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

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

- 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

Oral Iron - Which Preparation ?

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 diarrheoa starts within first 24-48 hours of starting iron source reduce dose by 50%.

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 doe 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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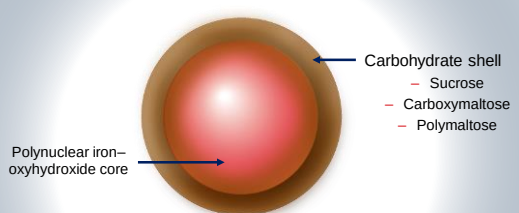
The Structure of intravenous iron



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Iron Polymaltose

$4.00/ 100mg

Suitable for TDI up to 2500 mg over 5-6 hours (or accelerated infusion)

Similar indications to Fe Carboxymaltose

Similar Adverse Drug Events (ADEs) to Fe Carboxymaltose

Iron Sucrose

$13.00 per 100mg

Multiple 100-200 mg doses or larger 500mg* dose

Licensed and PBS listed in Australia for :

- ✓renal indications: IDA in combination with ESA
- ✓documented hypersensitivity reaction to polymaltose
- ✓continued IV iron infusions where appropriate
- ✓undergoing chronic haemodialysis

Life threatening ADE's 0.6 per million and deaths 0.1 per million

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 (mg)***

*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 1st dose: 500 mg 2nd dose: 500 mg	Total deficit: 1000 mg 1st dose: 1000 mg 2nd dose: not required	Total deficit: 1500 mg 1st dose: 1000 mg 2nd dose: 500 mg
#Hb <100 g/L	Total deficit: 1400 mg 1st dose: 700 mg 2nd dose: 700 mg	Total deficit: 1500 mg 1st dose: 1000 mg 2nd dose: 500 mg	Total deficit: 2000 mg 1st dose: 1000 mg 2nd 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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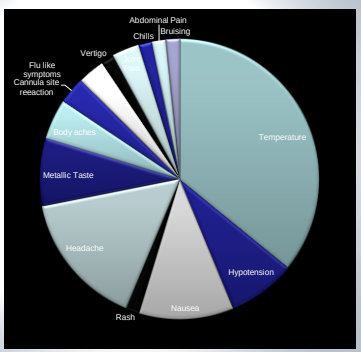
Adverse Events

~30% mild



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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

Protocol with clear instructions

- Stop infusion
- Some guidelines recommend aspiration
- Elevate/ice pack
- Medical review/documentation
- Inform patient and arrange ongoing follow up and management

Treatment

- Limited case studies only
- Laser treatment
- Chemical treatments
- Vifor recommends avoidance of sun exposure

Minimise risk

- Informed Consent
- Clear indication i.v. iron
- Appropriately trained personnel
- Avoid sites of multiple venepuncture
- Use large veins and avoid sites prone to movement (back of hand)
- High gauge cannula (Vifor)
- Check position by aspirating blood and then flush with saline before infusion
- Monitor infusion
- Flush with saline after infusion
- Stop infusion immediately if pain, swelling , redness develops

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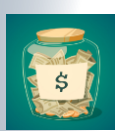
Finances



- 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-centre/videos

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