Antenatal Anaemia
Audit of practice and introduction of an Obstetric Anaemia Toolkit

Dr Ciara Donohue
Consultant Anaesthetist
Royal Free Hospital
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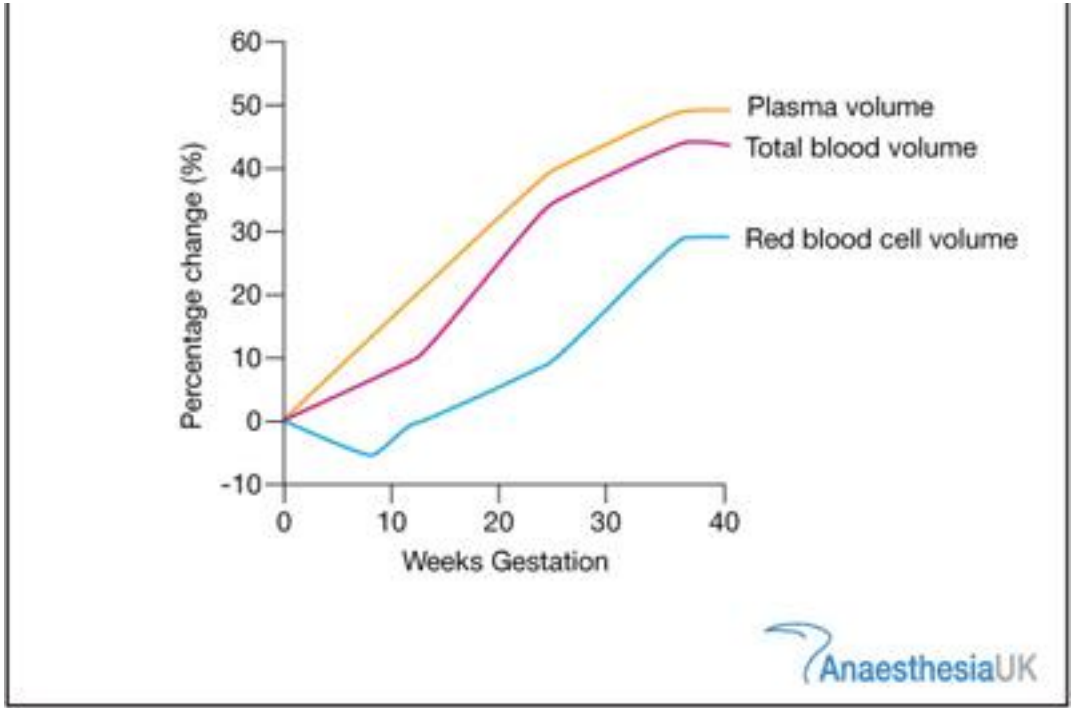
Overview

- Physiological changes
- Causes and risk factors and iron pathways
- Adverse effects of anaemia
- Antenatal guidelines and best practice advice
- Royal Free data – retrospective audit
- Improvement and education – Obstetric anaemia toolkit
- National Comparative Audit

Physiological changes

- Natural decline in Hb (& Hct) throughout pregnancy
  - Expansion of plasma volume (40%)
  - Proportionally smaller increase in RBC vol (20-30%)



Anaemia definitions

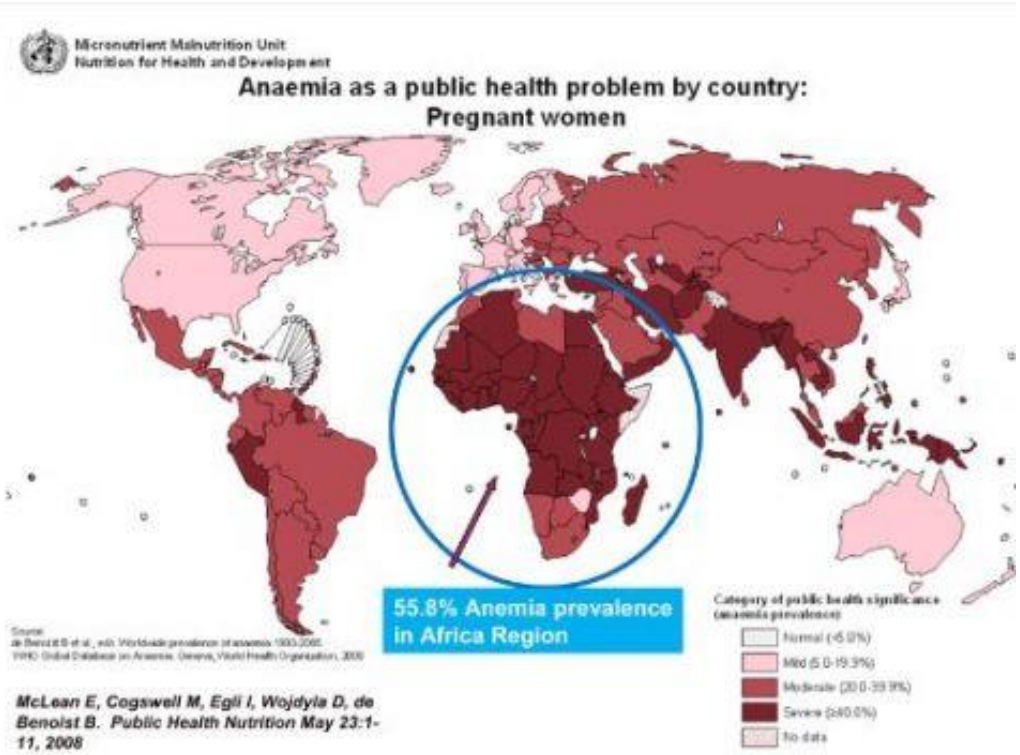
Stage of pregnancy	Hb (g/L)
1st Trimester	<110
2nd - 3rd Trimesters	<105
Post partum	<100

Hb (g/L)	Severity of anaemia (WHO)
100-109	Mild
70-99	Moderate
<70	Severe

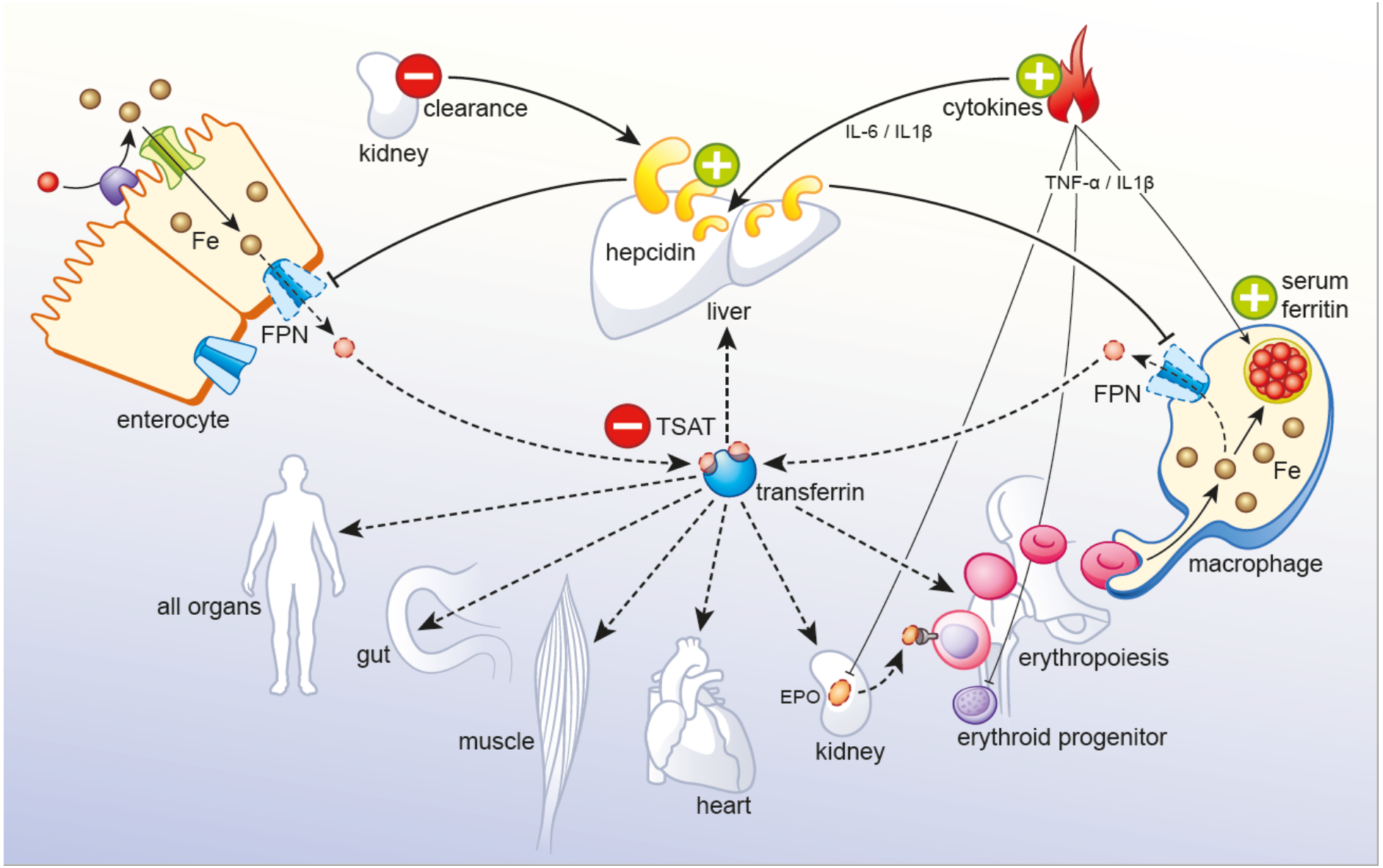
BCSH (British Committee of Standards in Haematology)

Causes of antenatal anaemia

- Iron deficiency (IDA)
- Folate deficiency
- B12 deficiency
- Haemoglobinopathies
- Infections
- Leukaemia/Lymphoma



Iron pathways



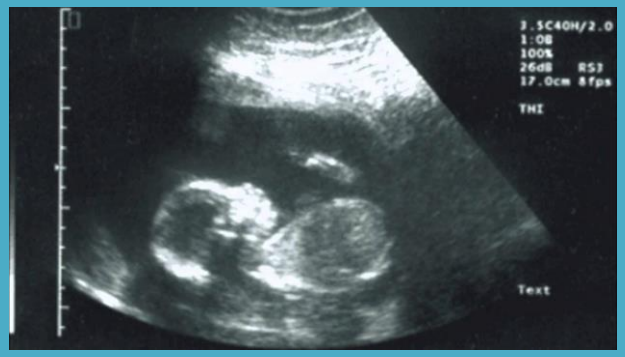
Risk factors for IDA in pregnancy

Deplete iron stores	Inadequate iron intake/absorption	Excessive iron demands (>normal 3 fold increase in iron requirement)
		
		

Adverse effects of antenatal anaemia

Maternal

Fetal



- Susceptibility to infection
- Reduced physical capacity and fatigue
- Non specific symptoms (pallor, weakness, dizziness, SOB, irritability)
- Reduced tolerance to peripartum blood loss
- Increased transfusion exposure
- Increased post partum depression
- Severe anaemia assoc with increased mortality

- Increased risk of prematurity
- IUGR
- Perinatal mortality
- Increased risk of early fetal anaemia
- Impaired psychomotor/neurological development

Diet and supplements

	Dose per tab	Elemental iron
Ferrous sulphate	200mg	65mg
Ferrous fumarate	200mg	65mg
Ferrous gluconate	300mg	35mg
Pregaday	305mg	100mg

200mg elemental iron/day
On empty stomach
Avoid tannins/milk
Ascorbic acid enhances absorption

Consider reduced dosing eg. BD, OD or alternate day regimens
Consider addition of laxatives

Royal Free Retrospective Audit of Antenatal Anaemia

world class expertise local care

Royal College of Obstetricians & Gynaecologists

NICE accredited
www.nice.org.uk/accreditation

Executive summary of recommendations

How can the risk of transfusion be reduced?

Optimisation of haemoglobin in the antenatal period

Diagnosis

Anaemia in pregnancy is defined as first trimester haemoglobin (Hb) less than 110 g/l, second/third trimester Hb less than 105 g/l, and postpartum Hb less than 100 g/l, in line with British Committee for Standards in Haematology (BCSH) guidance. B

For normocytic or microcytic anaemia, a trial of oral iron should be considered as the first step and further tests should be undertaken if there is no demonstrable rise in Hb at 2 weeks and compliance has been checked. ✓

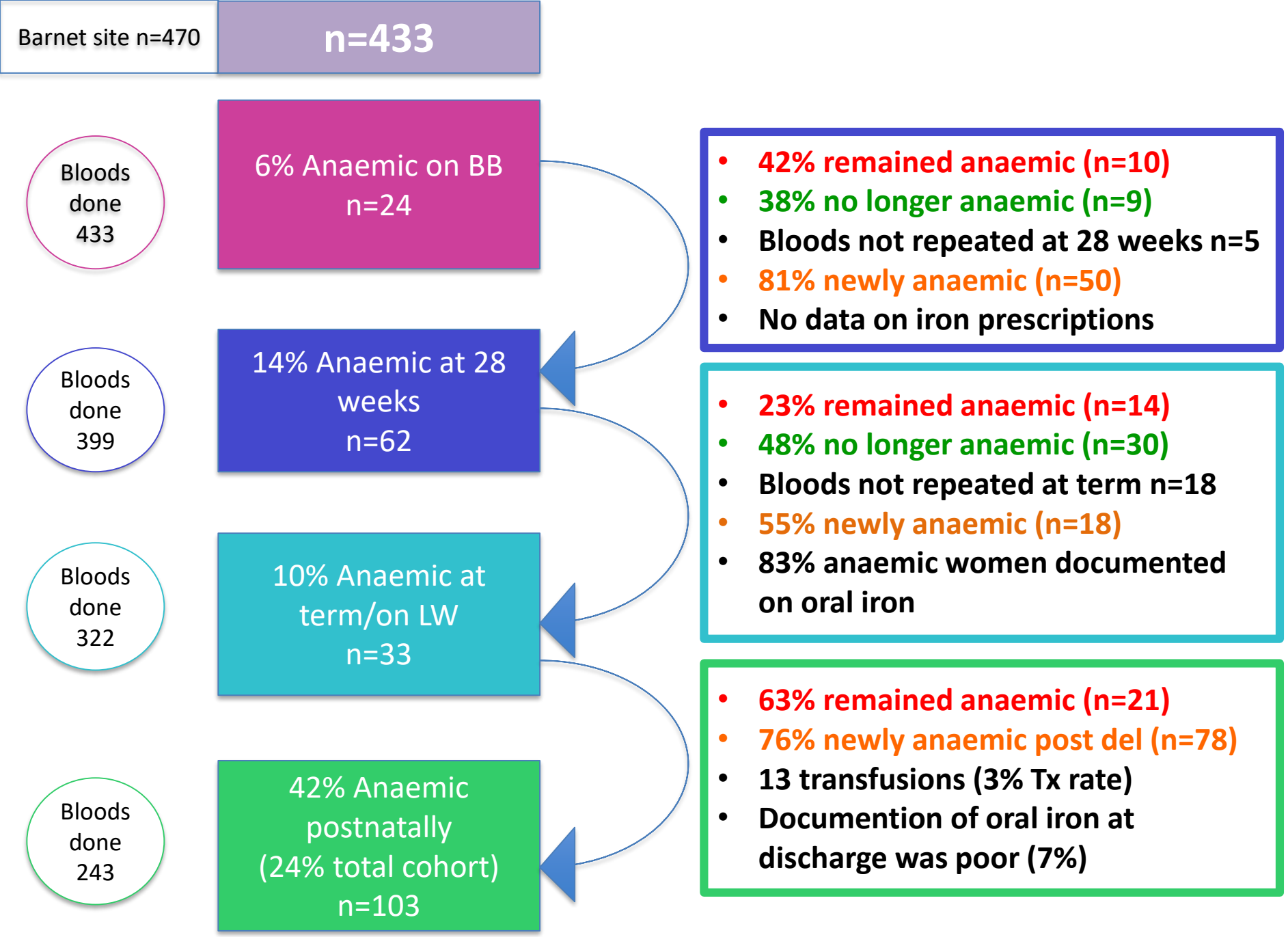
Pregnant women should be offered screening for anaemia at booking and at 28 weeks. Women with multiple pregnancies should have an additional full blood count done at 20–24 weeks. ✓

Treatment and management

Oral iron should be the preferred first-line treatment for iron deficiency. A

Parenteral iron is indicated when oral iron is not tolerated or absorbed or patient compliance is in doubt or if the woman is approaching term and there is insufficient time for oral supplementation to be effective. C

Women should receive information on improvement of dietary iron intake and factors affecting absorption of dietary iron. C


Barnet site n=470
n=433
Bloods done 433
6% Anaemic on BB n=24
42% remained anaemic (n=10)
38% no longer anaemic (n=9)
Bloods not repeated at 28 weeks n=5
81% newly anaemic (n=50)
No data on iron prescriptions
Bloods done 399
14% Anaemic at 28 weeks n=62
23% remained anaemic (n=14)
48% no longer anaemic (n=30)
Bloods not repeated at term n=18
55% newly anaemic (n=18)
83% anaemic women documented on oral iron
Bloods done 322
10% Anaemic at term/on LW n=33
63% remained anaemic (n=21)
76% newly anaemic post del (n=78)
13 transfusions (3% Tx rate)
Documention of oral iron at discharge was poor (7%)
Bloods done 243
42% Anaemic postnatally (24% total cohort) n=103

Transfusion practice

- 13 postnatal transfusions (3%)
  - 46% anaemic at term (all had been on oral iron)
  - Trigger Hb 73 g/L [70-75.5]
  - 69% 2 unit transfusions

Transfused	**Last Hb** recorded pre delivery (g/L) Median [IQR]	P value
Y	110 [98-114]	P>0.003
N	119 [111-126]	

Transfused	**EBL** (ml) Median [IQR]	P value
Y	1100 [675-1625.7]	P<0.00001
N	400 [300-600]	

Cell salvage

Mode of delivery	EBL≥500mls	EBL<500ml
Elective LSCS (n=81)	40 (49%)	40 (49%)
Emergency LSCS (n=94)	63 (67%)	28 (30%)

Cost of collection set = £18.50

Liverpool Women's NHS Foundation Trust

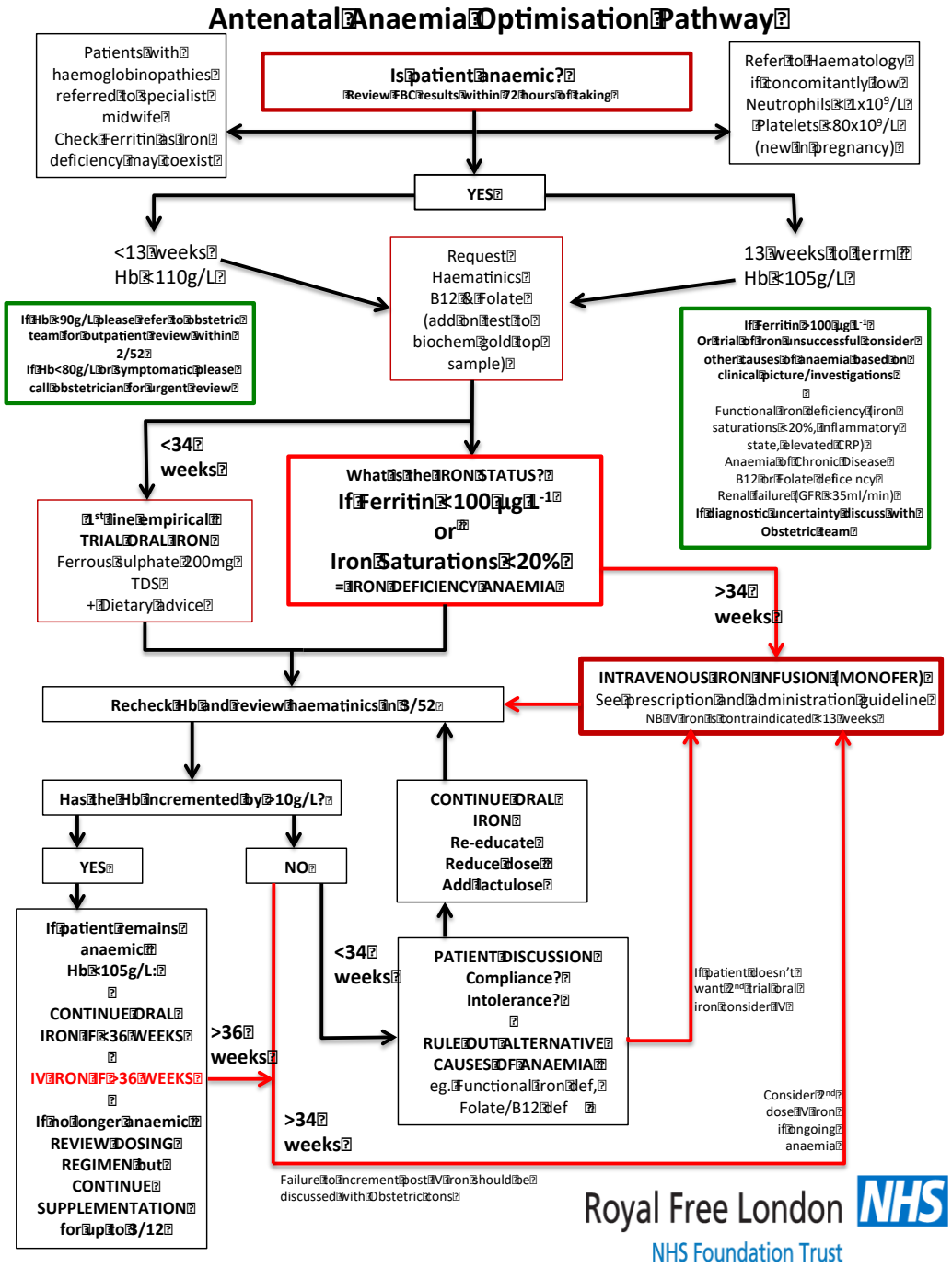
Summary of shortfalls & opportunities

- Unoptimised anaemia
  - 1 patient anaemic at every stage
  - 10 patients anaemic on BB and 28 week bloods
  - 14 patients anaemic at 28weeks and term
- Poor documentation of oral iron prescription
- No evidence of formal follow up/repeat bloods to assess response to oral iron
- No documentation of IV iron for non responders
- No use of cell salvage
- Suboptimal single unit transfusion practice

Other important outcome measures

- Transfusion rate low (3%)
- Optimising maternal Hb may have additional benefits
  - Maternal wellbeing/fatigue/QOL
  - Fetal outcomes

Obstetric anaemia toolkit



Pre-printed prescription stickers

<table>
<tr><td colspan="3">Patient details (attach sticker)

Name:

MRN:

DOB:</td><td colspan="3">Height (cm):

Booking Weight (kg):

BMI:

Current Hb (g/L):

Allergies:</td><td colspan="4">Dosing calculation (booking weight)

<table><tr><td>Hb (g/L)</td><td>50 to ≤ 75kg</td><td>>75kg</td></tr><tr><td>≥90</td><td>1000mg</td><td>1500mg</td></tr><tr><td><90</td><td>1500mg</td><td>2000mg</td></tr></table>If BMI ≥30 use ideal body weight at booking

If calculated dose >20mg/kg give as divided infusions 1 week apart (1x 20mg/kg, 1x remaining dose) rounded down to nearest 100mg</td></tr>
<tr><td>Date of infusion</td><td>Drug</td><td>Dose (mg)</td><td>Infusion fluid</td><td>Route</td><td>Duration of infusion

≤1000mg over 15mins, >1000mg over 30 mins, via infusion pump</td><td>Batch number</td><td>Time given</td><td>Given by</td><td>Checked by</td></tr>
<tr><td></td><td>MONOFER</td><td></td><td>100ml Sodium Chloride 0.9%</td><td>IV infusion</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td colspan="6">Prescriber
PRINT name & signature:

Date:</td><td colspan="4">Pharmacy
Screened by:

Ordered by:</td></tr>
</table>

Patient reported outcomes
FACIT fatigue score

1. I feel fatigue
2. I feel weak all over
3. I feel listless (washed out)
4. I feel tired
5. I have trouble starting things
6. I have trouble finishing things
7. I have energy
8. I am able to do my usual activities
9. I need to sleep during the day
10. I am too tired to eat
11. I need help doing my usual activities
12. I am frustrated
13. I have to limit my social activity because I am tired

Obstetric Anaemia Toolkit

- Educational program
  - Walk about face to face
  - PBM Lessons of the week
  - Teaching sessions for foundation doctors, obstetricians & midwives
  - Support for midwife champions to attend educational training days
- Trust endorsement and support
  - PBM committee
  - Reflex testing

National comparative audit of antenatal anaemia management

- Lack of national audit data evaluating antenatal anaemia management, perinatal transfusion and maternal and fetal outcomes
- Snapshot single day (~2000 deliveries)
- Data collection
  - Booking Hb
  - 28 week Hb
  - Pre delivery/post partum Hb
  - Haematinics
  - If offered appropriate treatment for anaemia
  - Success of treatment
  - Transfusion exposure
  - Simple maternal and fetal outcomes (gestation, birth weight)
- Planned launch Autumn 2018
- Individualised feedback to trusts

NHS Blood and Transplant

Thank you

- Acknowledgements
  - Emily Carpenter (NHSBT/King's)
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  - Toby (medical student)
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