measured?

A simple blood test can determine whether you are anaemic

What are the signs and symptoms of anaemia?

- Weakness
- Shortness of breath
- Dizziness
- Fast or irregular heartbeat
- Pounding or "whooshing" in your ears
- Headache
- Cold hands or feet
- Pale or yellow skin
- Chest pain
- Poor concentration
- Restless leg syndrome

What treatments are available?

The mainstay of treatment in pregnancy is oral iron tablets.

They should be taken on an empty stomach with a source of vitamin C (orange juice) to improve absorption.

It is very important that if you are prescribed iron tablets but are not able to tolerate them, you inform your midwife or doctor.

If you have a very low blood count or cannot tolerate oral tablets iron can be given in the form of an intravenous infusion (through a drip).