

## Intravenous Iron in General Practice



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## Key Messages

Intravenous iron infusions can be safely and effectively administered in general practice

- Right reason
- Right dose
- Reduce risk by adhering to protocol
- Informed consent is crucial
- Streamlined practice systems
- Follow up is essential and ensure a diagnosis is established

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## Iron Deficiency - A Recap

- A common condition – 80-120 patients per FTE
- Variable presentations, across age spectrum and accompanies many other conditions
- Better outcomes with treatment often independent of anaemia
- A cause must be ascribed when ID is found - may need further investigation

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- Absolute ID – Ferritin <30
- Functional ID - T sat <20, Ferritin 300 in chronic inflammation
- Anaemia -Hb<130 (male) Hb <120 (Female)
- Most cases can be managed safely and effectively in general practice
- Oral iron is generally first line option

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## Oral Iron - Which Preparation ?



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## Oral Iron - Instructions

- Take on empty stomach: In-between meals (1-1/2 hour before or after meal)
- Do not take at same time as other medication or supplements
- Do not take any acid reducing agents around the time of the iron dose (1-1/2 hr apart, and then discourage)
- Take with water. No tea, coffee or calcium enriched liquids
- Advise starting on stool softener at same time oral regime starts

**NOTE:** If diarrhoea starts within first 24-48 hours of starting iron source reduce dose by 50%.

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## Indications for Intravenous Iron

- Failure of oral iron therapy
  - ✓ Intolerance
  - ✓ Poor adherence
  - ✓ Poor response
- Malabsorption (e.g. inflammatory bowel disease, gastric paresis, some bariatric surgery)
- Chronic renal impairment or cardiac failure
- Ongoing loss of iron (blood) exceeding absorptive capacity (e.g. angiodysplasia)
- Clinical need for a rapid iron supply
- Pregnancy - refer guidelines, <https://www.blood.gov.au/pbm-module-5>

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## Contraindications and Precautions for i.v. iron carboxymaltose

### Contraindications

- Iron overload
- Microcytic anaemia not due to ID
- Known hypersensitivity to particular i.v. agent
- Pregnancy first trimester
- Children <14 yrs

### Precautions

- Significant hepatic dysfunction
- Acute or chronic infection
- Multiple allergic disorders
- Reaction to other i.v. iron preparations



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## Intravenous Iron in general practice – What do you need

- Infusing versus push doses
- Trained and skilled nurses (cannulation training and online training <https://bloodsafelearning.org.au/>)
- Equipment
- Protocol for infusing
- Consent procedure
- Good practice systems (process and documentation)
- Patient information
- Establish fees/costs
- Follow up arrangement

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## Iron Infusions - Equipment

### Equipment:

- Cannulas 20g
- Normal Saline bags 100ml/500ml
- i.v Giving Set/.Pump
- Resus equipment

### Treatment Room

Bed/Chair



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## Types of intravenous iron in Australia

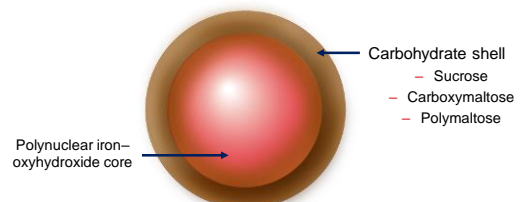
- Iron Polymaltose (FerrumH/Ferrosig)
- Iron Sucrose (Venofer)
- Ferric Carboxymaltose (Ferinject)



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## The Structure of intravenous iron



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<p><b>Iron Polymaltose</b> \$4.00/ 100mg</p> <p>Suitable for TDI up to 2500 mg over 5-6 hours (or accelerated infusion)</p> <p>Similar indications to Fe Carboxymaltose</p> <p>Similar Adverse Drug Events (ADEs) to Fe Carboxymaltose</p>	<p><b>Iron Sucrose</b> \$13.00 per 100mg</p> <p>Multiple 100-200 mg doses or larger 500mg* dose</p> <p>Licensed and PBS listed in Australia for :</p> <ul style="list-style-type: none"> <li>✓ renal indications: IDA in combination with ESA</li> <li>✓ documented hypersensitivity reaction to polymaltose</li> <li>✓ continued IV iron infusions where appropriate</li> <li>✓ undergoing chronic haemodialysis</li> </ul> <p>Life threatening ADE's 0.6 per million and deaths 0.1 per million</p>
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**Fe Carboxymaltose**

- \$30.00 per 100mg
- Up to 1000 mg (20mg/kg) over 15 minutes
- PBS listed (*iron deficiency anaemia where oral therapy is ineffective, not tolerated or inappropriate*)
- Comparison with other IV irons:
  - Similar rates of Injection site reactions, headache, hypertension, dizziness, vomiting and diarrhea
  - Lower rates of hypotension and taste disturbance
  - Higher rates of hypophosphatemia phosphate, flushing and increased ALT



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**How much to give ? – Calculation of iron deficit**

Ganzoni formula:

Total body iron deficit/cumulative iron dose (mg) =  
body weight\* (kg) x (target Hb – actual Hb in g/L) x 0.24\*\* + iron depot\*\*\*

\*Use ideal body weight in overweight patients. If underweight, use actual body weight  
 \*\*The factor 0.24= 0.0034 x 0.07 x 1,000:  
 For this calculation the iron content of haemoglobin = 0.34%,  
 blood volume = 7% of the bodyweight, and  
 1,000 is the conversion from g to mg  
 \*\*\* Iron depot:  
 <35 kg body weight: iron depot = 15 mg/kg body weight  
 ≥35 kg body weight: iron depot = 500 mg

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**How much to give ? – Calculation using the simplified method (doses for Fe Carboxymaltose)**

Hb (g/L)	*Body weight 35 to <50 kg	*Body weight 50 to <70 kg	*Body weight ≥70 kg
Hb ≥100 g/L	Total deficit: 1000 mg 1 <sup>st</sup> dose: 500 mg 2 <sup>nd</sup> dose: 500 mg	Total deficit: 1000 mg 1 <sup>st</sup> dose: 1000 mg 2 <sup>nd</sup> dose: not required	Total deficit: 1500 mg 1 <sup>st</sup> dose: 1000 mg 2 <sup>nd</sup> dose: 500 mg
	Total deficit: 1400 mg 1 <sup>st</sup> dose: 700 mg 2 <sup>nd</sup> dose: 700 mg	Total deficit: 1500 mg 1 <sup>st</sup> dose: 1000 mg 2 <sup>nd</sup> dose: 500 mg	Total deficit: 2000 mg 1 <sup>st</sup> dose: 1000 mg 2 <sup>nd</sup> dose: 1000 mg

\*If Hb normal or Hb <70 g/L, calculate total body iron deficit more accurately using Ganzoni formula

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**Iron Infusion - Process**



- Provide good patient information
- Consent overload
- Insert cannula to forearm (avoid back of hand)
- Assemble Equipment, add iron to the infusion fluid 100-200ml N saline) and mix the contents.
- Flush the intravenous cannula with at least 10ml 0.9% Sodium Chloride prior to connecting the iron infusion
- Infusion over 15 min
- Monitor Temp , PR and BP (0, 5, 15 min and 30 min post infusion)
- Check Hb and Ferritin at 6 weeks
- Post infusion instruction

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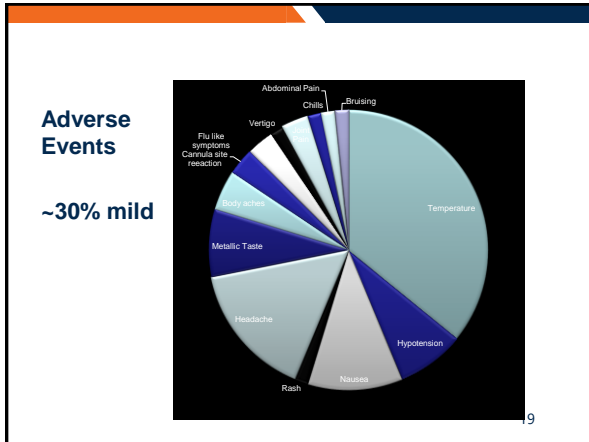
**Adverse Events to Fe Carboxymaltose**



- Pain at Insertion Site
- Immediate Reactions - Bronchospasm, Hypotension, Flushing, diarrhoea, vomiting
- Late Reactions – headache, fever, joint pain , hypophosphataemia (?significance)
- At Belmont n=2000 , minor AEs around 30%

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### Staining/Tattoos

- From paravenous leakage of iron solutions 'improper fixation or placement of cannula'
- Length and duration of staining related to volume of drug extravasated
- Often permanent
- Frequency:
  - PI: 1-10/1000
  - MDU: 1:20
  - Belmont Clinic: Nil after 1500

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### Staining

What to Do	Minimise risk
<p><i>Protocol with clear instructions</i></p> <ul style="list-style-type: none"> <li>✓ Stop infusion</li> <li>✓ Some guidelines recommend aspiration</li> <li>✓ Elevate/ice pack</li> <li>✓ Medical review/documentation</li> <li>✓ Inform patient and arrange ongoing follow up and management</li> </ul> <p><i>Treatment</i></p> <ul style="list-style-type: none"> <li>✓ Limited case studies only</li> <li>✓ Laser treatment</li> <li>✓ Chemical treatments</li> <li>✓ Vifor recommends avoidance of sun exposure</li> </ul>	<ul style="list-style-type: none"> <li>• Informed Consent</li> <li>• Clear indication i.v. iron</li> <li>• Appropriately trained personnel</li> <li>• Avoid sites of multiple venepuncture</li> <li>• Use large veins and avoid sites prone to movement (back of hand)</li> <li>• High gauge cannula (Vifor)</li> <li>• Check position by aspirating blood and then flush with saline <u>before</u> infusion</li> <li>• Monitor infusion</li> <li>• Flush with saline after infusion</li> <li>• Stop infusion immediately if pain, swelling, redness develops</li> </ul>

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### Finances

- Set up costs (pump \$1-1.5K, chair \$4K)
- Currently there is NO MBS item number for infusion
- Cost of consumables ~\$20
- Nurse time ~30 min
- Most practices charge consultation item number and fee for administering iron.

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### Summary

- Iron deficiency is common and most cases can be managed in general practice
- Iron can be safely and effectively administered in general practice
- Risks are minimised by:
  - ✓ good preparation
  - ✓ Clear indication for iv therapy
  - ✓ Initial and ongoing training of staff
  - ✓ Adhering to clear protocols
  - ✓ Routine process for informed consent
  - ✓ Good documentation
- Follow up and monitoring is essential

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### Resources

- Online eLearning: <https://bloodsafelearning.org.au/>
- IV iron tools including patient information, consent and protocol: <https://bloodsafelearning.org.au/iv-iron-tools/>
- Administering IV iron, a video: <https://bloodsafelearning.org.au/resource-centr>

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