

Managing Anaemia in Pregnancy

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CNS Haematology and Transfusion Medicine

What am I going to talk about?

- Iron
- B₁₂
- Folate
- Increasing women's wellbeing
- Reducing midwife workload
- A bit about the babies.

Iron

Increased requirements in pregnancy

Fetus	- 270mg
Placenta and cord	- 90mg
Delivery	- 150mg
Normal loss	- 280mg
(1mg per day)	
<u>↑RCM</u>	- <u>450mg</u>
Total	-1240mg

Iron

- BUT + gain 240-480mg (no menses)
- Total loss $1240\text{mg} - 240/480 = 1000/760$

Net requirement for all in 280 days 700 – 1400mg (2.5-5mg/d.)

Therefore where are

- Primips?
- Multips?

Aim of Antepartum treatment - to get to 3 months post partum with normal iron stores. It is possible!

It starts at booking.....

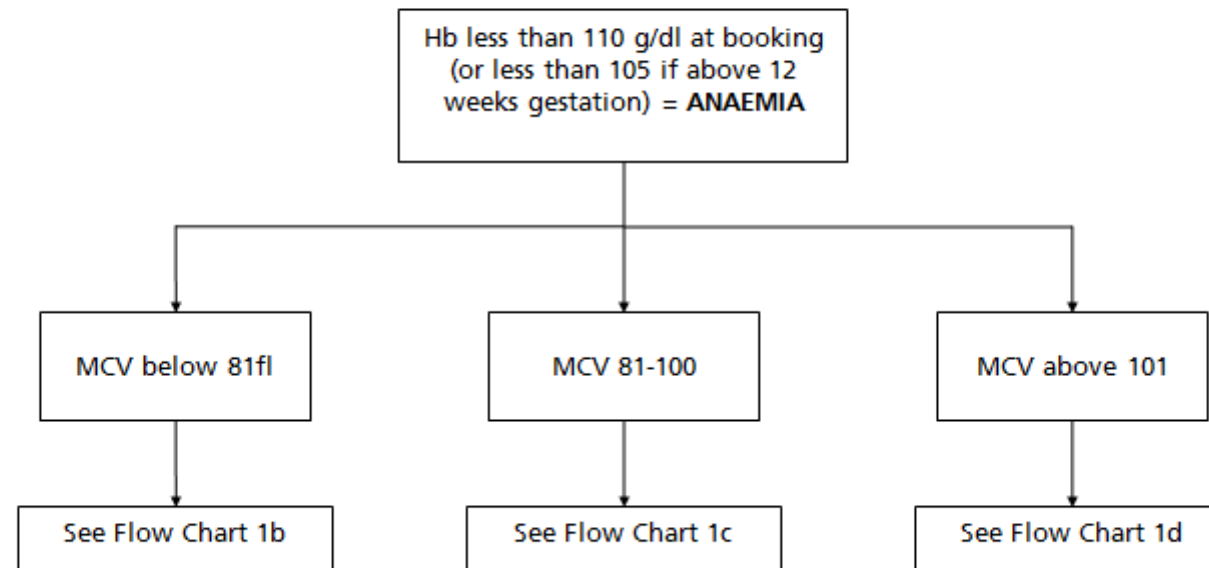
- A careful history
 - General health
 - Family history
 - Bleeding history – Obstetric and otherwise (menses, surgery)
 - Any previous history of anaemia?
- Beliefs and wishes and fears concerning blood transfusion
- Drug history
- Allergies

Request Reason : ANTENATAL

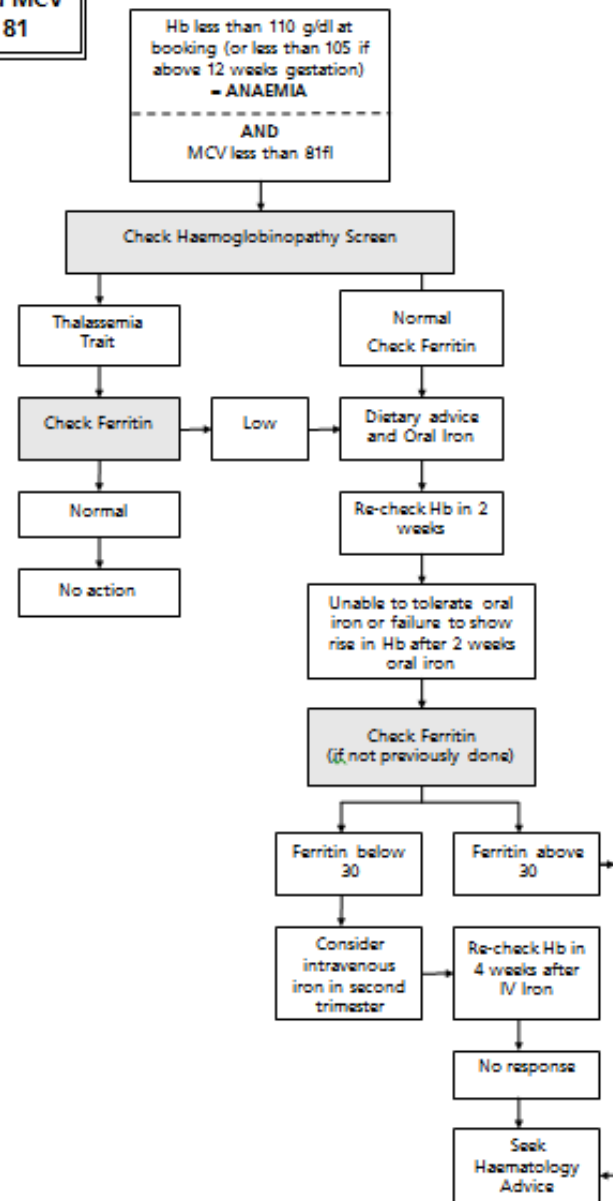
White Blood Cell Count	9.80	$\times 10^9/L$	(4 to 10)	Auth
Auto Neutrophil Count	7.00	$\times 10^9/L$	(1.8 to 7.7)	Auth
Auto Lymphocyte Count	2.10	$\times 10^9/L$	(1.5 to 3.5)	Auth
Auto Monocytes	0.32	$\times 10^9/L$	(0.2 to 1.0)	Auth
Automated Eosinophils	0.10	$\times 10^9/L$	(0.02 to 0.5)	Auth
Automated Basophils	0.19	$\times 10^9/L$	(0.02 to 0.1)	Auth
Red Blood Cells	3.62	$\times 10^{12}/L$	(3.8 to 4.8)	Auth
Haemoglobin	8.2	g/dL	(12.5 to 16.5)	Auth
Hematocrit	0.267	L/L	(0.38 to 0.46)	Auth
MCV	74.0	fL	(83 to 101)	Auth
MCH	22.6	pg	(27 to 32)	Auth
MCHC	30.6	g/dL	(31.5 to 34.5)	Auth
Platelets Count	340	$\times 10^9/L$	(150 to 400)	Auth

1 Date 2 Bar1st 3 Latst 4 rep acQ 5 Spec 6 DPT 7 Matches 8 Options 9 eXit X
Cursor Down for more

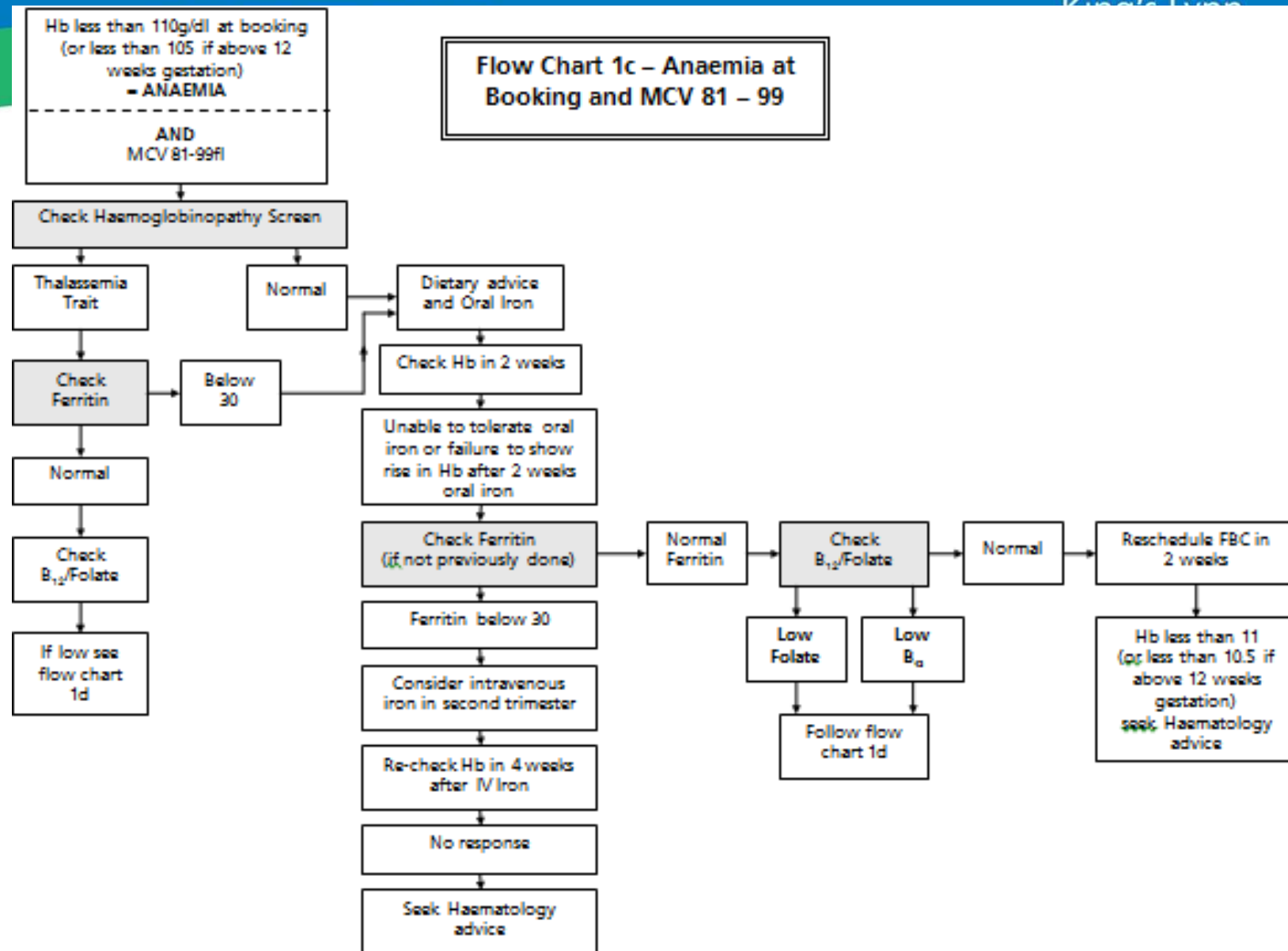
Flow Chart 1a – Anaemia at Booking



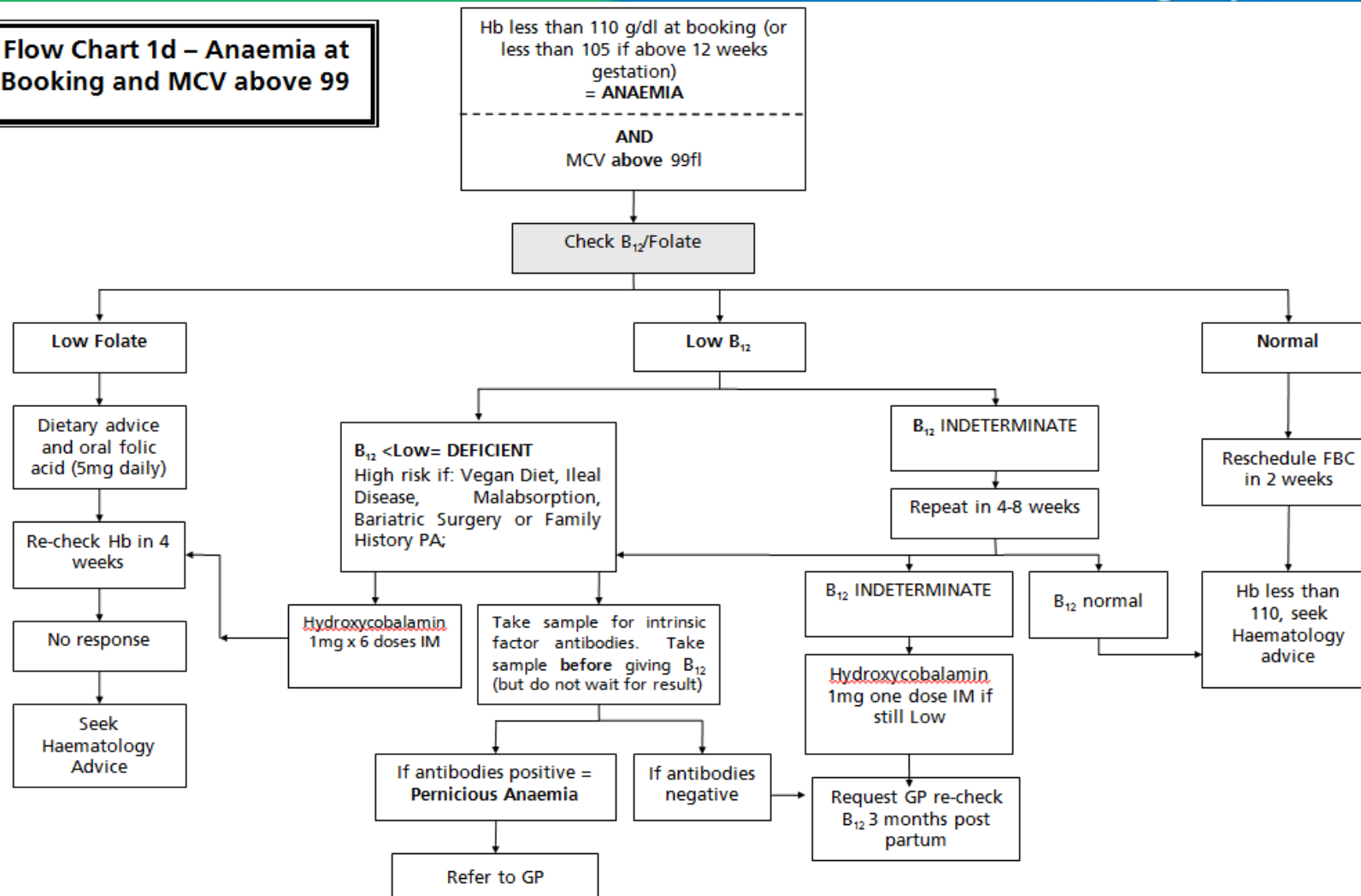
**Flow Chart 1b –
Anaemia at
Booking and MCV
less than 81**



Flow Chart 1c – Anaemia at Booking and MCV 81 – 99



Flow Chart 1d – Anaemia at Booking and MCV above 99



Investigations based on your findings

- Anaemia screen as baseline if there are concerns
 - Repeat FBC
 - U&E and LFT
 - Clotting
 - B₁₂, Folate and Ferritin
 - CRP
- Do a look back, if possible, to previous non pregnancy results – particularly the MCV, MCH

Haemoglobin

- Anaemia = haemoglobin < 120g/l for all women (WHO)
- Haemoglobin concentration determined by:
 - Red cell mass (RCM)
 - Plasma volume (PV)
- True anaemia = fall in RCM
- During pregnancy:
 - PV rises by 1 litre (max. at 24 – 30/40)
 - RCM rises by 300ml (max. at 30/40)
 - Overall fall in Hb, max at 30/40 = dilutional anaemia
(min. Hb =110g/l)

Into the 3rd Trimester

- **Look again at their blood**
- Has the MCV dropped?
- Think about Iron, B₁₂ and Folate.
- If Iron is low use a treatment dose of oral iron
- But they are on Pregaday....?
- If time is marching on (32/40+) consider IV Iron for complete stores replacement

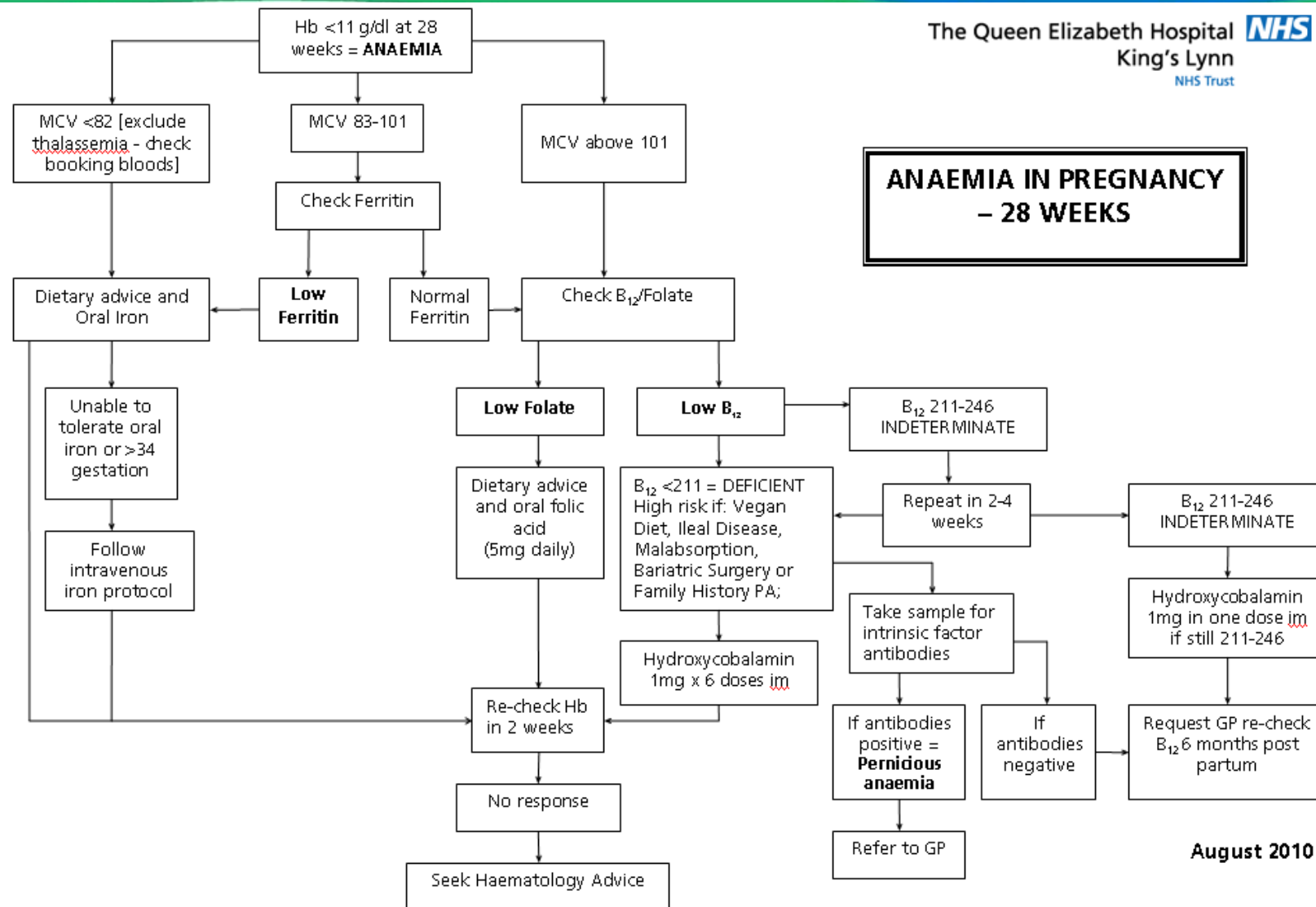
THOMAS, JAMES
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]

Request Reason : Antenatal (28 weeks)

White Blood Cell Count	19.10	$\times 10^9/L$	(4 to 10)	Auth
Auto Neutrophil Count	6.54	$\times 10^9/L$	(1.8 to 7.7)	Auth
Auto Lymphocyte Count	2.50	$\times 10^9/L$	(1.5 to 3.5)	Auth
Auto Monocytes	0.74	$\times 10^9/L$	(0.2 to 1.0)	Auth
Automated Eosinophils	0.20	$\times 10^9/L$	(0.02 to 0.5)	Auth
Automated Basophils	0.13	$\times 10^9/L$	(0.02 to 0.1)	Auth
Red Blood Cells	3.76	$\times 10^{12}/L$	(3.8 to 4.8)	Auth
Haemoglobin	9.3	g/dL	(12.5 to 16.5)	Auth
Haematocrit	0.270	L/L	(0.36 to 0.46)	Auth
MCV	74.0	fL	(83 to 101)	Auth
MCH	24.8	pg	(27 to 32)	Auth
MCHC	33.5	g/dL	(31.5 to 34.5)	Auth
Platelet Count	342	$\times 10^9/L$	(150 to 400)	Auth

1. Date 2 Serial 3 Latex 4 rep seq 5 Spec 6 DET 7 Matches 8 Options 9 exit X
Cursor Down for more

ANAEMIA IN PREGNANCY – 28 WEEKS



August 2010

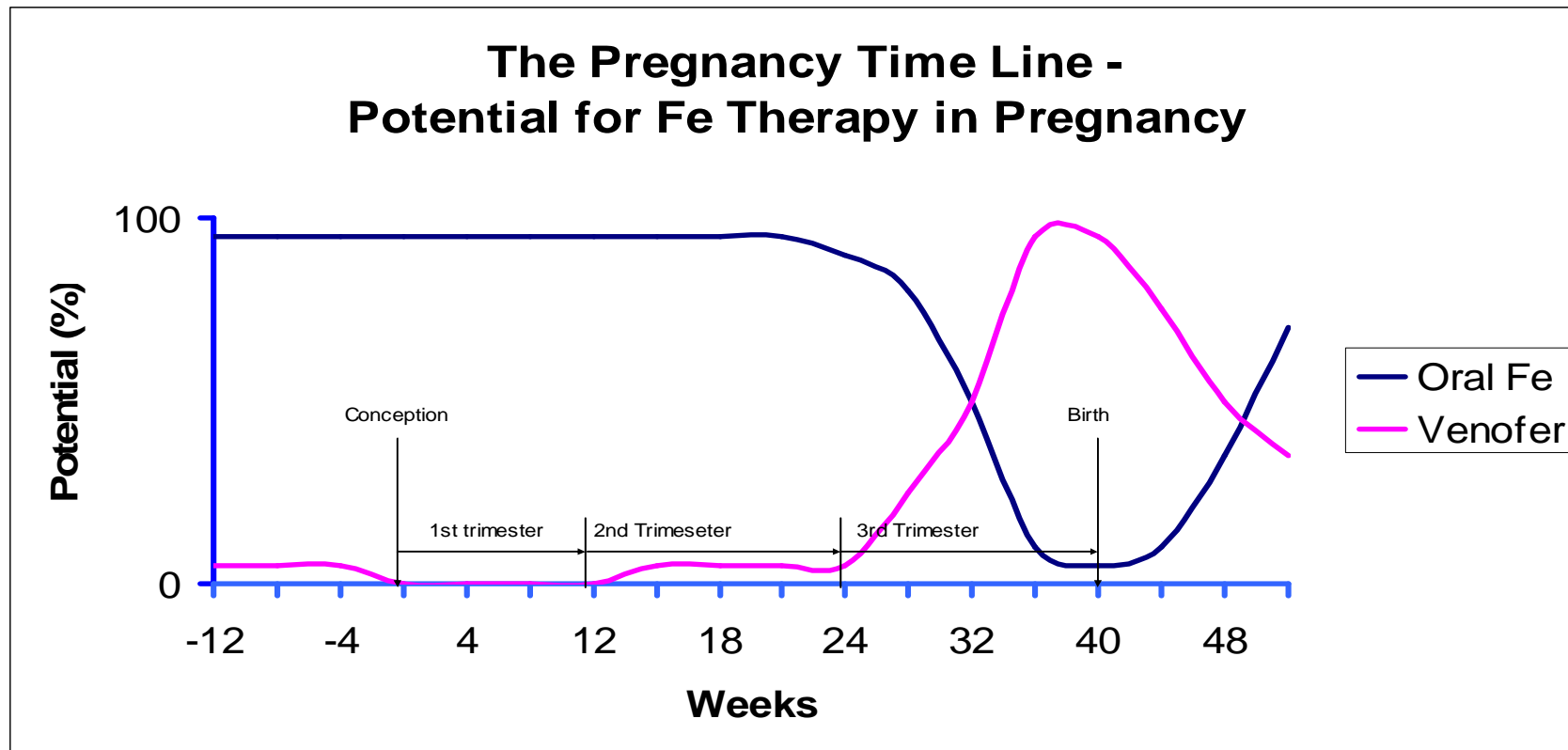
Adverse effects/risks of Iron deficiency in Pregnancy, Delivery and Post partum to Mum

- Unpleasant symptoms
 - Lethargy, dyspnoea, fatigue, **insomnia**, light headedness, dizziness and disorientation
- Increased susceptibility to **infection**
- Decrease in thermoregulation
- Ante partum **haemorrhage ++**
- Post partum **haemorrhage ++**
- Delayed wound healing
- Reduced quality and quantity of **Lactation** or even halted
- **Excessive fatigue and failure to cope**

And for the wee ones.....

- Poor uterine growth
- Decreased liquor
- Asymmetrical growth patterns
- Small for dates
- Premature delivery
- Low birth weight
- Failure to thrive (poor lactation)
- And if it continues - poor concentration and reduced scholarly achievements
- And for the Midwife.....??!!

Iron Therapy Timeline in Pregnancy



Oral Iron

- Very cheap
- Get the right dose and length of treatment.
- Slow to work but will raise Iron stores within 1/52.
- Side effects!
- Patient and practitioner confidence.

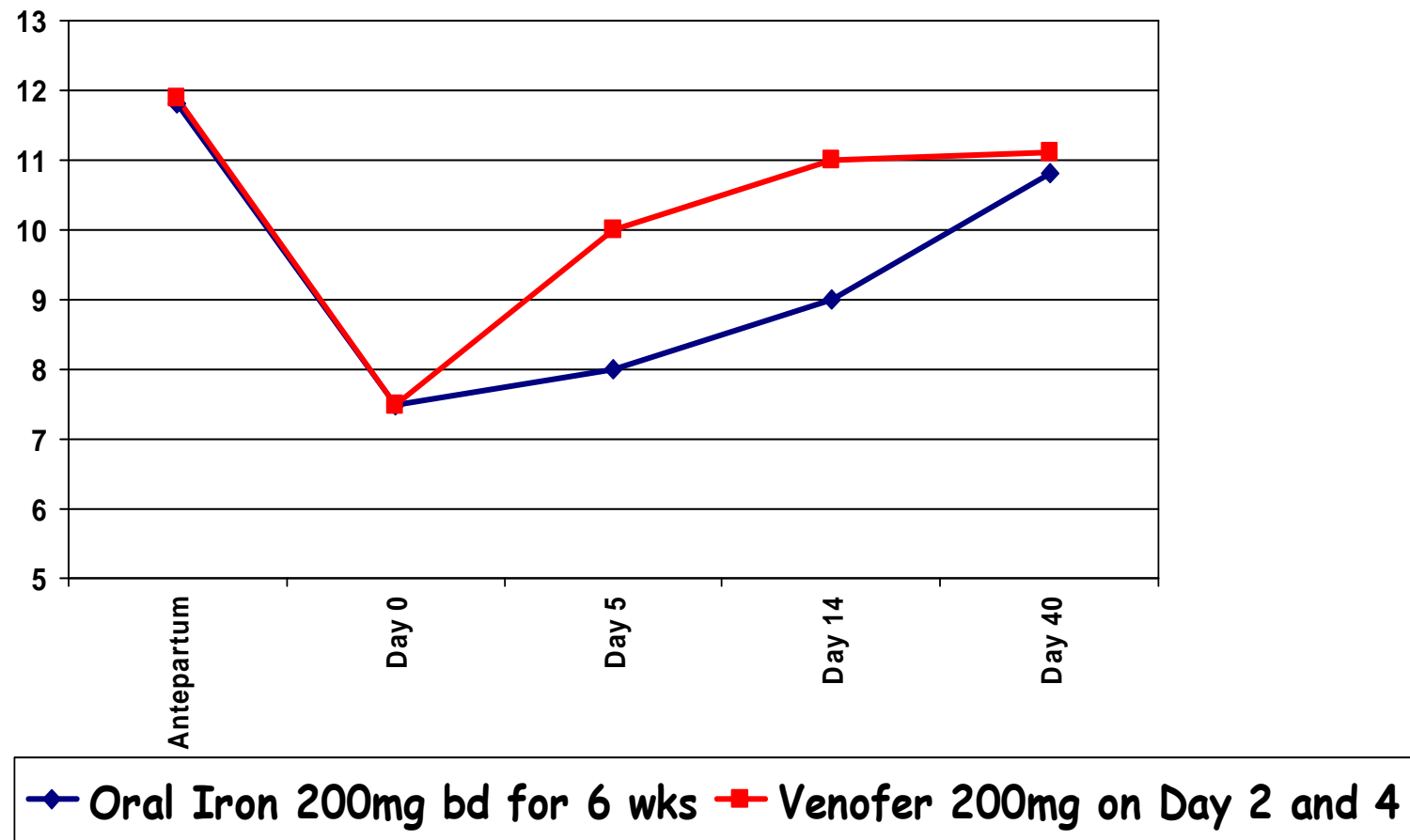


Intravenous

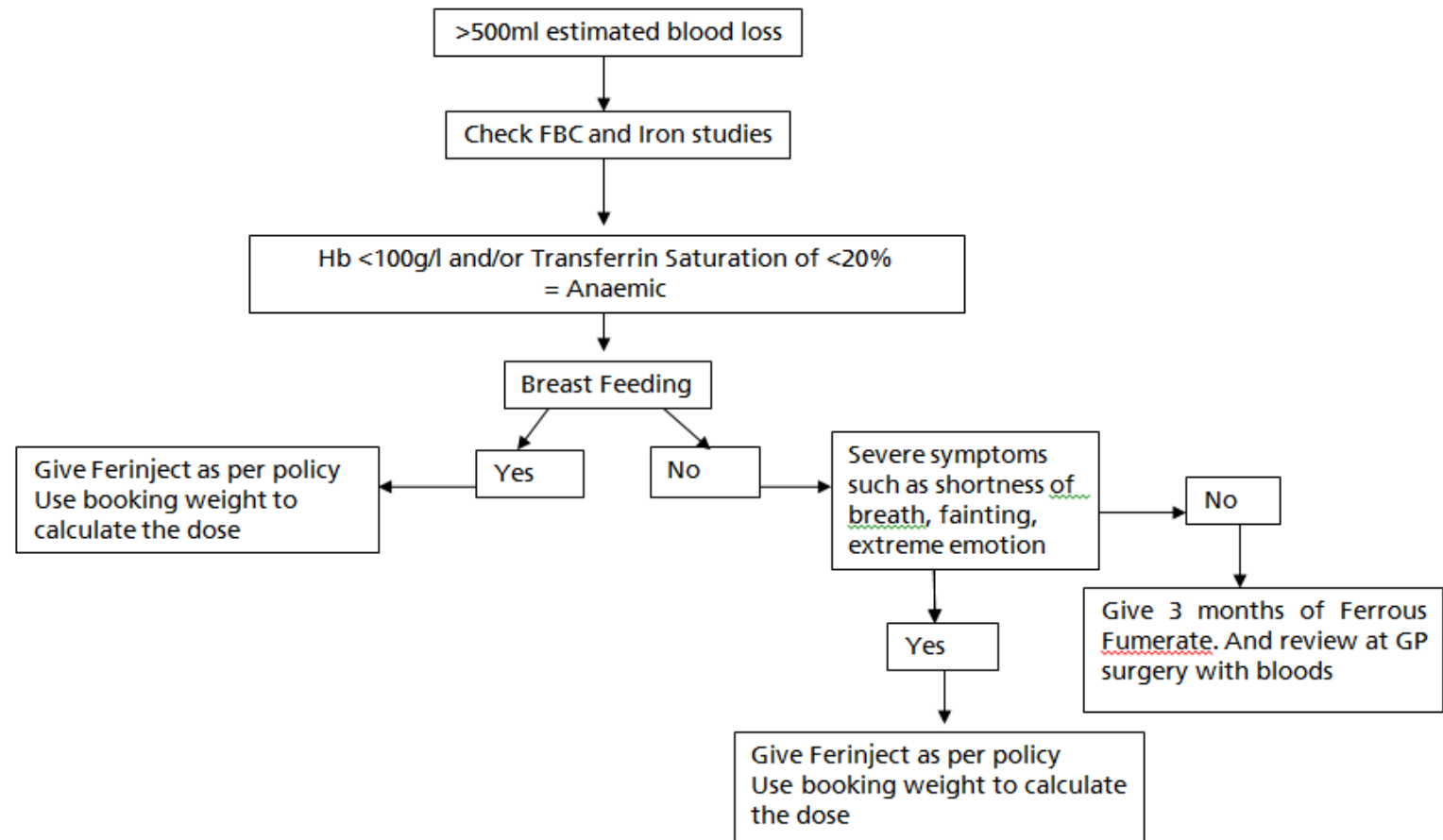
- Rapid (almost as fast as a transfusion).
- Can target an exact level of Iron and Hb.
- Licensed in 2nd and 3rd Trimester.
- Side effects?
- New product? Which product?

Oral Iron vs Venofer in the Postpartum

(Dr Nav Bhandal, John Radcliffe, Oxford, personal communication)



Post-Partum Anaemia or Iron
Deficiency following >500ml bleed.



Don't forget Folate deficiency (or B₁₂)

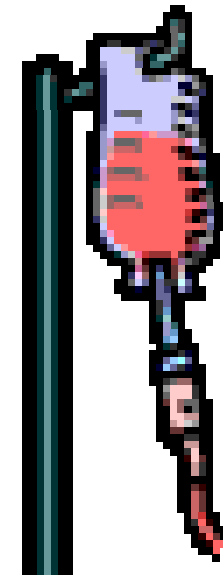
- Pregnancy requires extra 200 micro grams per day
- **Increased risk of deficiency:**
 - ❖ Poor nutrition
 - ❖ Twins
 - ❖ Haemolysis
 - ❖ Malaria
 - ❖ Infection
 - ❖ Drugs
- Diagnosis:
 1. Haemoglobin↓
 2. MCV↑
 3. Serum folate
 4. Red cell folate
- Treatment
 - ❖ Folic acid 5mg OD throughout pregnancy

Blood is more dangerous than you might think.....

Mini transplant of live cells from the donor to the recipient including some antibodies in plasma.

Consequences now?

In the future?



THE TIMES Thursday February 15 2007 200

Anita Roddick: I've had hepatitis C for more than 30 years

Helen Nugent

Anita Roddick, the founder of the Body Shop famous for her ethical business stance and clean living, announced yesterday that she is suffering from hepatitis C.

Dame Anita, 64, said that she contracted the disease through an infected blood transfusion in 1971 during the birth of her youngest daughter, Sam. The condition went undiagnosed for more than 30 years until a blood test in 2005.

She wrote in a posting on her website that she also has cirrhosis of the liver, one of the effects of hepatitis C. None of her family has the virus.

Dame Anita, who founded the Body Shop from a single store in Brighton in 1976, told *The Times*: "If I was 20 years old and just found out that I had passed this on to one of my kids, I would have been furious. But you can't be angry with things you didn't know existed. I just think it's a bummer, you

groan and you move on." She said that with no discernible symptoms for so long, she had not taken her condition seriously until recently.

"The one symptom I had last year was itching skin on my ankles and wrists," she said. "I had a little bit of trouble concentrating as well but I thought I'm 64, there's nothing unusual in that. I just wasn't educated about it."

She now has tests every three months to monitor the disease. "The next tests are to check for tumours. I'm taking it more seriously now."

"I could still have a good few years — even decades — of life left, but it's hard to say. I could be facing liver cancer tomorrow. What I can say is that having hep C means that I live with a sharp sense of my own mortality, which in many ways makes life more vivid and immediate."

Dame Anita made £110 million when she sold the Body Shop to L'Oréal, the French

beauty group, for \$652 million last year. She vowed to give the money away. Today the high street chain numbers more than 2,000 stores serving nearly 80 million customers.

Dame Anita's daughter Sam, who owns the erotic boutique *Coco de Mer* in London, said that she was proud of her mother for making her condition public.

"I think she is brave for coming out and saying this," she said. "There are certain stigmas attached to hepatitis C like there are to other liver diseases. She has put herself in a vulnerable position to talk about something that directly affects her life. She is dedicated to blowing apart the myth about the condition."

No vaccine exists to prevent hepatitis C, but drugs are available that are effective in more than half of cases.

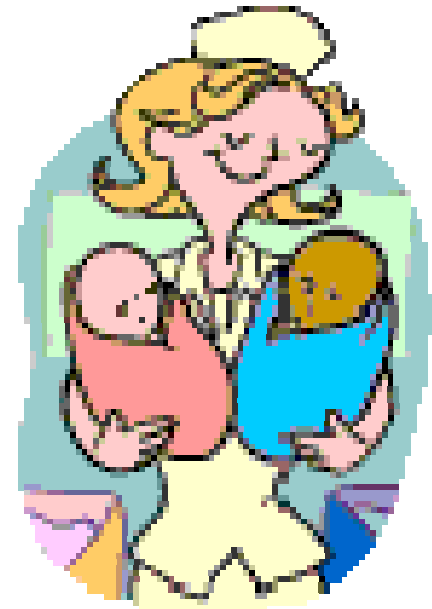
Dame Anita also announced that she has become a patron of the Hepatitis C Trust, and will campaign for better awareness of the condition.



Dame Anita contracted the disease from a blood transfusion

Transfusion

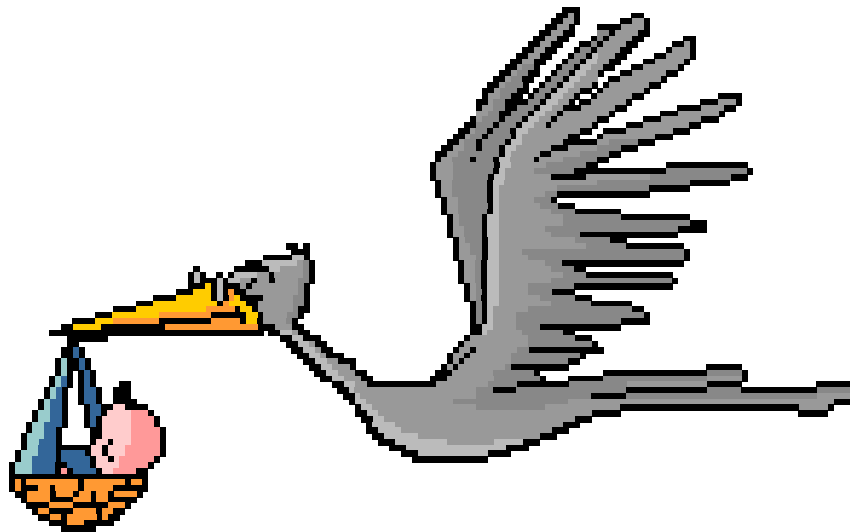
- What product?
- Any special requirements?
 - Irradiation /CMV negative?
 - Antibodies?
 - Childbearing age females – think!



What if they tell you they REALLY don't want blood?

- Find out why.
- What do they mean by blood?
- Are there fears or questions you can explain and answer?
- Get advice from the hospital transfusion team.
- Get an anaemia management and bleeding plan into the notes.
- Inform the Consultant Obstetrician, Anaesthetist and Haematologist (I always tell the lab too).
- Ask that they complete an Advanced Directive.
- If they are Jehovah's Witnesses suggest they discuss what to include in the AD with their Hospital Liaison Elder.

Case study1



- 37 yr Jehovah's Witness – 5th pregnancy
- Delivered at 39/40
- Hb at delivery 10.1g/dl
- Previous PPH x3 (no alert)
- Massive bleed
- Hb dropped to 4.5

Plan

- Take her to Theatre – ASAP (ligation not TAH).
- Ventilate on ITU.
- Check and recheck Advance Directive.
- Give 200mg Venofer TIW
- Give 3x doses 40K Eprex
- Hb dropped to 1.9 (eek!)
- Haematologists dash off to Athens to conference
- Hold nerve (mostly by phone)
- Hb 5.6 @1 week post delivery
- Hold debriefing meeting post discharge

What did we learn?

- Alert Consultant, Hospital Transfusion Team (HTT) and Anaesthetist at booking if refusing blood.
- Refer to CNS Transfusion (HTT) to make a plan and communicate clearly and widely to cover several eventualities.
- If PPH occurs out of hours call in the consultants (Obs, Haem and Anaesthetics) even if minor to start with.
- ITU were fantastic – ask for review early if bleeding.
- Advance directives are VERY useful especially in an emotionally charged situation.

Case Study 2

- 22 year old – 2 other children
- 37/40
- Admitted to Castleacre with Norovirus
- Christmas.
- Septic
- Distressed baby —→ Section
- Hb 3.1g/dl, Platelets $41 \times 10^9/l$, Neutrophils $0.3 \times 10^9/l$
- B₁₂ 99, Folate 1.6, CRP 280

Then...

- 14 days as inpatient
- Septic shock
- 8 units of Red cells
- 1 unit of Platelets
- IV antibiotics
- Lots of stress and anxiety for everyone.....

Back up a bit.....

- 30.9.08 - 28 week bloods showed MCV **109** and film comment “macrocytic anaemia. Probable B₁₂ deficiency”
- 6.11.08 MCV 116. Hb 9.0 Film comment “Macrocytic picture ?Liver
?B₁₂ /Folate deficiency.”
- 13.11.09 B₁₂ 117, Folate 0.9 (3-20) Red Cell Folate 48 (93-641)
- Patient given oral iron. Usual Midwife on AL. Patient moved house.
- 10.12.09 UTI – E-Coli
- 27.12.09 Admitted with diarrhoea. Baby distressed.

Case study 3

- 36 year old Journalist
- Best friend a Specialist Transfusion Nurse (woohoo)
- Not keen on blood transfusion
- On Pregaday
- Hb 9.0 at 28weeks
- MCV slightly lower than pre-pregnancy (91→85)
- Asked for advice

Plan

- Increase oral Iron to FeSO_4 200mg BD from week 28
- Continue folic acid to delivery

- Delivered at 42/40
- 1400 ml bleed
- Hb at 2 days PP 10g/dl

Remember - No blood needs planning (and nerve!)

- Assessment of anaemia for all patients at booking.
- Get advice and a plan from the HTT (it's all in the planning and preparation).
- Find out if your patient really is immovable if refusing blood.
- Blood should only be used in Obstetrics to save a life.
- Advance Directives help.
- Use an appropriate product that is safe and cost effective.

THANK YOU!

