Anaemia during Pregnancy

Summary statement: How does the document support patient care?	By providing evidence based guidance for Obstetric, Midwifery and Haematology staff on the parameters and treatment for anaemia during pregnancy and the postnatal period.
Staff/stakeholders involved in development:	Labour Ward Leads (Obstetric and Midwifery), Anaesthetists, Senior midwives, Haematology Consultants, Pharmacy
Division:	Women and Children's
Department:	Maternity
Responsible Person:	Chief of Service
Author:	CE Team & Specialist Midwife
For use by:	Midwives, Obstetricians, Haematology staff and General Practitioners
Purpose:	To provide evidence based guidance for staff when caring for women and people with anaemia during pregnancy and the postnatal period.
This document supports:	NICE: Antenatal Care for uncomplicated pregnancies CG 62 (2019) British Committee for Standards in Haematology (2019)
Key related documents:	**UH Sussex Maternity SRH&WH guidelines:** Antenatal Care and Patient Information, Antepartum & Intrapartum Haemorrhage, Postpartum Haemorrhage **UH Sussex Maternity PRH&RSCH guidelines:** Obstetric heamorrhage, Provison and schedule of antenatal care
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If you require this document in another format such as Braille, large print, audio or another language please contact the Trusts Communications Team	
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Version	Date	Author	Status	Comment
1.0	October 2023	CE Team (SRH&WH) H.Woods, Specialist Lead Midwife SMMC	Live	New UH Sussex Maternity guideline adapted from CG12025 Anaemia in Pregnancy Guideline (legacy West).

The interpretation and application of clinical guidelines will remain the responsibility of the individual clinician.
If in doubt contact a senior colleague or expert.

Contents

Anaemia during Pregnancy

1.0 Aim

To provide evidence based and up to date guidance for healthcare professionals in the diagnosis and treatment of anaemia during pregnancy and in the postnatal period. This guidance also covers guidance for pregnant women and people who are at risk of becoming iron deficient, or who are non-anaemic with iron deficiency. Iron deficiency anaemia has been linked to poor maternal and fetal outcomes.

2.0 Scope

This guideline applies to:

- Midwives
- Obstetricians
- General Practitioners

3.0 Introduction

Anaemia is defined as a low haemoglobin (Hb) concentration. The lower limit of current reference range is two standard deviations below the mean in a healthy population (WHO, 2015). The definitions in pregnancy are:

- ▶ Hb <110 g/l in the first trimester
- ▶ Hb <105 g/l in second and third trimester
- ▶ Hb <100 g/l postpartum.

Prevalence

- Iron deficiency is the most common cause of anaemia in pregnancy.
- Globally, iron deficiency is the most common nutritional deficiency and is the leading cause of anaemia. An estimated 40% of women and people worldwide are anaemic (WHO, 2015).
- In the UK Nair et al conducted a retrospective cohort analysis of 14,001 women and people with singleton pregnancies >24 weeks at Guy's and St Thomas and Wolverhampton hospitals between 2013 and 2015. They found that **46% of women and people had anaemia at some point during their pregnancy** (Nair et al., 2015).

4.0 Abbreviations used in this guideline

BJH - British Journal of Haematology	**EBL -** Estimated blood loss
FBC - Full blood count	**Fe -** Iron
GI - Gastrointestinal	**Hb -** Haemoglobin
HSR - Hypersensitivity reaction	**TIBC -** Total iron-binding capacity

IM - Intra Muscular	**IOL -** Induction of labour
IV - Intravenous	**MCH -** Mean corpuscular haemoglobin
MCHC - Mean corpuscular haemoglobin concentration	**MCV -** Mean cell volume
MEOWS - Modified Early Obstetric Warning Score	**MET -** Medical emergency team
OD - Once a day	**PPH -** Postpartum Haemorrhage
PO - By mouth	**RBC -** Red Blood Cells
RDA - Recommended daily amount	**SLE -** Systemic Lupus Erythematosus
IBW - Ideal birth weight	**MIS -** Maternity Information System eg Badgernet

5.0 Responsibilities

Midwives & obstetricians have a responsibility to:

- To access, read, understand and follow this guidance.
- To use their professional judgement in application of this guideline.

Management have a responsibility to:

- To ensure the guideline is reviewed as required in line with Trust and National recommendations.
- To ensure the guideline is accessible to all relevant staff.

6.0 Background

6.1 Causes of anaemia in pregnancy

Iron Deficiency

The most common cause of anaemia during pregnancy is deficiency of iron. In iron depletion, the body's stored iron is reduced and individuals are at greater risk of anaemia in situations of increased demand, such as pregnancy. Iron utilisation is significantly increased during pregnancy, as iron is required for fetal growth and development and for maternal and birthing parent erythropoiesis. Iron deficiency, with or without anaemia, can cause maternal and birthing parent fatigue. Anaemia is also associated with poorer maternal and birthing parent and perinatal outcomes including preterm birth, small for gestational age neonates, perinatal death, maternal and birthing parent postpartum haemorrhage (PPH) and need for blood transfusion.

Other cause of anaemia

Less common causes of anaemia include vitamin B12 and folate deficiency, the presence of a variant haemoglobin or thalassaemia, inflammatory disorders such as Crohn’s or ulcerative

colitis, malabsorption, haemolysis and blood loss. If there are uncertainties seek medical advice.

B12 related anaemia

In the young maternal and birthing parent population with a reasonably normal diet this is an unlikely cause of anaemia. Serum B12 levels are physiologically reduced in pregnancy (table below) and confirming significant deficiency is not reliably possible in pregnancy (BJH). Senior medical advice should be sought if there are particular reasons why B12 anaemia might be present (other red blood cell changes (macrocytosis), previous gastric surgery or conditions influencing normal gastric secretion and absorption and ileal small bowel disease).

Advice from the British Journal of haematology concludes that during pregnancy, in the presence of a strong suspicion of underlying deficiency, a short course of empirical hydroxocobalamin should be given, with further investigations post-partum – either one intramuscular 1 mg hydroxocobalamin or oral cyanocobalamin 50-150 micrograms daily.

Vitamin B12 , cobalamin (serum)				
Units	**Non-pregnant Adult**	**First Trimester**	**Second Trimester**	**Third Trimester**
ng/L	279 - 966	118 - 438	130 - 656	99 – 526
pmol/L	206 - 713	87 - 323	96 - 484	73 – 388

6.2 Clinical signs and symptoms

Anaemia may be asymptomatic, and therefore only diagnosed at routine screening. The signs and symptoms of anaemia are non-specific. However, fatigue is the most common symptom reported by patients. Other symptoms include dizziness, syncope, palpitations, shortness of breath and headaches. These symptoms may occur even in women and people with low Fe (iron) stores but as yet normal Hb.

6.3 Consequences of anaemia

Maternal and birthing parent anaemia has been associated with a significantly higher risk of perinatal and neonatal mortality, low birth weight and pre-term birth, and maternal and birthing parent morbidity and mortality.

7.0 Diagnosis

7.1 Screening

All women and people are recommended to have a FBC taken at booking and 28 weeks, to screen for anaemia. If a woman and person is found to be anaemic at screening they should be started on oral iron, this is helpful for both diagnosis and management. A rise in Hb should be seen after 2-3 weeks when it should be rechecked: this supports the diagnosis of iron deficiency.

Anaemia in pregnancy is diagnosed if:

- Hb <110 g/l in the first trimester
- Hb <105 g/l in second and third trimester

7.2 Haemoglobinopathy

Women and people with a known haemoglobinopathy should have a serum ferritin taken to identify concomitant iron deficiency and exclude iron loading states. In these patients oral iron should not be started without a ferritin result and they should be referred to the maternal medicine consultant. Anaemia can be 'normal' for people with haemoglobinopathies.

7.3 Non-anaemic women and people at risk of iron deficiency

At booking women and people who are at high risk for iron deficiency should be identified. The British Haematology Society gives guidance on the management of women and people at risk of iron deficiency. Their advice states that this group of women and people should be started on a prophylactic dose of iron empirically or have serum ferritin checked first and iron replaced if ferritin <30 even if Hb is in normal range (Pavord et al., 2020). This should be with oral Iron.

Ferritin of <30 is indicative of iron deficiency.

Risks of iron deficiency include:

- Previous anaemia
- Multiparity > or equal to 3
- Twin pregnancy
- <1 year since last pregnancy
- Poor diet
- Vegetarian/vegan diet
- Pregnant teenagers
- Recent history of significant bleeding
- Declines blood products
- Previous bariatric surgery

Non-anaemic women and people where serum ferritin analysis may be necessary:

- High risk of bleeding during pregnancy or at birth.
- Women and people declining blood products, such as Jehovah's Witnesses.
- Women and people for whom providing compatible blood is challenging.

7.4 Laboratory testing

Red cell indices

A low Hb, mean cell volume (MCV), mean cell haemoglobin (MCH) and mean cell haemoglobin concentration (MCHC) are suggestive of iron deficiency, but need to be interpreted with caution in view of the physiological increase of MCV in pregnancy, of around 6 fl (Chanarin *et al*, **1977**). Microcytic, hypochromic indices may also occur in haemoglobinopathies.

Ferritin <30

A low ferritin (<30) despite having a normal Hb is diagnostic of iron deficiency. These women and people should be started on oral iron. However if the woman and person is symptomatic they may be considered for an iron infusion as first line. These patients should be discussed with a consultant if any concerns. Beware that a normal ferritin level does not exclude iron deficiency because it is an acute phase protein which can be raised in pregnancy. Unselected routine screening with ferritin is not recommended.

Other biomarkers

Transferrin saturation, serum Fe, TIBC etc. have not been formally evaluated in pregnancy and should not be used therefore do not request.

8.0 Management of iron deficiency in pregnancy

8.1 Dietary Advice

All women and people should receive dietary advice at their booking appointment. In pregnancy the physiological iron requirements increase from 1-2 mg to 6 mg per day, with increasing demand as pregnancy progresses. The recommended daily intake (RDA) of iron in pregnancy is 27 mg (twice that of a non-pregnant woman and person). Once a woman and person becomes iron-deficient it is not possible to ensure that repletion is through diet alone and oral supplementation is needed.

Iron Rich Foods include:

- Meat
- Nuts

- Beans
- Dried fruit
- Wholegrain foods
- Fortified breakfast cereals
- Soybean flour
- Most dark green leafy vegetables

Reducing tea and coffee intake can also help to improve iron levels. Over the counter iron supplements are not sufficient once iron deficiency has occurred.

8.2 Oral Iron Replacement

If anaemia is diagnosed, oral iron replacement therapy should be recommended:

Recommended dose of oral Iron:

200mg Ferrous sulphate / 210mg Ferrous Fumarate orally once per day in the morning on empty stomach with vitamin C

Note: This can be reduced to an alternate day dosage if patient is having difficulty with side effects

Oral iron preparations are safe and effective but often have significant side effects. Recent studies have shown that a lower daily or alternate day dose is associated with better absorption with less side-effects. Therefore an **elemental** iron dose of **40-80 mg each morning or alternate day is recommended**. Preparations are shown in the table below. Higher doses are not necessarily absorbed and have worse side effects due to the excess unabsorbed iron remaining in the gastrointestinal tract.

Iron Salt	Preparation	Elemental Iron Content*
Ferrous Fumarate	210 mg	**65 mg**
Ferrous Gluconate	300 mg	**35 mg**
Ferrous Sulphate	200 mg	**65 mg**
Ferrous Feredetate	190 mg/5ml	**27.5 mg/5ml**
Pregaday® (includes 350mcg Folic acid)	322mg	**100mg**

For vegetarians or vegans: please note that there can be animal derived excipients in solid form iron preparations eg gelatin shellac and lactose. Please discuss with pharmacist for a suitable alternative.

8.3 Side effects of oral iron

Typical side effects include gastric irritation, nausea, and disturbed bowel function. Side effects are normally directly related to the elemental dose of iron in each preparation. Therefore, it is recommended that dose should be reduced to alternate day dosing if a

patient is having difficulty with side effects with daily dose. Advise women and people that it is common for their stool to change colour on iron therapy.

Women and people should be warned about the most likely side effects and given written information about iron supplements in pregnancy. Advice should be given to take oral iron supplementation on an empty stomach, with water or a source of vitamin C to enhance absorption.

8.4 Hb Monitoring

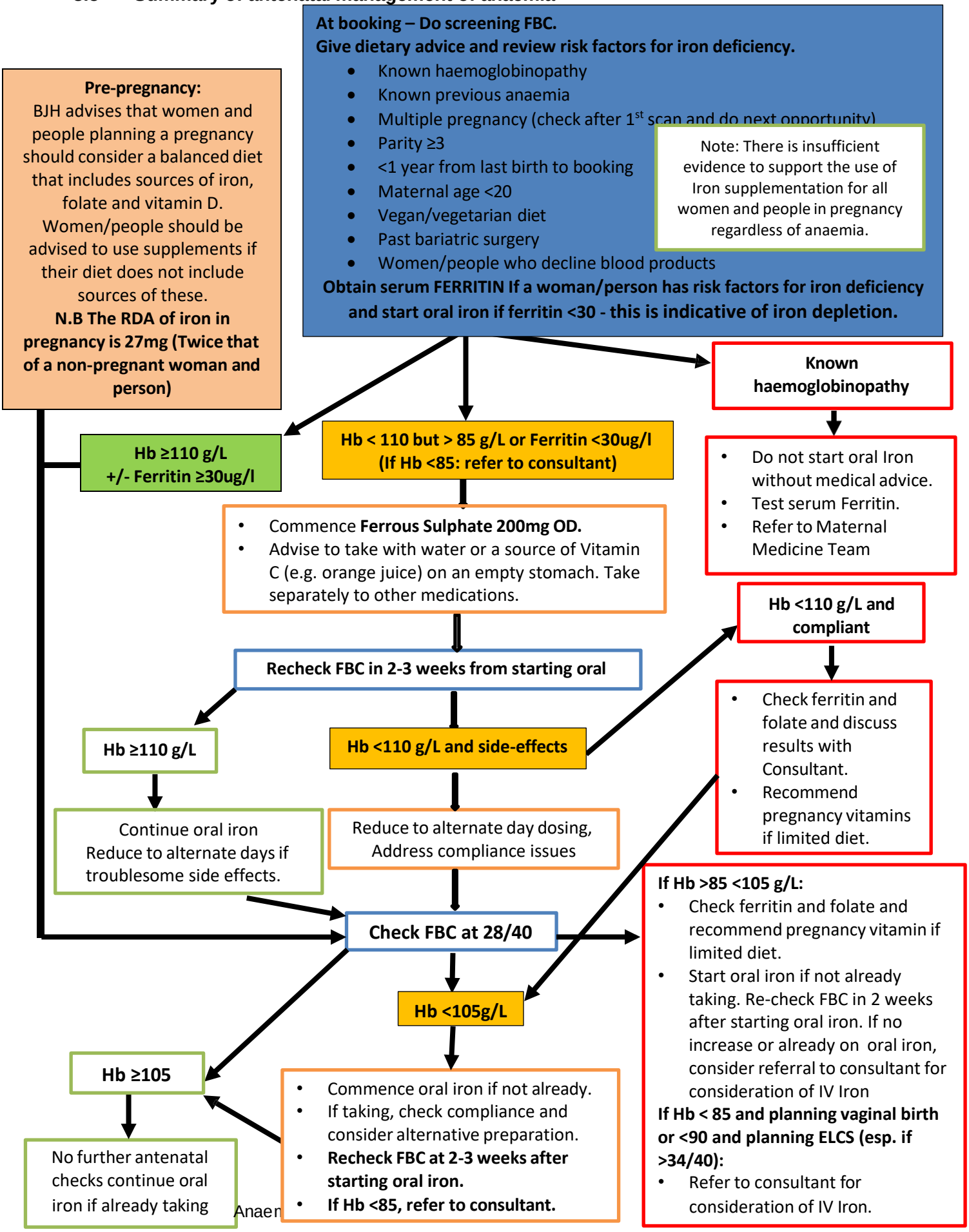
FBC should be re-checked 2-3 weeks after commencing oral iron. If iron deficiency is the cause of anaemia a patient's Hb should rise after treatment with compliance with daily oral iron for 2-3 weeks.

The timing of further checks will depend upon the degree of anaemia and period of gestation. Once the Hb is in the normal range, treatment should be continued for a further 3 months and until at least until 6 weeks postpartum to replenish iron stores.

Compliance

In cases of a poor response on oral iron, maternal and birthing parent compliance should be checked. If there is good compliance and poor response alternative causes of anaemia should be considered. Discussion with senior medical staff is recommended if there are uncertainties.

8.5 Summary of antenatal management of anaemia



9.0 Intravenous Iron Therapy

IV iron therapy can be considered beyond the first trimester (ideally >14-15 weeks' gestation) and has been shown to achieve target Hb more often with fewer side effects. Oral therapy is preferred and should be tried first if there is no reason to the contrary. If IV iron therapy is required, the woman and person should be advised that oral iron therapy should be withheld for 5 days post IV iron infusion. Hb levels should be rechecked in 3-4 weeks post iron therapy.

9.1 Indications

IV iron therapy is indicated when there is non-compliance and or intolerance of oral preparations, proven malabsorption (which includes post-bariatric surgery), GI diseases such as Crohns/ulcerative colitis or in late gestation (>34 weeks) where a more rapid Hb response is required (Pavord et al., 2020). IV iron is also indicated where there is a poor response to oral Iron.

Thresholds for IV iron therapy should be individualised according to medical and obstetric factors, but should be considered in the third trimester in women and people who present after 34 weeks' gestation with confirmed iron deficiency and a Hb<100 g/l. Ideally IV iron therapy should be administered 3-4 weeks prior to birth to allow time for absorption.

Any woman and person consented for IV iron therapy should be given the Trusts patient information leaflet ''Treatment for iron deficiency anaemia with intravenous iron' available on the intranet.

IV iron therapy should not be administered out of hours to reduce the risk in cases where there is an adverse reaction.

9.2 Contraindications

- History of anaphylaxis or serious reactions to parenteral iron therapy.
- Risk of hypersensitivity reactions are enhanced in patients with known allergies including drug allergies and in patients with a history of severe asthma, eczema or atopic allergy. There is also increased risk in women and people with active immune or inflammatory conditions (e.g. SLE, rheumatoid arthritis).
- First trimester of pregnancy (if indicated in 1st trimester discuss with senior medical staff).
- Active acute or chronic bacteraemia.
- Decompensated liver disease.

9.3 Preparation used

The preparation currently in use is **Ferric Derisomaltose Pharmacosmos** (previously known as Monofer) which should be prescribed as per the trust guideline after informed consent from patient – see (Appendix 1).

9.4 During the Infusion & techniques to minimise the risk of iron staining

- Please use the IV iron Nurse Checklist (Appendix 2) for the prescribing, monitoring of the infusion and discharge checklist. The Patient Information Leaflet must be provided to all women and people receiving IV iron therapy.
- Avoid intravenous iron administration via cannulation at sites of flexion (e.g. antecubital fossa, wrist) or on the back of the hand. The distal veins of the forearm are the preferred site. If site of flexion is only option, use smaller cannula and slow down infusion.
- Use an appropriate cannula size (20- to 24-gauge).
- Minimise the number of cannulation attempts- ask for help if difficult to cannulate.
- Secure the cannula and use an extension set to minimise catheter movement.
- Never cover the injection site with a bandage.
- Ensure the patency of the vein before administration – cannula must flush easily. If patency is uncertain, do not administer intravenous iron, re-site cannula.
- Do not give infusions at night-time or if patient is unable to report symptoms.
- The cannula should be monitored throughout the infusion for any signs of extravasation. Iron infusions can cause permanent staining in the event of extravasation (See Appendix 2).
- CTG monitoring is advised during administration of IV iron. This is because fetal bradycardia may occur following administration of IV iron doses; this is usually transient and a consequence of a hypersensitivity reaction in the mother and /birthing parent. If unresolved, an emergency caesarean birth may be required.
- Record baseline observations of pulse, blood pressure, respiration rate and temperature, and repeat after 15 minutes, and at the end of the infusion. Record all observations on MEOWS score on MIS.
- Monitor women and people carefully for signs and symptoms of hypersensitivity reactions during and following each administration of iron infusion. These include urticaria, rashes, itching, nausea and shivering. Administration must be stopped immediately if any of these signs occur (see also section 9.5). **Acute severe anaphylactic reactions are uncommon but usually occur within the first few minutes of administration and are generally characterised by sudden onset respiratory difficulty and/or cardiovascular collapse. If this is to occur call for medical help immediately,** consider calling the Medical Emergency Team (MET) and treat as per anaphylaxis protocol.
- Parenteral iron should be used with caution in presence of acute or chronic infection.
- Ferric Derisomaltose Pharmacosmos (previously known as Monofer) should not be used in patients with on-going bacteraemia.
- Parenteral iron should only be administered when staff trained to evaluate and manage anaphylactic reactions are immediately available in an environment with full resuscitation facilities.
- Hypotensive episodes may occur if intravenous injection is administered too rapidly.
- The patient should be observed for adverse effects for at least 30 minutes following an iron infusion.

- Delayed reactions may also occur and include arthralgia, myalgia and sometimes fever. Onset varies from several hours up to 4 days after administration. Symptoms last two to four days and settle spontaneously or following use of simple analgesics. In addition, exacerbation of joint pain in rheumatoid arthritis can occur and local reactions may cause pain and inflammation at or near injection site and a local phlebitic reaction.

9.5 Management of hypersensitivity reaction (HSR)

Mild/moderate (also known as a Fishbane reaction):

- Stay calm, stop the infusion.
- Monitor patients for signs of developing a severe hypersensitivity reaction. This is extremely rare and isolated symptoms generally resolve without intervention.
- It is usually safe to restart when the symptoms pass (usually around 10 mins) but at half the rate, so over 1 hour instead of 30 mins.
- It is unnecessary to treat Mild/Moderate HSR's unless urticaria occurs and this can be treated in the usual way with anti-histamine if indicated. Mild/moderate hypersensitivity reactions do not require adrenaline.

Severe Hypersensitivity/anaphylaxis:

- Stop the infusion immediately.
- Call for urgent medical assistance- put out a MET call (2222 adult medical emergency).
- Treat as per Resusitation Council UK Anaphylaxis algorithm 2021
- For anaphylaxis **Adrenaline 1 in 1000 (1mg in 1ml) 500 micrograms IM injection** should already be prescribed on the IV Infusion Administration of Ferric Derisomaltose Pharmacosmos (appendix 2).
- Monitor observations continuously.
- Ensure a DATIX is completed.

9.6 Acute Management of iron extravasation (iron staining)

(See appendix 3)

- If the patient complains of pain, swelling, soreness at the injection site or there is any obvious swelling or discolouration, **stop the infusion immediately** and assess the site. Disconnect the giving set.
- Aspirate any residual drug from the cannula **DO NOT FLUSH.**
- Remove the cannula.
- Document volume of infused fluid.
- Apply a cold pack if there is swelling or soreness, keep arm level for as long as possible to avoid spread of stain, consider drawing around stain to assess spread.
- Inform Obs Reg and arrange outpatient follow up - dermatology referral may be needed if severe.
- Ensure a DATIX is completed.

10.0 Management at birth

There should be efforts to maximise Hb prior to labour. **Iron deficiency anaemia alone should not influence the mode and timing of birth.** There is no place for offering routine Induction of labour (IOL), based on iron deficiency anaemia alone.

Maternal anaemia increases the risk of PPH and has an association with postpartum sepsis. Women and people with an Hb <100 approaching term should be considered for iron infusion ideally 3-4 weeks prior to birth to allow time for absorption and have an individualised care plan in place (consider IV access in labour, birth in an obstetrician led unit, and active management in the third stage of labour). Hb should be checked on admission to hospital.

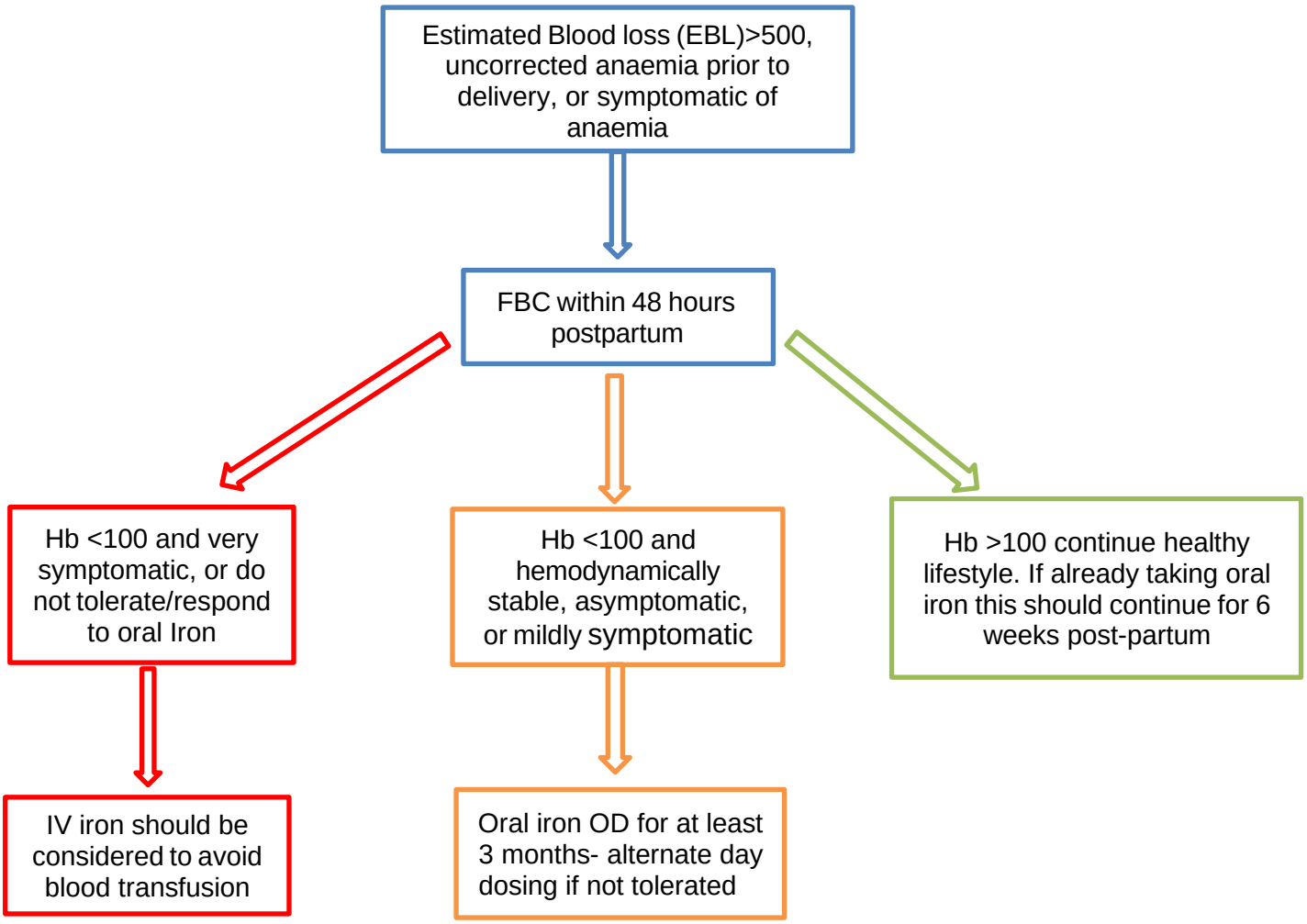
11.0 Postnatal care

Women and people with a blood loss >500 ml, who are symptomatic of anaemia or who had uncorrected antenatal anaemia should have their Hb checked within 48 hours of birth. Interpretation of results should take into account intrapartum events and likely further redistribution of intra and extravascular volumes.

11.1 Management

- **Hb ≥ 100 g/L**: continued healthy diet and lifestyle. Consider plans for breastfeeding.
- **Hb <100 g/L,** haemodynamically stable with mild or no symptoms: offer oral iron replacement for at least 3 months (Ferrous sulphate 200mg PO OD) or alternate day dosing if not tolerated.
- **Hb <100 g/L**, with mild/moderate symptoms of anaemia (exaggerated fatigue, dizziness on standing, etc.): consider IV iron therapy or blood transfusion. Senior medical advice or review recommended.

11.2 Summary of postnatal management of anaemia



12.0 Blood transfusion

Decision for transfusion should be by careful evaluation, and oral or IV iron replacement should be considered as alternatives. Women and people who do receive a RBC transfusion should be given full explanation of why transfusion is needed (risk vs benefits); option for alternative treatment should be explained. This discussion needs to be documented along with clear documentation of consent on MIS.

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Appendix 1: Ferric Derisomaltose Pharmacosmos iron infusion
(previously known as Monofer)

Patient body weight is determined by booking weight.

If a patient has a BMI >30 use the Ideal Body Weight (IBW) below.

IBW (female) = 45.5kg + 2.3kg for each inch over 5 feet. This is summarised in the table 1 below:

Height (feet and inches)	Height (cm)	IBW (kg)
5ft	152	45.5
5ft 1in	154.5	47.8
5ft 2in	157	50.1
5ft 3in	159.5	52.4
5ft 4in	162	54.7
5ft 5in	164.5	57
5ft 6in	167	59.3
5ft 7in	169.5	61.6
5ft' 8in	172	63.9
5ft 9in	174.5	66.2
5ft 10in	177	68.5
5ft 11in	179.5	70.8
6ft	182	73.1
6ft 1in	184.5	75.4
6ft 2in	187	77.7
6ft 3in	189.5	80
6ft 4in	192	82.3
6ft 5in	194.5	84.6

Table 1: Ideal body weight for BMI >30

Ferric derisomaltose Pharmacosmos (previously Monofer) doses for pregnant and postnatal patients.

- Table 2 assumes a target Hb of 110-120g/L and doses do not exceed 20mg/kg so can be given as a single infusion. Doses are expressed in mg of iron. Use booking weight unless patient is obese (BMI > 30) when the ideal body weight should be used.
- If the prescriber requires support with deciding on an appropriate dose, please contact pharmacist for advice.

		Actual Hb (g/L)				
Weight (kg)	**Max dose 20mg/kg**	**50-59**	**60-69**	**70-79**	**80-89**	**90-100**
40-44kg	800	800	800	800	700	600
45-49kg	900	900	900	900	800	700
50-54kg	1000	1000	1000	900	800	700
55-59kg	1100	1100	1100	1000	800	700
60-64kg	1200	1200	1200	1000	900	700
65-69kg	1300	1300	1200	1100	900	800
70-74kg	1400	1400	1300	1100	1000	800
75-79kg	1500	1500	1400	1200	1000	800
80-84kg	1600	1600	1400	1200	1000	800
85-89kg	1700	1700	1500	1300	1100	900
90-95kg	1800	1700	1500	1300	1100	900

Table 2: Ferric derisomaltose pharmacosmos (previously Monofer) doses for pregnant and postnatal patients

Administration of Ferric Derisomaltose Pharmacosmos:

- Dilute the dose of Ferric Derisomaltose Pharmacosmos to 250 mls of sodium chloride 0.9%. For stability reasons, Ferric Derisomaltose Pharmacosmos should not be diluted to concentrations less than 1 mg iron/ml (not including the volume of the ferric derisomaltose pharmacosmos solution) and never diluted in more than 500 ml.

Iron dose	Minimum administration time
≤1000 mg	More than 15 minutes
>1000 mg	30 minutes or more

Medusa Injectable Medicines Administration Guide

Appendix 2: IV Iron Nurse Checklist

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University Hospitals Sussex
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MATERNITY Pre-Infusion Checklist ***CONSENT MUST BE COMPLETED BEFORE TREATMENT***	Checked by:
Patient has been given and has had an opportunity to read the Patient Information Leaflet	
Patient understands risks and signs of hypersensitivity and anaphylactoid reactions (please note increased risk in patients with asthma, eczema or inflammatory conditions).	
Patient understands the risk and signs of extravasation and staining. Patient understands the measures that reduce risk and severity of staining e.g. refrain from moving the limb throughout duration of infusion and avoid rubbing the site if symptoms occur.	
Patient understands the need for continuous CTG monitoring due to the risk of fetal bradycardia following IV iron administration.	
Patient understands that they should monitor throughout the duration infusion for any adverse effects, including cannula site reactions, and immediately raise alert if any occur.	
Patient has provided verbal informed consent to receive IV iron infusion.	
Confirm booking weight has been used to calculate correct dose.	
Cannula inserted in larger visible vein and in date. Record observations on Maternity Observations Bundle.	

Hypersensitivity Checked	Observations – Dose 1				
	BP	Pulse	RR	SpO2	Temp
Pre-infusion (Baseline).	*Record observations on MIS*				
15 min after start of infusion.					
30-minute post infusion.					
At any stage that patient feels unwell*					

After the infusion, extend and elevate the patient's arm and apply pressure for at least 5mins to avoid leakage which can lead to inflammation, necrosis or sterile abscesses and permanent discolouration of skin

Discharge Checklist	Checked by:
*If a reaction is experienced at any stage of the process, a pre-discharge review must also be completed by a member of the medical team.	
Arrange a follow up appointment for balance of dose to be administered if needed.	
Advise patients taking oral iron supplements to withhold them for 5 days.	
Ensure the patient is provided with contact details where appropriate.	
Arrange blood test for 3 weeks post infusion, and any follow up if needed.	

Extravasation Checklist ***to be completed in the event of extravasation at ANY stage of process***	Checked by:
Stop and disconnect infusion immediately but leave cannula in place for senior review.	
Aspirate as much of the drug as possible from the cannula.	
Seek advice from medical team OR duty anaesthetist (theatres only) and refer to Plastics.	
If appropriate, gently flush with sodium chloride 0.9% to dilute the vesicant medication – to be done under instruction and supervision of senior medic/anaesthetist.	
Remove affected cannula immediately when no longer required.	
If visible, mark the area of extravasation with a pen or take photographs on a Trust device.	
Re-iterate to patient that rubbing of the site should be avoided for several weeks.	
Complete Datix form.	
Complete online MHRA Yellow Card (www.mhra.gov.uk/yellowcard) or request via Pharmacy	

- **IV iron should be administered by staff trained to evaluate and manage anaphylaxis**
- **IV iron should not be administered overnight where visibility will be poor for observations**

***** Scan into MIS once completed *****

Pharmacy Dept 2022 — Approved by Medicines Governance Committee Sept 2022
IV Iron nurse checklist v1.3 — Review date: Sept 2024
Maternity specific amendments made 18th May 2023 | Maternity Clinical Effectiveness Team

Appendix 2: IV Iron Nurse Checklist cont.

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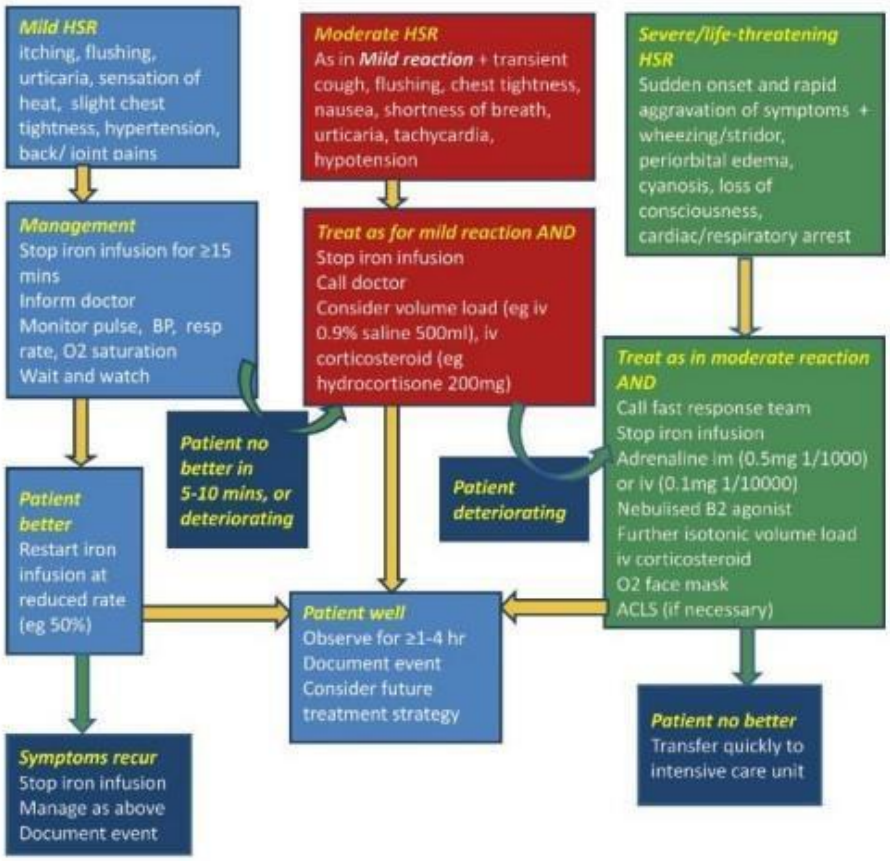
Adverse reactions

1. Cardio-pulmonary resuscitation equipment MUST be available when administering as allergic or anaphylactic reactions may occur
2. Prescribe adrenaline, hydrocortisone and chlorphenamine in case needed
3. Allergy risk is present even if previous administration has been uneventful

Management of Hypersensitivity Reactions



Rampton, David et al. "Hypersensitivity reactions to intravenous iron: guidance for risk minimization and management." Haematologica vol. 99,11 (2014): 1671-6. doi:10.3324/haematol.2014.111492

Pharmacy Dept 2022
IV Iron nurse checklist v1.3

Approved by Medicines Governance Committee Sept 2022
Review date: Sept 2024

Appendix 2: IV Iron Nurse Checklist cont.

DO NOT PRINT FROM GUIDELINE

Addressograph label

NHS
University Hospitals Sussex
NHS Foundation Trust

Patient Consent for IV iron infusion

I acknowledge and understand that the proposed treatment of an intravenous (IV) iron infusion/s has been explained to me and is to be given to me, the patient.

- **Benefits**: to treat iron deficiency anaemia.
- **Risks**: IV iron can cause serious hypersensitivity reactions and anaphylaxis although this is uncommon. The risk may be increased in patients with known allergies, immune or inflammatory conditions as well as patients with a history of severe asthma or eczema.
- **Side effects** may include: headache, dizziness, flushing, high blood pressure, nausea, injection site reactions (common), abdominal pain, vomiting, cramps, muscle ache, itching, numbness, chest pain, diarrhoea, fatigue (uncommon), angioedema (lip/throat swelling), impaired consciousness, anxiety, difficult breathing (rare) & staining.
- CTG monitoring is advised during administration of IV iron as fetal bradycardia may occur following administration of IV iron doses; this is usually transient and a consequence of a hypersensitivity reaction in the mother. If unresolved, an emergency caesarean section may be required.
- The potential alternatives to IV iron (which may include blood or oral iron therapy) have been offered to me (if appropriate) and explained to me.
- I have been given a copy of the patient information leaflet about IV iron.
- I have been given the opportunity to ask questions about the treatment.
- I understand I can withdraw my consent at any time.

Patient signature..... Date.....

Patient name.....

****** Scan into MIS once completed ******

Pharmacy Dept 2022 — Approved by Medicines Governance Committee Sept 2022
IV Iron nurse checklist v1.3 — Review date: Sept 2024
Maternity specific amendments made 18th May 2023 | Maternity Clinical Effectiveness Team

Appendix 3: Medication Safety Incident Learning on Extravasation

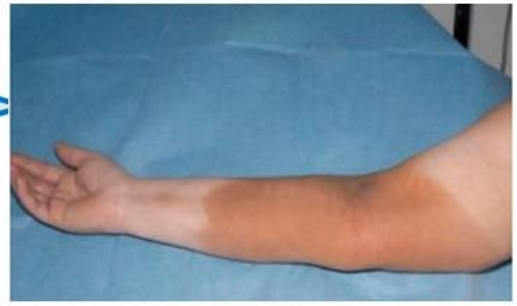
Medication Safety Incident Learning

Watch Out *for...* *Iron infusion – permanent skin staining*

Date: Oct 2022 Produced By: Naomi Burns, Medication Safety Pharmacist (WG/SRH)

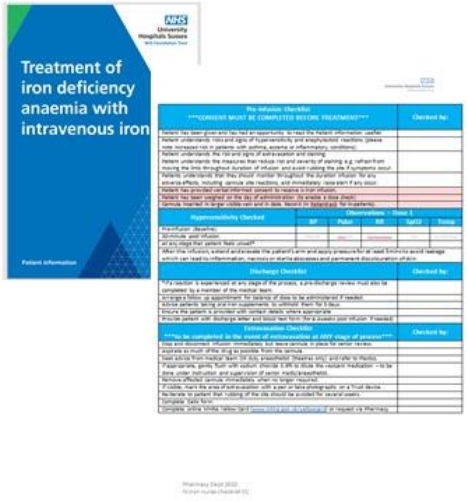
What Happened?

- Cases of extravasation have been reported when receiving an iron infusion.
- In some cases this has lead to permanent brown skin staining around the infusion site.



The Facts:

- All iron infusions can cause permanent staining in the event of extravasation.
- Risk can be reduced by:
  - ensuring vein patency before administration
  - ensuring appropriate cannula care and size
  - close monitoring throughout the duration of the infusion (no night time infusions)
  - avoiding moving the limb/area during the infusion
- In the event of extravasation, the infusion must be **discontinued immediately**



Protect Your Patients:

Before administering iron infusion you MUST:

- Ensure you are aware of the iron infusion guidelines on the intranet
- Order patient information leaflets from the Print Centre, SRH
- Ensure the patient has been counselled and given the patient information leaflet
- Ensure that the pre-infusion checklist and consent form has been completed before administration

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