RCN Gastrointestinal Nursing Forum

Iron deficiency and anaemia in adults: a new guide for nursing management

Vifor Pharma UK have supported the RCN Iron Deficiency Anaemia Project and development of the guidance: ***Iron deficiency and anaemia in adults. RCN guidance for nursing staff (2015)***

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Background

- IDA affects 2 billion worldwide
- Most common cause of anaemia worldwide
- Causes >57,000 emergency admissions per year in NHS
- Cost to NHS £55.48m

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Aims of Guidance

Led by GI Forum

Developed by nurses from relevant specialties

For any nurse

Aims

- Identifying and managing IDA
- Why it occurs
- Dietary advice and oral iron
- IV iron and its delivery
- Patient info
- Specialty appendices

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Definitions

Iron deficiency:

- When the supply of iron is insufficient to meet the body's demand.
- Absolute iron deficiency:
  Total body iron depleted with low iron stores

- Functional iron deficiency:
  Inability to access stores to support erythropoietic demands

Iron deficiency anaemia:

- Absolute or functional iron deficiency
- Low Hb

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Parameters

Iron deficiency:[1]

- Ferritin <30µg/l if normal CRP
- Ferritin <100µg/l if raised CRP
- Transferrin saturation <16%

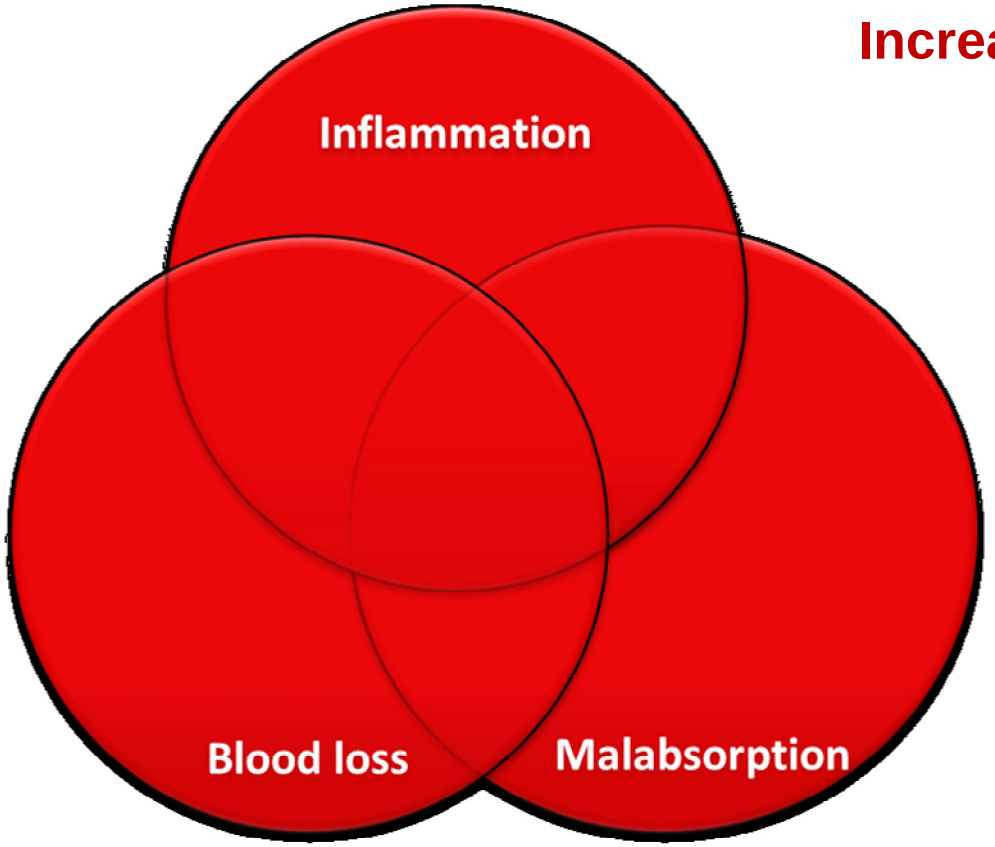
Anaemia:

- Hb <120 g/l in women; <130 g/l in men

1. Gasche C et al. Inflamm Bowel Dis 2007;13:1545-53

Causes of ID and IDA

Dietary insufficiency



Increased demand for iron

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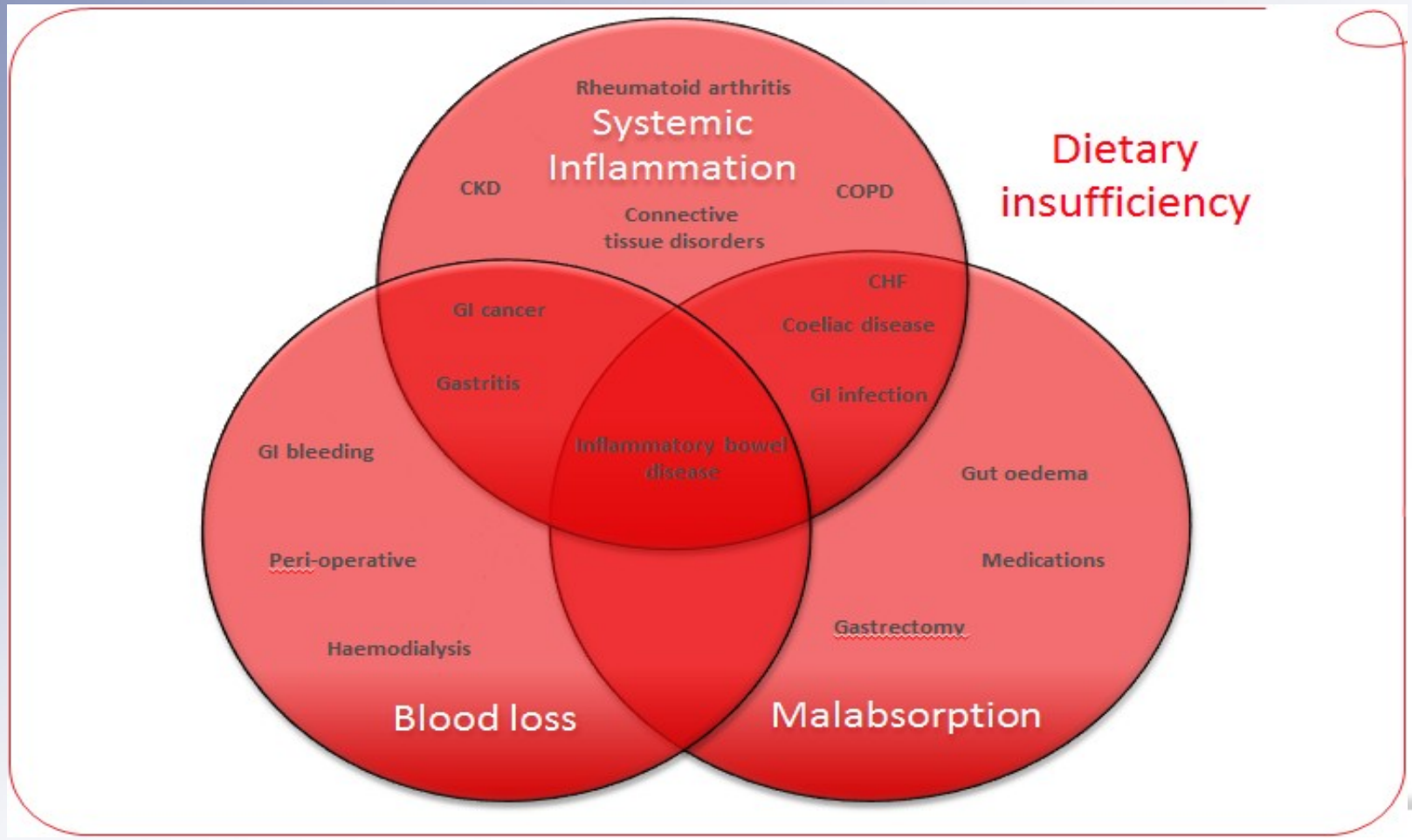
Causes of IDA



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Blood Loss

The commonest cause of IDA in older people in the UK is GI blood loss.

There is approximately 0.5mg iron in each ml of blood lost.

Body on average absorbs 1-2mg/day iron via the gut, up to a maximum of 20mg.[2]

1. Gasche C et al. Inflamm Bowel Dis 2007;13:1545–53

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GI Bleeding Disorders

Common[1]

- Peptic ulcer disease
- Gastritis
- GI malignancy
- Angiodysplasia

Uncommon

- Oesophagitis
- Gastric antral vascular ectasia

1. Goddard AF et al. Gut 2011;60:1309-1316

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Malabsorption of Iron

GI mucosal disease

- Coeliac disease
- Inflammatory Bowel Disease

Medications (e.g. PPIs)

Gut oedema (e.g. CHF)

Gastric surgery

Dietary interactions

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Inflammation

Hepcidin is understood to be the principal regulator of iron homeostasis.

Peptide hormone produced by the liver.

Acts to reduce iron uptake by enterocytes in the GI tract and block the release of iron from hepatocyte and macrophage stores.

Levels are high when the body is iron replete and low when the body is iron deficient.

Hepcidin is also an acute-phase reactant.

Systemic inflammation, and co-morbid inflammatory conditions lead to the up-regulation of the hormone hepcidin which inhibits the utilisation of iron in the body.

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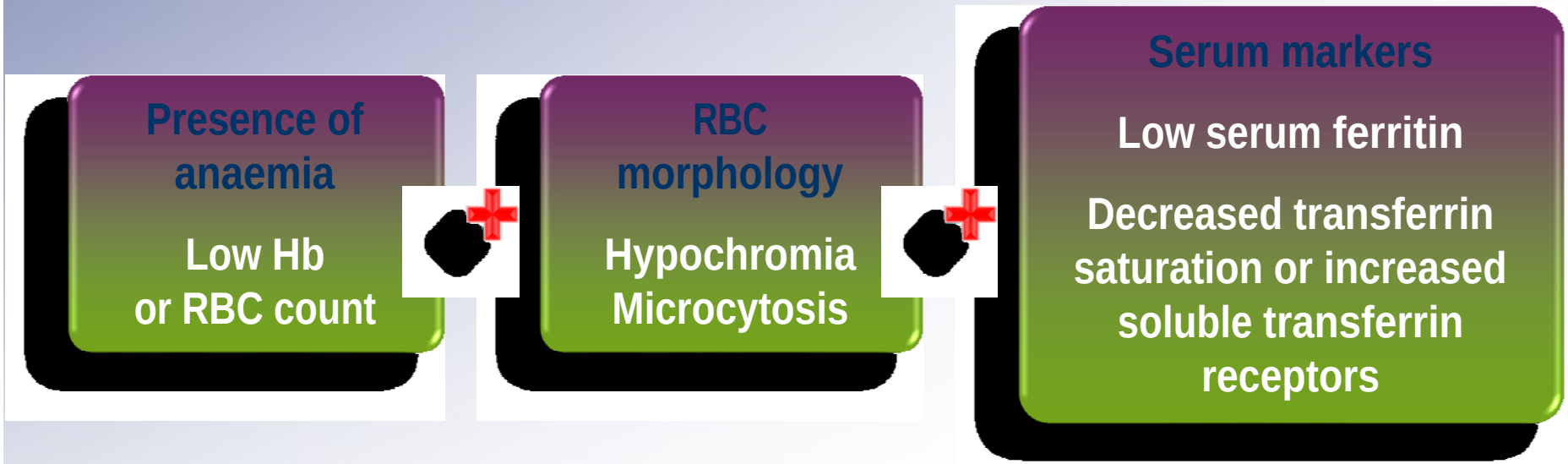
Diagnosis of IDA



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Indicators of Iron Deficiency Anaemia

Low haemoglobin (Hb)

- Hb <120g/l in women / <130g/l in men

Mean cell volume (MCV)

- Measure of the average size of RBCs in the blood sample
- <76 fl

Mean cell haemoglobin concentration (MCHC)

- Average concentration of Hb per red cell
- <30g/dl

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Serum ferritin

Most specific biochemical test of total body iron stores **in absence of inflammation or infection.**

Low serum ferritin levels reflect depleted iron stores

- No universally agreed cut-off to diagnose IDA
- Usually between **10-30 µg/L**

Serum ferritin is an acute phase protein ➔ **increases in presence of inflammation or infection**

- Can be ≥100 µg/L even in presence of iron deficiency[1]
- C-reactive protein (CRP) can be used to assess degree of inflammation
- Other markers may be needed to diagnose iron deficiency

1. Dignass AU et al. J Crohns Colitis 2015; doi 10.1093/ecco-jcc/jju009

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Dietary Iron

Enhancers – lean red meat, oily fish, vit C, fermented products (soy sauce & bread)

Inhibitors – calcium, phytates (cereals and seeds), polyphenol and tannin (tea & coffee)

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Tips on Dietary Iron Advice

- Only small amount of iron absorbed from diet
- Haem iron (red meat) more easily absorbed
- Don’t drink tea or coffee immediately around meals
- Eat dairy as snacks rather than with meals
- Eat x5 portions per day

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Treatment of IDA

Oral iron

Parenteral iron

Blood transfusion

AIM IS TO CORRECT ANAEMIA AND REPLENISH IRON STORES[1]

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1. Goddard AF et al. Gut 2011;60:1309-16

Ferrous Iron Preparations Available in the UK[1]

Iron salt	Dose	Ferrous iron/dose
Ferrous sulphate	300 mg	60 mg
Ferrous sulphate (dried)	200 mg	65 mg
Ferrous fumarate	200 mg	65 mg
Ferrous gluconate	300 mg	35 mg

Oral dose of ferrous iron for iron deficiency: 100 – 200 mg daily

- Historically administered as dried ferrous sulphate 200 mg three-times-daily (TDS).
- Hb should increase by approximately 1–2 g/L per day.
- Once Hb in normal range, treatment should continue for 3 months.

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1. British National Formulary (BNF)

Oral Iron Therapy

Ongoing loss of blood may exceed capacity to absorb oral iron – body on average absorbs 1-2mg/day iron via the gut, up to a maximum of 20mg.[1]

Absorption of oral iron may be limited due to hypochlorhydria/achlorhydria or gut oedema.

Therapy with oral iron can take a number of months.

Oral iron is poorly tolerated which can lead to reduced compliance.

Lower doses are better tolerated

Warn patients of GI side effects (most can tolerate)

1. Gasche C et al. Inflamm Bowel Dis 2007;13:1545–53

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Reasons for a Failure to Respond to Oral Iron[1]

Raised hepcidin and other inflammatory cytokine levels, altering absorption

Continuing haemorrhage

Failure to take tablets

Wrong diagnosis (e.g. thalassaemia trait, sideroblastic anaemia)

Mixed deficiency (e.g. associated folate or vitamin B_{12} deficiency)

Malabsorption

1. Hoffbrand AV and Moss PAH. Essential Haematology (6th edition). Wiley-Blackwell 2011: Chapter 3

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Parenteral Iron

In the UK, parenteral administration of iron is reserved for patients who have been intolerant of oral iron therapy, or in whom oral iron therapy is not appropriate.

Comparative clinical trials show a faster and more prolonged response with IV iron than with oral iron.[1]

IV iron is more effective, better tolerated and improves QoL to a greater extent than oral iron.[1]

1. Gasche C et al. Inflamm Bowel Dis 2007;13:1545–53

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UK/OTH/15/0045
Date of Preparation: February 2015

	Venofer	Cosmofer	Monofer	Ferinject
Maximum single dose	200mg 3x per wk	20mg/kg	20mg/kg	20mg/kg, up to 1000mg
Test dose required	✗	✓	✗	✗
Infusion times	30 mins	4-6 hours	≤1000mg – 30 mins >1000mg – 60 mins	≤500mg - 6 mins >500mg - 15 mins
Use in children	✗	≥14 years	✗	≥14 years
Use in pregnancy	Not in 1st trimester	Not in 1st trimester	Not in 1st trimester	Not in 1st trimester
Use in breastfeeding	✓	Not recommended	No information	✓
Use with caution in asthma, eczema or other atopic allergy	✓	✓	✓	✓
Use with caution in decompensated cirrhosis and hepatitis	✓	✗	✗	✓
Use with caution in rheumatoid arthritis with active inflammation	✓	✓	✓	✓
Acute renal failure	✓	✗	✓	✓
Use with caution in patients with acute or chronic infection	✓	✗	✓	✓

Treatment Options for ID/IDA

	Oral iron	IV iron	Blood transfusion
Advantages	Cost	High iron content	Essential in cases of cardiovascular instability[1]
	Non-invasive	100% bioavailable	Replaces RBCs
	Simple administration	Compliance	Compliance
	Convenient	Fast acting[2]	
		Well tolerated[3]	
Disadvantages	Intolerance	Potential adverse reactions	Potential transfusion reactions
	Potential poor compliance	Invasive	Invasive
	Risk of malabsorption in inflammatory conditions	Day case / inpatient	Day case / inpatient – secondary care input needed
	Slower to increase haemoglobin vs IV iron[2]	Cost	Cost
	Interactions with common oral drugs		Limited supply
	Can delay investigative procedures, i.e. colonoscopies		May worsen outcomes in acute bleeds and surgical cases[4]
	Can only absorb 10-20mg a day[3]		Complex administration

1. Goddard AF et al. Gut 2011; 60:1309-1316
2. Kulnigg S et al. Am J Gastroenterol 2007; 102:1-11
3. Gasche C et al Inflamm Bowel Dis 2007; 13(12):1545-53
4. Restellini S et al. Aliment Pharmacol Ther 2013; 37:316-322

Blood Transfusion

- Emphasis to reduce inappropriate and overuse of blood transfusion
- Patient blood management (PBM)
- Puts patients at heart of decision making
- 2013 Audit – 25% of transfusion for anaemia could have been avoided, only 8% give IV iron

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Preop Optimsation

Assessing pre op patients

‘Anaemia should be identified and treated in a timely fashion’

Handbook of Transfusion Medicine

Assess anaemia and bleeding risk

Escalate issues

Discuss patients views on blood transfusion (e.g. Jehovahs witness)

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Appendices

- Gastro
- Heavy Menstrual bleeding
- Patient blood management
- Renal
- Pregnancy, postpartum and post delivery
- Contains more specialist info, references and guidance

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Questions for you…….

- Who are the patients at risk of IDA in your practice?
- What's your current role in identifying IDA and escalating treatment?
- How are the issues or dietary and oral iron addressed?
- Is there any option to use IV iron as treatment within your Trust? When can patients access it?
- Would you feel able to promote IV iron as an alternative to blood transfusion?
- Are you able to influence IV iron pre op?

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Availability

The full RCN guidance ***Iron deficiency and anaemia in adults. RCN guidance for nursing staff (2015)*** can be downloaded at www.rcn.org.uk/publications

Hard copies at this meeting.

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