

Overview of Obstetric Requirements for Transfusion

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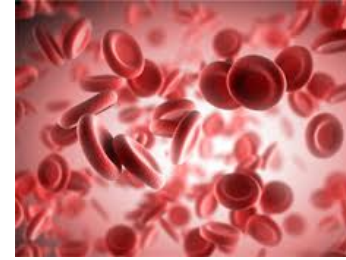
British Blood
Transfusion Society

#BBTS2018

Disclaimer

- I receive honoraria and travel expenses for lecturing from a number of pharmaceutical companies
- No company dominates over others and there are no large sums involved

Objectives



- To consider transfusion issues that are specific to obstetrics and the role of the blood transfusion team in the care of obstetric patients
- To highlight the importance of multidisciplinary working and timely communication

Obstetric Transfusion Committee

Objectives

To reduce costs and prevent harm to patients by poor transfusion practice.

Obstetric Transfusion Committee Agenda

- Patient Blood Management

- Haemoglobin optimisation
- Prevention of bleeding
- Bleeding control/ haemostasis

- Appropriate Transfusion

- Haemoglobin thresholds
- Proportion of single unit tx
- Consent

- Operational issues

- use of SafeTx, fridges,
- wastage

- Red cell alloimmunisation

- Problem cases
- Process and ffDNA service

- Clinical Governance

- Audits
- incidents
- WBITs

Obstetric Transfusion Committee Membership

■ Doctors

- Haematologist
- Obstetrician
- Obstetric Anaesthetist
- Fetal Maternal Medicine Specialist

■ Midwives

- Delivery suite
- Observation area
- Assessment area
- Community MW
- Antenatal Screening

■ Scientists

- Blood bank manager
- Senior BMS

■ Nurses

- Transfusion nurses

■ Clinical Governance

- Transfusion
- maternity

■ IT

- obstetric lead
- transfusion

■ Haemonetics staff

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Management of iron deficiency anaemia in pregnancy

bjh guideline

UK guidelines on the management of iron deficiency in pregnancy

Sue Parred,¹ Bethan Myers,² Susan Robinson,³ Shubha Allard,⁴ Jane Strong¹ and Christina Oppenheimer⁵ on behalf of the British Committee for Standards in Haematology

¹University Hospitals of Leicester, ²United Lincolnshire Hospitals Trust, ³Gay's and St Thomas' Hospital, and ⁴Bart's and the London NHS Trust & NHS Blood and Transplant, London, UK

Summary

Iron deficiency is the most common deficiency state in the world, affecting more than 2 billion people globally. Although it is particularly prevalent in less-developed countries, it remains a significant problem in the developed world, even where other forms of malnutrition have already been almost eliminated. Effective management is needed to prevent adverse maternal and pregnancy outcomes, including the need for red cell transfusion. The objective of this guideline is to provide healthcare professionals with clear and simple recommendations for the diagnosis, treatment and prevention of iron deficiency in pregnancy and the postpartum period. This is the first such guideline in the UK and may be applicable to other developed countries. Public health measures, such as helminth control and iron fortification of foods, which can be important to developing countries, are not considered here. The guidance may not be appropriate to all patients and individual patient circumstances may dictate an alternative approach.

Keywords: iron, iron depletion, iron deficiency, anaemia, pregnancy.

The guideline group was selected by the British Society for Haematology, Obstetric Haematology Group (BSH OHG) and British Committee for Standards in Haematology (BCSH), to be representative of UK-based medical experts. MEDLINE and EMBASE were searched systematically for publications from 1966 until 2010 using the terms iron, anaemia, transfusion and pregnancy. Opinions were also sought from experienced obstetricians and practice development midwives. The writing group produced the draft guideline, which was subsequently considered by the members of the BSH Obstetric Haematology Group and revised by consensus by members of the General Haematology Task Force of the BCSH. The guideline was then reviewed by a sounding board of approximately 50 UK

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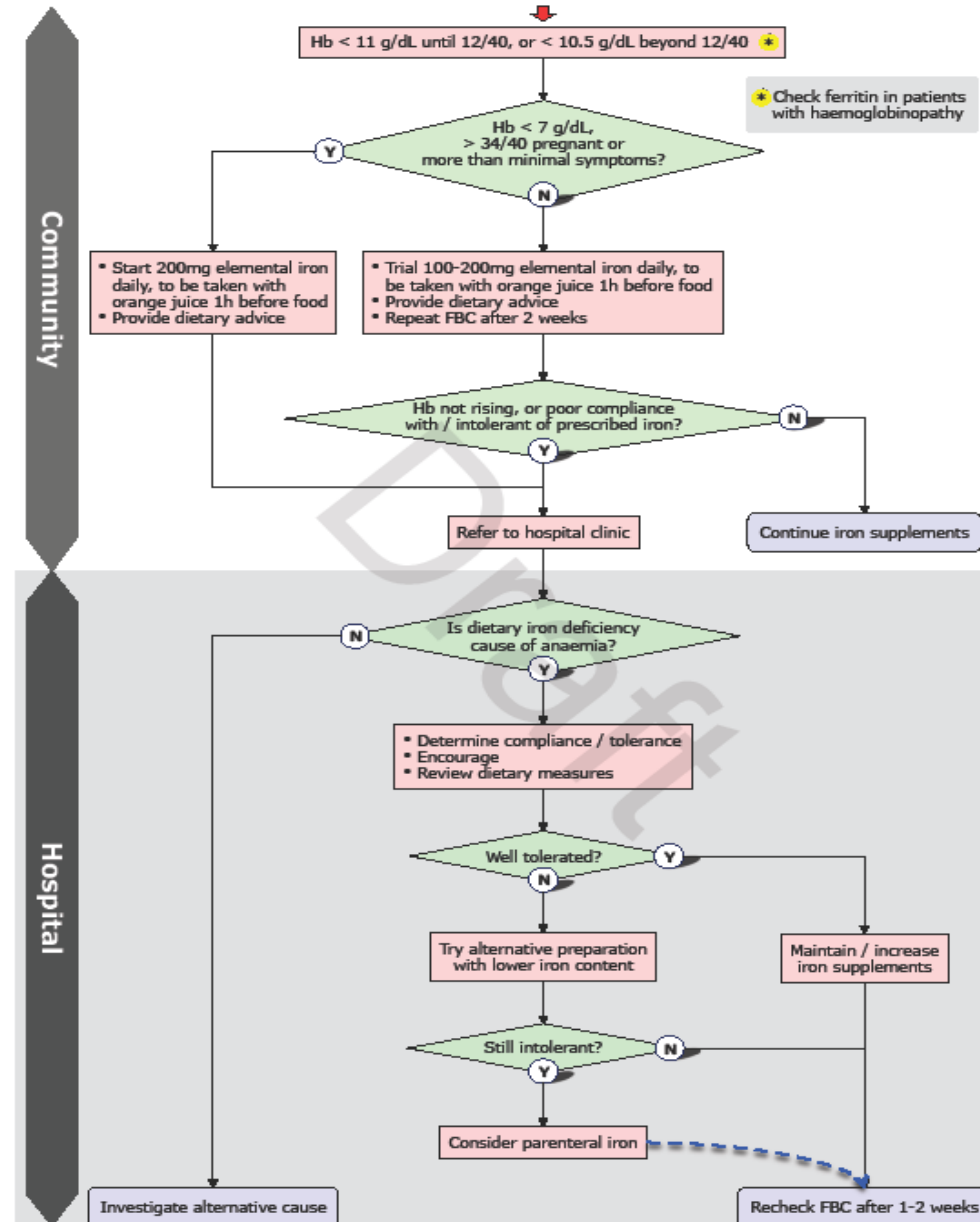
First published online 16 January 2012
doi:10.1111/j.1365-2141.2011.03012.x

haematologists, the BCSH and the BSH Committee and comments incorporated where appropriate. Criteria used to quote levels of recommendation and grades of evidence are as outlined in the Procedure for Guidelines Commissioned by the BCSH.

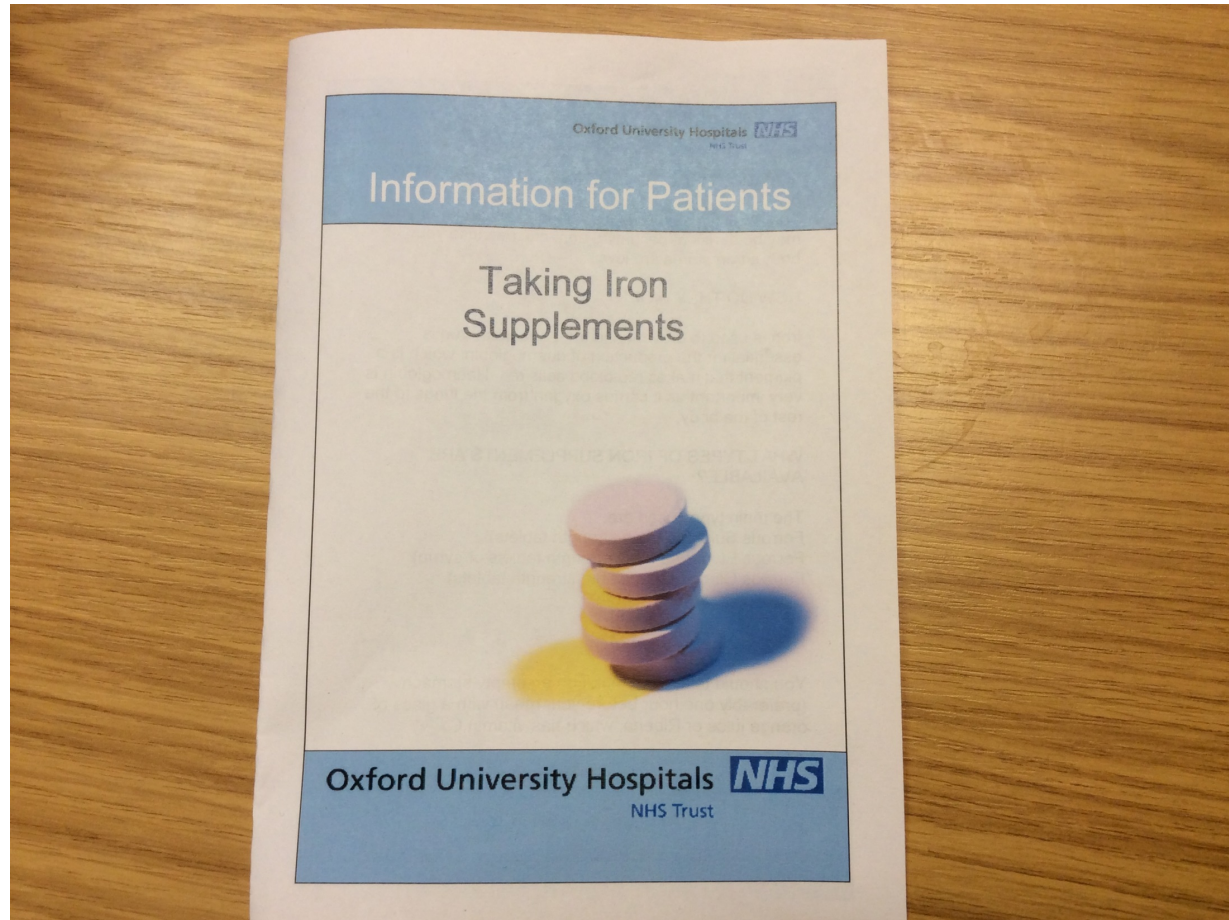
Summary of key recommendations

- Anaemia is defined by Hb <110 g/l in the first trimester, <105 g/l in the second and third trimesters and <100 g/l in the postpartum period.
- Full blood count (FBC) should be assessed at booking and at 28 weeks.
- All women should be given dietary information to maximize iron intake and absorption.
- Routine iron supplementation for all women in pregnancy is not recommended in the UK.
- Unselected screening with routine use of serum ferritin is generally not recommended although individual centres with a particularly high prevalence of 'at risk' women may find this useful.
- For anaemic women, a trial of oral iron should be considered as the first line diagnostic test, whereby an increment demonstrated at 2 weeks is a positive result.
- Women with known haemoglobinopathy should have serum ferritin checked and offered oral supplements if their ferritin level is <30 µg/l.
- Women with unknown haemoglobinopathy status with a normocytic or microcytic anaemia, should start a trial of oral iron (IR) and haemoglobinopathy screening should be commenced without delay in accordance with the National Health Service (NHS) sickle cell and thalassaemia screening programmes.
- Non-anaemic women identified to be at increased risk of iron deficiency should have their serum ferritin checked early in pregnancy and be offered oral supplements if ferritin is <30 µg/l.
- Systems must be in place for rapid review and follow up of blood results.

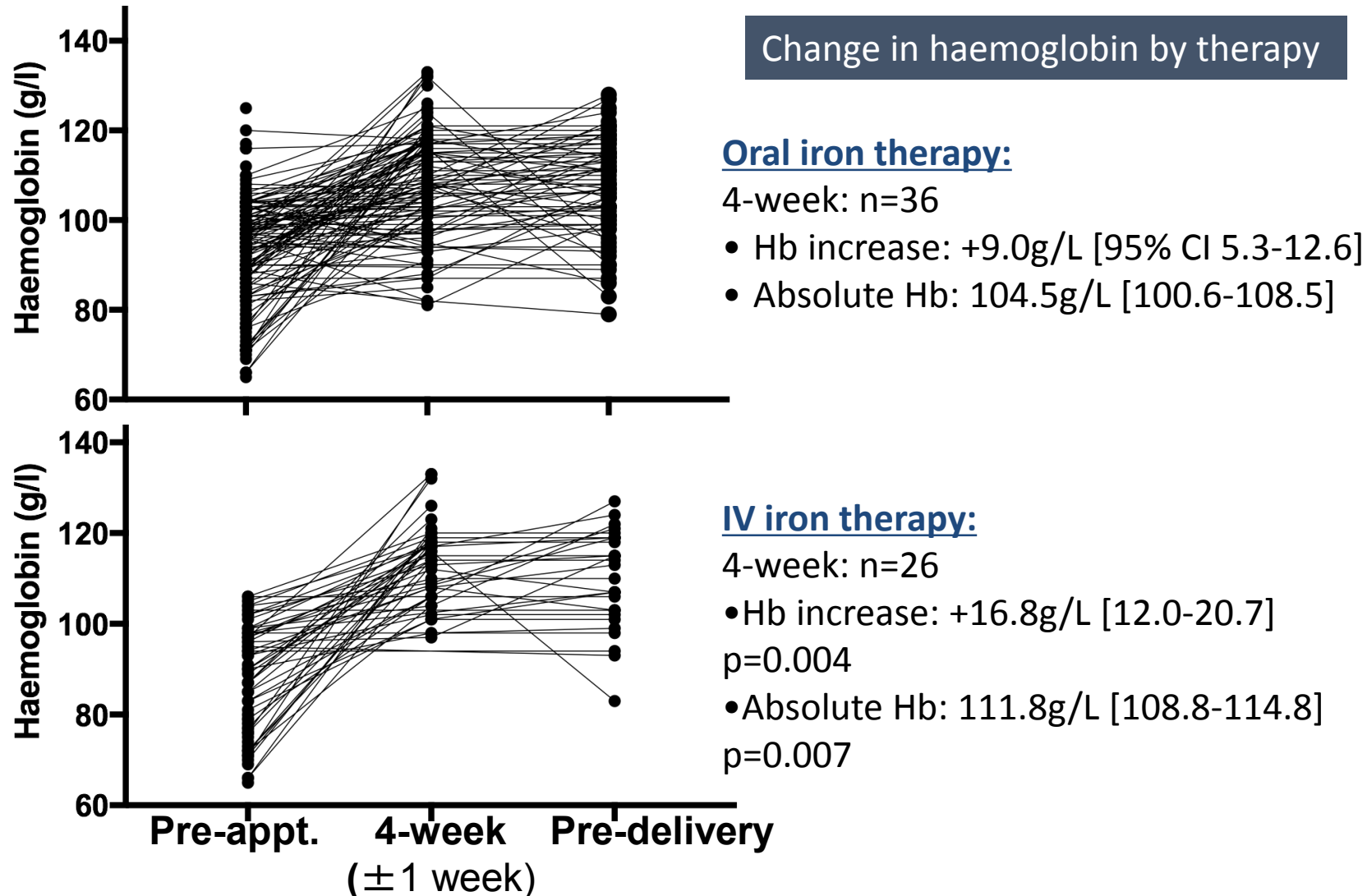
© 2012 Blackwell Publishing Ltd
British Journal of Haematology, 2012, 156, 588–600



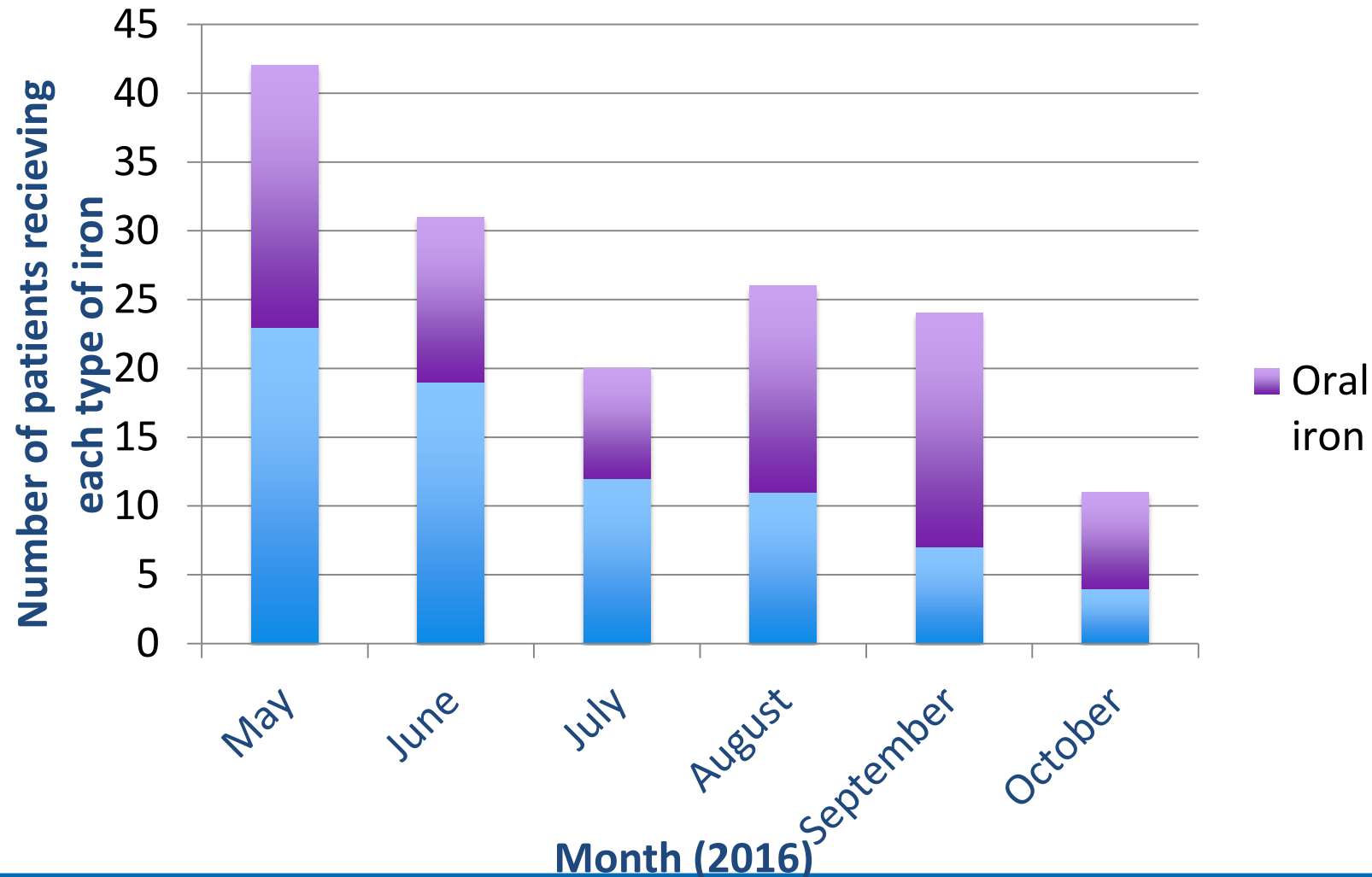
Oral iron supplements



Virtual clinic for 'refractory' patients



Decreasing requirement for intravenous iron



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Postpartum haemorrhage

■ Increasing Incidence

- 2004/5 7%
- 2014/15 14.5%

(Health and social care information centre)

■ Major Obstetric Haemorrhage (>2.5L)

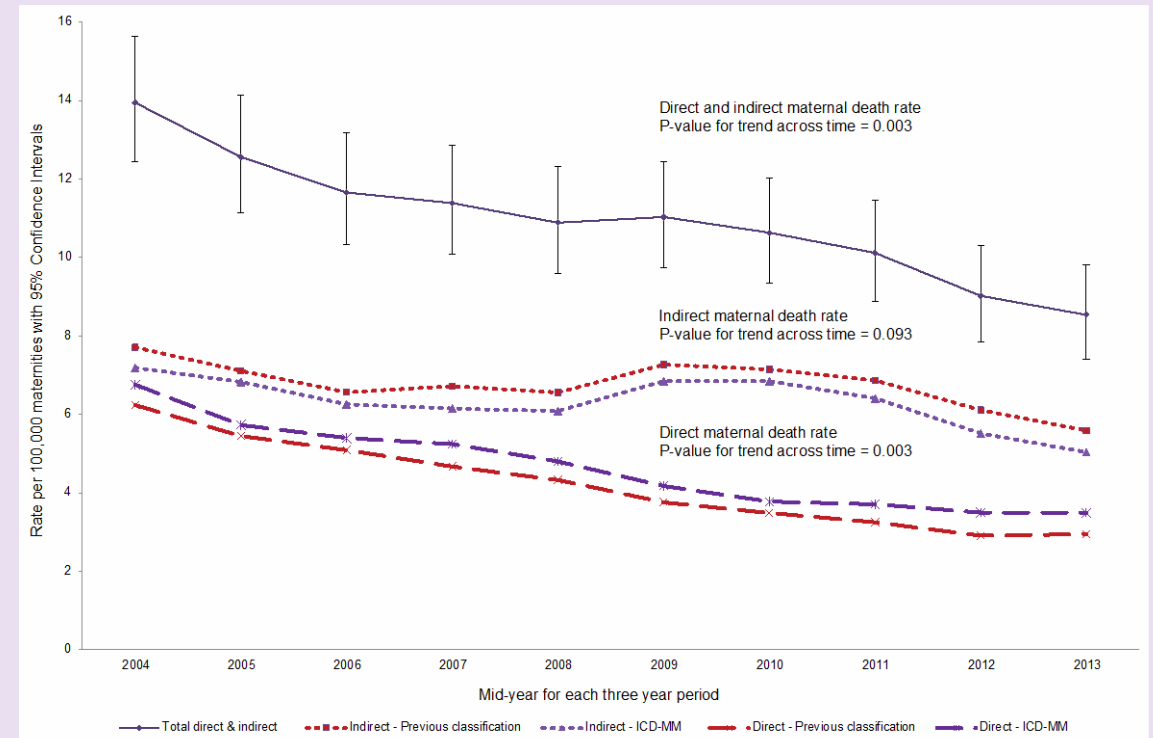
- 6:1000

■ Death from Haemorrhage

- 0.46:100,000

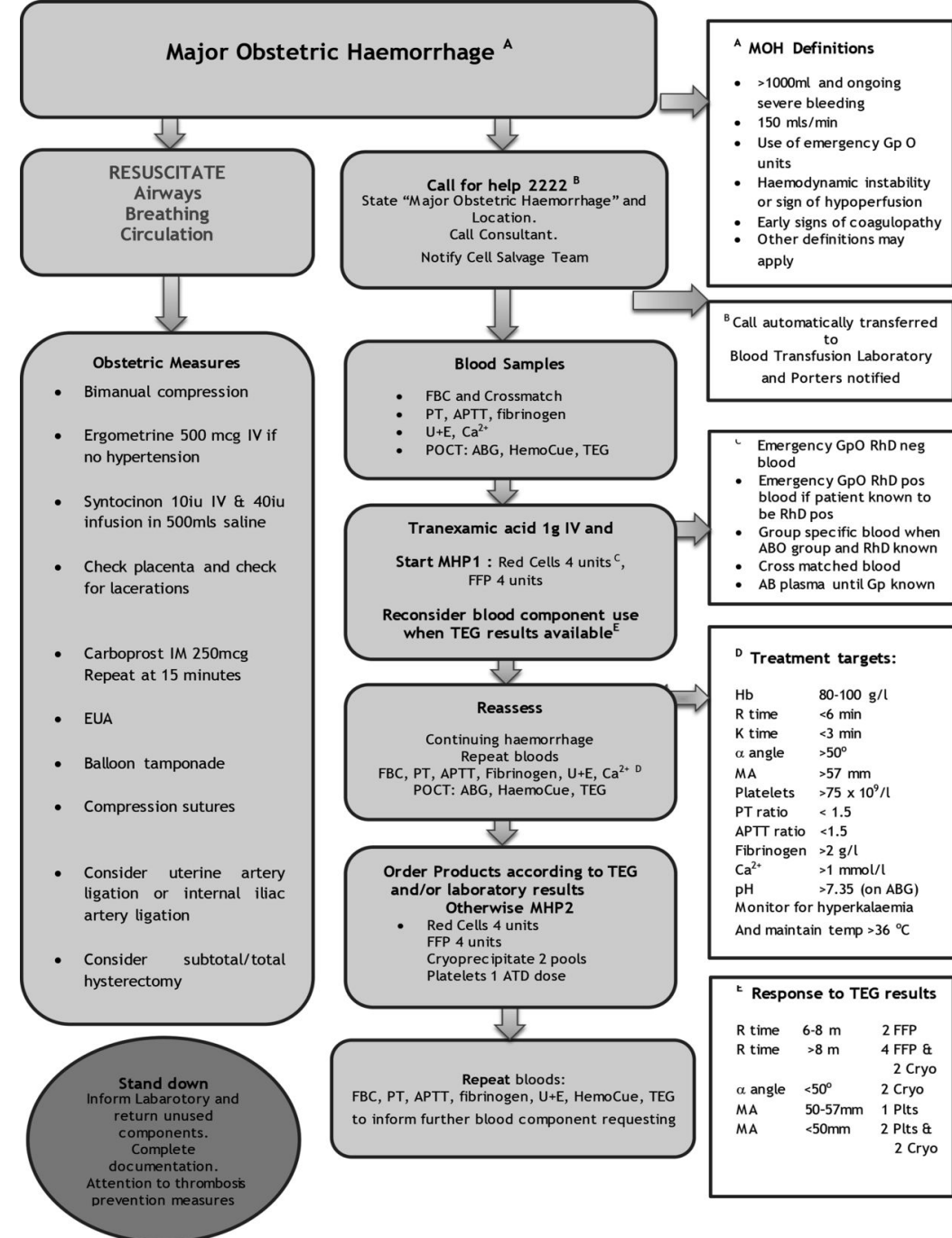


Figure 2.1: *Direct and Indirect maternal mortality rates per 100,000 maternities using ICD-MM and Previous UK classification systems; rolling three year average rates 2003–2014*



Sources: CMAE, MBRRACE-UK

Major Haemorrhage Protocol



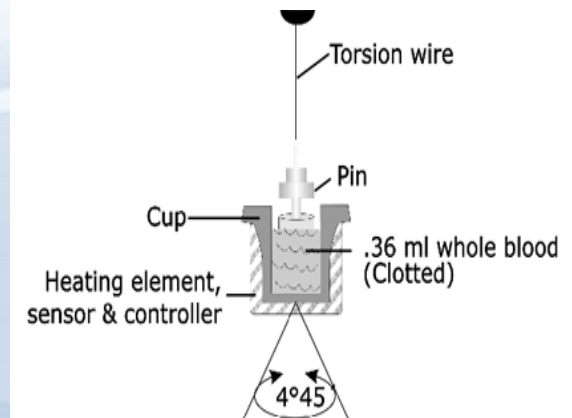
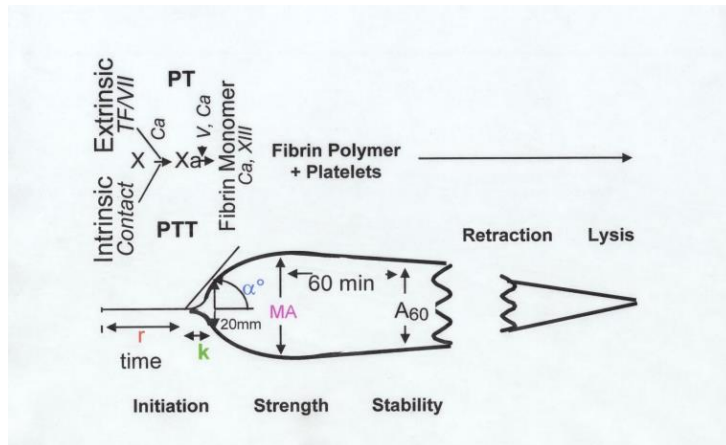
Management of haemostasis

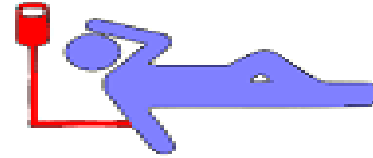
- Regular monitoring – labs, POCT
- Blood components
- Plasma:blood 1:1
- maintain platelets $>75 \times 10^9/l$
- cryoprecipitate / Fibrinogen concentrate
- Tranexamic acid



Thromboelastography (TEG)

A rapid, near-patient test of whole blood haemostasis

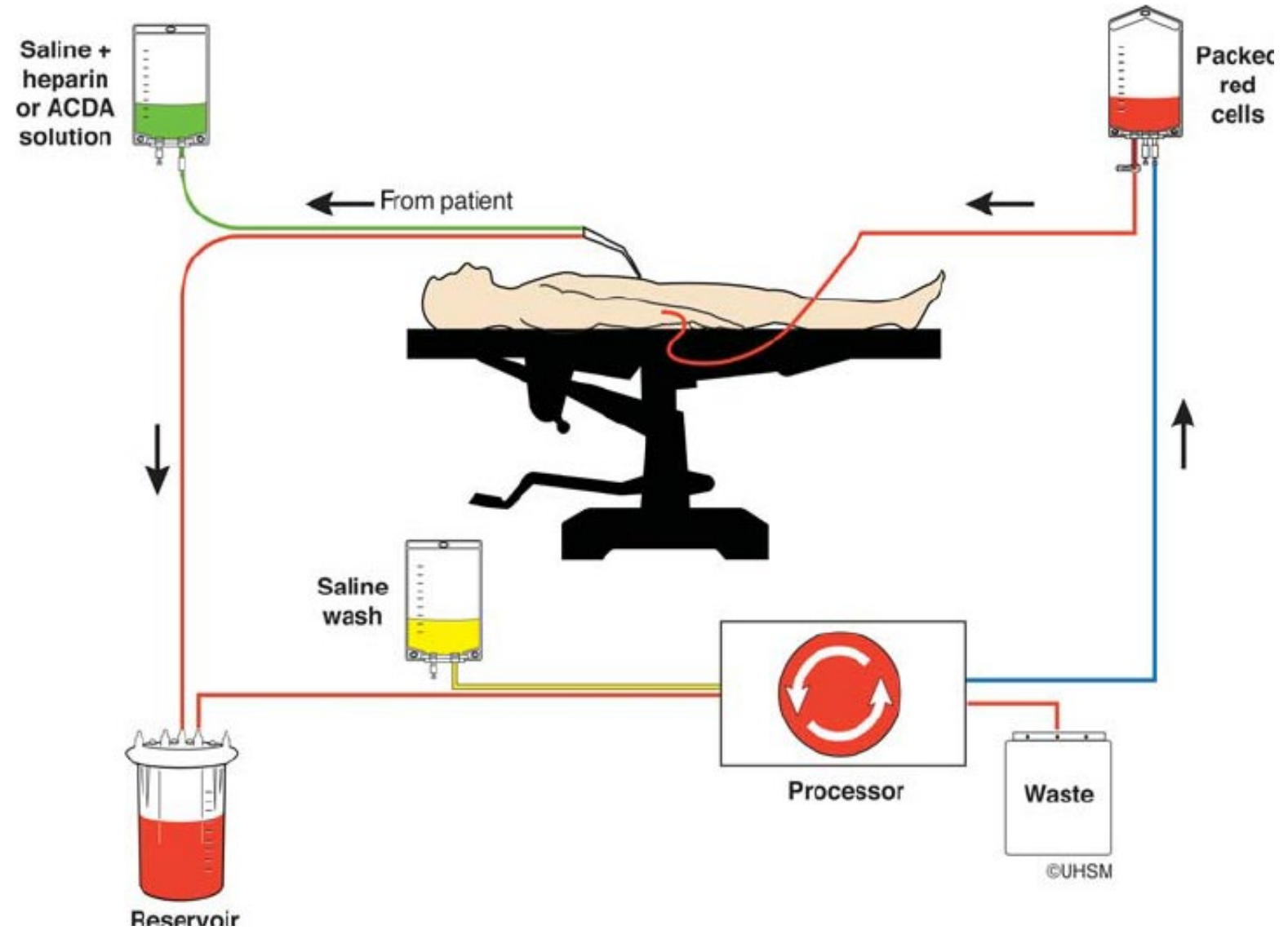




Clinical study

- Prospective study of women with PPH of >1000ml
- ROTEM results compared with laboratory samples
- Can these predict the need for RBC/FFP transfusion?
- 360 women (5.8%) had a PPH defined as 1000ml blood-loss
- A fibrinogen of <3g/L or A5 <16mm + on-going bleeding is associated with the need for an average of 8 units of blood products.

Cell Salvage



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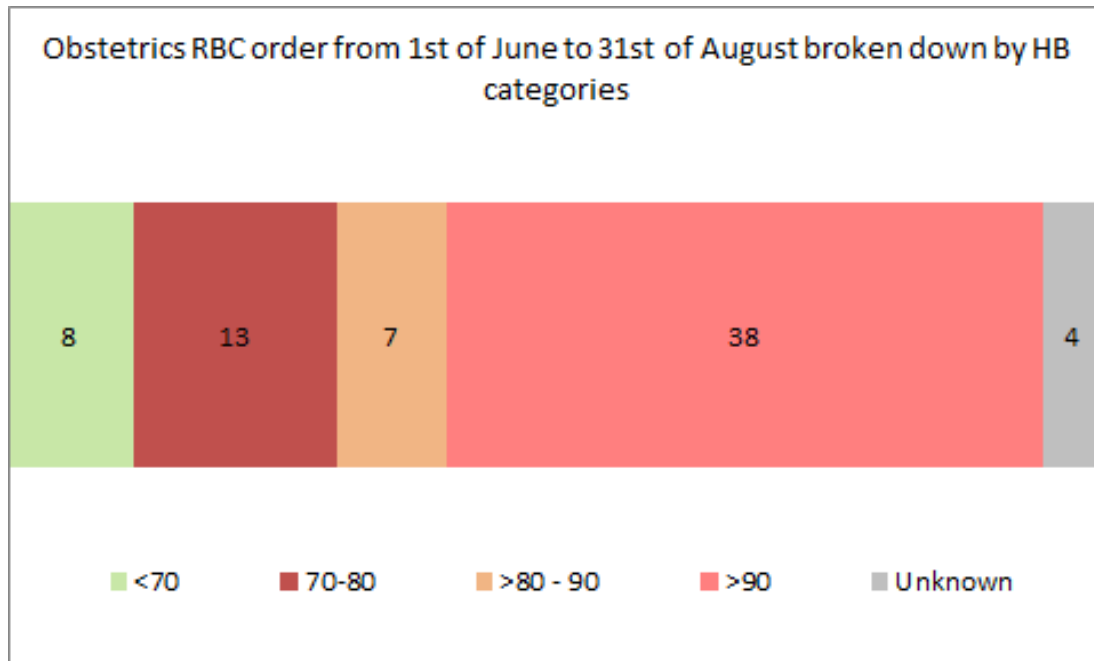
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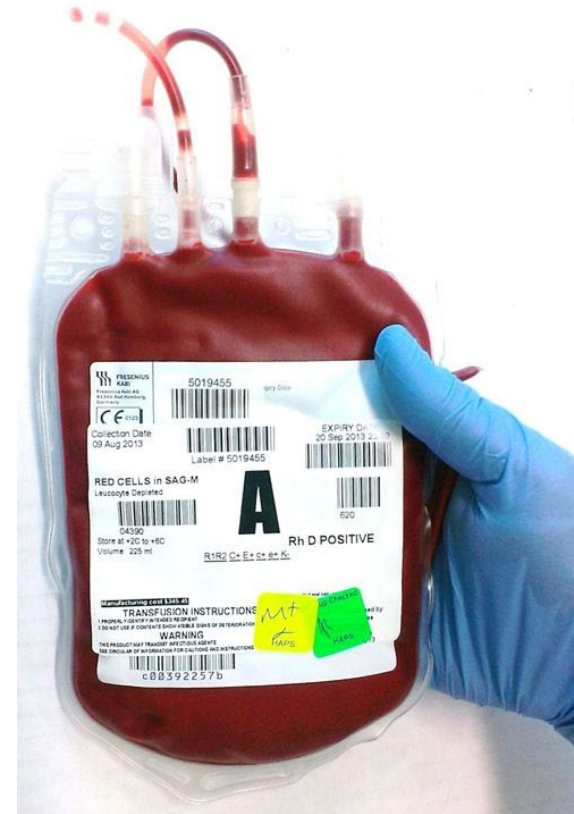
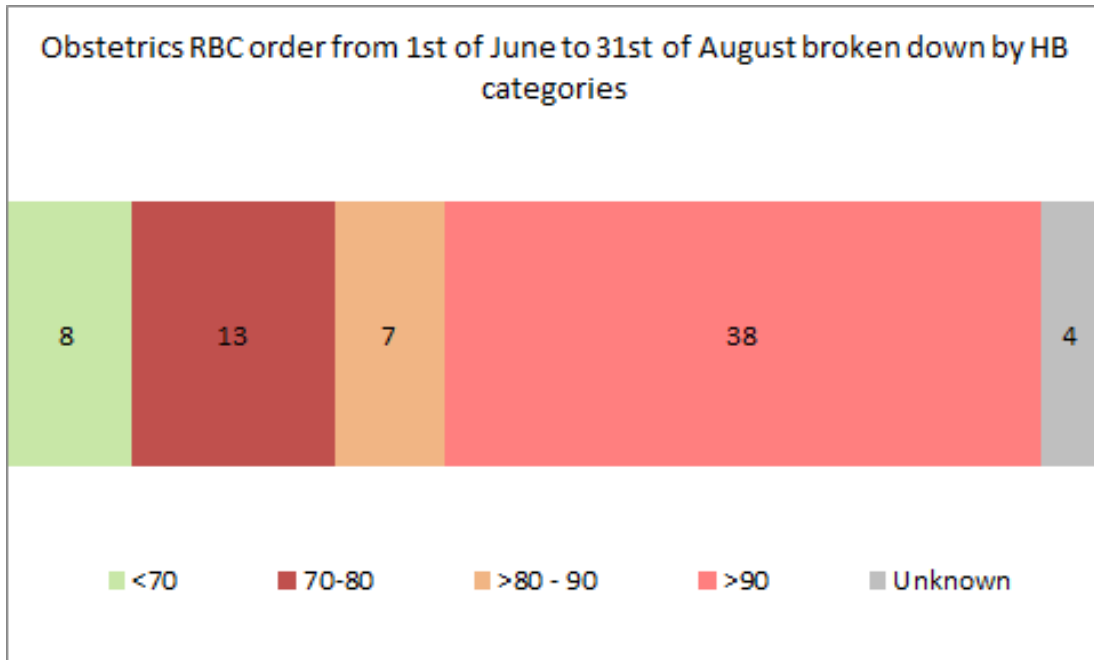
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Appropriate transfusion practice



Appropriate transfusion practice



Every **ONE** matters

Transfuse **One Unit**

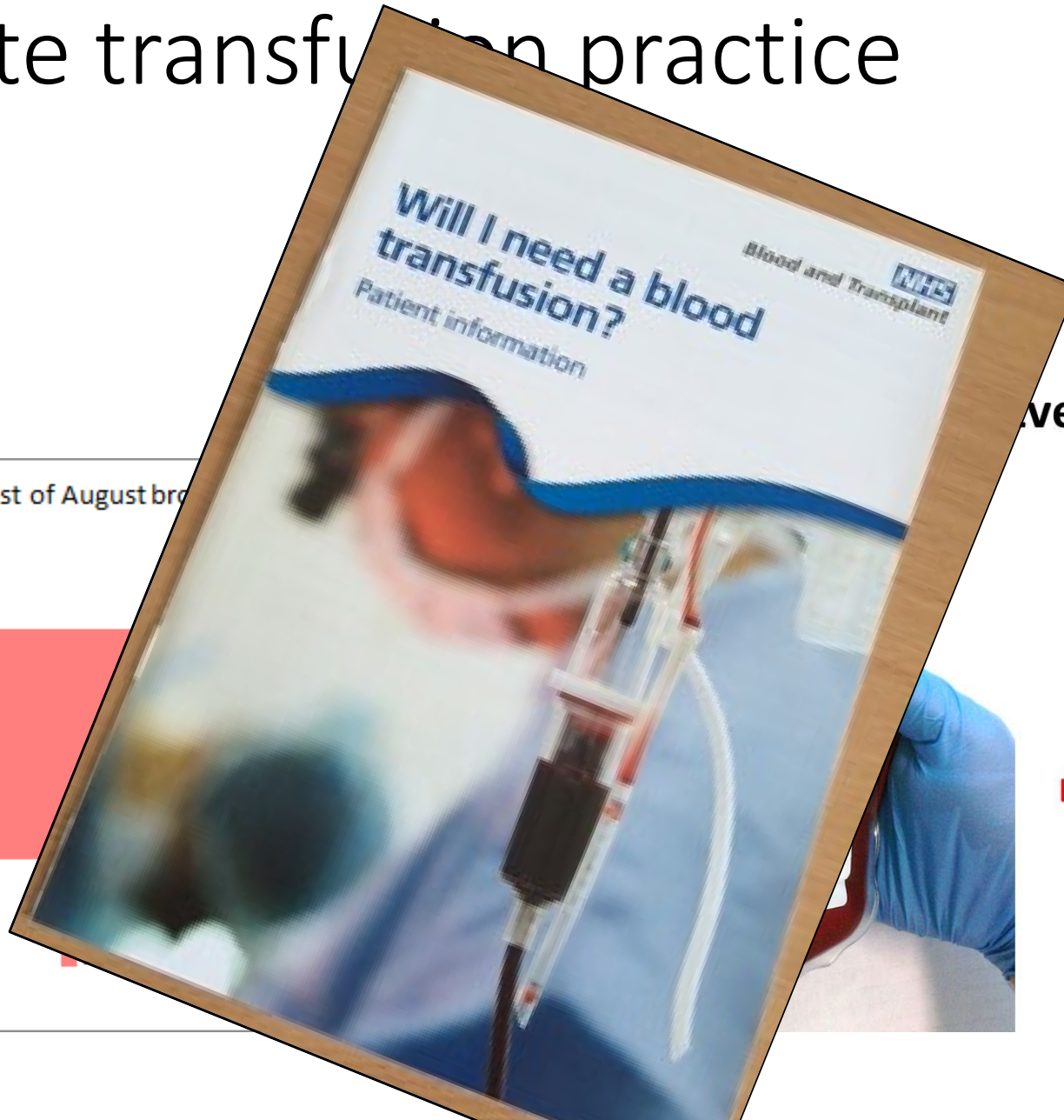


Re-assess the patient



Don't increase the RISKS
if
NO BENEFIT

Appropriate transfusion practice



Every **ONE** matters

Transfuse **One Unit**

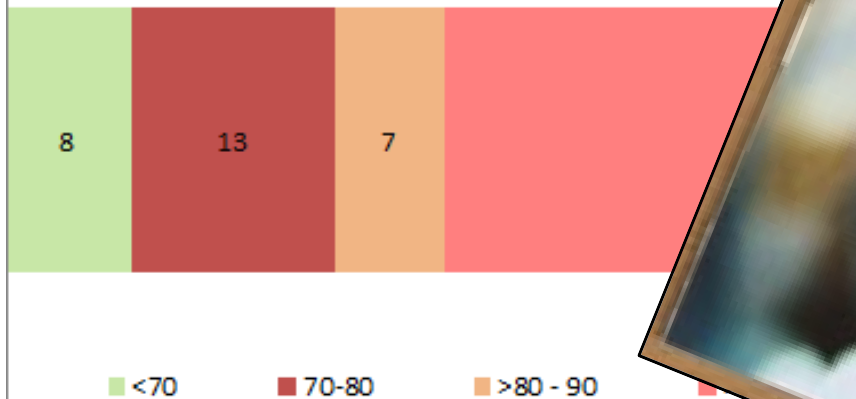


Re-assess the patient



Don't increase the RISKS
if
NO BENEFIT

Obstetrics RBC order from 1st of June to 31st of August by categories



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 - **wastage**

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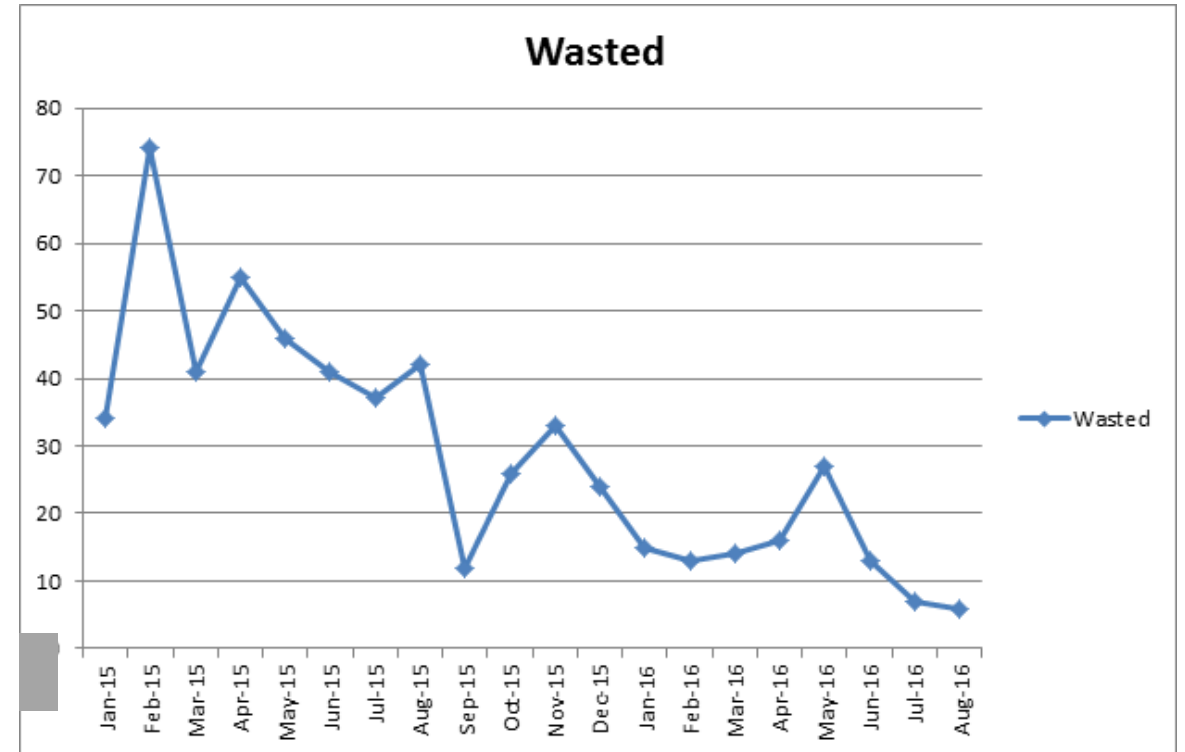
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Neonatal blood wastage

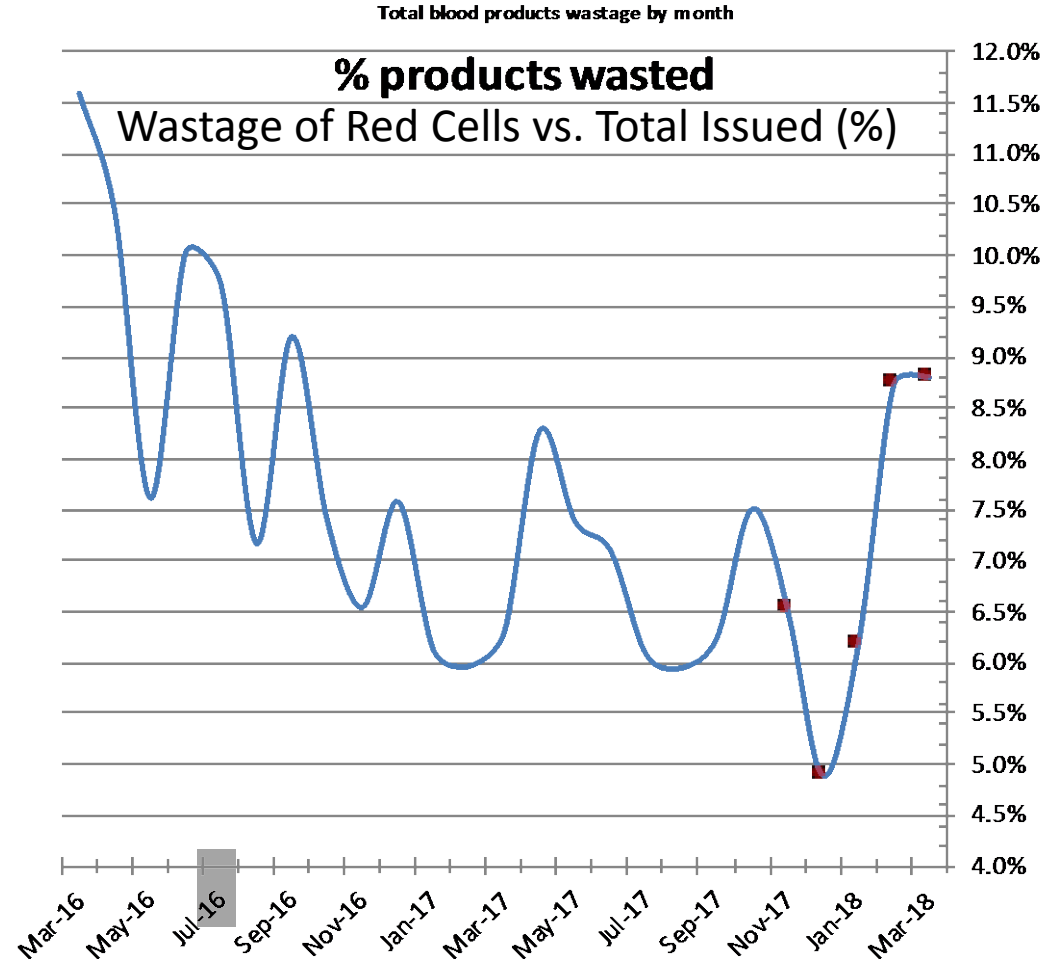
- Changing issue and reservation policy
 - Wastage reduced from 55% to 8% in 12 months
 - Previous wastage ~ 60 units (£3k) per month
 - Donor exposure did not increase

Wastage of Red Cells vs. Total Issued (%)



Total blood wastage

Month	%	Total products allocated	Total products wasted
Mar-16	11.59%	2803	325
Apr-16	10.43%	2732	285
May-16	7.62%	2717	207
Jun-16	10.03%	2552	256
Jul-16	9.71%	2625	255
Aug-16	7.17%	2551	183
Sep-16	9.21%	2660	245
Oct-16	7.39%	2583	191
Nov-16	6.55%	2473	162
Dec-16	7.59%	2794	212
Jan-17	6.13%	2366	145
Feb-17	5.97%	2345	140
Mar-17	6.31%	2775	175
Apr-17	8.28%	2451	203
May-17	7.39%	2477	183
Jun-17	7.11%	2491	177
Jul-17	6.09%	2432	148
Aug-17	5.95%	2587	154
Sep-17	6.24%	2259	141
Oct-17	7.51%	2329	175
Nov-17	6.52%	2516	164
Dec-17	4.89%	2350	115
Jan-18	6.19%	2553	158
Feb-18	8.73%	1992	174
Mar-18	8.81%	2191	193



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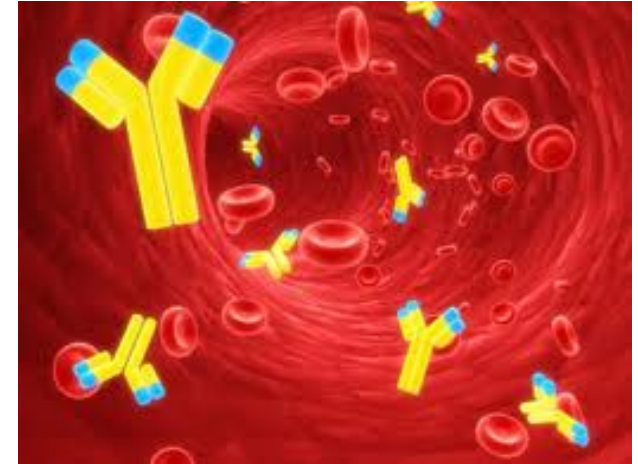
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Red cell alloimmunisation

Clinically significant red cell antibodies

affects approx. 1% of pregnancies

May cause haemolytic disease for the **fetus** and **neonate**
and could impact on blood availability during peripartum
haemorrhage





Royal College of
Obstetricians &
Gynaecologists

The Management of Women with Red Cell Antibodies during Pregnancy

Green-top Guideline No. 65
May 2014

Anti-D, -c and -K are the three main antibodies that have been reported to cause severe anaemia, jaundice or death in the fetus or neonate. Many other antibodies (*) can cause anaemia or jaundice predominantly in the neonatal period but there have also been occasional case reports of the **fetus** being severely affected.

The antibodies listed in the table above are the most common, clinically significant antibodies. Other rarer antibodies can cause HDFN and haemolytic transfusion reactions occasionally. For further advice, discussion with the transfusion laboratory and/or consultant haematologist would be beneficial.

Appendix I: Red cell antibodies showing published clinical significance

Antibody	HDFN	Haemolytic transfusion reaction
D	Severe in fetus and neonate	Severe
c	Severe in fetus and neonate	Severe
K	Severe in fetus and neonate	Severe
c+E	Severe in fetus and neonate*	Severe
E	Yes in neonate ^{*39,40}	Yes
C	Yes in neonate*	Yes
e	Yes in neonate	Yes
Ce	Yes in neonate	Yes
Fy ^a	Yes in neonate ^{*6}	Yes
Fy ^b	Yes in neonate	Yes
Fy ³	No	Yes
JK ^a	Yes in neonate*	Yes
JK ^b	No	Yes
S	Yes in neonate	Yes
s	Yes in neonate	Yes
U	Yes in neonate*	Yes
M	Yes (occasionally) ^{*41}	Yes (if active at 37°C)
N	Mild (1 case)	Yes
H (Bombay)	Yes in neonate*	Yes
G	Yes in neonate	Yes
k	Yes in neonate ^{*42}	Yes
Kp ^a	Yes (in neonate occasionally)	No
C ^o	Yes (in neonate occasionally)	No
Vel	No	Yes

Antepartum surveillance

The majority will not require input from Fetal Medicine

Antibody level should be regularly sent and reviewed with robust governance mechanisms

Fetal Medicine management if there is risk of fetal disease:

- Previous HDFN
- Anti D > 4 IU/ml
- Anti c > 7.5 IU/ml
- Any Kell titre
- Other significant antibody > 1 in 32
- Multiple antibodies (c and E)

Red cell antibody detected...

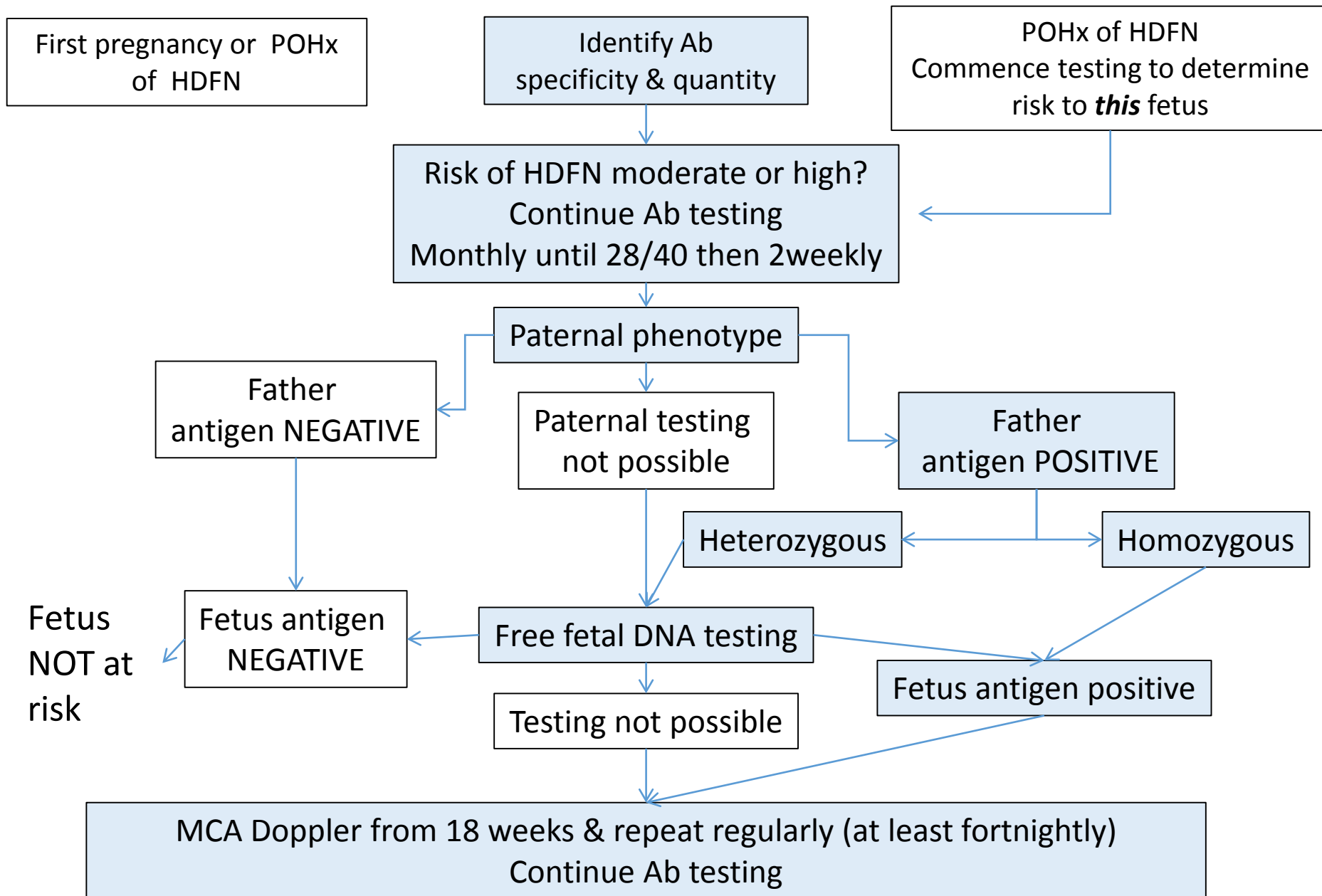
How bad?

- Previous history
- Antibody type
- Antibody level

Is the fetus susceptible?

- Fetal genotype

Level of surveillance



cff DNA for fetal genotyping

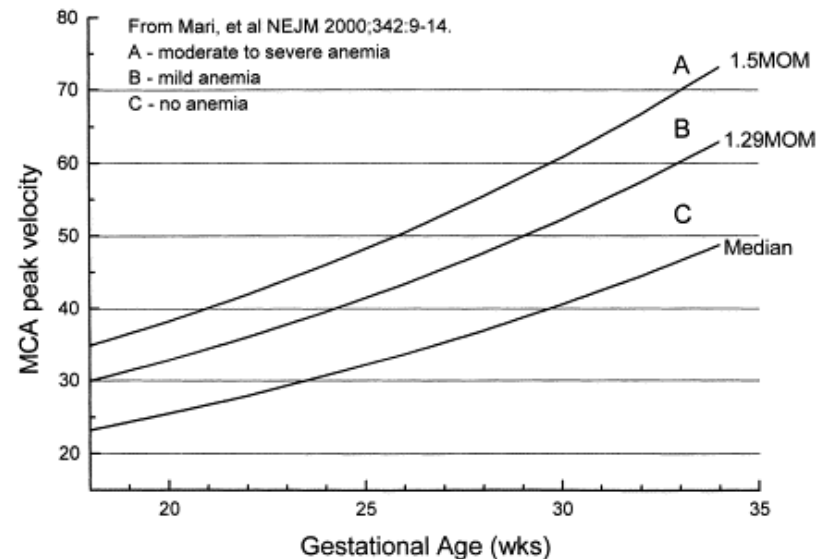
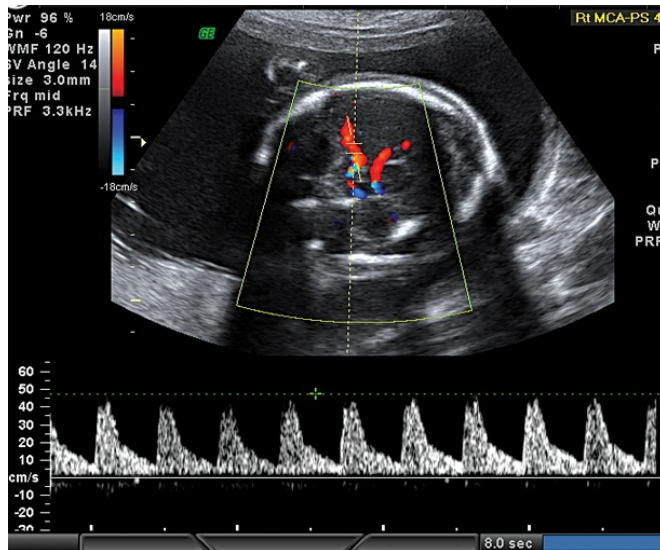
- Centrally provided by Bristol NBS
- Available for D, C, c, E, e antigens from 16 weeks; and for Kell at around 20 weeks
- Excellent negative predictive value (therefore, Fetal Medicine surveillance not necessary when fetus not susceptible)
- Bypasses the pitfalls of uncertain paternity

Antigen positive fetus and high risk of HDFN

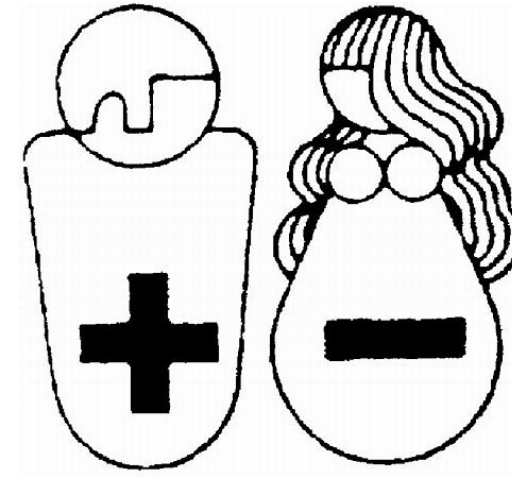
MCA Doppler from 18 weeks
& repeat regularly (at least fortnightly)
Continue Ab testing

MCA < 1.5MoM: anaemia unlikely:
Deliver by 37/40 & inform NNU

MCA > 1.5MoM: at risk of mod-severe anaemia
Refer to FMU: assess and ?IUT
Timing of delivery- 36-37/40 depending on IUT



Anti D prophylaxis



Has markedly reduced (but not eliminated) disease due to D antibody

Given at **28 weeks** and **delivery**; but inadequate cover or “other” sensitising events can still cause HDFN in future pregnancy

Potential for excessive use in women with recurrent antepartum bleeds

Errors in Analysis

Errors in anti-D immunoglobulin administration: retrospective analysis of 15 years of reports to the UK confidential haemovigilance scheme

PHB Bolton-Maggs,^{a,b} T Davies,^b D Poles,^b H Cohen^c

^a University of Manchester, Manchester, UK ^b Serious Hazards of Transfusion (SHOT) Office, Manchester Blood Centre, Manchester, UK

^c Department of Haematology, University College London Hospitals NHS Foundation Trust and University College London, London, UK

Correspondence: Dr P Bolton-Maggs, SHOT Office, Manchester Blood Centre, Plymouth Grove, Manchester M13 9LL, UK.

Email paula.bolton-maggs@manchester.ac.uk

Accepted 4 January 2013. Published Online 13 March 2013.

Table 1. Incident types and initial mistakes 1998–2011

Type of event	Number of reports			
	Cases	Initial mistake made by:		
		Nurse/ midwife	Laboratory	Doctor
Omission or late administration of anti-D Ig	609	526	61	22
Anti-D Ig given to RhD-positive mother	280	153	118	9
Anti-D Ig given to mother with immune anti-D	108	64	44	0
Anti-D Ig given to mother of RhD-negative infant	61	14	47	0
Anti-D Ig given to wrong patient	49	47	0	2
Wrong dose of anti-D Ig given	54	16	36	2
Anti-D Ig handling and storage errors	50	22	26	2
Total	1211 (100%)	842 (69.5%)	332 (27.5%)	37 (3.0%)

Maternal Screening Programme for Fetal RhD Status

Department of Laboratory Haematology
John Radcliffe Hospital
Headington
Oxford
OX3 9DU
Switchboard 0300 304 7777

Oxford University Hospitals **NHS**
NHS Foundation Trust

☐ ☐

Dear

Your blood group has been identified as Rhesus D negative (RhD neg). If your baby is RhD positive, there is a small chance that you form antibodies that may cause anaemia in your baby. We are able to prevent this with anti-D injections given at 28 weeks and after delivery.

At the moment all RhD negative women are offered these injections, but you may not need them if your baby is also RhD negative. We are now able to identify the RhD type of the baby from your blood sample.

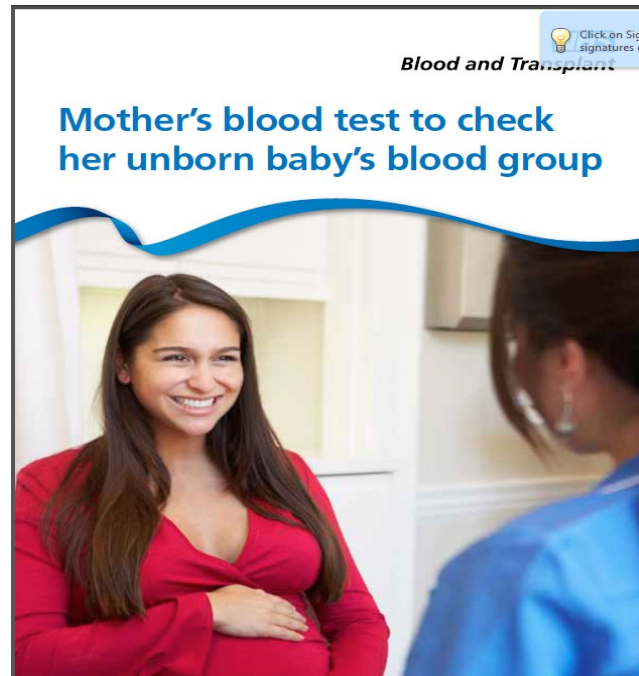
If you would like to take this opportunity to find out the RhD type of your baby, please take this letter and form to your midwife or GP (not an option if this is out of Oxford County) or to the phlebotomist at the John Radcliffe Women's Hospital (available to all) or when you attend your 20 week scan at the John Radcliffe.

Yours sincerely

Dr Sue Favord
Consultant Haematologist
Transfusion Medicine and Obstetric Haematology

Dr Brenda Kelly
Consultant Obstetrician
Fetal Medicine Unit

Enc:



FRMS19271

Request for cell free fetal DNA (cffDNA) Screen **Blood and Transplant** **NHS**
RhD Fetal Genotyping Service

This form is only to be used for RhD negative pregnant women. Please **DO NOT USE** this form for samples from women who have anti-D antibodies. For those cases, please speak to the Fetal Maternal Unit first (a different form and sample volume are required). At least three points of matching identification must be used on form and sample tubes

Mother's Details:

NHS No. _____ or* Hospital No. _____
*If NHS No. is not known. Please ensure that the numbers are the same on this form and the sample tube i.e. NHS No. on both form and sample and/or Hospital No. on both form and sample

Surname _____
First name _____
Address _____

DOB _____ EDD from scan* _____
*If scan has not been done, then one should be arranged before taking sample

Please provide 6ml EDTA blood sample from the mother

Date of sample taken _____ Name of person taking sample _____

Hospital and Requester Details:

Full Hospital Trust Name _____ Hospital NHS Code* _____
*ODS code (Formerly NACS code)

Midwife code _____ Practice code _____

Sender's name and address	For Hospital Laboratory use
Telephone: _____ Email: _____	Date received: _____
SEND SAMPLE WITH THIS FORM TO THE PATHOLOGY LABORATORY	For NHST use

Obstetric Blood Bites

Created by the OUH Transfusion Medicine Team September 2018 Edition

What are we doing well?

- Culture of multi-disciplinary working
- Identifying women at risk
- Prompt access to blood products
- Emergency drills on delivery suites
- Collecting and analyzing data
- Reflecting and learning lessons

Questions?

