

## Iron in Pregnancy

Document Type	Guideline
Function	Clinical Practice
Directorate(s)	National Women's Health
Department(s) affected	Maternity (including outliers)
Applicable for which patients, clients or residents?	All maternity women
Applicable for which staff members?	All clinicians in maternity including access holder lead maternity carers (LMCs)
Key words (not part of title)	n/a
Author – role only	Obstetric Physician
Owner (see <a href="#">ownership structure</a> )	Service Clinical Director, Secondary Maternity
Edited by	Clinical Policy Advisor
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## 1. Purpose of guideline

The purpose of this guideline is to provide guidance for prescribing iron in pregnancy, wherever indicated for a pregnant woman. This applies to all clinicians, midwifery and nursing practitioners within Auckland District Health Board (Auckland DHB).

Once prescribed, in accordance with the Auckland DHB 'Medications–Prescribing' policy, this medication should be administered and documented in accordance with the Auckland DHB 'Medications – Administration' policy (see associated Auckland DHB documents section).

See section below on specific prescribing notes for iron in pregnancy.

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## 2. Background

Serum ferritin should be performed to establish the diagnosis of iron deficiency before treatment with parenteral iron. Oral iron supplementation is the first line treatment. IV iron infusion is the preferred method for administration of parenteral iron. Caution should be exercised with any form of parenteral iron. As the gestation advances, the need to replenish iron stores becomes more urgent, and an early diagnosis of iron deficiency enables its treatment through the use of oral iron supplementation. To that end, a serum ferritin is recommended with the “booking bloods” for a pregnant woman and for a woman at 26 - 28 weeks of gestation.

If iron deficiency anaemia (Hb < 100) is detected at booking, this is an urgent indication to start oral iron supplementation and refer the woman for consideration of parenteral iron.

Intravenous iron infusion is indicated in iron deficiency anaemia, which is unresponsive or intolerant to oral iron, or when a woman is unable to ingest the adequate dose (e.g. ongoing bleeding), or anaemia with impaired iron utilization (e.g. severe renal failure). Ferric carboxymaltose is the preferred intravenous iron infusion at Auckland DHB. A recent funding decision by PHARMAC has enabled the use of ferric carboxymaltose, as an alternative to iron polymaltose. Intramuscular iron is no longer the administration method, of choice for parenteral iron due to adverse effect profile.

After parenteral administration, iron is cleared by the reticuloendothelial cells and processed. The iron is then released back into the plasma and bone marrow. Because the rate of iron incorporation into haemoglobin does not exceed that achieved by oral iron therapy, the Hb can be expected to increase at a rate of 15 to 22 g/L/week during the first 2 weeks and by 7 to 16 g/L/week thereafter until normal values are attained.

For alternative indications and further information, refer to Reference Viewer or Medsafe datasheet (see supporting evidence section).

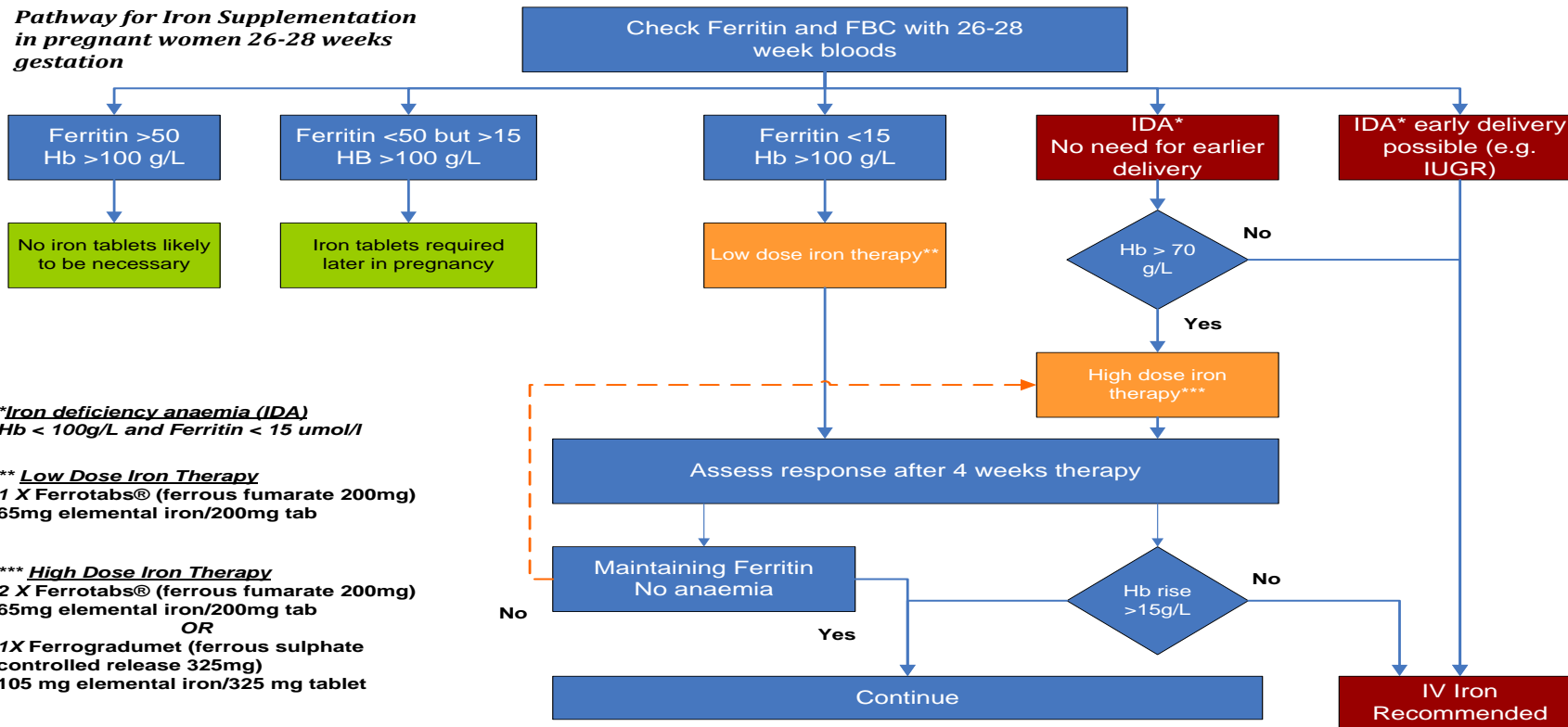
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## 3. Prescribing

A CR9048: IV Iron Prescribing Checklist should be completed before prescribing intravenous iron in pregnancy (see associated Auckland DHB documents).

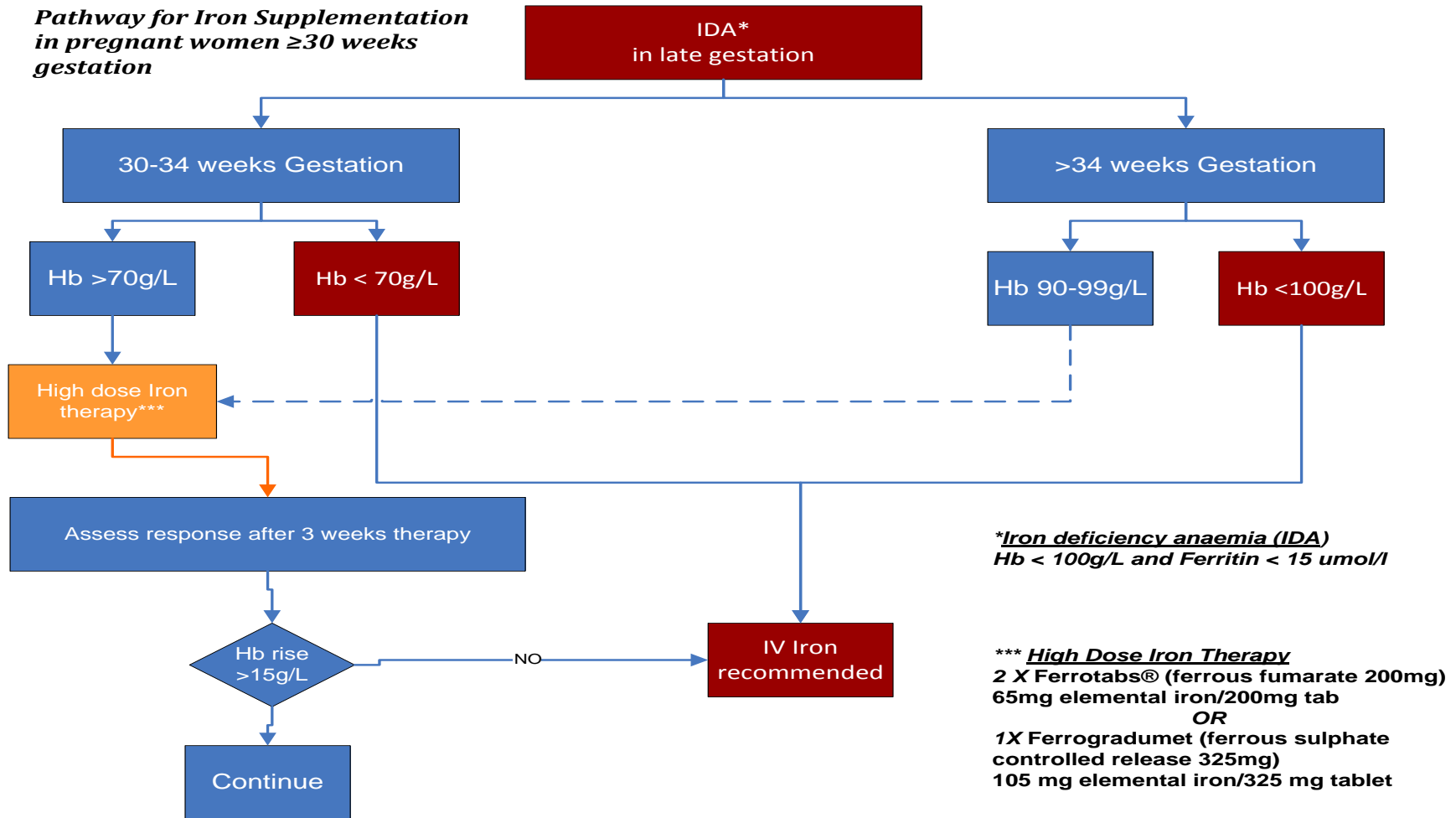
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#### 4. Flowchart: Pathway for iron supplementation in a pregnant woman starting at 26 - 28 weeks



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### 5. Flowchart: Pathway for iron supplementation in a pregnant woman starting at ≥30 weeks



### Summary statements

If  $Hb \leq 70$  then iron infusion is indicated, otherwise, please follow the pathway according to Hb and ferritin levels and assess response to oral iron after 4 weeks of therapy.

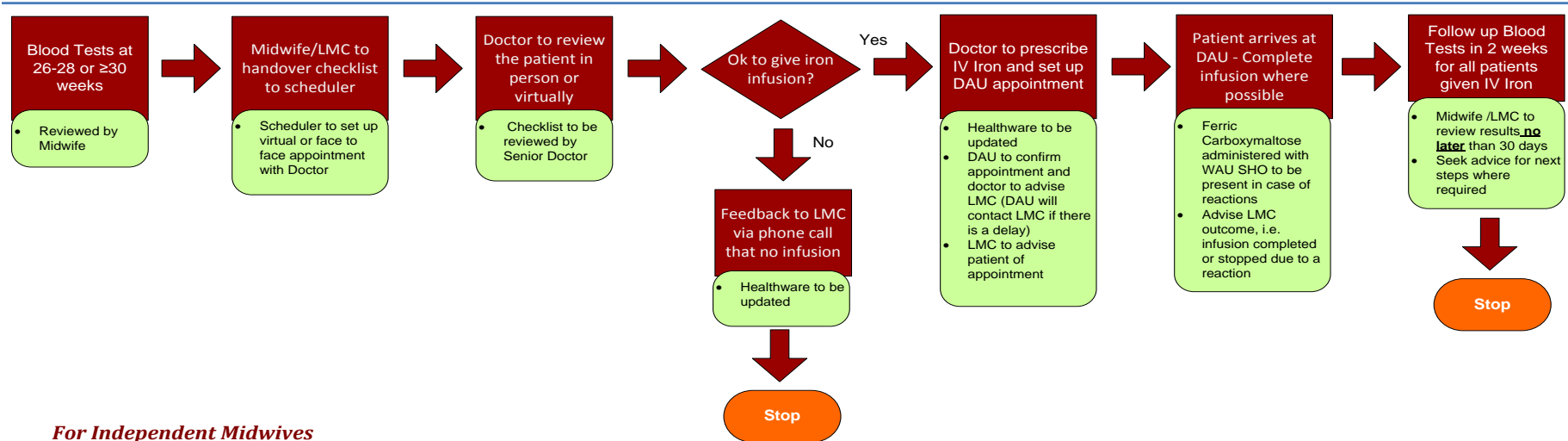
If the rise in Hb is not more than 15 g/L with ongoing anaemia ( $Hb < = 100$  g/L), iron infusion is recommended.

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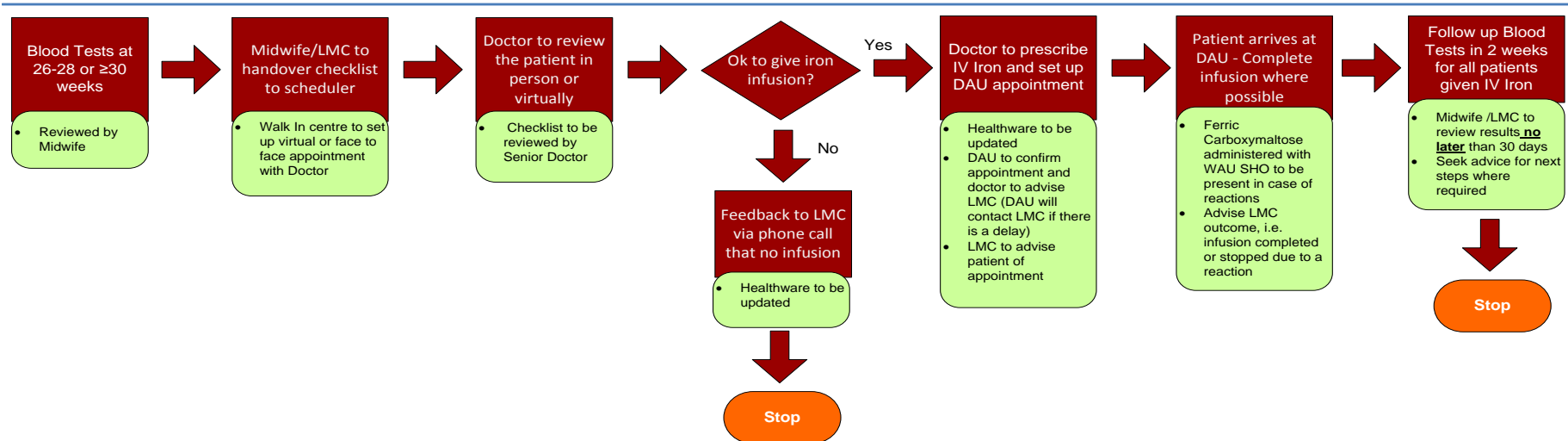
## 6. Flowchart: Process for referral for an iron infusion in the Day Assessment Unit

**Process for Iron Infusion for all maternity patients**

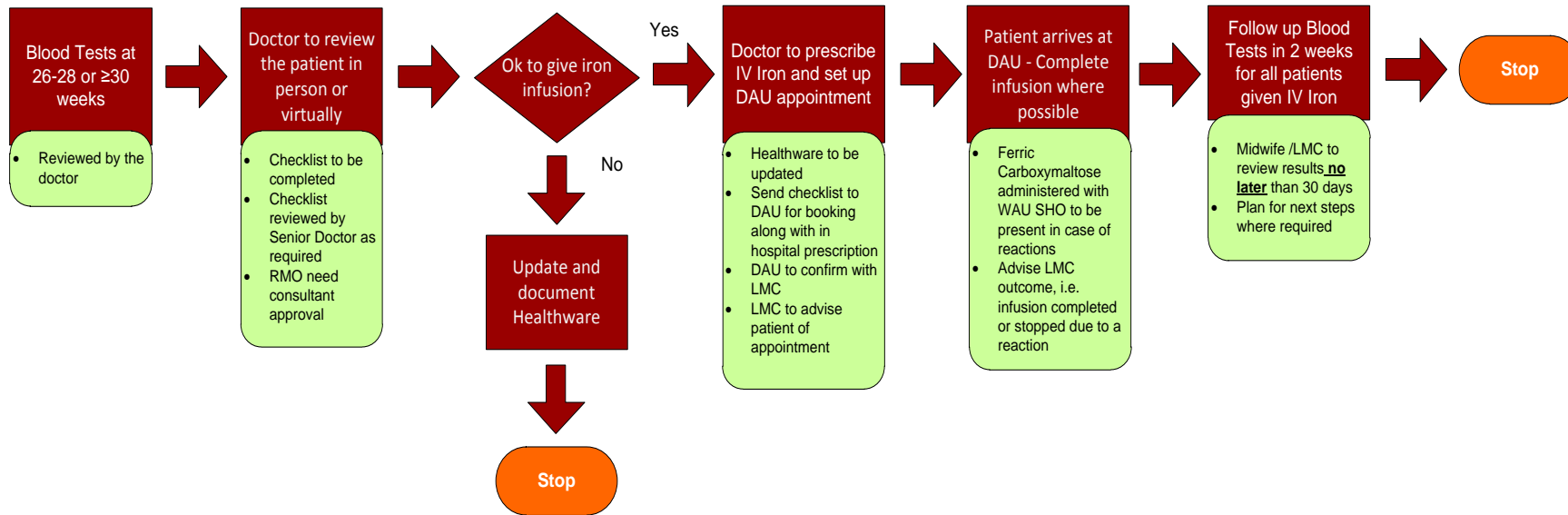
**For Community Midwives**



**For Independent Midwives**



*For Obstetricians, Obstetric Physicians & High Risk Clinics*



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## 7. Administration of ferric carboxymaltose for infusion

### Presentation of ferric carboxymaltose for infusion

- 500 mg/10 mL ampoule (equivalent to 500 mg elemental iron in 10 mL)
- Trade name: Ferinject®

### Dosage

- A woman with a booking weight\* of  $\geq 35$  kg to be administered:
  - Ferric carboxymaltose 1000 mg **intravenously**
  - If late booking with significant weight gain of > 10kg compared to pre pregnancy, use pre pregnancy weight
- If, after the 2 week follow up of the blood test, the woman requires further iron treatment, then administer a further dosage of ferric carboxymaltose 500 mg or 1000 mg. Consult with an obstetric physician if unsure about this additional dose
- **Note: Do NOT administer more than 1000 mg of iron per week (as ferric carboxymaltose)**
- Each 10 mL vial of Ferinject® contains 500 mg of iron as ferric carboxymaltose

### Preparation and administration

- Add required dose to 250 mL sodium chloride 0.9%
- Sodium chloride 0.9% is the only diluent to be used
- Do not dilute to concentrations less than 2 mg/mL of iron
- Infuse by intravenous infusion over 15 minutes
- NOT to be given by subcutaneous or intramuscular route
- A doctor should be advised of commencement of infusion, and it is recommended, that a doctor is present at the start of the infusion in case of an adverse reaction

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## 8. Monitoring during an infusion

### Maternal

- Baseline recordings of the pulse, respiration rate and blood pressure should be documented prior to commencement of the infusion
- After commencement of the infusion repeat recordings at 5 minutes interval, and at the end of the infusion
- A nurse has to observe the woman for adverse reactions, especially during the first 5 minutes of administration
- Repeat and document observations every 15 minutes, post completion of infusion
- Monitor for adverse effects (see adverse reactions and effects section)
- Arrange for the follow up of full blood count (FBC) test, 2 weeks after the infusion

### Fetal

- For a pregnancy beyond 28 weeks of gestation, record the CTG for at least 20 minutes immediately prior to the commencement of the infusion
- Intermittent auscultation of fetal heart at same frequency of maternal observations throughout infusion

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## 9. Contra-indications, warnings and precautions in a pregnancy for ferric carboxymaltose infusion

### Use in pregnancy

- Intravenous iron should not be administered in the first trimester of a pregnancy
- Intravenous iron should not be used in a pregnancy unless clearly necessary

### Pregnancy category

Ferric carboxymaltose is ADEC category B3 – medicine which has been taken by only a limited number of pregnant women, without any increase in the frequency of malformation, or other direct or indirect harmful effects on the human fetus having been observed. Studies in animals have shown evidence of an increased occurrence of fetal damage, the significance of which is considered uncertain in humans.

### Contraindications

Consult “contra-indications, warnings, and precautions” in manufacturer’s datasheet for details (see supporting evidence section).

Contra-indications for ferric carboxymaltose (Ferinject®)

- There can be hypersensitivity to ferric carboxymaltose complex, Ferinject®, or to any of its excipients
- A woman can develop anaemia not caused by iron deficiency (eg other microcytic anaemia)
- Evidence of iron overload, or disturbances in the utilisation of iron

### Precautions

- Care to be taken during the first trimester of pregnancy
- Precautions to be taken in liver dysfunction. Avoid administering to a woman with a liver dysfunction, where iron overload is the precipitating factor
- Acute infections eg sepsis, pneumonia
- Avoid administering iron in a woman with asthma, eczema or atopic allergies
- Hypersensitivity reactions have been reported, including anaphylactoid reactions, which may be potentially fatal. A woman must be observed for adverse effects both during the infusion and for 15 minutes following the Ferinject® injection

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## 10. Adverse reactions and effects

### Adverse reactions to ferric carboxymaltose

Symptoms may include headache, dizziness, hypertension, nausea, abdominal pain, constipation, diarrhoea, hypophosphataemia, and injection site reactions. Less common adverse reactions may be hypersensitivity, including anaphylactoid reactions, tachycardia, hypotension, flushing, dyspnoea, vomiting, rash, myalgia, pyrexia, chills.

Based on the definitions below, the reactions should be classified as 'mild', 'moderate' or 'severe'. This is consistent with current literature.

If there is a rash, swelling, wheeze and/or abnormal vital signs, consider anaphylaxis and manage as per 'severe reaction' (below).

If the CTG is concerning, the iron infusion should be stopped immediately. Consult the obstetric team regarding further management of the woman and whether it is appropriate to restart the iron infusion or an alternative plan be made.

All cases of suspected or confirmed medicine induced anaphylaxis should be reported to the Centre for Adverse Reactions Monitoring (CARM). Reporting will allow a "Danger" to be entered against the woman's NHI on the Medical Warning System to alert other health professionals.

To report a reaction, go to the CARM website (see supporting evidence section).

#### Mild reaction

Definition: "symptoms but no observable patient discomfort"

Management:

- Stop the infusion immediately
- Reassure the woman – most symptoms resolve in 10 minutes
- Check vital signs (BP, pulse, respiratory rate, CTG etc.)
- Wait and observe for 15 minutes
- If symptoms persists beyond 15 minutes consult a doctor.
- If symptoms resolve, observe for another 30 minutes

### **Moderate reaction**

Definition: “symptoms and observable patient discomfort”

#### Management

- Stop the infusion immediately
- Reassure the woman
- Check vital signs (BP, pulse, respiratory rate, CTG etc)
- Consult a doctor
- Give 1 g PO paracetamol for arthralgia and 10 mg PO loratidine for allergic symptoms such as itching
- Wait and observe for 15 minutes (30 minutes, if above medication given)
- If symptoms recur, consult the doctor again.

### **Severe reaction**

Definition: “severe distress or cardiorespiratory compromise”

#### Management:

- Stop the infusion immediately and disconnect the giving set
- Check vital signs (BP, pulse, respiratory rate, CTG etc.)
- Call for emergency medical assistance (dial ‘777’ declare an ‘Obstetric Emergency’ and give the operator the location)
- Initiate maternal and fetal resuscitation as necessary
- Check CTG as soon as possible
- Further management should be done as per the arriving medical team. If anaphylaxis is not suspected and no cardiorespiratory compromise has occurred then the options are
  - i. Give paracetamol/loratidine and proceed as above
  - ii. Consider whether the woman could continue with oral iron therapy with advice around management of side effects and retesting of Hb/ferritin in two weeks
  - iii. Consider IV iron sucrose therapy

If anaphylaxis is suspected/diagnosed treat according to the Auckland DHB/NZ Resuscitation Council Anaphylaxis guideline (see associated Auckland DHB documents section). Please note all adverse reactions to iron infusions should be reported to CARM.

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## 11. Interactions

Ferric carboxymaltose infusion should not be administered concomitantly with oral iron preparations, as the absorption of oral preparations is impaired. Oral iron therapy should not commence until at least 5 days after the last infusion of ferric carboxymaltose.

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## 12. Supporting evidence

- [Centre for Adverse Reactions Monitoring](#) (CARM). Reporting on the Medical Warning System
- Haider, B. A., I. Olofin, et al. (2013). "[Anaemia, prenatal iron use, and risk of adverse pregnancy outcomes: systematic review and meta-analysis.](#)" BMJ: British Medical Journal 346
- Khalafallah, A., A. Dennis, et al. (2010). "[A prospective randomized, controlled trial of intravenous versus oral iron for moderate iron deficiency anaemia of pregnancy.](#)" Journal of internal medicine 268(3): 286-295
- Khalafallah, A. A. and A. E. Dennis (2012). "[Iron deficiency anaemia in pregnancy and postpartum: pathophysiology and effect of oral versus intravenous iron therapy.](#)" Journal of pregnancy 2012
- M. Garg, G. Morrison, A. Friedman, A. Lau, D. Lau and P. R. Gibson. [A rapid infusion protocol is safe for total dose iron polymaltose: time for change.](#) Internal Medicine Journal 2011.548-554
- [Medsafe Datasheet](#) for contra-indications, warnings, and precautions
- [Medsafe Prescriber Update](#) – March 2014
- Pregnancy & Breastfeeding, Medicines Guide. Parkville: The Royal Women's Hospital, 2010.

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### 13. Associated Auckland DHB documents

- [Anaphylaxis Management](#) - Perioperative
- [Intravenous Fluid Prescription - Adult](#)
- [Iron Infusion in Adult Chronic Kidney Disease \(CKD\) & Dialysis Patients](#)
- [Iron Infusions](#) – Child Health
- [Iron IV Administration](#) - Haematology
- [Iron Polymaltose Infusion – Adult \(MAG\)](#)
- [Medications - Administration](#)
- [Medications - Allergies & Adverse Drug Reactions \(ADRs\) Identification, Documentation & Reporting](#)
- [Medications - Intravenous & Infusions Administration](#)
- [Medications - Prescribing](#)

#### Clinical forms

- CR9048: [IV Iron Prescribing Checklist](#)

#### Patient information

- [Intravenous \(IV\) Iron Infusions](#)

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### 14. Disclaimer

No guideline can cover all variations required for specific circumstances. It is the responsibility of the health care practitioners using this Auckland DHB guideline to adapt it for safe use within their own institution, recognise the need for specialist help, and call for it without delay, when an individual patient falls outside of the boundaries of this guideline.

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### 15. Corrections and amendments

The next scheduled review of this document is as per the document classification table (page 1). However, if the reader notices any errors or believes that the document should be reviewed before the scheduled date, they should contact the owner or the Clinical Policy Advisor without delay.

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