South West Regional Transfusion Committee

# SW RTC Meeting

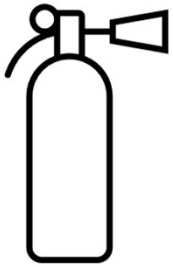
22 NOVEMBER 2023

OAKE MANOR, TAUNTON


Chair- Dr Stuart Cleland

Apologies for Absence

# House keeping



Fire drills and fire escapes –
no fire alarm tests/drills planned

# SW Regional Transfusion Committee Business & Education Meeting

22 November 2023

**REGIONAL TRANSFUSION COMMITTEE MEETING**
**22 November 2023 – 10.30 to 15.30, Oake Manor, Taunton**

## AGENDA

***Coffee from 10.00; Business Session 10.30-13.00; Lunch 13.00-14.00; Education Session 14.00-15.30***

| | | |
|---|---|---|
| 10.30 – 10.35 | Welcome, Apologies and Minutes of Previous Meeting | Stuart Cleland |
| 10.35 – 10.55 | NBTC Update | Stuart Cleland |
| 10.55 – 11.15 | HTC Report Feedback, including any issues to be discussed | Stuart Cleland |
| 11.15 – 11.30 | Customer Services & PBM Update | Carol Stenning/ Sam Timmins |
| | Universal Components Project Update | Rhian Edwards |
| 11.30 – 11.50 | Feedback from RTC Groups | |
| | TLM | Ian Sullivan |
| | - AB Plasma/A- Platelet Survey Proposal | |
| | TP | Stuart Lord |
| | - MH Sims Toolkit Launch | |
| | SWPBM | Elmarie Cairns |
| 11.50 – 12.20 | RTC Objectives & Education Update : Round up of current objectives and discussion on future priorities | Stuart Cleland |
| | TXA Poster Presentation | Katie Preston, UHD, Poole |
| 12.20 – 12.50 | Roundtable Discussion/Shared Learning | |
| | Patient Case: Amniotic Embolism with DIC | Stuart Lord, GHNHSFT |
| 12.50 – 13.00 | Any Other Business | All |
| 13.00 – 14.00 | Lunch | |
| 14.00 – 15.30 | RTC Education : Maternal Anaemia | |
| | To include: | |
| | PRAMS National Improvement Project Presentation | Mary Garven |
| | Maternal Anaemia Survey Feedback | Stuart Cleland/ Alison McCormick |
| | Woman2 Trial Results Feedback | Sarah Wheeldon |

# Previous Meeting Summary

- SC gave an overview of the key outcomes of the NBTC/NHSBT stakeholder event which looked at ways of raising the profile of transfusion by developing closer links with the regional and ICB Medical Directors.
- Key messages were highlighted regarding forecasting demand during uncertainty, universal components and Ro type red cell supply.
- Future objectives/education discussed included the development of a regional NMA course and electronic tracking IT workshops with system providers.
- 2021/2022 Transfusion Survey results presented.
- 2 x incident and learning outcome presentations given
- Results of a PCC audit presented and discussed.
- Overview given of collaborative research involving the military.

South West Regional Transfusion Committee

**South West Regional Transfusion Committee Meeting – 24.05.23 – Action Log**

| Actions from meeting minutes | | Actioner(s) | Status | Notes |
|---|---|---|---|---|
| Item | | | | |
| 2 | Feedback any major deviations between inspection bodies via TLM meeting | TLMs | | |
| 3 | Raise awareness of new JPAC website within groups | All | | |
| 3 | Distribute amber alert survey results with minutes | JM | | Complete |
| 4 | Organise meeting with Rebecca Tizzard to further discuss Nuffield blood tx practices | SC | | |
| 5 | Feedback to NHSBT TW-B's comments re bank holiday blood usage | RE | | Closed |
| 5 | Establish need for a regional NMA course | RTT | | |
| 8 | Take back to NHSBT ongoing concerns around the use of paedi-packs after day 14 for emergency resuscitation | RE | | Closed |

# Previous Meeting - Matters Arising

# NBTC meeting update

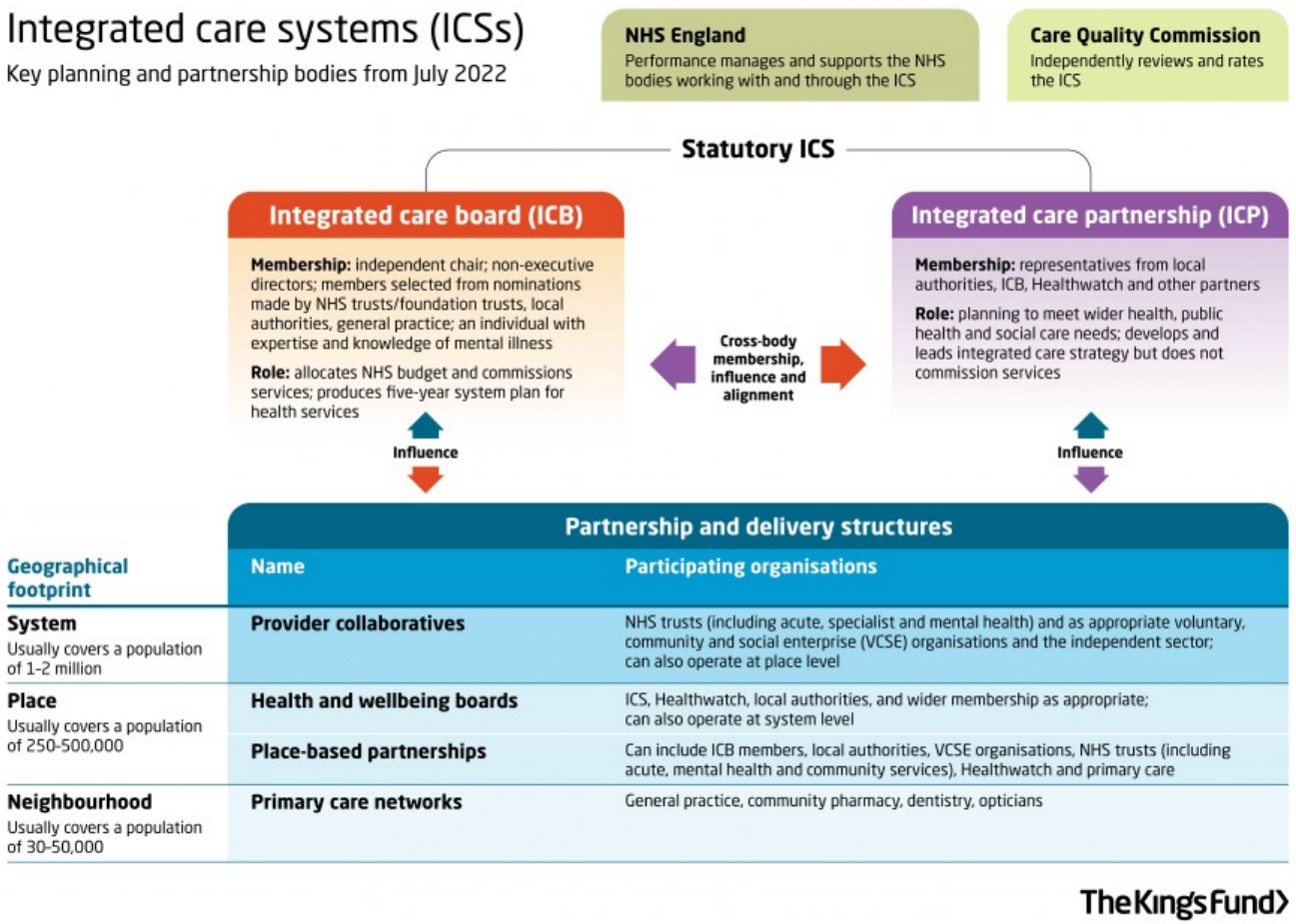
SOUTH-WEST REGIONAL TRANSFUSION COMMITTEE

22ND NOVEMBER 2023

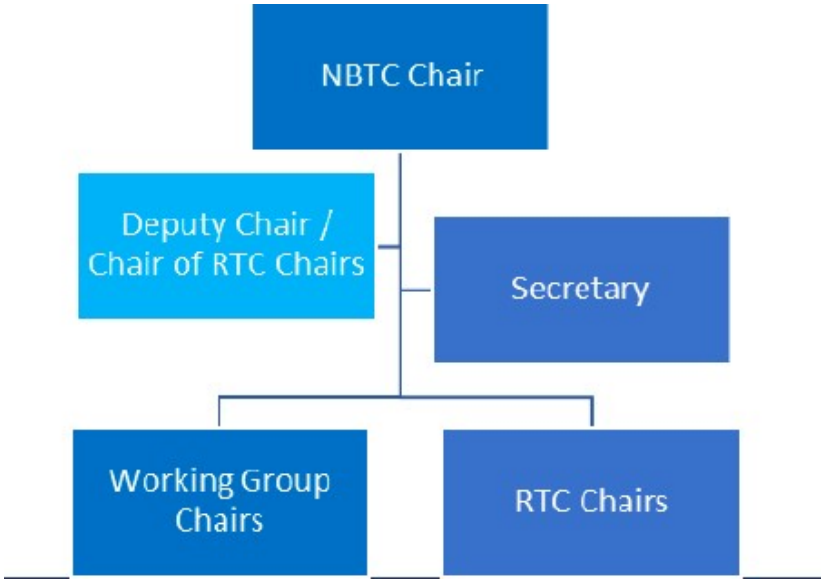
STUART CLELAND

- NBTC restructuring and governance
- R+D BTRU
- NBTC education programme
- Transfusion 2024

# NBTC restructuring



# RTC chair position




Delivery, leadership and management of RTC

RTC activities aligned with NBTC strategy + blood safety initiatives

Build relationships – ICB's, NHSE regional teams, Pathology Networks

Voice of hospitals in NBTC in developing national strategies

Drive development and delivery of regional work plan

Provide education activities and events throughout the year

Review blood ordering, usage and wastage data to allow benchmarking and implementation of best practice.

# Outcome measures for RTCs

Providing data on the transfusion practice of Trusts in the Region.

Monitoring and recording transfusion audit on a regional basis.

Demonstrating regional education in good transfusion practice.

Reporting on performance monitoring of the transfusion-related services provided by NHSBT.

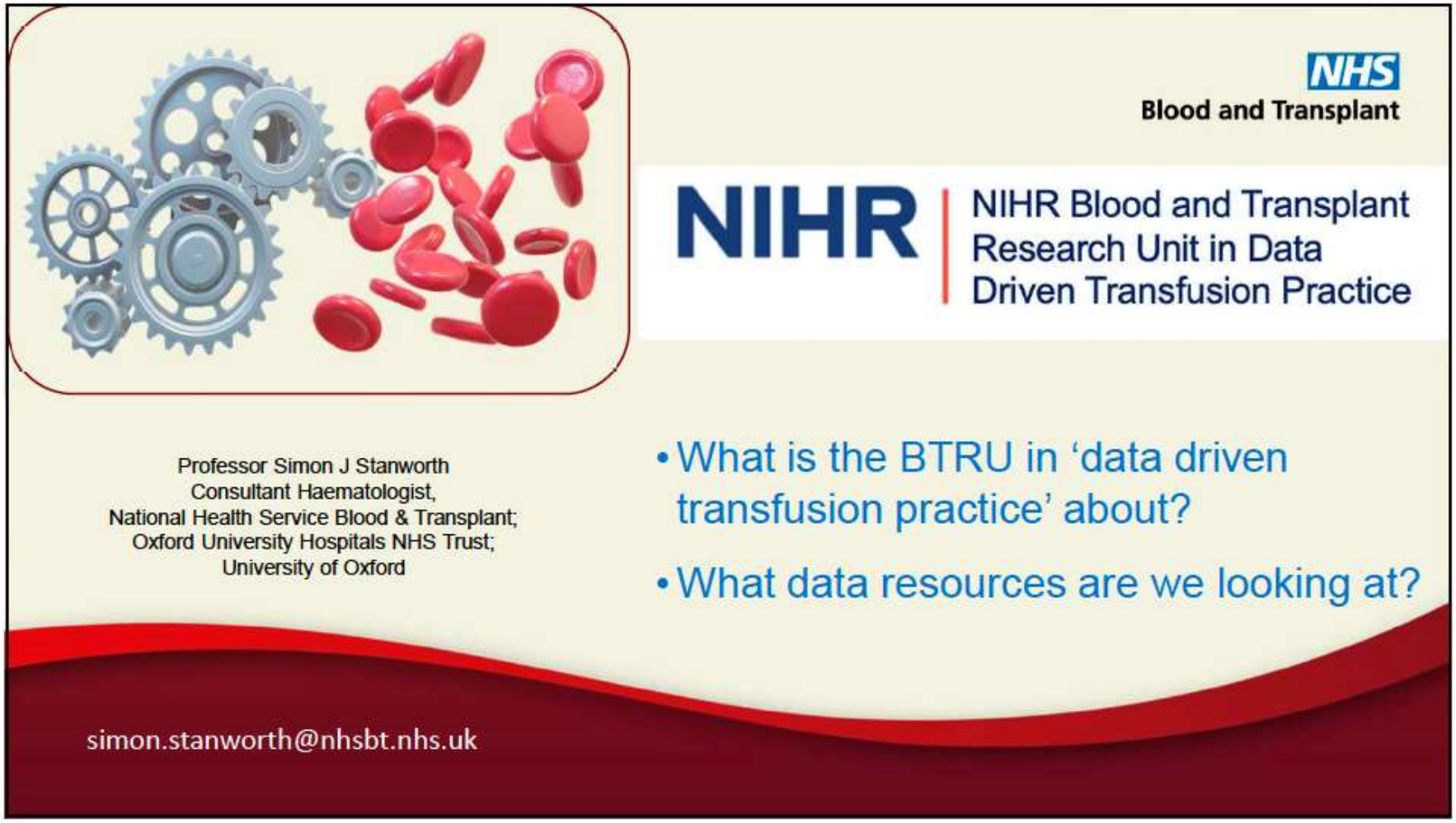
Providing information on patients' experiences about the provision of transfusion services.

# South-West as Pilot site

Formed links with Pathology networks

- RTC Chair (Stuart Cleland) and TLM (Ian Sullivan) have been invited onto SW Pathology Group – feed directly into ICB's
- Have discussed developing Transfusion KPI's for SW Pathology dashboard – in progress
- Have discussed idea of SW maternal anaemia pathway/policy. If buy in from region good potential for support from ICB/SW regional medical director.
- F2F meeting in Jan 24 with NBTC/NHSE to discuss next steps.

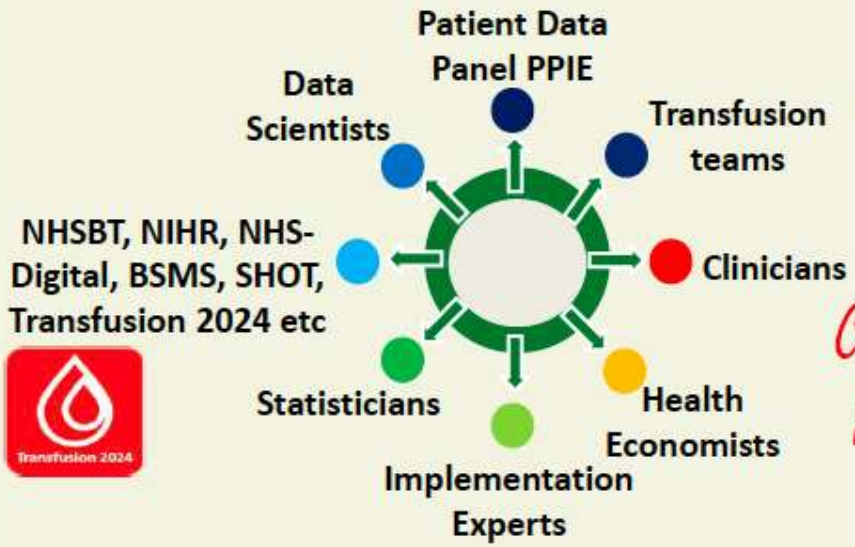
# NIHR Blood & Transfusion Research Unit



# NIHR Blood & Transfusion Research Unit

## Who are we?

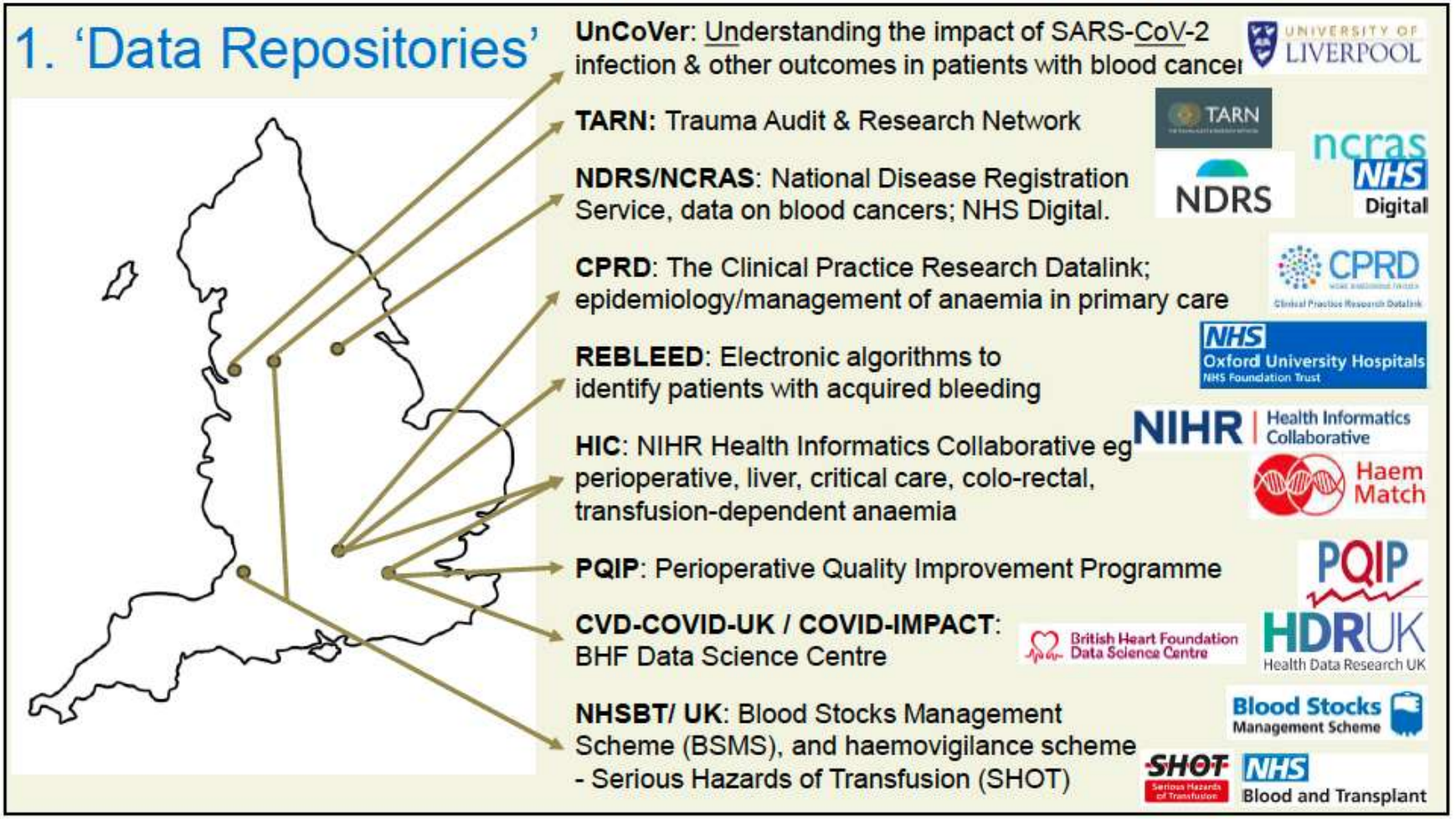
NIHR | NIHR Blood and Transplant Research Unit in Data Driven Transfusion Practice



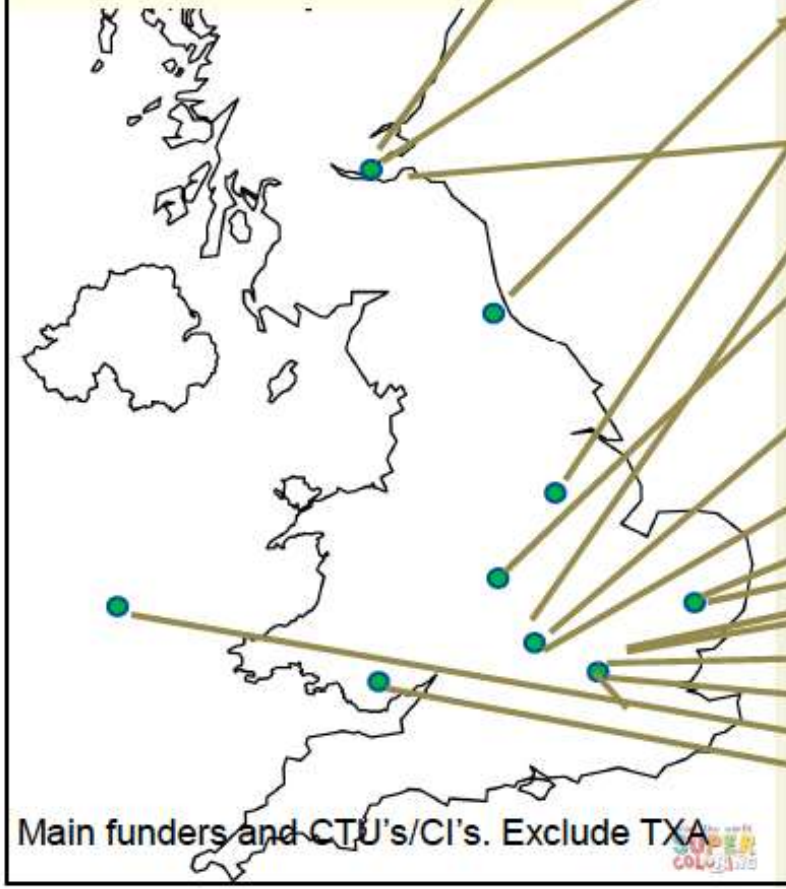

*Contact us if interested in joining*


Developing **pragmatic evidence-based standards** for safe and effective transfusion which are **supported by data and IT**, and which enable more **efficient, cost-effective and iterative benchmarking of practice** and quality improvements

# NIHR Blood & Transfusion Research Unit



# 2.'Transfusion' PBM trials



RESULT-HIP: Hip fracture & red cells thresholds*

ABC: Intensive Care survivors and red cell thresholds

REDDS2: MDS and red cell thresholds

POP-I: Hip fracture and laparotomy and iv iron & EPO*

INTACT 2: Intensive Care survivors and iv iron*

PROPEL: Prehabilitation and anaemia in AML*

T4P: Intensive Care and platelet thresholds*

PANDA: Pregnancy, anaemia and (oral) iron*

TOP: Traumatic brain injury and anticoagulation/plasma

SWIFT: Prehospital whole blood

PROPHESY 2: Cardiac surgery - FFP vs PCC*

pOpTICCA: Paediatric Critical care and red cell thresholds

WHEAT: Neonates with NEC and red cells*

PlaNeT3: Neonates and platelet volumes

OBS – UK: PPH and quality improvement*

Main funders and CTU's/CI's. Exclude TXA

NIHR | National Institute for Health and Care Research *

Canadian Institutes of Health Research

NHS The Newcastle upon Tyne Hospitals

THE JON MOULTON CHARITY TRUST *

MONASH University

NHS Blood and Transplant

The Brain Charity

HRB Health Research Board

# PANDA study

PANDA
Primary prevention of maternal ANaemia to avoid preterm Delivery and other Adverse outcomes

**Participants:** We aim to recruit 11,020 non-anaemic pregnant women from participating maternity units over 18 months. We estimate that around 90% of women attending the units for their first visit will be eligible.

**Inclusion criteria:**
Healthy non-anaemic pregnant women receiving NHS maternity services, identified at booking or dating ultrasound scan

**Exclusion criteria:**
Women with haemoglobinopathies, a current diagnosis of anaemia of any cause, severe gastrointestinal disease, or multiple pregnancy.

**Consent Procedure:** We will use multiple options including e-consent to minimise the burden on site staff and maximise participant recruitment.

**Intervention:** Ferrous Sulphate 200mg tablets, dose regimen to be confirmed following analysis of our dose finding study

**Comparator:** Placebo matched to Ferrous Sulphate tablets

**Co-Chief Investigators:**

**Professor Simon Stanworth**
University of Oxford and NHS Blood and Transplant

**Professor Marian Knight**
National Perinatal Epidemiology Unit (NPEU)

# PANDA study

- Primary outcome - Composite outcome of: -
  - Pre-term birth (<37 completed weeks gestation)
  - Small for gestational age (<10th centile sex-specific weight for age)
  - Stillbirth (at 24 weeks gestation or above)
  - Neonatal death (up to 28 days)

- Secondary Outcomes: -
  - Proportion of women developing anaemia during pregnancy
  - Transitions in Hb from recruitment to 28 weeks' gestation& birth
  - Proportion of women with PPH
  - Proportion of women requiring red cell transfusion
  - Proportion of women requiring iron infusion
  - Proportion of women with infection or sepsis
  - Proportion of women with postpartum psychosis/depression

# Rolling programme of Virtual Education Sessions

NBTC Education Working Group will choose list of topics to be covered each year.

7 education sessions will be delivered between April 2024 and April 2025. Each RTC will chose and deliver one.

Range of transfusion subject matters will be covered – clinical and laboratory topics.

Topics can be requested by RTC members.

Meetings will be recorded and hosted on-line.

# Transfusion 2024

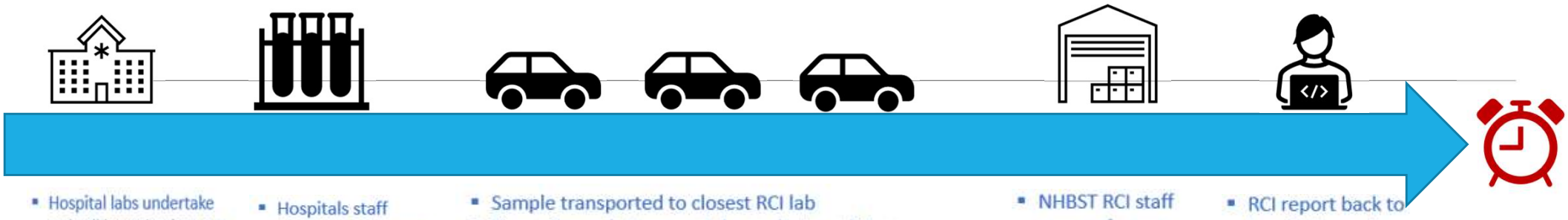
- Request for hospitals to participate in the Fetal RHD requesting and reporting and Red Cell Immunohaematology (RCI) remote interpretation pathology pilots.

mawa.sall@nhsbt.nhs.uk

- Woking on business case for hospital blood data integration project. Stakeholder engagement group is supporting this work. Need integrated data feed to get more accurate information about  day to day stoke holding.
- LIMS suppliers CLINISYS to allow electronic requesting. Should save time for Fetal RHD and RCI.
- Working with 2 pathology networks currently comprising of 10 hospitals to pilot RCI remote interpretation. Looking to onboard additional sites

# T2024 B3: NHSBT Pathology labs are piloting provisioning of remote interpretation of test results

NHS Blood and Transplant



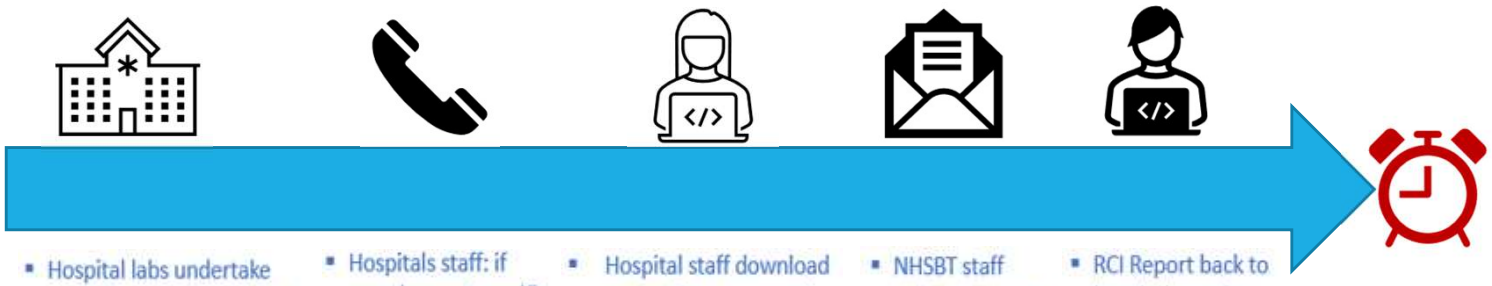
- Hospital labs undertake red cell investigations e.g. antibody investigation
- Staff unsure about the test results

- Hospitals staff decision to refer to RCI

- Sample transported to closest RCI lab
- Time of sample transport dependant on distance from RCI site and traffic issues. E.g. Pilgrim hospital, Boston Part of Pathlinks is 95 miles approx. 2 hours drive before work begins at RCI

- NHBST RCI staff repeat the test and may undertake further testing

- RCI report back to hospitals results (SPICE)



- Hospital labs undertake red cell investigations e.g. antibody investigation
- Staff unsure about the test results

- Hospitals staff: if sample meet specific criteria, contact for RCI remote interpretation advice

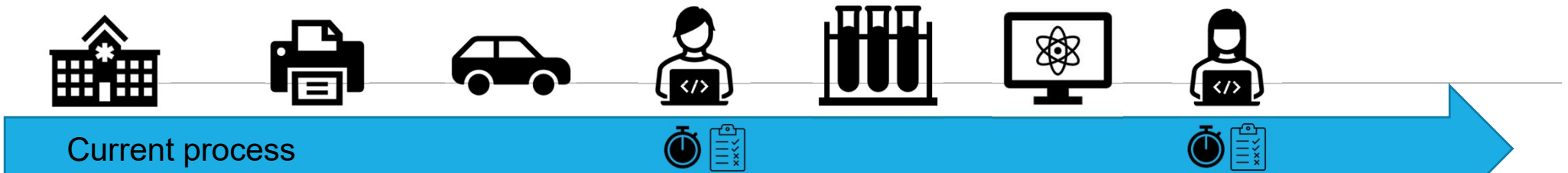
- Hospital staff download report from automatic blood grouping systems
- Email report securely to RCI team

- NHSBT staff review hospital automatic report

- RCI Report back to hospitals results (SPICE)

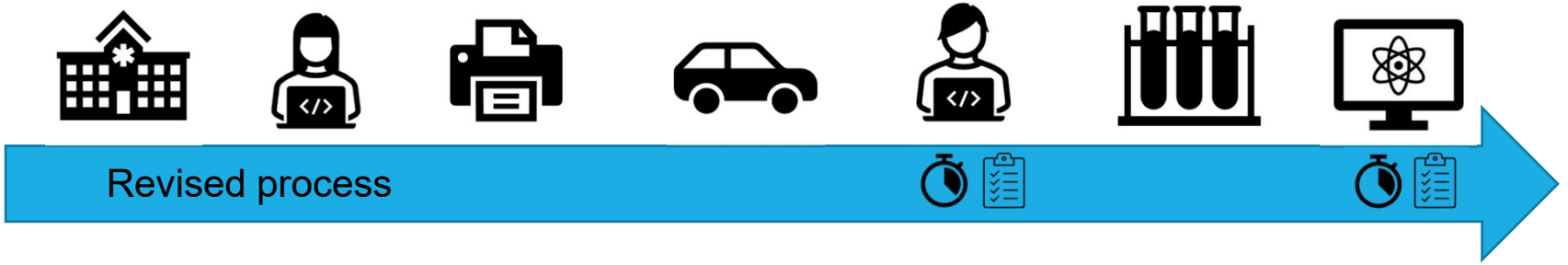
- Standardises work on samples before referral to RCI
- Acts as a guide for less experienced staff
- Shorter time to provide test results and more environmentally friendly: sample doesn't have to travel and no repetition of testing
- Lower system costs by working in partnership with hospital transfusion laboratories

# T2024 C1b: e-requesting & e-reporting of Fetal RHD Screens



## Current process

- Hospital input information into LIMS
- Hand written request form
- Included in bag with sample
- Sample and request form transported to Bristol
- Information cross-checked and typed in at NHSBT lab
- Tests carried out
- Results reported back to hospitals via SPICE
- Results are authorised and then transcribed manually from SPICE to hospitals LIMS



## Revised process

- Hospital input information into LIMS
- Information received by Labgnostic
- HTL log into Labgnostic and select Shipments Out
- HTL selects Assemble Shipment and scans each barcode for the samples to be sent
- HTL confirms Specimens Packaged and prints shipping manifest
- Sample and shipping manifest transported to Bristol
- Information cross-checked
- Barcode scanned in from shipping manifest and sample as part of booking in
- Tests carried out
- Results are authorised via SPICE, then double checked against those reported back directly from NHSBT LIMS into hospital LIMS via Labgnostic

- Reduced transcription / demographic errors
- Savings in hospital and NHSBT laboratory processing time
- Hospital get results in their LIMS quicker
- Reductions in sample rejection and need to rebleed patients

# Transfusion 2024

**PBM**

Request to participate in NCA of NICE QS – Data uploaded to model hospital

QS138 Quality Insight tool – support ongoing QI within hospitals

**Transfusion Lab Safety**

MHRA have stated they will not support unified standards but willing to review when discrepancies occur. (Lab managers group)

**Information Technology**

Script have developed:

- Transfusion IT toolkit, working to develop transfusion IT standards
- Survey reported only 30% respondents have v2v tracking.

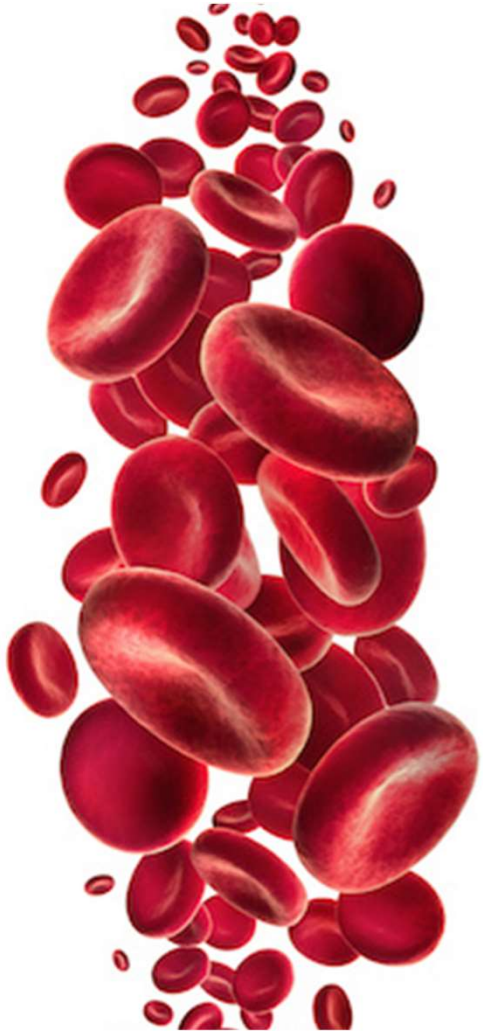
# Hospital Transfusion Committee Reports

South West Regional Transfusion Committee meeting

22nd November 2023

**Stuart Cleland**

**Chair of the South West RTC**



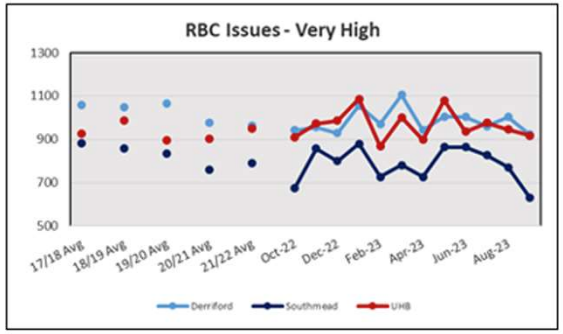
# Introduction

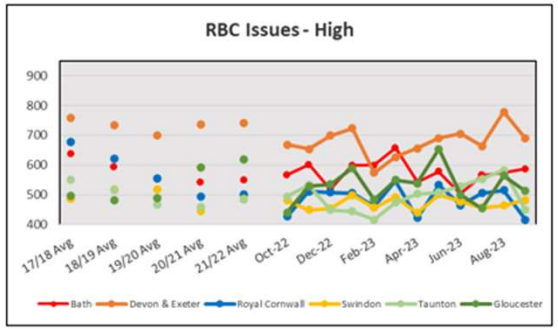
- 6th Meeting with presentation of HTC reports at SWRTC
- Responses from 12/18 hospitals (10/14 trusts)  this round, slight drop from last RTC.

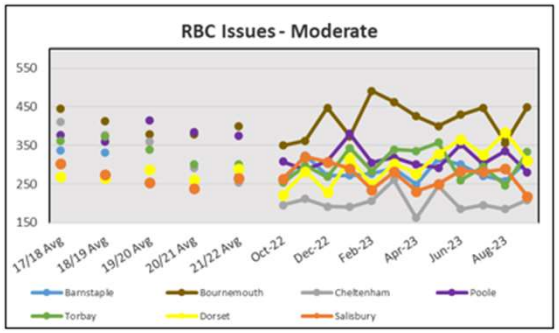
# Responses

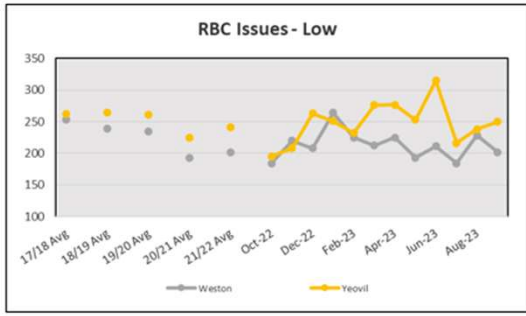
| Hospital | May 21 (pilot) | November 21 | May 22 | November 22 | May 23 | Nov 23 |
|---|---|---|---|---|---|---|
| Derriford | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Southmead | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| University Hospitals Bristol | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Bath | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Royal Devon + Exeter | | ✓ | ✓ | ✓ | ✓ | ✓ |
| Royal Cornwall | ✓ | | ✓ | ✓ | | ✓ |
| Great Western | | ✓ | | ✓ | ✓ | ✓ |
| Taunton | ✓ | ✓ | | ✓ | ✓ | |
| Barnstable | ✓ | | | | ✓ | ✓ |
| Bournemouth | ✓ | ✓ | ✓ | ✓ | ✓ | |
| Cheltenham | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Gloucester | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Poole | ✓ | ✓ | ✓ | ✓ | ✓ | |
| Torbay | ✓ | ✓ | ✓ | ✓ | ✓ | |
| Dorset | | | | ✓ | | ✓ |
| Salisbury | ✓ | ✓ | | ✓ | | |
| Weston | | ✓ | ✓ | ✓ | ✓ | |
| Yeovil | | ✓ | ✓ | ✓ | | ✓ |

# Usage: Red blood cells



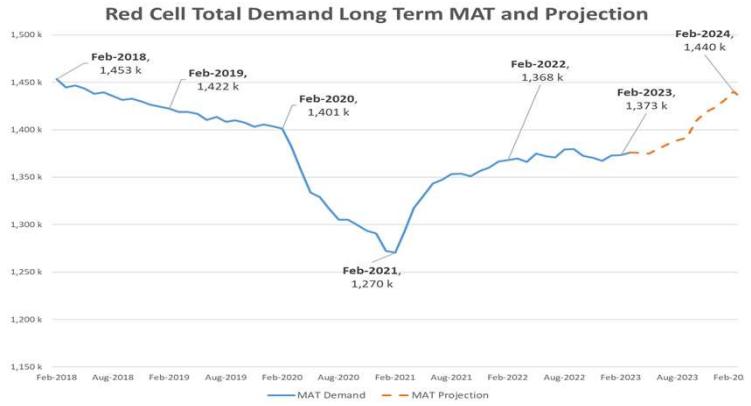



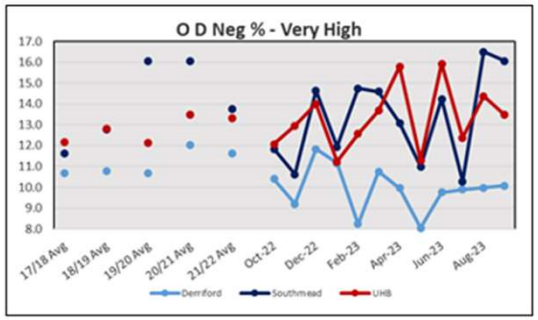



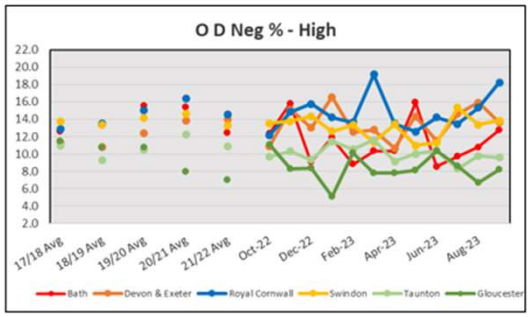

Yeovil - Fluctuation in usage is due to small overall numbers of transfusions, an increase in major haemorrhages for instance will skew monthly figures.

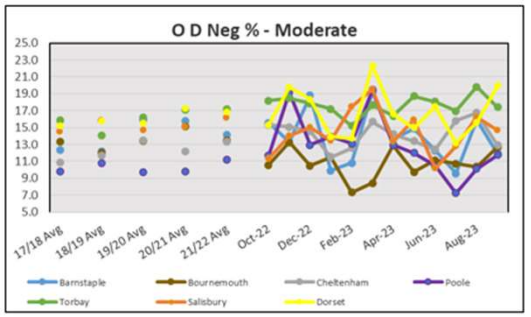
The population of the region feeding into YDH is growing massively on account of major house building projects

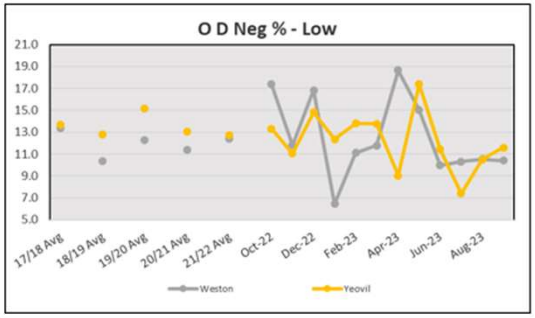


# Usage: O-ve units



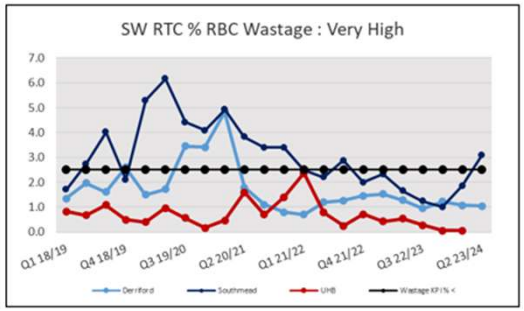

1. North Bristol –

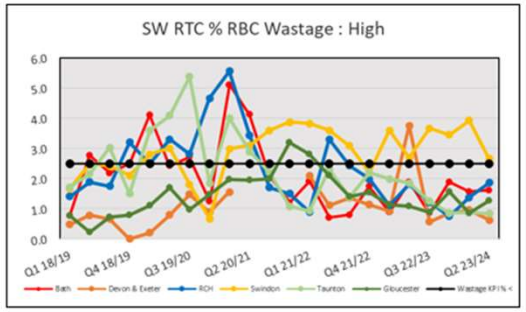
- 2 high risk obstetric patients at high risk of bleeding. One had 8 units available on day of delivery, none for either patient.
- All units were issued at least twice for different patients in an attempt to use them but were not transfused.

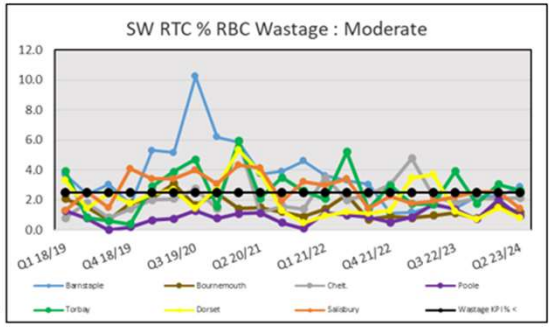
Corrective action. Discuss with obstetrics if they would be willing to drop from 4 to 2 units of blood available for high-risk obstetrics.

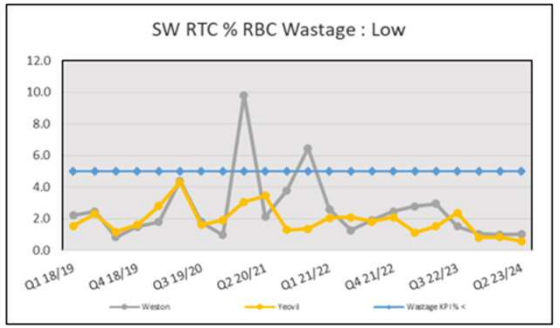
2. Bournemouth – Introduction of emergency O+ve red cells for males >18 and females >60

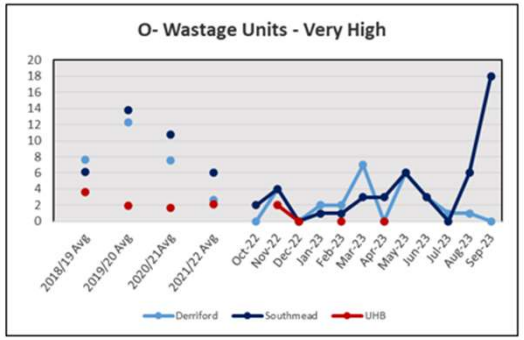
# Wastage: Red cells

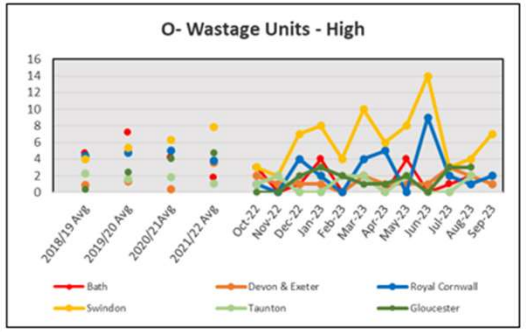


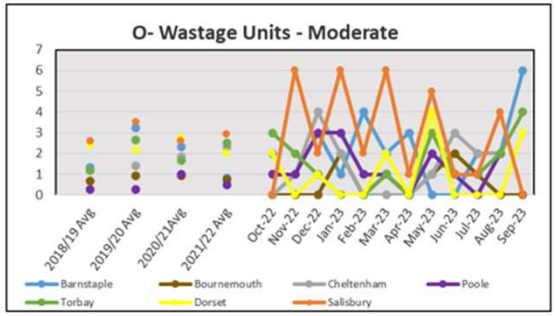



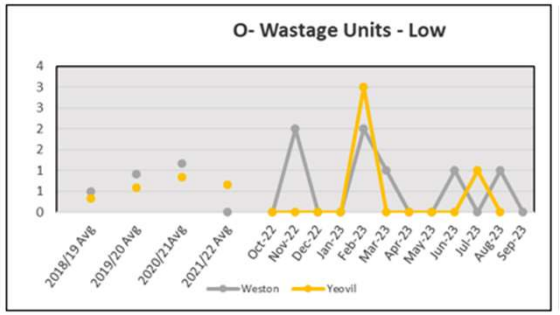



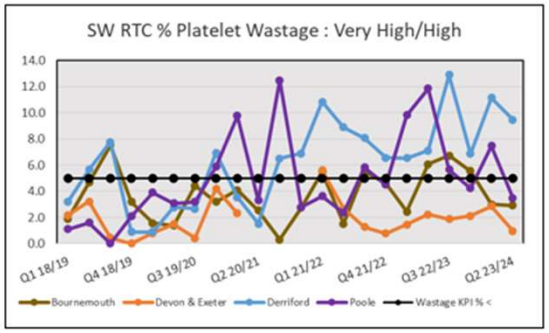



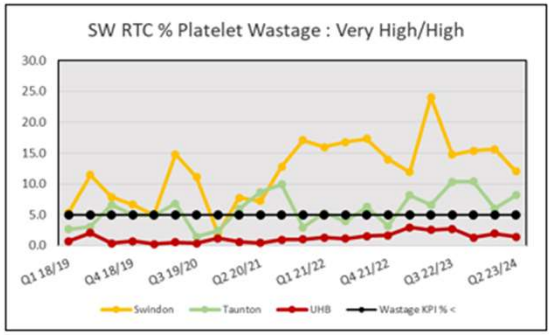



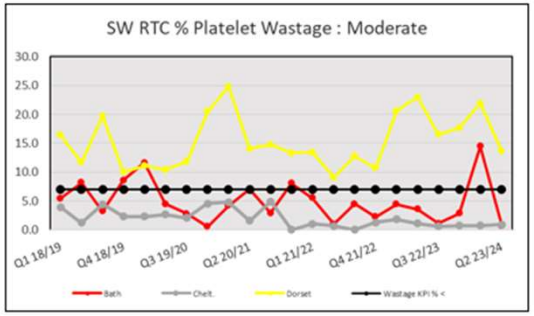



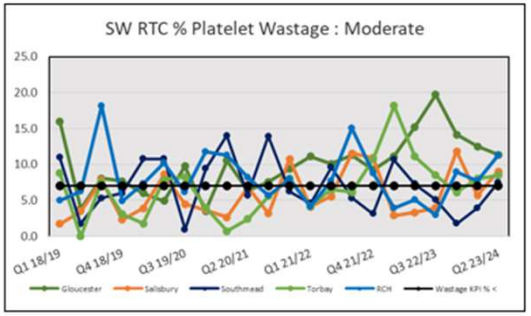

1. Gloucester – Short dated RBC's from Nuffield hospital. Persists despite audit of usage and MSBOS and making recommendations based on data. Impacting stock control in Gloucester lab.
2. Swindon – Rates of transfusion are low, discussions with NHSBT, increased ad hoc deliveries particularly for weekends where elective transfusion work takes place for blood dependent patients. Educational programme to reduce wastage.
3. Weston – reduced blood reservation time from 48 to 24 hours, BloodTrack courier implemented – increased stock visability.

# Wastage: Platelets




1. Gloucester

- Platelet wastage increased at Gloucester site. Increased stock holding of emergency A Neg platelets (1 > 2, one on each of our sites). This is because we are now ordering from Birmingham NHSBT center, which provides a longer blue light delivery time
- Carrying out a prospective audit on platelet usage (already completed retrospective) and how they are ordered from our Hematology Day unit to see if we can improve our process and mitigate both wastage and usage

# NICE Quality Standards – IV iron

1. Gloucester

ongoing project / work with commissioners and transfusion team regarding an IV Iron service to improve the provision of pre-operative IV iron for elective patients

Oncology anaemia protocol / guideline written and in use

2. Yeovil

Major multi-centre study for those undergoing surgery for colorectal cancer is being led by our surgical professor. Focussing on investigating, treating and monitoring iron deficiency Pre-, peri- & post-op and following discharge.

Peri-operative transformation project anaemia workstream for the merged Somerset FT region will be going live when the Band 7 Anaemia nurse commences her role in December. She will be managed by the peri-op transformation team, not part of the anaemia service. Data will be collected and analysed as part of the project.

3. NBT

1 WTE band 6 anaemia practitioner appointed, business case for service provision and resilience

# NICE Quality Standards - TXA

Great Western: Policy for all forms of moderate blood loss surgery. Elective and emergency surgery + bleeding in palliative care, CNS bleeds + GI haemorrhage.

Bournemouth: TXA given to all arthroplasty surgery and hysterectomies.

Other trusts currently auditing compliance with policies.

# Other issues

**Bristol:** Blood bank staffing remains limiting and in particular resource to train new staff. Transfusion remains difficult to prioritise against other hospital needs - for example introduction of blood tracking has been postponed to allow IT to concentrate on clinical chemistry.

**Great Western:** Audit primary hips/knees, very low rates transfusion (<1%). ? Need for 2x G+S's. Have other hospitals had similar move away? Move from blood hound to Blood 360 – potential to free time for other projects. Bid for 2x cell salvage.

**Bournemouth:** TACO audit – increase in cases reported. 190 charts, only 50% had TACO checklist completed. Of 95 charts completed, 72 completed appropriately. Fluid balance charts not being undertaken.

**Yeovil:** Blood Track on hold until Blood Track Manager appointed. Cell salvage machines have been commissioned.

**Poole:** ROTEM live implemented. Southern Counties Pathology group – 7 trusts (9 sites) with shared LIMS, impacting on transfusion policies as LIMS rules being altered due to other trust requirements. Changing TEG to ROTEM at Bournemouth to align with Poole

**Gloucester:** New LIMS system, new transfusion medicine element in EPR. OAA posted "evaluation of PBM measures in maternity"

# Non-medical authorization courses

Meeting with North East & Yorkshire NMA course

Due to attend as observer of course in December

Could we run course in the SW?

NHS
Blood and Transplant

# NHSBT Customer Service Update

Carol Stenning, Hospital Customer Service Manager

Caring Expert Quality

# Southampton Update

NHS Blood and Transplant

- The Emergency Blood and Platelet SHU at Southampton has reopened.
- We have provided a number of emergency deliveries since its reopening.
- Updates on the Southampton site will be released on the website update page, the customer services team have been given permission to take over the responsibility for updating this page

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# The Update - July to September 2023

NHS Blood and Transplant

## If you receive components you did not order please advise your Hospital Services department

## Updated instructions for returning blood units with suspected bacterial contamination

- Do not use the Bacteriology Request Form (FRM1581) and discard any blank copies

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- Blood Pack Changes

  new contract for blood pack supply from November 2023 onwards. .
  The majority of blood packs will not change, with the exception of some minor cosmetic changes to the pack base label. These changes will mostly be covered by NHSBT product and ABO labelling. The pack reference and lot number barcodes are still visible at the bottom of the base label.
  A change of supplier applies to these, only:
  - Neonatal Platelets
    Previous supplier - Macopharma
    New supplier - Fresenius Kabi
    Differences - port covering tears horizontally not vertically
  - Clinical buffy coats & some apheresis FFP
    Previous supplier - Macopharma
    New supplier - Fresenius Kabi
    Differences - port covering tears horizontally not vertically; clearer in colour

  You'll continue to see blood packs from the current suppliers for an extended period until we've depleted our stock.
  We'll also be doing some validation work of additional suppliers, to ensure we have robust business continuity. You'll only see minor cosmetic changes with these blood packs.

NHS Blood and Transplant

Caring Expert Quality

NHS
Blood and Transplant

## Check your internet browser supports OBOS

- The next version of OBOS, due for release in April 2024, will only be accessible using supported internet browsers, for example, Microsoft Edge, Safari, Chrome, Opera etc.
- From December 2023,  if you log on using an unsupported browser, a banner will display advising the browser is not fully supported, which means that  functionality/performance may be affected.

## The Blood Stocks Management Scheme (BSMS) portal updated on 5 September to provide new functionality and information

- To make sure you're accessing the latest version of the portal, with the new functionality, refresh your browser (to delete the cache) by pressing ctrl + F5 on your keyboard.

NHS
Blood and Transplant

- Management of the Molecular Diagnostics laboratory moves to the Histocompatibility and Immunogenetics (H&I) function
- Latest versions of user guides for Fetal RHD screening and for referring other samples to Molecular Diagnostics are now available on the IBGRL website
- Latest versions of H&I laboratory test request forms available from 31 October
- We want lab staff to help us to identify and address knowledge gaps in education and training by completing our questionnaire – T2024

NHS
Blood and Transplant

## Joint Statement from NHS Blood and Transplant, National Blood Transfusion Committee, United Kingdom Thalassaemia Society and Sickle Cell Society.

### Removal of maximum age requirements for red cell transfusion to patients including those with Haemoglobinopathies

NHSBT released a statement in January 2023 requesting Clinical leads responsible for the transfusion of patients with haemoglobinopathies to remove the maximum age requirement for red cell transfusion. At that time the aim of the request was to support the management of the Amber Alert on red cell stock.

**We ask you to continue this practice.**

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## Update: Red Cell Pack Volume

NHS Blood and Transplant

Since notifying hospitals of the incident involving a few red cell units that may have had a discrepancy between the volume stated on the label and the volume in the pack, we have additional information available.

Out of all the units bled between 02 Sept 2023 and 18 October 2023 we have identified that only 14 units fell outside of the NHSBT published volume range of 220-340 mls, having volumes between 205 to 210mls, had been issued to hospitals. We have identified these units and contacted those hospitals directly.

All other units bled fall within the volume range of 220- 340 mls. If you have quarantined any units following the communication issued on Friday 20 October, they can be returned to stock for use.

Root Cause, Corrective and Preventive investigations continue, if you require any additional information to support any internal QI's you have had to raise due to this event, please contact your local Customer Service Manager and we will share outcomes when available.

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# RCI Triage Questions for urgent referrals

NHS Blood and Transplant

https://hospital.blood.co.uk/the-update/referring-urgent-samples-to-rci-where-you-require-results-in-less-than-5-working-days/

https://hospital.blood.co.uk/the-update/prioritising-testing-within-rci/

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# Plymouth Delivery Review

NHS Blood and Transplant

The Plymouth delivery review is due to be recommenced, when it was initially suggested in Jul/Aug there was such push back it was temporarily paused, it has restarted.

Sonia Dhillon (CSM Logistics) will be considering all aspects of the delivery structure, subjects include

- Cut off times
- Target Delivery Times
- Hospital Requests

NHS
Blood and Transplant

# PCM's

Friendly reminder from Hospital Services

Stickers plus the residue they leave behind, has the potential to be a microbiological hazard.

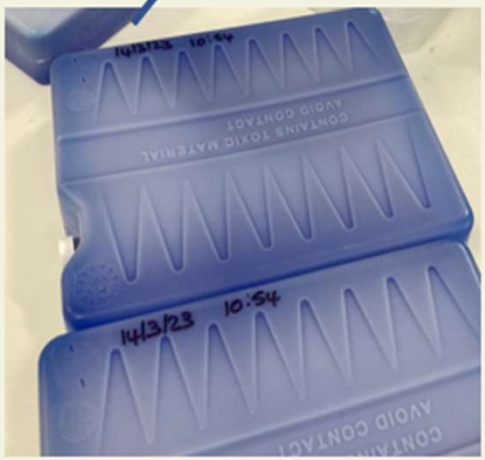
Thank you for your cooperation.

**Please Do NOT put stickers or write on PCMs as these are difficult to remove**


Not valid sticker

NHS
Blood and Transplant

Permanent marker can't be removed




Sticky labels difficult to remove

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Hospital customer services

# CREDITS

NHS Blood and Transplant

- Please ensure that your hospital is submitting your credit requests **once** only - unless asked to resubmit any by your local CSM.
- Witnessing the same credits being requested/submitted in duplicate/treplicate sometimes months apart.
- Any reason for this?

NHSBT
England
Tel: 02082013107

Date: October 2023

| Item | Qty | Price | |
|---|---|---|---|
| RBC | x 5940 | £158.18 | £939,589.20 |
| PLTs | x 296 | £246.28 | £72,898.88 |
| FFP | x 660 | £40.02 | £26,413.20 |
| Pooled Cryo | x 100 | £213.00 | £21,300 |
| Adhoc | x 124 | £58.11 | £7205.64 |
| Total | | | > 1,000,000 |

Refund Payable by NHSBT to the Hospitals

# Demand Printed Labels


- Please ensure you provide NHSBT with a minimum of a months notification if you plan to introduce DPL within your hospital/trust.
- The requested NHSBT laboratories need to approve the labels before use, failure to do so can lead to concessions (including associated costs).

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# NHSBT Transport Delivery's

NHS Blood and Transplant

Please can you ensure your laboratory staff sign for products delivered

This is good practice and can help the NHSBT resolve any delivery discrepancies.

# Pack Defects

Please can you include photos for any reportable pack defects

This helps us to follow up with the supplier and try and identify pack defect trends

Caring Expert Quality

# Samples

NHS Blood and Transplant

- If you have not received any results or products and you believe a sample has not reached the appropriate NHSBT laboratory, please contact that laboratory immediately
- The NHSBT laboratory can then start an investigation into the whereabouts of the missing sample.
- The investigation will be logged into the NHSBT quality system which will include actions to
  1. Determine what has happened in the incident reported
  2. Produce actions to stop future incidents

# General News

NHS Blood and Transplant

- JPAC set to release a statement shortly on vaccination statement of blood components, also a statement is expected on directed donation.
- Stock platelets and HT- platelet ordering
- Universal platelet/plasma survey released today and will be open for 3 weeks, TLM and TP/Consultant version.

# Customer Satisfaction Survey

NHS
Blood and Transplant

- Thank you for your participation, we had a fantastic response rate.
- The response have been collated and are currently being analysed and the highlights will be fed back shortly.
- We will also be following up on any comments raised.
- Compliments

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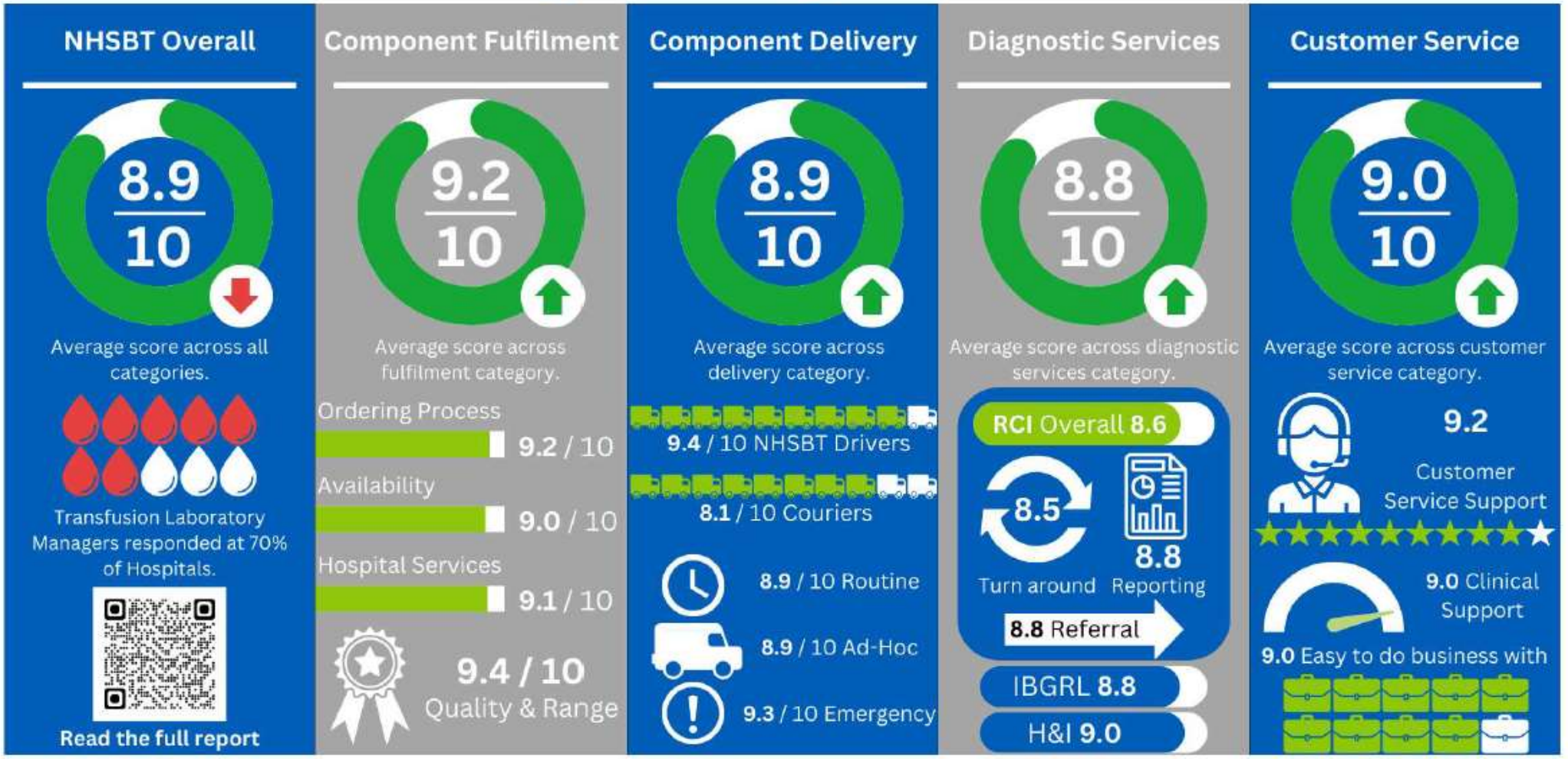
The provision of transfusion components and services
**Customer Satisfaction Survey Autumn 2023**
Summary of Findings

- 6 Month Review
- Online Survey
- Survey: 4th September - 1st October 2023
- Conducted by Hospital Customer Service

NHS Blood and Transplant



NHS
Blood and Transplant

# Thank You

Any questions, comments or feedback?

Caring Expert Quality

Patient Blood Management

# PBMP update

NHS Blood and Transplant

## Blood Stocks

- We remain at Pre-Amber status for A D negative Platelets, rest of platelet groups remain stable
- Stocks remain stable at the moment for Red Cells except for O D negative and B D negative
- Ro stock we are only meeting demand of 50%
- Extraordinary efforts from BD teams to improve stock levels- but impact from storm activity and sickness.

## NCA Update

- Acute upper gastrointestinal bleeding (AUGIB) **(Report due Spring 24)**
- PBM in paediatric surgery **(Open)**
- Blood sample collection and labelling **(Report now available)**
- NICE Quality Standard QS138- **(Report pending)**
- Bedside transfusion practice **(March)**

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Patient Blood Management

# PBMP update

NHS Blood and Transplant

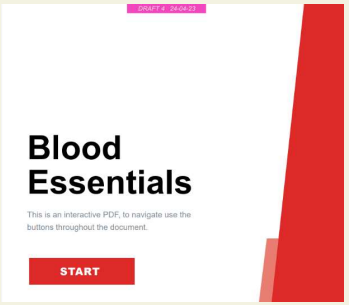
New and updated resources to support consent. Including patient focused content Consent for Blood Transfusion - Guidance for Healthcare Practitioners in the UK (transfusionguidelines.org)

Obstetric anaemia toolkit updated

BSH perioperative anaemia guideline update- final review

CPOC guidelines

ADOK/AWOK update due Jan 2024




**Genotyping study for haemoglobinopathies:**
Recording will be available on the PBM You Tube Channel
Start date now TBC MHRA pending- funding will be extended.

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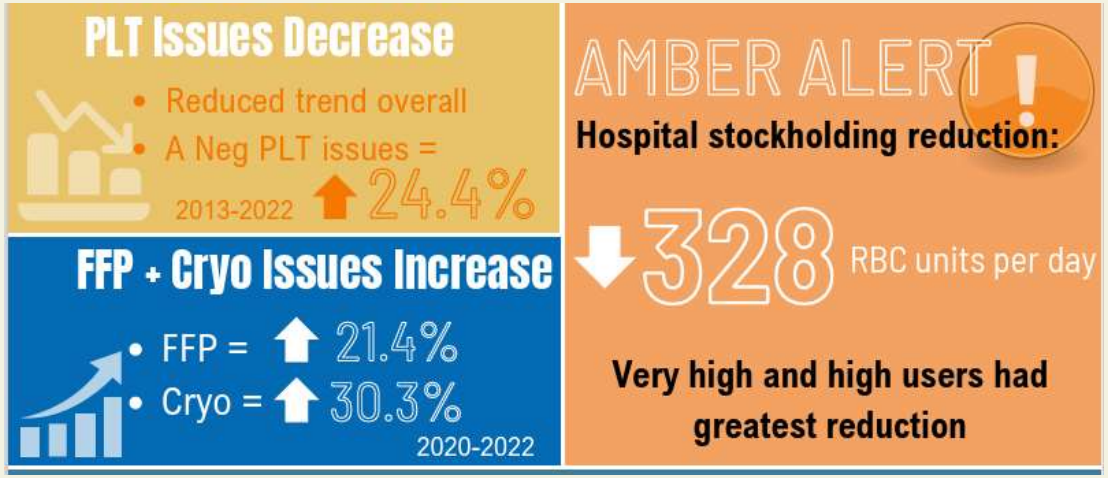
Patient Blood Management

# PBMP update

NHS Blood and Transplant

Blood Stocks Management Scheme

BSMS 10 Year component activity review- published and live on BSMS website

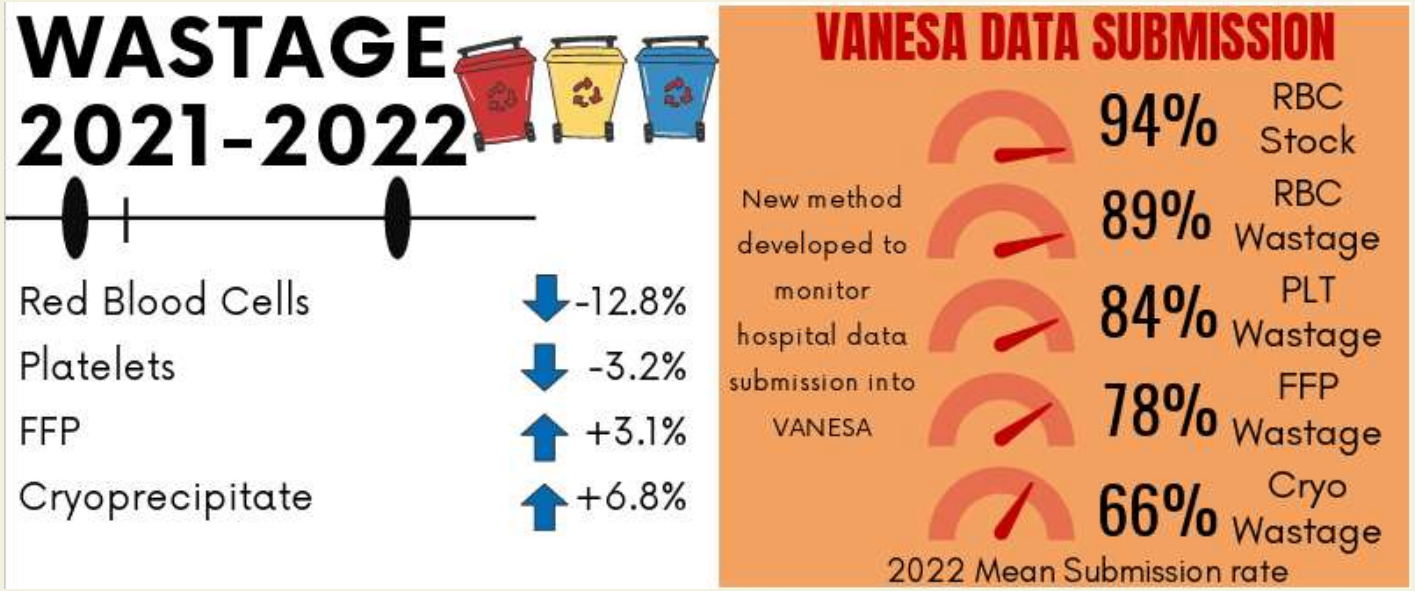

Caring Expert Quality

Patient Blood Management

# PBMP update

NHS Blood and Transplant

Blood Stocks Management Scheme




Caring Expert Quality

Patient Blood Management

# PBMP update

NHS Blood and Transplant

QS138 QUALITY INSIGHTS

QUALITY IMPROVEMENT BENCHMARKING. SELF ASSESSMENT, MADE EASY.

QI tool live, Wales now signing up hospitals

Updated Anti-D aide memoire
Monthly newsletter

SHOT Serious Hazards of Transfusion 25 YEARS

National Blood Transfusion Committee

NBTC Website update and accessibility


BBT- second phase beginning

TXA infographics available


Caring Expert Quality

Patient Blood Management

# PBMP update

NHS Blood and Transplant


IRONMAN Study published- demonstrated pt's with HF, reduced LV ejection fraction and ID benefited from repletion- lower risk of admissions and cardiovascular death

PBM awareness week Pop up stand success!

**Don't forget…..** NBTC education programme, BMSEDG, PBM YouTube, PILS, toolkits

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NHS
Blood and Transplant

# Universal Components Project Update:

## RTC – 22nd November 2023

Rhian Edwards

# What is the NHSBT vision for Universal Platelets?



## Current situation

More than 120 types of platelets must be stocked to meet ABO, RhD, irradiation and additional requirements.

## Universal future: every patient receives the donation they need

- ✓ Manufactured from donor platelets
- ✓ Suitable for transfusion to all patients regardless of their ABO and/or RhD group
- ✓ All irradiated

*HLA is outside of the project scope*

NHS

South West Regional Transfusion Committee

# RTC Objectives & Education Update

Dr STUART CLELAND – RTC CHAIR, CONSULTANT ANAETHSETIST –DERRIFORD HOSPITAL

# RTC Objectives

O+ use in emergency and major haemorrhage:

- Closed as an objective/now monitored as a regional piece of work.
- Planned MH survey to include question on O+ compliance.

Maternal Anaemia Management:

- Regional survey feedback to be reported in Education session.

# Future RTC Objectives

# EDUCATION UPDATE

**Transfusion Matters, 04.10.23:**
A virtual event for BMS's and lab. staff with <24 months transfusion experience

- National for first time
- 74 attendees

The event evaluation was very positive and has provided suggestions for future topics.

As always, if there are any topics you would like to see covered, either as a stand-alone event or as education at a future RTC meeting, please email your suggestions to:
jackie.mcmahon@nhsbt.nhs.uk

# EDUCATION UPDATE

Next planned national education event

**Hazards of Transfusion**

- Date tbc

Proposed topics:

TACO Risk Assessments in renal impairment and heard failure

Transfusion Reactions and Management

Input from SHOT

# Increasing Perioperative TXA

Dr Katie Preston, Dr Ramy Khalil, Dr Alison McCormick

Vikki Chandler – PH transfusion lead

KP1

KP2

# Why is it important?

- TXA reduces blood loss, death from bleeding and the need for perioperative blood transfusion

- Blood transfusion
  - Increases mortality periop
  - Has risks – infection, immune-modulation
  - Costs £158
  - Limited resource

## Slide 67

**KP1** Katie Preston, 09/09/2023

**KP2** Katie Preston, 09/09/2023

# Summary TXA trials

| | | | |
|---|---|---|---|
| **CRASH-2** | Bleeding major trauma | 1g/10min<br>Then 1g/8hr | Reduced risk of death (14.5% / 16%)<br>No reduction in transfusion |
| **CRASH-3** | TBI | 1g/10min<br>Then 1g/8hr | Reduced risk of death if given <3 hr in mild/moderate injury |
| **WOMAN** | PPH | 1g/10min | No difference death from any cause<br>Reduced death from bleeding but fragility index 0 |
| **TRAAP2** | LSCS | 1g/1min | Significant difference in Hb drop 1.2 vs 1.4g<br>No difference in transfusion or weighed blood loss |
| **HALT-IT** | GI bleed | 1g/1 hr<br>Then 3g/24hr | No difference in risk of death/transfusion<br><br>Increased VTE TXA 0.8%/placebo 0.4% |

# POISE-3

- 9500 patients

- 1g TXA at start and 1g end of surgery
- Surgical or patient factors increasing bleeding risk
- Type of surgery
  - 37% general, 22% ortho, 15% vascular, 13% urology, 5% spinal, 3% gynae, 3% thoracic
- Average preop Hb 131 +/- 19

# Inclusion

- Staying overnight
- >45 years old
- One of
  - Raised proBNP
  - Known IHD, PVD or stroke
  - Undergoing major vascular surgery
  - 3 risk factors of
    - Undergoing major surgery
    - Known heart failure
    - Previous TIA
    - Diabetes
    - Age >70
    - HTN
    - Creat >175
    - Recent smoking
    - Urgent surgery

# Exclusion

- Allergy
- eGFR<30ml/min
- Seizure disorder history
- MI/CVA/VTE < 1 month
- Recent SAH

# Outcomes

- Reduced bleeding events - TXA 9.1% placebo 11.7%
  - 'life-threatening', post op Hb <70, required transfusion or needed intervention e.g. embolization, vascular repair, packing etc
- Reduced transfusion TXA 9.4% placebo 12%

- No difference in MI/CVA,VTE - TXA 14.2% placebo 13.9%
  - Hazard ratio 1.02 (0.92 to 1.14)
- No increase in seizures

# National picture

- 2023 snapshot of 145 hospitals
- Asked which surgeries TXA is routinely given for?

| | |
|---|---|
| Elective orthopaedics | 44.0% |
| Orthopaedic trauma | 43.8% |
| Major trauma | 27.8% |
| Cardiac | 27.3% |
| Obstetrics | 22.4% |
| Major gynaecology cancer | 17.7% |

| | |
|---|---|
| Major urology cancer | 7.1% |
| Neurosurgery | 6.7% |
| Vascular | 6.1% |
| Major head and neck cancer | 5.3% |
| Lower gastrointestinal | 4.0% |
| Hepatobiliary | 2.8% |
| Upper gastrointestinal | 1.4% |

RAFT
RESEARCH & AUDIT
FEDERATION OF TRAINEES

NHS
Blood and Transplant

# Poole picture

**Two audits**

Local standard operating procedure for # NOF recommends TXA

- 2022-23 audit
- 46/100 received TXA (or had valid contraindication)

NICE QS138

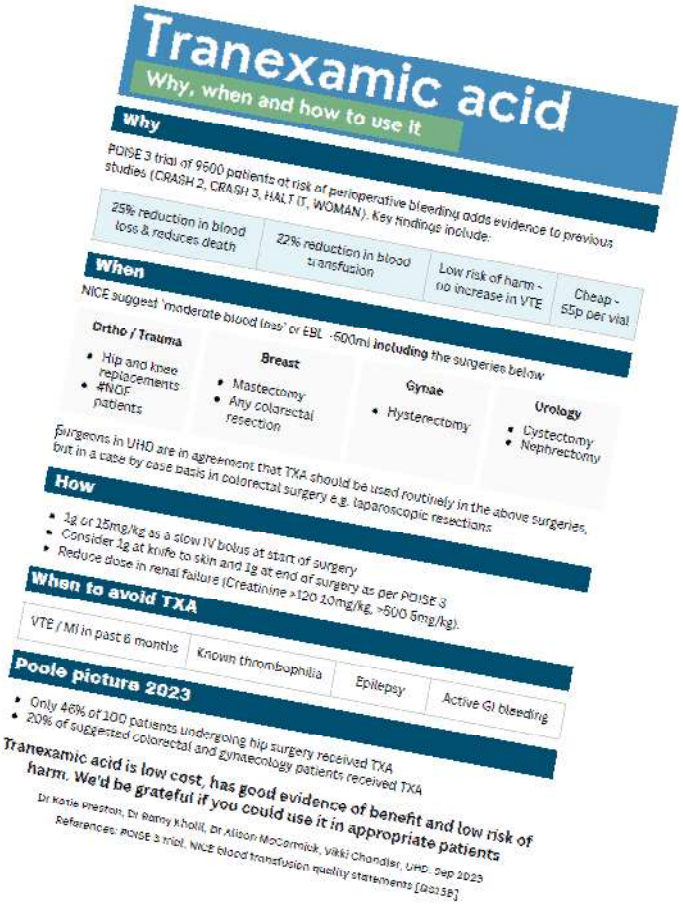
Adults who are having surgery and are expected to have moderate blood loss (>500ml) are offered tranexamic acid.

- 2/10 received TXA (mainly general surgery and gynae)

# Our strategy for increasing TXA use

- Education
  - Summary of evidence with clear guidance on administration
  - Posters
  - Presented at anaesthetic CGM
- Peer pressure

  All relevant surgical leads in agreement that TXA should be given routinely



Tranexamic acid

Why, when and how to use it

**Why**

POISE 3 trial of 9600 patients at risk of perioperative bleeding adds evidence to previous studies (CRASH 2, CRASH 3, HALT IT, WOMAN). Key findings include:

- 25% reduction in blood loss & reduces death
- 22% reduction in blood transfusion
- Low risk of harm - no increase in VTE
- Cheap - 55p per vial

**When**

NICE suggest 'moderate blood loss' or EBL >500ml including the surgeries below

**Ortho / Trauma**
- Hip and knee replacements
- #NOF patients

**Breast**
- Mastectomy
- Any colorectal resection

**Gynae**
- Hysterectomy

**Urology**
- Cystectomy
- Nephrectomy

Surgeons in UHD are in agreement that TXA should be used routinely in the above surgeries, but in a case by case basis in colorectal surgery e.g. laparoscopic resections

**How**

- 1g or 15mg/kg as a slow IV bolus at start of surgery
- Consider 1g at knife to skin and 1g at end of surgery as per POISE 3
- Reduce dose in renal failure (Creatinine >120 10mg/kg, >500 5mg/kg).

**When to avoid TXA**

- VTE / MI in past 6 months
- Known thrombophilia
- Epilepsy
- Active GI bleeding

**Poole picture 2023**

- Only 46% of 100 patients undergoing hip surgery received TXA
- 20% of suggested colorectal and gynaecology patients received TXA

**Tranexamic acid is low cost, has good evidence of benefit and low risk of harm. We'd be grateful if you could use it in appropriate patients**

Dr Katie Preston, Dr Ramy Kholil, Dr Alison Mccormick, Vikki Chandler, UHD, Sep 2023

References: POISE 3 trial, NICE Blood transfusion quality statements [QS15&7]

# Tranexamic acid

## Why, when and how to use it

## Why

POISE 3 trial of 9500 patients at risk of perioperative bleeding adds evidence to previous studies (CRASH 2, CRASH 3, HALT IT, WOMAN). Key findings include:

| | | | |
|---|---|---|---|
| 25% reduction in blood loss & reduces death | 22% reduction in blood transfusion | Low risk of harm - no increase in VTE | Cheap - 55p per vial |

## When

NICE suggest 'moderate blood loss' or EBL ~500ml **including** the surgeries below

### Ortho / Trauma

- Hip and knee replacements ~10%
- #NOF patients ~40%

### Breast

- Mastectomy ~3%
- Any colorectal resection ~15%

### Gynae

- Hysterectomy ~2-12%

### Urology

- Cystectomy ~30%
- Nephrectomy ~18%

## How

- 1g or 15mg/kg as a slow IV bolus at start of surgery
- Consider 1g at knife to skin and 1g at end of surgery as per POISE 3
- Reduce dose in renal failure (Creatinine >120 10mg/kg, >500 5mg/kg).

## When to avoid TXA

| | | | |
|---|---|---|---|
| VTE / MI in past 6 months | Known thrombophilia | Epilepsy | Active GI bleeding |

## Poole picture 2023

- Only 46% of 100 patients undergoing hip surgery received TXA
- 20% of suggested colorectal and gynaecology patients received TXA

**Tranexamic acid is low cost, has good evidence of benefit and low risk of harm. We'd be grateful if you could use it in appropriate patients**

# Next steps

- Assess impact with PDSA cycles
- Consider staff survey as we don't know why TXA isn't being given
    - ? Clinicians not aware of benefits, don't believe evidence, forget to give it

- End goal
    - Embed TXA into clinical practice in SOPs and ideally on WHO checklist….

# SW RTC Working Groups Feedback

# SW RTC TLM Group Update

Ian Sullivan
TLM, RCHT
Chair – SW TLM Group

Hybrid meeting held on 17.11.23

Topics covered included:

- SW RTC laboratory survey results
- SW FFP and platelet survey – currently being undertaken
- Recent MHRA and UKAS inspections, and any learning points
- BMT/PBSC shared care
- 'One peninsular' joint request form for patients being bled at one hospital, but surgery at another. Supports NHSE project for patient operations.
- NTLM update
- Finally, the structure, content and meeting types were discussed and agreed by all present

# SW TP Group Update

Stuart Lord
Lead Transfusion Practitioner, GHNHSFT
Chair – SW TP Group

**Since the last RTC….**

- Informal teams meeting held 28th June
- Formal face to face Business and Education meeting 17th October
- 16 attendees, 8 trusts and NHSBT in attendance

**Discussion / education / action summary**

- BBTS and SHOT symposium feedback
- Summary of SHOT symposium TP posters from the South West
- ‘Pitfalls in electronic blood tracking’ presented by Pedro Valle-Vallines at October BBTS symposium in Harrogate
- QS138 Insights Tool
- Regional NMA course – TP involvement

**Actions**

- ToR reviewed and updated
- NMA course
- Call set up this month for potential regional Haemonetics/MSoft workshop

# Major Haemorrhage Simulation – toolkit launch

Project undertaken by SWTP working group (NBT, RCHT, GHNHSFT, NHSBT)

Toolkit now available as ratified earlier in the year

For all to use as a tool to support simulation-based training for major haemorrhage, but also other aspects of transfusion education

On TP SharePoint and on the SW RTC webpage

## New - Major Haemorrhage Simulations Toolkit for Transfusion Practitioners

A toolkit/guide to enable Transfusion Practitioners to facilitate effective simulation-based education.

| Attachment | Size |
| --- | --- |
| A toolkit/guide for Transfusion Practitioners | 441.65 KB |

# SW PBMG Group Update

Elmarie Cairns
Blood Conservation Practitioner, NBT
Chair – SW PBM Group

- Informal meeting in June on Teams

- F2F meeting in September:

1. RTC & PBM Updates
2. UKCSAG update
3. PBM aspects of regional Transfusion survey
4. Regional cell salvage data presentation
5. Maternal Anaemia presentation
6. Use of EPO in Preoperative Anaemia presentation
7. Case study of when the electronic remote blood fridge breaks in a MH

UKCSAG sending winter newsletter to RTC Chairs for cascade to cell salvage/PBM leads

# SWPBM Plans for 2024

<u>To provide education, knowledge and support on all aspects of the pillars of PBM</u>

- 17th January teams meeting
- Subgroup discussions regarding KPI's for cell salvage and plans for regional data.
- 13th June informal teams meeting
- F2F meeting in September

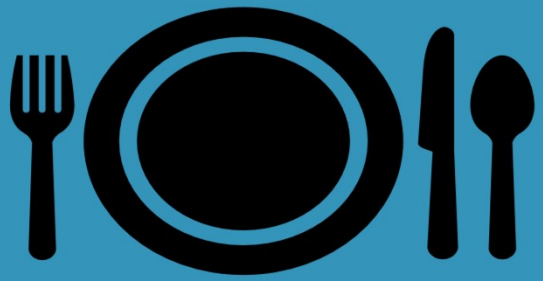
# Roundtable Discussion

## Incidents/ Learning Outcomes

Stuart Lord
Transfusion Practitioner,
Gloucestershire Hospitals NHS FT

# Any Other Business

Regional Transfusion Survey, incorporating QS138 audit tool



# Lunch

# SW RTC Education

# Maternal Anaemia

PRAMS National Improvement Project

Maternal Anaemia Survey Feedback

Woman2 Trial Results Feedback

Our purpose

Working together to achieve the healthiest life possible for everyone in Ayrshire and Arran

NHS Ayrshire & Arran

# Ayrshire's team approach to PRAMS

## Pregnancy Anaemia Management for Scotland

Our values

Caring Safe Respectful

# PRAMS, Pregnancy anaemia management Scotland)


bjh guideline

UK guidelines on the management of iron deficiency in pregnancy

Sue Pavord,[1] Jan Daru,[2] Nita Prasannan,[3] Susan Robinson,[4] Simon Stanworth[5] and Joanna Girling[6] on behalf of the BSH Committee

- Project  funded by Scottish Government for midwife post for 22.5 hours per week (Ayrshire and Arran pilot site)
- Recognition that anaemia in pregnancy is a significant public health issue.(WHO,2017)

**Aims**

- Reduce anaemia at all stages in pregnancy and postnatal periods
- Improve prescription pathways for women at local level
- Collect data throughout participating areas in Scotland

# Why change?

- Anaemia associated with increased maternal and perinatal morbidity and mortality (1) Pavord et al, (2019)
- Iron deficiency is the most common cause of anaemia in pregnancy
- Early detection and appropriate management is the key
- Up to 46% pregnant women anaemic in pregnancy, worldwide problem ( Nair et al.2017)
- Conventional dosing of oral iron is associated with GI side effects and consequently poor compliance.
- 22% of pregnant women in Scotland anaemic at delivery, Hb <105 g/L

# Risk factors for anaemia in pregnancy

- Previous anaemia
- Multiparity >3.
- Multiple pregnancy
- Inter-pregnancy interval< one year
- Those who follow a vegan/vegetarian diet
- Age<19
- Recent history of clinically significant bleeding
- Increased risk of bleeding during pregnancy or at birth
- Women declining blood products
- Women for whom providing compatible blood is challenging (positive antibody screen) Pavord et al (2019)

# Potential benefits of treating IDA for mother

- Reduced Fatigue
- Reduced blood loss and risk of PPH
- Reduced hospital stay
- Reduced risk of infection
- Reduced risk of post natal depression
- Reduced healthcare costs – IV iron, length of stay, transfusions

Benson C et al (2021)

# Potential benefits of treating anaemia (babies)

- Reduced risk of premature birth
- Reduced risk of growth restriction
- Reduced incidence of low apgar score(<5 at 1 min)
- Improved neurodevelopment of infant
- Higher incidence of breastfeeding

Rukuni et al. (2015)

# Local Project Aims

- Educate women and staff regarding importance/benefits of anaemia management
- Offer serum ferritin level testing at approximately 12 weeks gestation
- Commence the majority of pregnant women on regime of oral prophylactic iron, one tablet three times per week. (Karakoc G et al,2021)
- Improve rates of Hb>105 g/L at delivery by 20%

# Change to practice

- Anaemia management guideline updated and patient info leaflets developed
- Ferritin level checked at first ante natal appointment
- Initial pack of iron tablets given out at consultant clinic by CMW's
- Contact GP to continue oral iron prescription in pregnancy
- Record information on electronic patient record re advice/compliance/dose
- Encourage anaemia to be discussed at each ante natal visit
- IV iron protocol changed

Ayrshire's poster

# Methodology

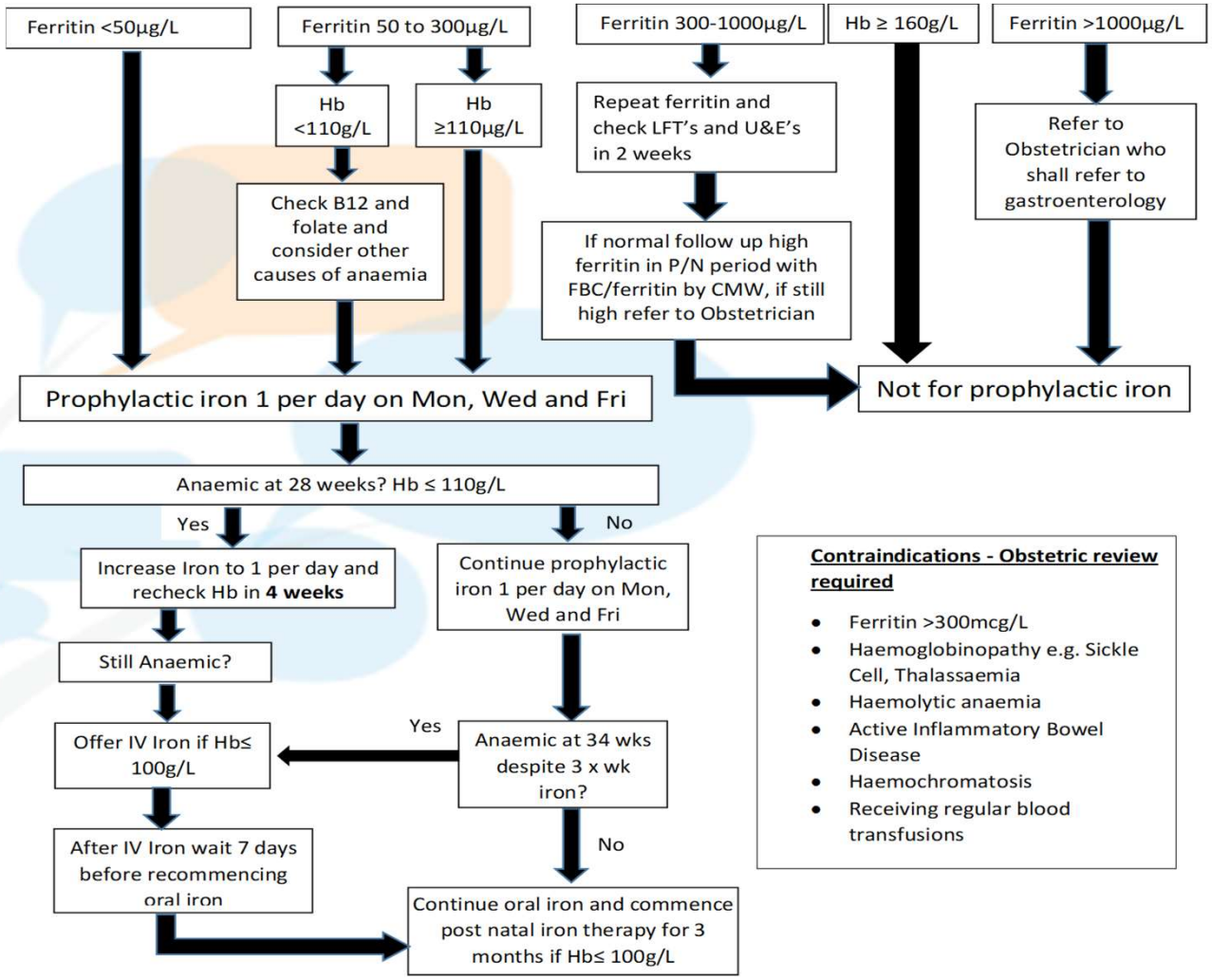
- Started in small geographical area within community setting with ten women per week
- Moved to second geographical area after two months increasing to 20 women per week
- Moved to third geographical 2 months later with 50 women per week
- Within six months 250 women per month were included in project
- Quality improvement methodology used to roll out measures to participants
- Plan, Do, Study, Act (PDSA) cycles were used to amend treatment flowchart.
- 527 women included in data collection for analysis of cohort
- Haemoglobin levels extracted from electronic records at 28, 34 weeks gestation and prior to birth

# Sample of Ayrshire's data

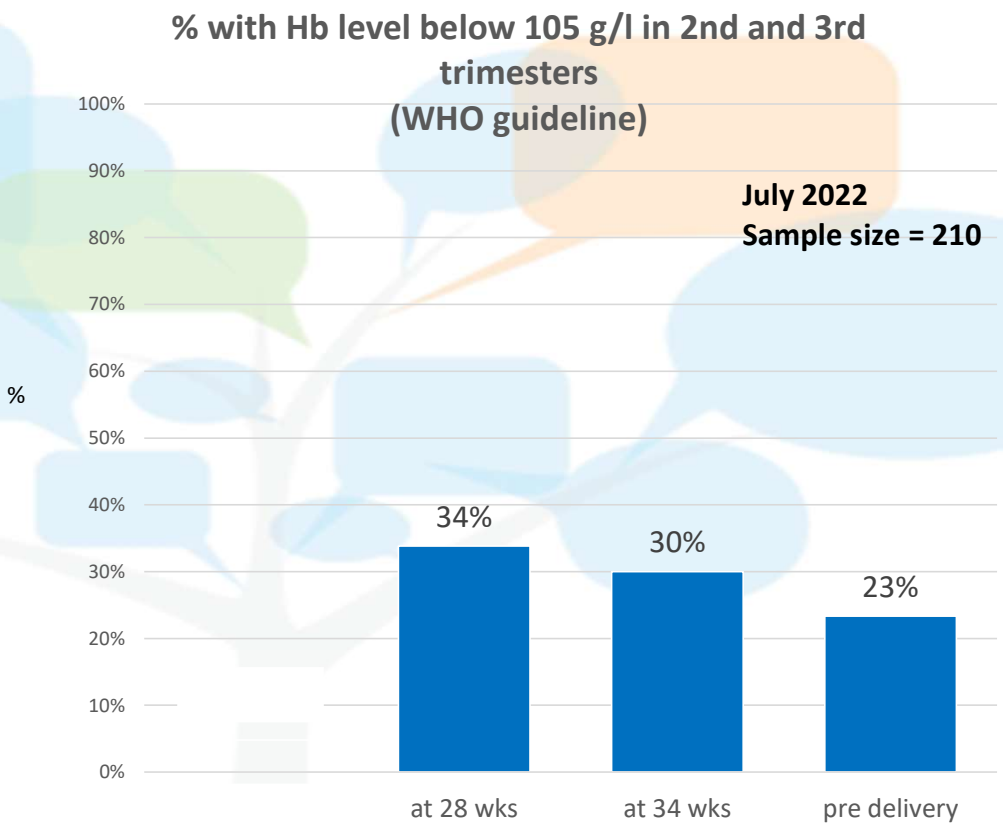
U ▾ | ⌃ ⌄ | $fx$ | 141

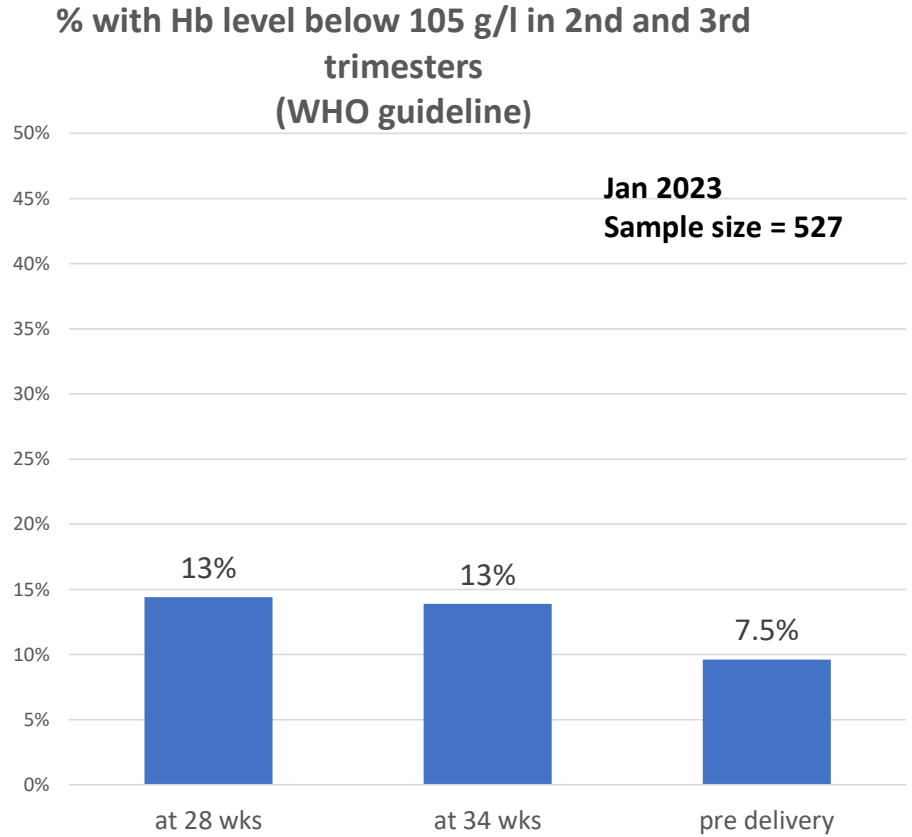
| B | C | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Date data started | ID | Age | High risk | Parity | Booking Hb | 28 Hb | 34 Hb | Ferritin taken | Ferritin result | Repeat ferritin level | Fe prescibed | EBL | Transfusion | EDD | Date of delivery | Last Hb before birth | P/N Hb | Compliance | GI upset | Nausea or Vomiting | Constipation or Diarrhoea |
| 28-Aug-21 | 1 | 27 | no | 3+0 | 142 | 131 | 140 | yes | 87 | | yes | 550 | | 05-Mar-22 | | 137 | 116 | never | no | yes | no |
| 26-Aug-21 | 2 | 21 | no | 0+1 | 128 | 109 | 101 | yes | 26 | | yes | 550 | no | 18-Feb-22 | | 96 | 87 | always | no | no | no |
| 26-Aug-21 | 3 | 17 | yes | 0+0 | 124 | 119 | 137 | yes | 243 | | yes | 1000 | no | 27-Feb-22 | | 123 | 120 | es | no | no | no |
| 26-Aug-21 | 4 | 32 | no | 2+2 | 127 | 120 | 118 | yes | 69 | | yes | 500 | no | 28-Feb-22 | | 118 | 0 | always | Yes | yes | yes |
| 26-Aug-21 | 5 | 23 | yes | 1+0 | 146 | 136 | 138 | yes | 50 | | yes | 400 | no | 06-Mar-22 | | 140 | 127 | | | | |
| 26-Aug-21 | 6 | 37 | yes | 2+0 | 128 | 119 | 116 | yes | 67 | | yes | 150 | no | 07-Mar-22 | | 123 | n/a | es | Yes | no | yes |
| 26-Aug-21 | 7 | 17 | no | 0+0 | 133 | 123 | 122 | yes | 27 | | yes | 450 | no | 18-Mar-22 | | 138 | n/a | sometime | no | no | yes |
| 02-Sep-21 | 8 | 18 | no | 0+0 | 125 | 105 | 106 | yes | 34 | | yes | 200 | no | 13-Mar-22 | | 128 | 128 | sometime | no | no | yes |
| 02-Sep-21 | 9 | 32 | yes | 2+0 | 131 | 122 | 145 | yes | 29 | | yes | 555 | no | 14-Mar-21 | | 131 | 111 | always | no | no | no |
| 02-Sep-21 | 10 | 30 | no | 1+0 | 132 | 138 | 0 | yes | 102 | | yes | 100 | no | 18-Mar-22 | | 138 | 135 | always | no | no | no |
| 02-Sep-21 | 11 | 29 | no | 1+0 | 141 | 120 | 119 | yes | 48 | | yes | 500 | no | 17-Mar-22 | | 129 | 102 | always | no | no | no |
| 02-Sep-21 | 12 | 25 | yes | 3+0 | 136 | 129 | 129 | yes | 35 | | yes | 350 | no | 27-Mar-22 | | 133 | 106 | always | no | yes | no |
| 09-Sep-21 | 13 | 24 | yes | 1+0 | 125 | 120 | 113 | no | nil | | yes | 200 | no | 21-Mar-21 | | 116 | n/a | always | no | no | no |
| 06-Sep-21 | 14 | 33 | no | 1+0 | 131 | 111 | 114 | yes | 25 | | yes | 350 | no | 20-Mar-22 | | 114 | n/a | always | no | no | no |
| 06-Sep-21 | 15 | 31 | no | 0+0 | 141 | 121 | 120 | yes | 74 | | yes | 900 | no | 17-Mar-22 | | 129 | 97 | never | no | no | no |
| 06-Sep-21 | 16 | 37 | no | 0+0 | 140 | 125 | 127 | yes | 52 | | yes | 300 | no | 15-Mar-22 | | 125 | n/a | always | no | no | no |
| 06-Sep-21 | 17 | 23 | no | 0+1 | 141 | 117 | 127 | yes | 55 | | yes | 1500 | no | 20-Mar-22 | | 136 | 112 | always | no | no | no |
| 09-Sep-21 | 18 | 20 | no | 1+0 | 117 | 117 | 113 | yes | 44 | | yes | 250 | no | 23-Mar-21 | | 113 | n/a | sometim | no | no | yes |
| 09-Sep-21 | 19 | 40 | yes | 1+0 | 141 | 114 | 132 | yes | 53 | | yes | 400 | no | 15-Mar-22 | | 123 | n/a | always | no | no | no |
| 09-Sep-21 | 20 | 27 | yes | 2+0 | 108 | 99 | 92 | yes | 11 | | yes | 400 | no | 04-Mar-22 | | 103 | 95 | always | no | no | no |
| 13-Sep-21 | 21 | 26 | no | 0+0 | 125 | 106 | 112 | no | 0 | | yes | 550 | no | 24-Mar-21 | | 113 | 98 | always | no | no | no |
| 13-Sep-21 | 22 | 24 | no | 0+0 | 138 | 125 | 125 | yes | 223 | | yes | 590 | no | 15-Mar-21 | | 126 | 111 | always | no | no | no |

# Anaemia management in pregnancy flowchart



# Cohort analysis as project progressed



# Results of oral prophylactic iron

- Introducing serum ferritin levels to booking bloods showed that **20%** of women had iron deficiency anaemia at booking

- Introducing prophylactic iron, one tablet, three times per week showed a reduction in the number of anaemic women (Hb<105g/L ) at delivery from **23%** to **7.5%**

- A further local audit of anaemia at delivery prior to caesarean section (EROSS) of 1,012 women showed a rate of **15%** in 2021; this reduced to **9%** in 2022 in 1,026 women.

Results presented at RCOG World Congress 2023

# Results of Prams national database in Ayrshire and Arran

| Month | % Booking Ferritin<30 | 28/40 Hb<105 | 34/40 Hb<105 | Pre-op Hb<105 | Births | Oral iron prescribed |
|---|---|---|---|---|---|---|
| May-23 | 19% | 8% (180) | 15% (192) | 14% (79) | 228 | 95% |
| Jun-23 | 17% | 6% (200) | 10% (183) | 10% (97) | 233 | 94% |
| Jul-23 | 18% | 9% (211) | 11% (215) | 6% (110) | 262 | 96% |
| Aug-23 | 20% | 10% (215) | 12% (208) | 6% (85) | 263 | 96% |
| Sep-23 | 25% | 11% (202) | 9% (184) | 8% (94) | 245 | 93% |
| Oct-23 | 21% | 11% (214) | 9.5% (200) | 6.5% (91) | 246 | 96% |

# Post natal management of oral iron

Maternal anaemia may also increase the risk  of post partum haemorrhage (PPH) (Briley et al, 2014)
One explanation is impaired uterine contractions due to a reduced availability of oxygen.
Postnatal anaemia associated with:

- Impaired quality of life
- Reduced cognitive abilities
- Emotional instability
- Depression

## Action taken

- Post natal user friendly patient leaflet developed
- Oral iron now prescribed for three months if Hb<100g/L
- Further audit in place to assess response to oral iron and whether routine 6 week repeat FBC is required

**Effects of postnatal anaemia still poorly recognised for both mum and baby.**

# Next steps

- Embed and sustain
- Introduce the provision of IV iron in labour ward following high blood loss in women who are haemolytically stable aiming to reduce rate of blood transfusion
- Improve the service to women discharged home with postnatal anaemia
- Official launch of PRAMS in primary and secondary care
- National management of anaemia pathway planned via Scottish Government

# Conclusions

- Significant improvements have been made in the prevention and management of anaemia in pregnancy
- New guidance of checking  serum ferritin levels at booking have proved to be safe and evidenced based
- Three oral tablets per week is cost effective and better tolerated - £3.30 for the pregnancy
- IV iron  pathway changes have seen an improvement in service provided
- Introducing oral prophylactic oral iron has contributed to a significant reduction in anaemia levels in Ayrshire

# Reflections

- Anaemia in pregnancy levels had not changed in Scotland in the past 20 years, now time for change!
- The impact of anaemia in pregnancy and beyond has not been well understood by health professionals .
- Small changes could have a large impact on health of mum and baby.
- This change in practice could be adapted and become policy throughout the UK

# References


1.WHO (2017) Nutritional anaemias: Tools for Effective Prevention and C. World Health Organisation Geneva.page 7 License CC BY-NC-SA 3.0

2.Pavord et al. UK guidelines on the management of iron deficiency in pregnancy. British Journal of Haematology 2019,Volume 188, Issue 6,Pgs 819-830 https://doi.org/10.1111/bjh.16221

3. Benson C et al(2021) The effect of iron deficiency and anaemia on women's health. Anaesthesia, Volume 76, (Suppl.4),Pg84-95

4. Rukuni et al. BMC Pregnancy and Childbirth (2015) 15:269 DOI 10.1186/s12884-015-0679

5.Nair et al. Association between maternal haemoglobin and stillbirth: a cohort study among multi-ethnic population in England.Br J Haem 2017,179,829-837

6.Karakoc G et al. Is every other day iron supplementation effective for the treatment of iron deficiency anaemia in pregnancy? J Mat Fetal Neonatal Med 2021;18:1-5

7.Briley et al.(2014) Reporting errors, incidence and risk factors for postpartum haemorrhage and progression to severe PPH a prospective observational study.BJOGt,121,876-888

Our purpose

Working together to achieve the healthiest life possible for everyone in Ayrshire and Arran

NHS Ayrshire & Arran

# For further information please do not hesitate to contact:-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Lead Pharmacist

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Our values

Caring Safe Respectful

South West Regional Transfusion Committee

22 November 2023

Stuart Cleland

# Maternal Anaemia Survey

# Background

- Survey undertaken to assess approach to management of maternal anaemia across trusts in the South-West.
- Aim to try and capture response outside of main transfusion committee (Midwives, Obstetricians, Obs Anaesthesia Leads)
- Aim to support Maternal Anaemia objective of SW RTC
- Responses from 13 trusts – thank you.

# WHO guidelines anaemia

## Recommendations

Table 1

**Haemoglobin levels to diagnose anaemia at sea level (g/l)±**

| Population | Non -Anaemia* | Anaemia* | | |
|---|---|---|---|---|
| | | Mild[a] | Moderate | Severe |
| Children 6 - 59 months of age | 110 or higher | 100-109 | 70-99 | lower than 70 |
| Children 5 - 11 years of age | 115 or higher | 110-114 | 80-109 | lower than 80 |
| Children 12 - 14 years of age | 120 or higher | 110-119 | 80-109 | lower than 80 |
| Non-pregnant women (15 years of age and above) | 120 or higher | 110-119 | 80-109 | lower than 80 |
| Pregnant women | 110 or higher | 100-109 | 70-99 | lower than 70 |
| Men (15 years of age and above) | 130 or higher | 110-129 | 80-109 | lower than 80 |

± Adapted from references 5 and 6

* Haemoglobin in grams per litre

a "Mild" is a misnomer: iron deficiency is already advanced by the time anaemia is detected. The deficiency has consequences even when no anaemia is clinically apparent.

# BSH guidelines 2019

Anaemia should be defined as haemoglobin concentration(Hb)

- <110 g/l in first trimester and
- <105 g/l in second and third trimesters
- <100 g/l postpartum (2D).

Hb checked at booking and 24 weeks

If no other cause of anaemia suspected course of oral iron recommended with repeat blood test in 2-3 weeks.

Routine ferritin not recommended

Non-anaemic women at risk of iron deficiency should be identified and started on oral iron or have serum ferritin checked.

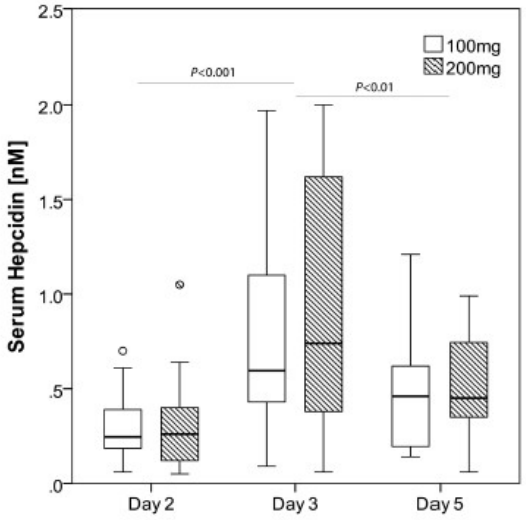
Serum ferritin of <30mcg/l in pregnancy is indicative or iron deficiency.

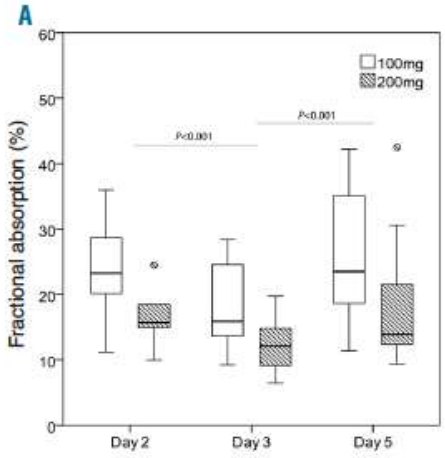
# Iron absorption from supplements is greater with alternate day than with consecutive day dosing in iron-deficient anemic women

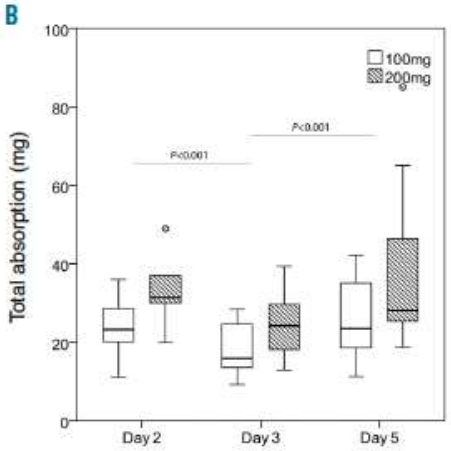
Nicole U. Stoffel,[1] Christophe Zeder,[1] Gary M. Brittenham,[2] Diego Moretti[1*] and Michael B. Zimmermann[1*]


Haematologica 2020
Volume 105(5):1232-1239

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Group 1 | 100mg | 100mg | 100mg | | | 200mg | 200mg | 200mg |
| | Day 2 | Day 3 | Day 5 | | | Day 23 | Day 24 | Day 26 |
| Group 2 | 200mg | 200mg | 200mg | | | 100mg | 100mg | 100mg |




200mg iron alternate days gives best absorption

**Table I.** Indications for empirical iron supplementation and/or serum ferritin.

| |
|---|
| **Anaemic women where testing serum ferritin is necessary prior to iron supplementation:** |
| Known haemoglobinopathy |
| Prior to parenteral iron replacement |
| **Non-anaemic women with high risk of iron depletion for empirical iron treatment with/without serum ferritin testing:** |
| Previous anaemia |
| Multiparity ≥P3 |
| Twin or higher order multiple pregnancy |
| Interpregnancy interval <1 year |
| Women who have poor dietary habits |
| Those following a vegetarian/vegan diet |
| Pregnant teenagers |
| Recent history of clinically significant bleeding |
| **Non-anaemic women where serum ferritin may be necessary:** |
| High risk of bleeding during pregnancy or at birth |
| Women declining blood products, such as Jehovah's Witnesses |
| Women for whom providing compatible blood is challenging |

# Maternal Anaemia at UHP

European Journal of Obstetrics & Gynecology and Reproductive Biology 258 (2021) 60–62

Contents lists available at ScienceDirect

European Journal of Obstetrics & Gynecology and Reproductive Biology

journal homepage: www.elsevier.com/locate/ejogrb

Review article

## Implementation of early management of iron deficiency in pregnancy during the SARS-CoV-2 pandemic

T. Stewart[a], J. Lambourne[b], D. Thorp-Jones[a], D.W. Thomas[a,*]

[a] University Hospitals Plymouth NHS Trust, Plymouth, Devon, PL6 8DH, United Kingdom
[b] East Kent Hospitals NHS Foundation Trust, William Harvey Hospital, Kennington Road, Willesborough, Ashford, Kent, TN24 0LZ, United Kingdom

# Maternal Anaemia at UHP

1715 pregnancies studied, Hb <13 weeks gestation assessed

- 148 (8.6%) had Hb <120
- 25 (1.5%) had Hb <110
- Median Hb 132, lower limit 95% confidence interval was 116

At UHP we set cut off 120g/l as definition of anaemia at UHP

Average MCV was 87.5 in patients with Hb <120, not useful guide to iron deficiency

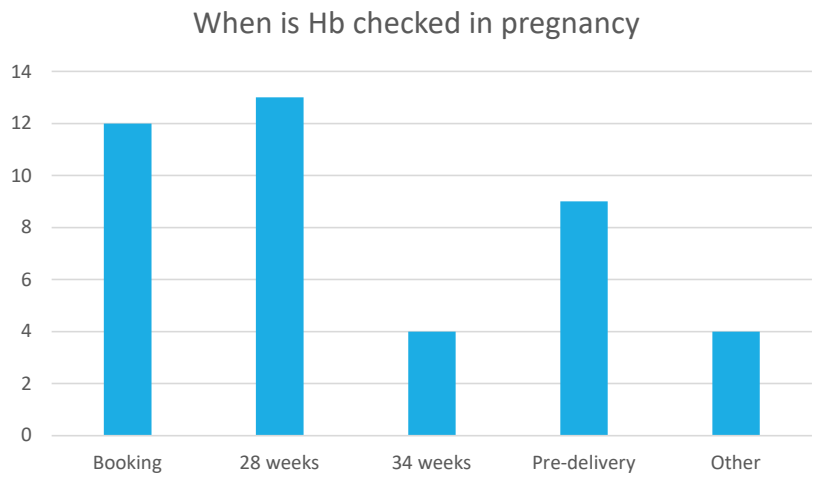
Only 16 women (18%) had serum ferritin checked

Outcome:

Universal screening for iron deficiency in first trimester with SF

Treat all women with anaemia or iron deficiency with low dose oral iron

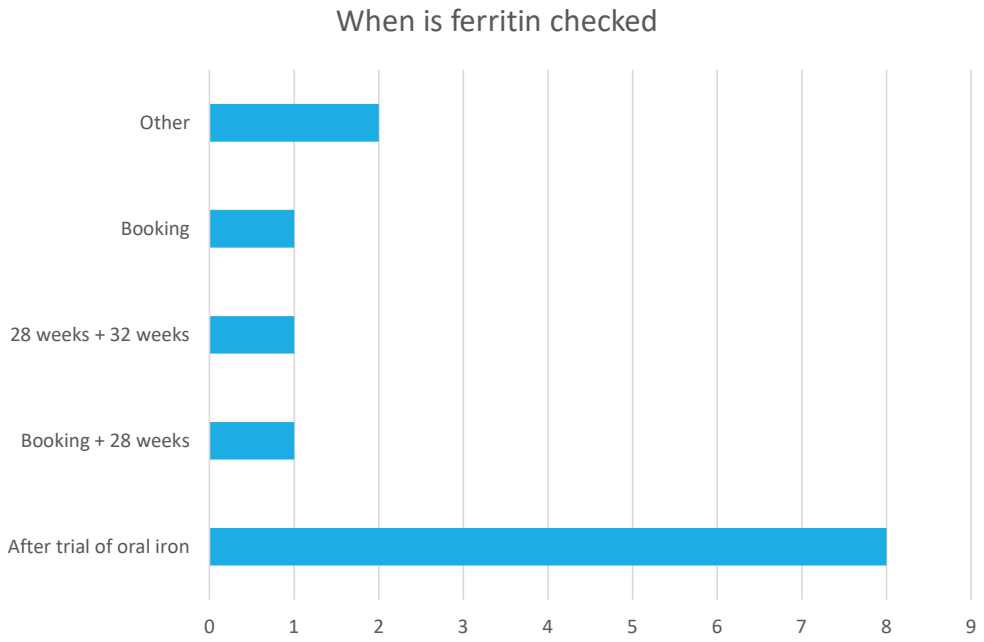
# Question 1: When is Hb checked in the trust




Other

- 34 weeks if known to be anaemic
- Post-partum if EBL >500mls
- 2 weeks post oral iron
- Symptomatic of anaemia

# Question 2: When is ferritin checked?




Other

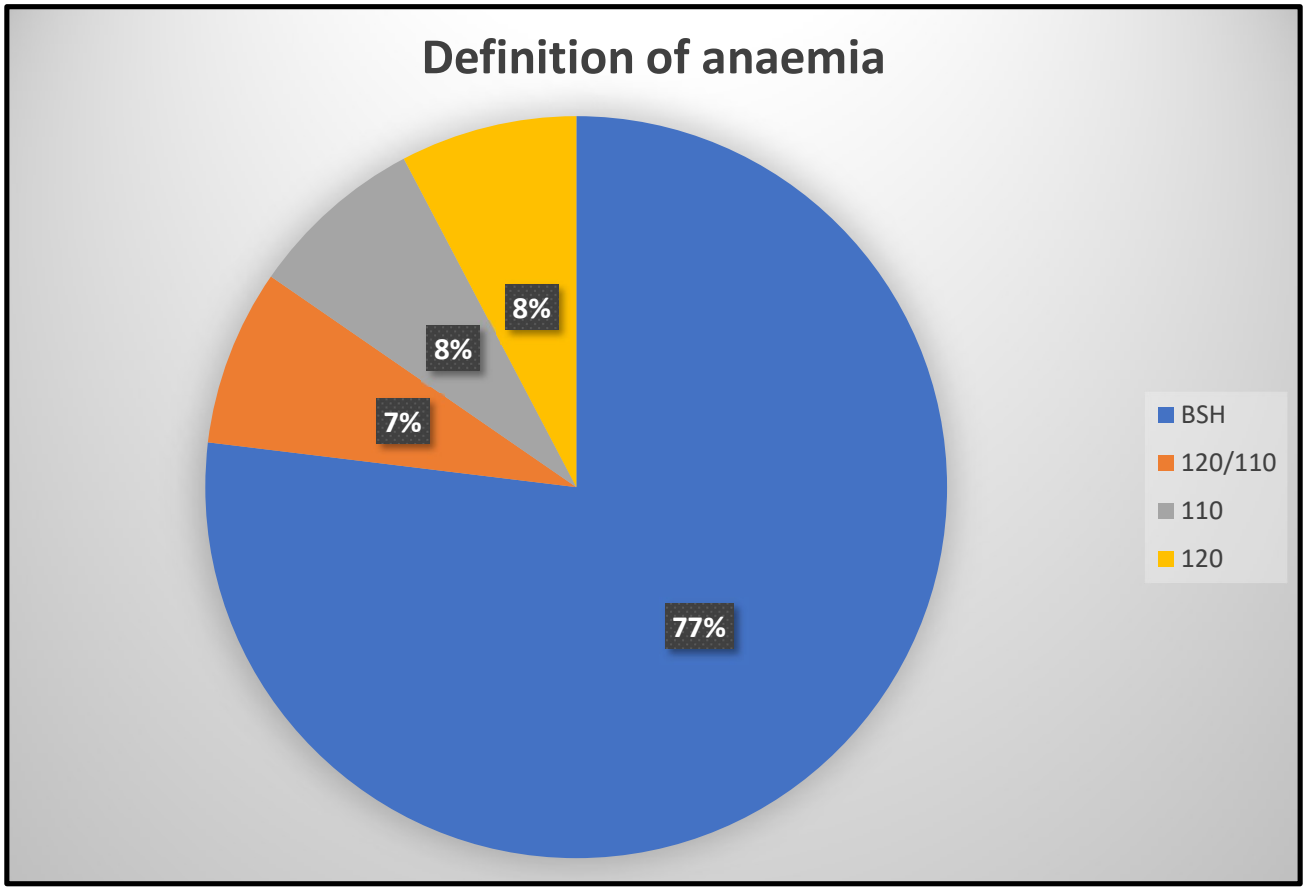
If symptomatic of anaemia

Suspected known haemoglobinopathy

In Jehovah's witnesses

UHB – Ferritin on high risk women at booking and all at 28/34 weeks.

# Question 3: Definition of anaemia




- One trust RCH uses Hb of 120 at booking and 110 at 28 weeks
- Most use BSH (WHO) guidelines of: -
  - Booking: 110
  - 2/3rd trimester: 105
  - Postpartum: 100

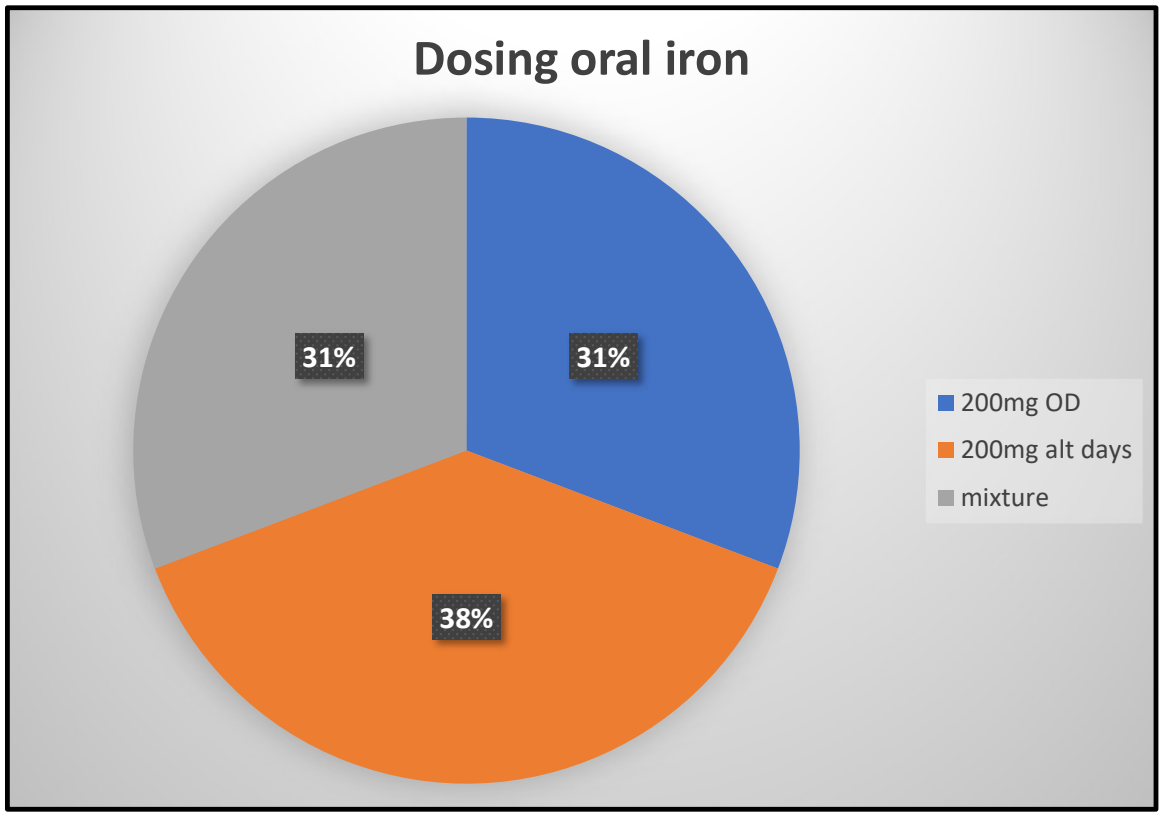
# Question 4: Dedicated obstetric anaemia clinic

No trust had a dedicated clinic for this

## Alternatives in place

- RCH - Haematologist contacted on case be case basis
- Somerset - Lead haematology obstetrician for advice / obs haem clinic if required
- Great Western - Maternal medicine clinic
- NBT - Looking to set up IV iron service, looking to widen criteria outside BSH
- UHP – Soon to start routine ferritin at booking / 3rd trimester, will treat ID and IDA with midwife dispensed oral iron

# Question 5: Dosing / formulation oral iron



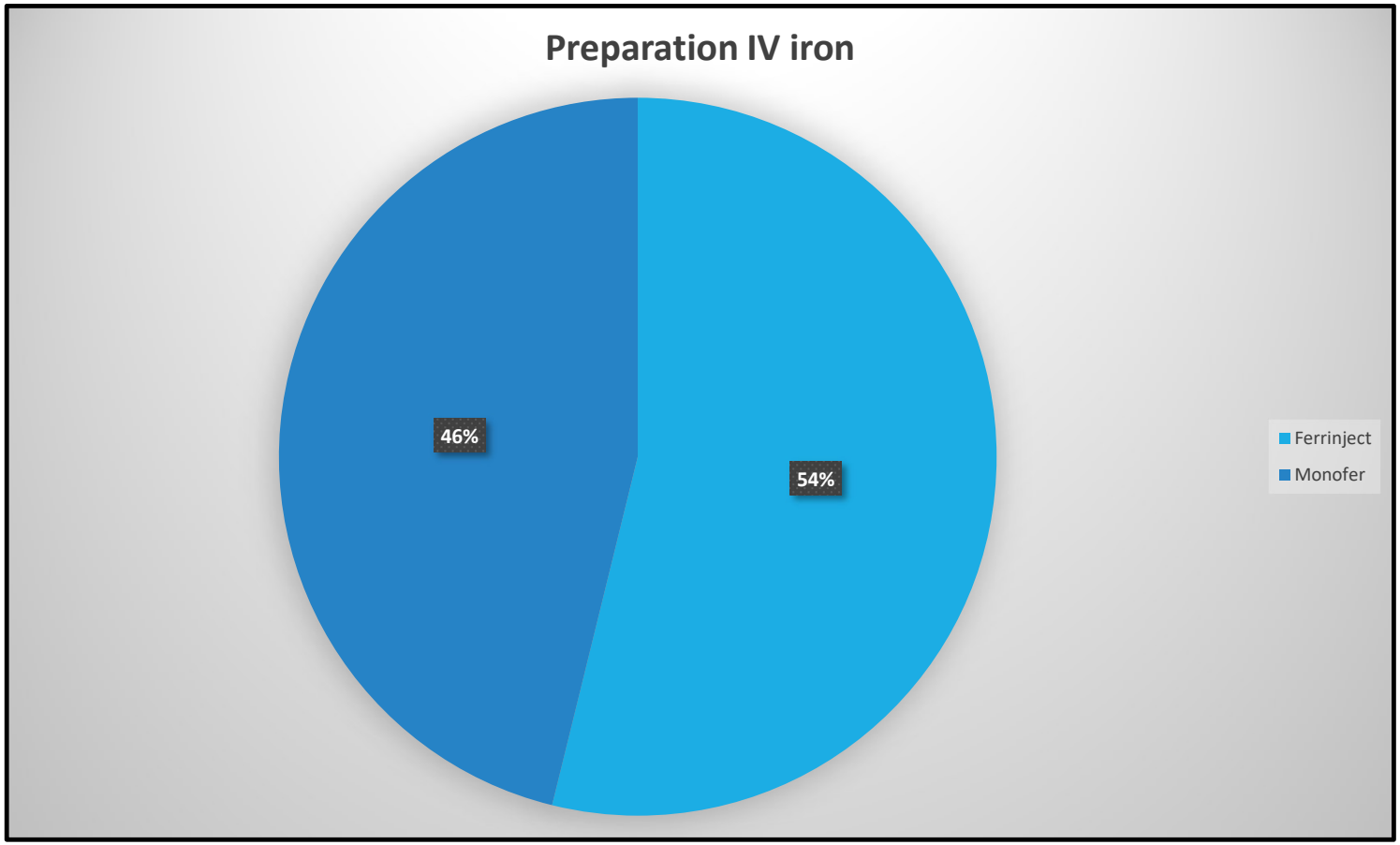

- Mixture
  - 1 trust uses OD as first line and Alt days as second line
  - 1 trust uses OD for treatment and alt days for maintenance.
  - 1 trust uses OD for high-risk patients switch to alt days if  not tolerated.

# Question 6: Information for oral iron

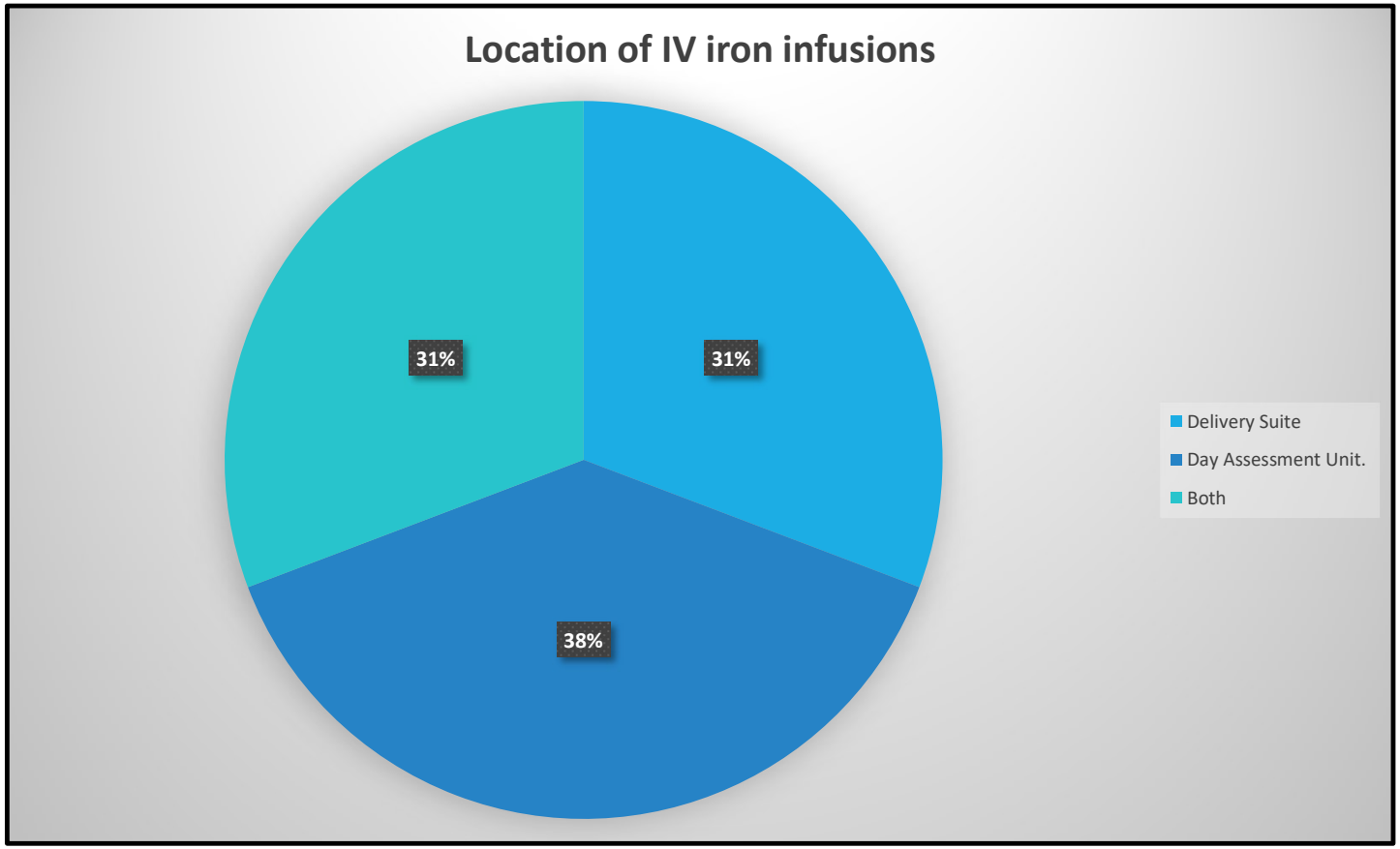
6/14 respondents provided information on taking oral iron

- 1 trust provides leaflet
- 2 advise to take before food, with vit C, no antacids.
- 1 offers advice on iron rich diets
- 1 offers advice on side effects

# Question 7: What preparation for IV iron



# Question 8: Where are iron infusions given



# Question 9: Free comments

| | |
|---|---|
| *Gloucester:* | We currently are using 120 g/l Hb as the definition of anaemia but the workload it is creating is almost breaking our service. Patients also know that they can 'take' the oral iron (they don't) but then will get an iron infusion instead (much more convenient) |
| *Cornwall:* | We do check no history of haemoglobinopathy before starting empirical iron, these patients would be discussed with haematology |
| *Barnstable:* | Ferritin in addition to FBC at the usual time of bloods (booking and 28 weeks) would be supportive to care planning in view of potential iron deficiency. Would consider adopting any suggestions if there is good evidence. e.g. oral iron on alternate days |
| *Somerset:* | Struggling with engagement of community midwives and GP's - feel that we are over medicating. I hope that a regional guideline inline with national guideline will further support our local practice. |

# Question 10: Free comments.

*Yeovil:* Have discussed prophylactic iron even at WHO recognized Hb as our concern is the transfusion rate following PPH. A woman with Hb 100 at term, a blood loss of more than 1500mls will make her symptomatic with eventual transfusion which can be avoided if we aimed for higher optimal Hb

*North Bristol:* *E*ager to expand the anaemia service to include IV iron for iron deficiency without anaemia, and for women with higher thresholds of Hb however I am meeting resistance. Only guideline BSH guidance. It would be great if you could make a referenced guideline that you are able to share! We are trying to move to Monofer. A lot of ferritin checking in the Community without anaemia.

*Exeter:* It would be great to have a SW guidance. I would like to move away from giving IV iron on LW I have been in contact with our AHSN regarding the PRAMs project in Scotland and feel we could consider this locally where they check ferritin for all at booking and give every other day iron to nearly a 1/3 of their women. Maybe your group could drive this forward?

# Question 10: Free comments

*Poole:* We would like a dedicated obstetric iron/anaemia clinic but lack funding for this Fully support raising the threshold of diagnosis for anaemia to Hb 120. In practice, the Hb recheck limits effectiveness of oral iron which is given - we believe a further check at 34 weeks, or at least x1 pre-CS, would be beneficial.

*Bristol:* Given identified risks of iron deficiency and given potential risk of haemorrhage at delivery for all women we decided to offer alternate day oral iron to all pregnant women - less time to action low ferritins if only first identified at 28 weeks. MDT agreement. We need HB targets rather than anaemia definitions as this would simplify management.

*Plymouth:* A dedicated clinic would obviously be useful but staffing and space does not allow that. Until promoted by NICE nationally change takes time . The algorithms have taken 3 years to develop with the MDT. We hope the new algorithms would lead to single figure anaemia rates rather than the pre covid 50% at term.

# Proposed Actions

1. Check Hb @ booking, 28wks, 34wks, pre-delivey
2. Check ferritin @ booking, 28wks, 34 wks, (?pre-delivery ?when indicated)
3. Hb <120 = definition of anaemia
4. Alternate days oral iron + standard patient info on how to take it
5. Standardise dose of IV iron (simplified table)

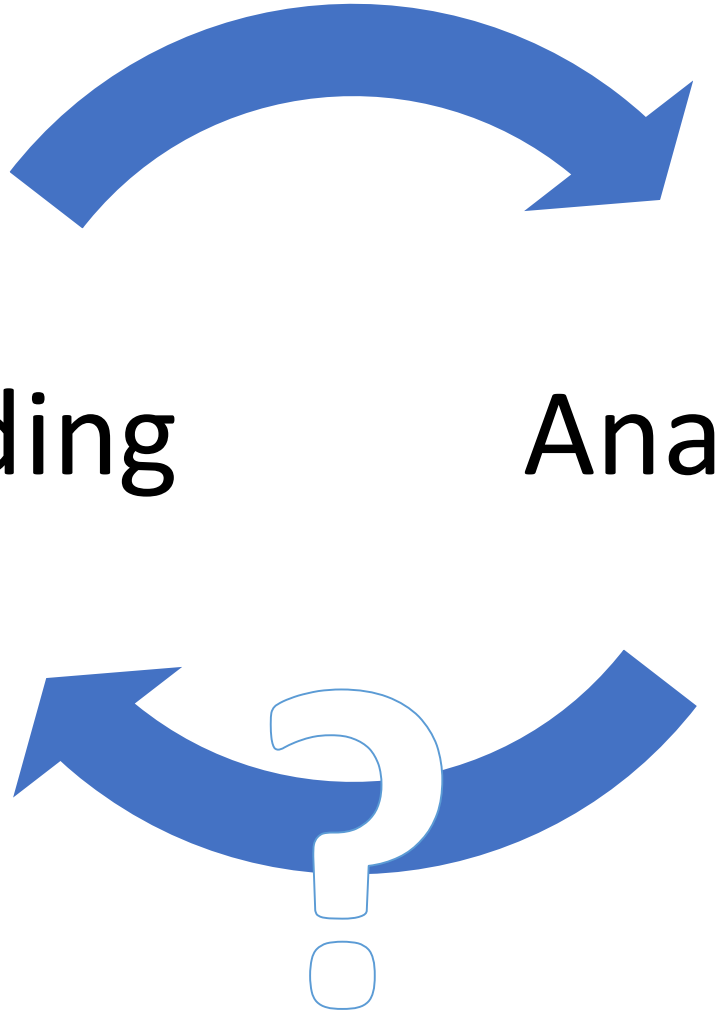
# Anaemia and the risk of bleeding: Data from the WOMAN2 Trial

**Dr Sarah Wheeldon**

**Slides adapted from those kindly provided by Dr Ian Roberts**

**London School of Hygiene & Tropical Medicine**

**Presented at HAEMSTAR 15th September 2023**


Bleeding
Anaemia

*J Obstet Gynaecol Res.* 2021 August ; 47(8): 2565–2576. doi:10.1111/jog.14834.

# Prenatal anemia and postpartum hemorrhage risk: A systematic review and meta-analysis

**Moshood O. Omotayo**[1,2], **Ajibola I. Abioye**[3,4], **Moshood Kuyebi**[5], **Ahizechukwu C. Eke**[6]

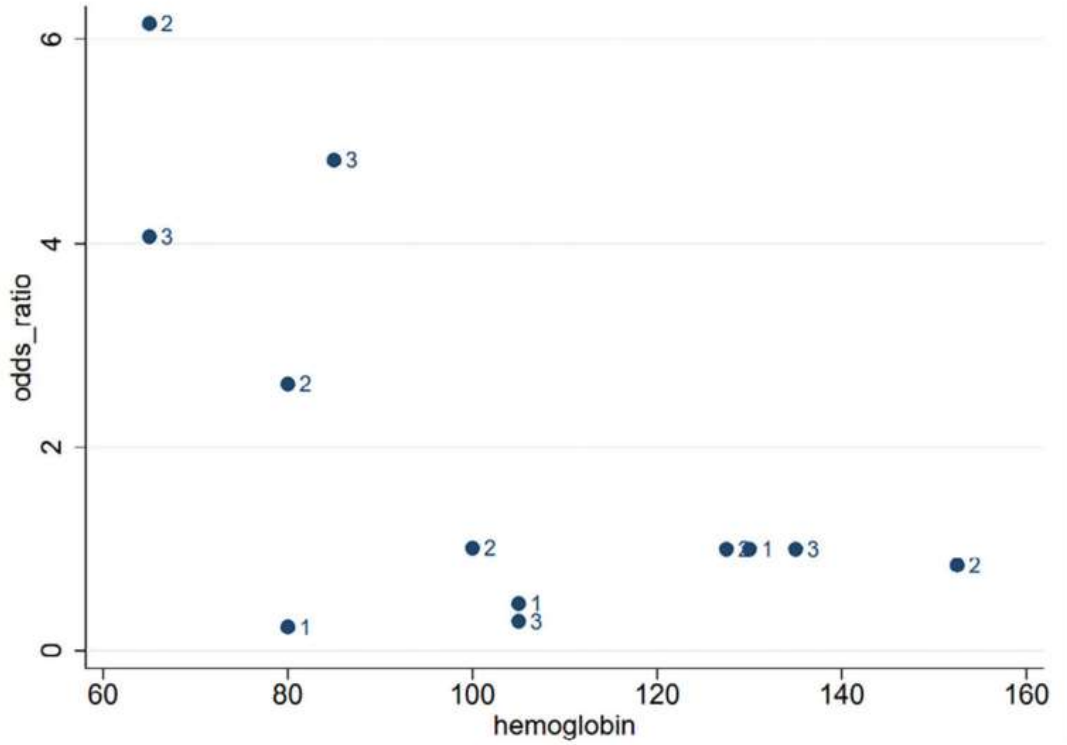



**Figure 2.**
Scatterplot of the association between categories of anemia severity and PPH

Open access Original research

BMJ Open

# Relationship between anaemia, coagulation parameters during pregnancy and postpartum haemorrhage at childbirth: a prospective cohort study

Manisha Nair ,[1] Shakuntala Chhabra,[2] Saswati Sanyal Choudhury,[3] Dipika Deka,[4] Gitanjali Deka,[5] Swapna D Kakoty,[6] Pramod Kumar,[2] Pranabika Mahanta,[7] Robin Medhi,[6] Anjali Rani,[8] Seeresha Rao,[9] Indrani Roy,[10] Carolin Solomi V,[11] Ratna Kanta Talukdar,[7] Farzana Zahir,[12] Nimmi Kansal,[13] Anil Arora,[13] Charles Opondo ,[14] Jane Armitage,[14] Michael Laffan,[15] Simon Stanworth,[16] Maria Quigley,[17] Colin Baigent,[14] Marian Knight,[17] Jennifer J Kurinczuk,[17] on behalf of the MaatHRI collaborators

1342 patients

**Table 4** Association of PPH at childbirth with haemoglobin and anaemia

| | Outcome: PPH at childbirth | | |
|---|---|---|---|
| **Independent variables** | **Unadjusted OR (95% CI)** | **Adjusted* OR (95% CI)** | **P value—test for linear trend** |
| Anaemia | | | |
| No/mild | 1 (ref) | 1 (ref) | 0.035 |
| Moderate | 1.84 (0.68 to 4.93) | 1.82 (0.66 to 5.01) | |
| Severe | 4.17 (1.08 to 16.12) | 5.11 (1.19 to 21.93) | |

*Adjusted for gestational age, maternal age, hypertensive disorders of pregnancy, pre-existing medical problems and mode of birth.
PPH, postpartum haemorrhage .

# 427 Mild Anemia and Risk of Postpartum Hemorrhage or Blood Transfusion in Preeclampsia

Richard M. Burwick[1], Rachel A. Newman[1], Monica Rincon[2]

[1]Cedars-Sinai Medical Center, Los Angeles, CA, [2]Department of Obstetrics and Gynecology, Oregon Health & Science University, Portland, OR

**Table 2.** Odds of PPH or blood transfusion in participants with PE stratified by anemia severity, utilizing univariable and multivariable logistic regression.

| Hemoglobin Concentration | PPH or Transfusion OR (95% CI) | P-value | PPH or Transfusion aOR* (95% CI) | P-value |
|---|---|---|---|---|
| Hemoglobin ≥ 11.0 g/dL | Ref | N/A | Ref | N/A |
| Hemoglobin 10.0-10.9 g/dL | 2.1 (1.4-3.2) | <0.001 | 2.0 (1.3-3.1) | 0.001 |
| Hemoglobin 9.0-9.9 g/dL | 2.1 (1.2-3.7) | 0.01 | 1.9 (1.1-3.5) | 0.03 |
| Hemoglobin <9.0 g/dL | 7.7 (4.6-13) | <0.001 | 7.9 (4.5-14) | <0.001 |

* Adjusted for maternal age, BMI, gestational age, race-ethnicity, parity, multifetal gestation, diabetes, gestational diabetes, insurance status

PPH, postpartum hemorrhage; OR, odds ratio; Ref, reference; N/A, not applicable


World Maternal Antifibrinolytic Trial

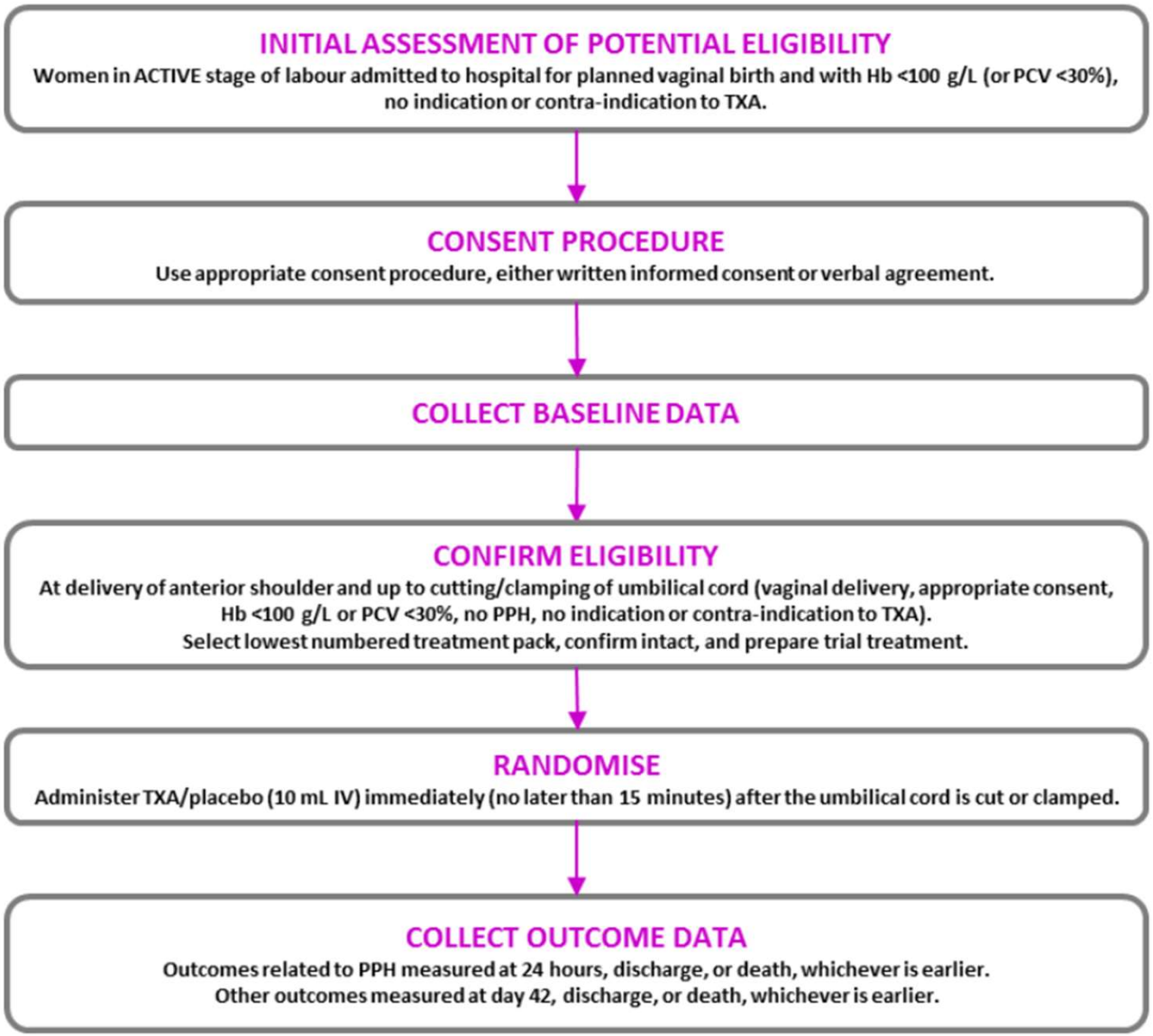

# Effect of early tranexamic acid administration on mortality, hysterectomy, and other morbidities in women with post-partum haemorrhage (WOMAN): an international, randomised, double-blind, placebo-controlled trial

*WOMAN Trial Collaborators**

PPH is responsible for about 100,000 maternal deaths every year, almost all of which occur in low and middle income countries. When given within 3h of birth, TXA reduces deaths due to bleeding in women with PPH by almost 1/3. However, for many women, treatment of PPH is too late to prevent death and severe morbidities. >1/3 of pregnant women in the world are anaemic and many are severely anaemic.

**We are now doing the WOMAN-2 trial to see if giving tranexamic acid can prevent PPH and other severe outcomes in women with moderate and severe anaemia.**

## 3.2 TRIAL OVERVIEW

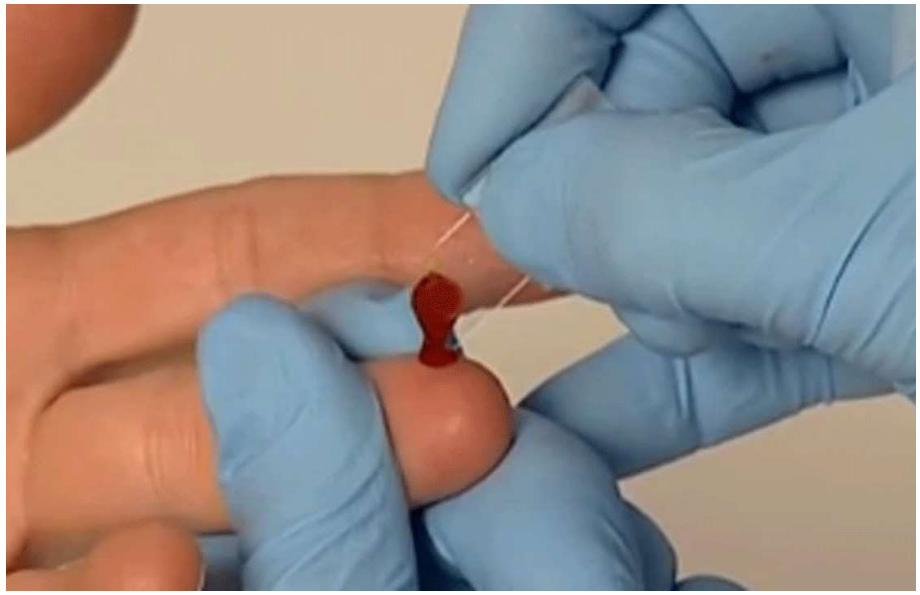


# Study design

- Cohort analysis of data from randomised trial (>10,000 women)
- Exposure is maternal haemoglobin measured before birth
- Outcome is postpartum haemorrhage
- All known confounders controlled in multivariable model

# Prebirth haemoglobin

- Measured using a HemoCue 201+
- Measured while woman is in labour (part of the assessment for trial entry)



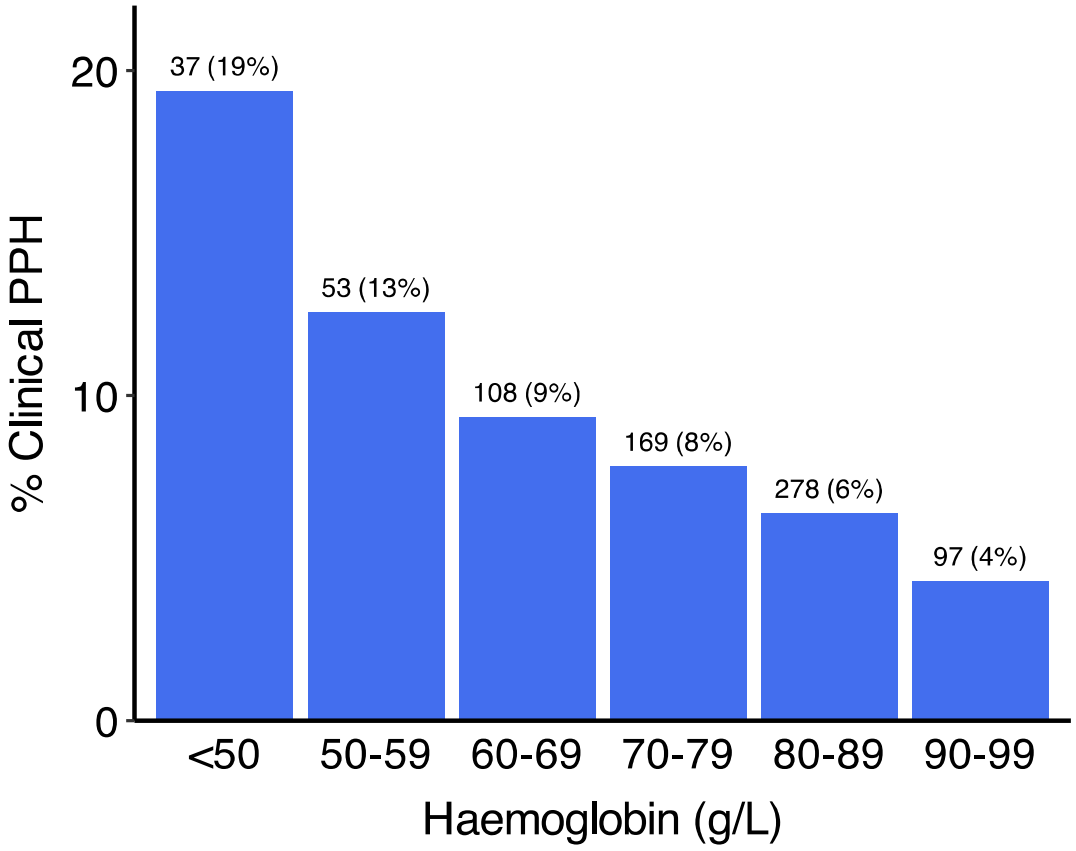
# Postpartum haemorrhage

**Clinical PPH:** Estimated loss ≥500 ml or sufficient to compromise haemodynamic stability

**WHO PPH:** Estimated blood loss ≥500ml

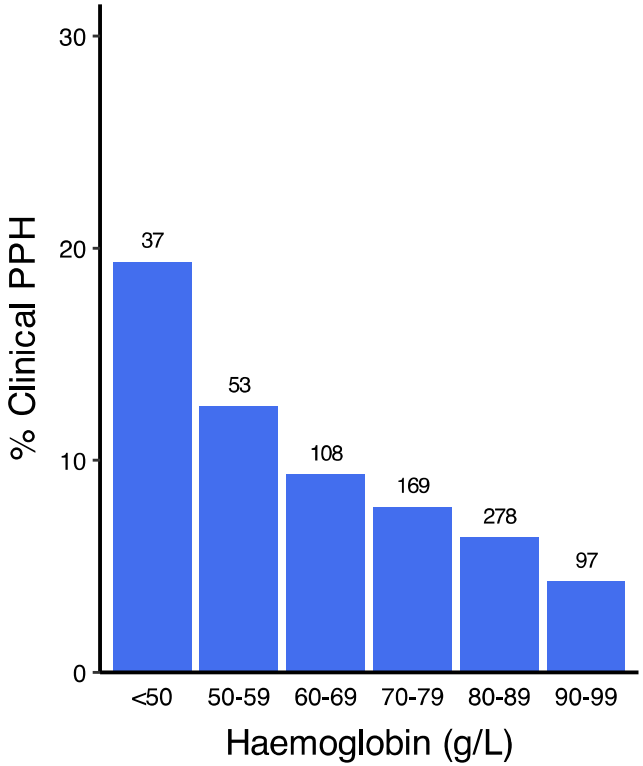
**Calculated PPH:** Calculated estimated blood loss of ≥1000ml (Calculated blood loss based on peripartum change in haemoglobin and body weight).

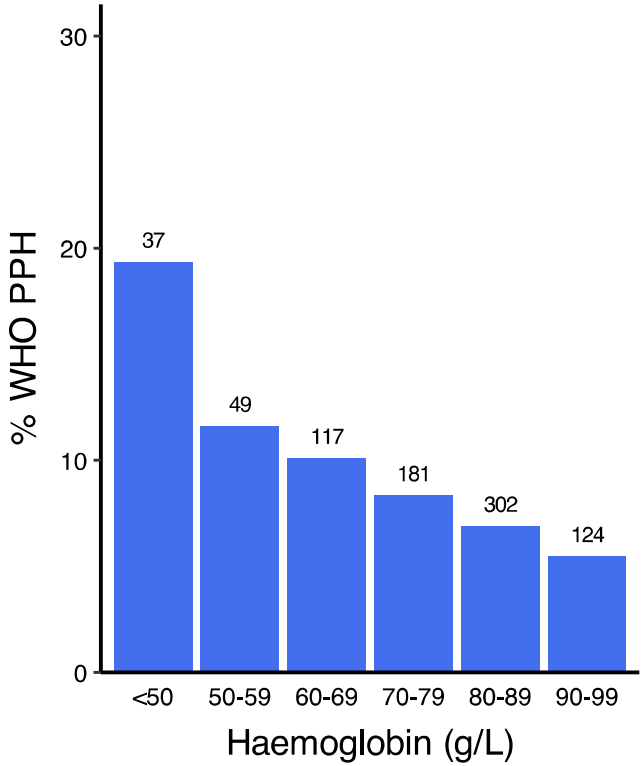
# Prebirth haemoglobin vs PPH risk

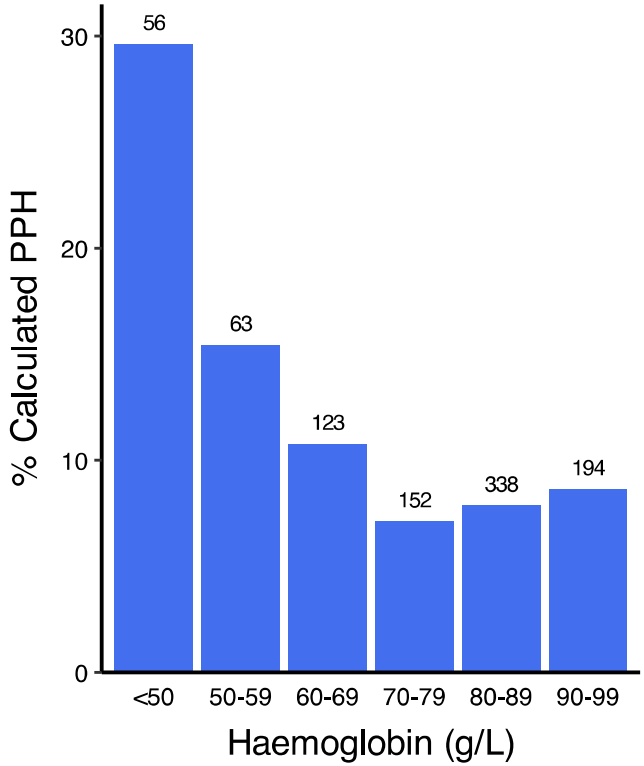


# Results are similar using different measures of PPH

WOMAN 2 trial (N=10561)



# Multivariable analysis for clinical PPH

WOMAN-2 trial (N=10396)

| Variable | OR (95% CI) |
|---|---|
| **Haemoglobin (-10 g/L)** | **1.23 (1.16-1.31)** |
| **Previous PPH** | |
| No or no previous birth | 1.00 |
| Yes | 2.23 (1.29-3.86) |
| **Placenta abnormalities** | |
| No | 1.00 |
| Yes | 4.08 (2.67-6.23) |
| .... | |

A 10 g/L decrease in haemoglobin is associated with a **23 %** increased odds of PPH

# Maternal death or near miss

Severe vs moderate, near sevenfold increased odds of death (OR=6.65, 2.30-19.18).

For the 68 women who died or near miss, the mean (SD) haemoglobin was 65.0 (18.1) g/L.

Severe vs moderate, sevenfold increased odds of death or near miss (OR=7.25, 4.45-11.80).

## What are the mechanisms?

1. Increased heart rate and cardiac output increases blood loss from bleeding vessels.

2. Reduced blood viscosity leads to increased flow.

3. Anaemia prevents platelet margination and increases bleeding time.

4. RBC direct contribution to haemostasias (thrombin formation and fibrin generation)

5. Anaemic blood clots are more susceptible to fibrinolysis.

# Anaemia and heart rate

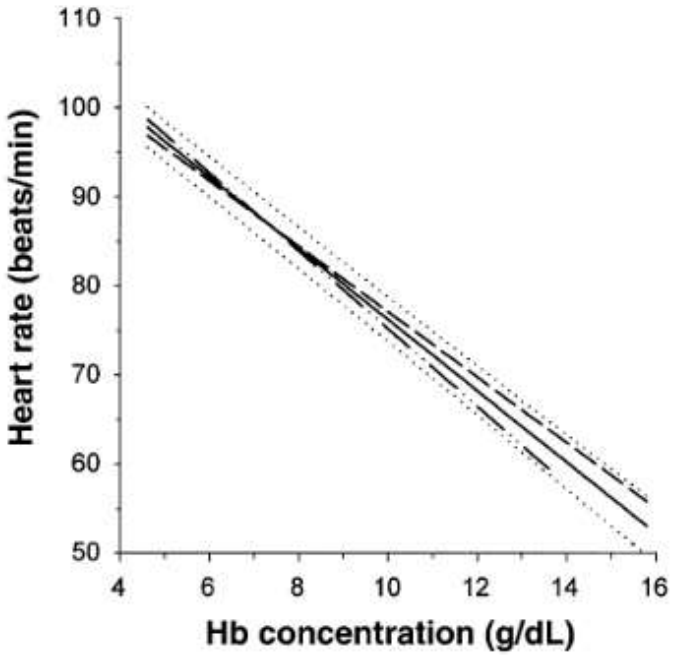



**Fig. 3. Calculated linear regression equations for heart rate as a function of Hb concentration of all 95 subjects (——), 52 women (— ·· —), and 43 men (– – –). The 95-percent CIs for the line for all subjects are shown with dotted curves (·····).**

Weiskopf R, et al. Heart rate increases linearly in response to acute isovolemic anemia. Transfusion. 2003;43:235-40.

# Anaemia and reduced blood viscosity



with the lowest available concentrations of corpuscles were all about 1·6, variations in different experiments being negligible, but the shape of the curve indicated that pure plasma would have had a viscosity of 1·5. In effect, then, the reduction factor for the limb curve was obtained by scaling the flow of our actual "plasma" circulation to 1·5, whereas the factor for the viscometer curve was obtained by scaling the flow of the same fluid down to 1·6.

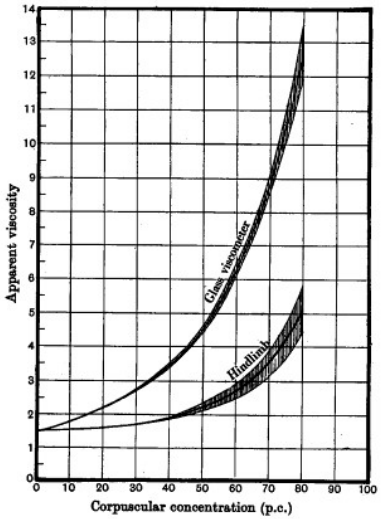



Fig. 8. The mean value and the probable error of the apparent viscosity of blood in the glass viscometer and the hindlimb at different corpuscular concentrations (dog's defibrinated blood at 37° C.).

Fig. 7 illustrates that the experimental values of the apparent viscosity in a given limb fall on a smooth curve, although the corpuscular concentrations were changed in different haphazard orders in different experiments; this would be unlikely to happen unless the bore of the blood vessels remained unaffected.

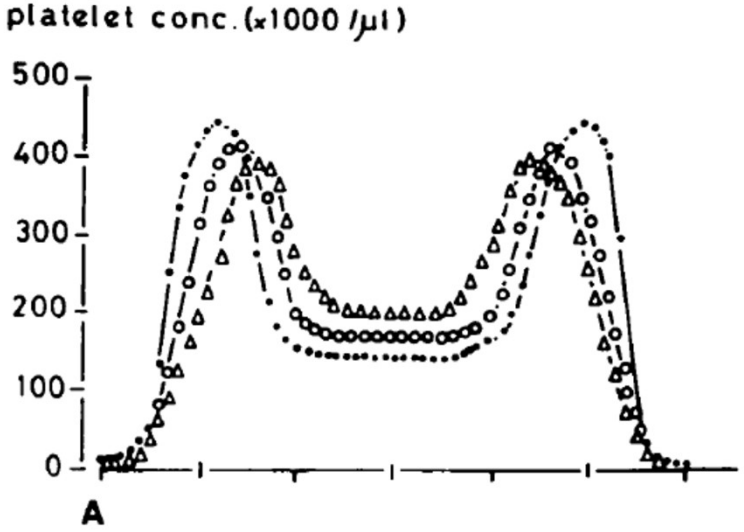
| | |
|---|---|
| Q | Flow rate |
| P | Pressure |
| r | Radius |
| η | Fluid viscosity |
| l | Length of tubing |

$$Q = \frac{\pi P r^4}{8 \eta l}$$

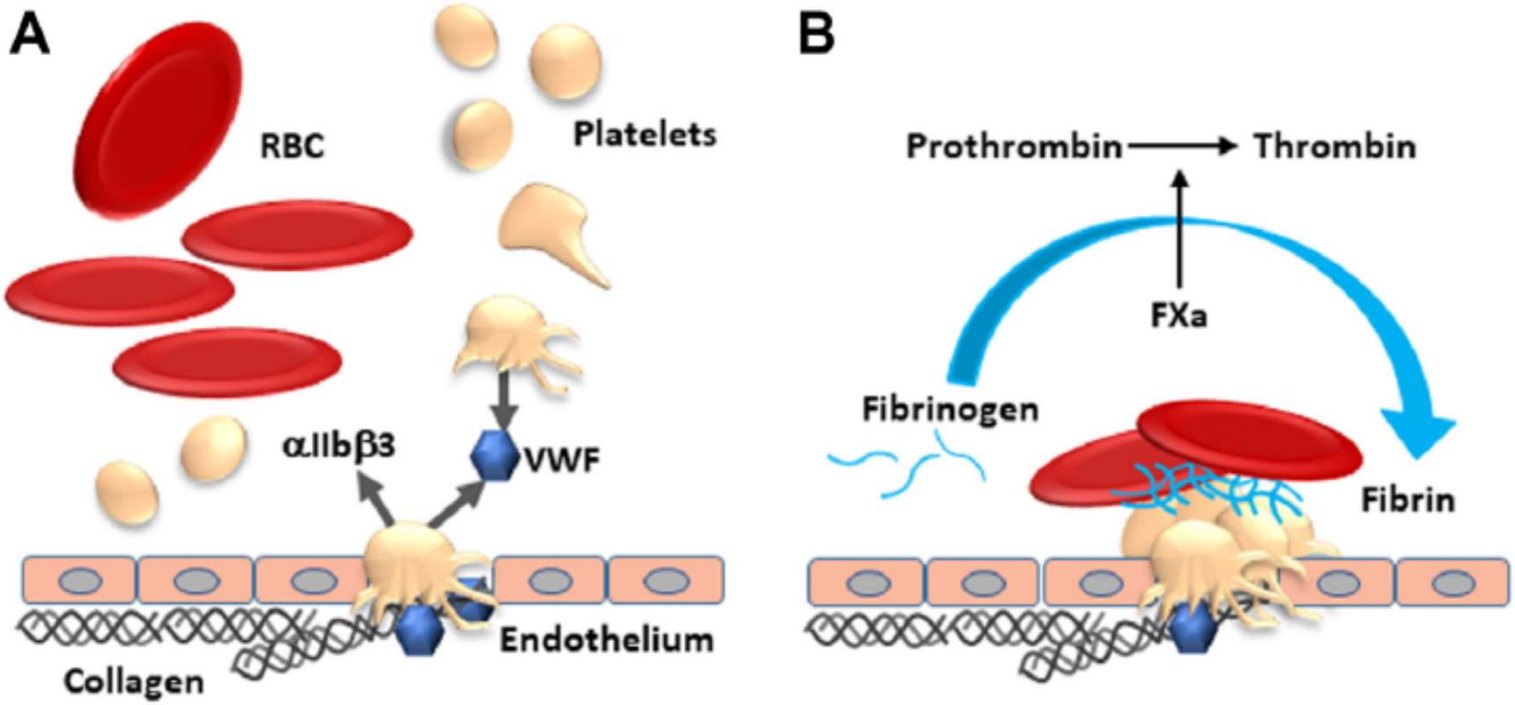
# Anaemia and platelet margination

## Blood Platelets Are Concentrated near the Wall and Red Blood Cells, in the Center in Flowing Blood

Piet A.M.M. Aarts, Sjaak A.T. van den Broek, Gerrit W. Prins,
Gerard D.C. Kuiken, Jan J. Sixma, and Robert M. Heethaar



# Anaemia and thrombin generation




Lassila R, Weisel JW. Role of red blood cells in clinically relevant bleeding tendencies and complications. J Thromb Haemost. 2023 May 18:S1538-7836(23)00422-1.

# Lytic Resistance of Fibrin Containing Red Blood Cells

Nikolett Wohner, Péter Sótonyi, Raymund Machovich, László Szabó, Kiril Tenekedjiev, Marta M.C.G. Silva, Colin Longstaff, Krasimir Kolev

***Objective***—Arterial thrombi contain variable amounts of red blood cells (RBCs), which interact with fibrinogen through an eptifibatide-sensitive receptor and modify the structure of fibrin. In this study, we evaluated the modulator role of RBCs in the lytic susceptibility of fibrin.

***Methods and Results***—If fibrin is formed at increasing RBC counts, scanning electron microscopy evidenced a decrease in fiber diameter from 150 to 96 nm at 40% (v/v) RBCs, an effect susceptible to eptifibatide inhibition (restoring 140 nm diameter). RBCs prolonged the lysis time in a homogeneous-phase fibrinolytic assay with tissue plasminogen activator (tPA) by up to 22.7±1.6%, but not in the presence of eptifibatide. Confocal laser microscopy using green fluorescent protein–labeled tPA and orange fluorescent fibrin showed that 20% to 40% (v/v) RBCs significantly slowed down the dissolution of the clots. The fluorescent tPA variant did not accumulate on the surface of fibrin containing RBCs at any cell count above 10%. The presence of RBCs in the clot suppressed the tPA-induced plasminogen activation, resulting in 45% less plasmin generated after 30 minutes of activation at 40% (v/v) RBCs.

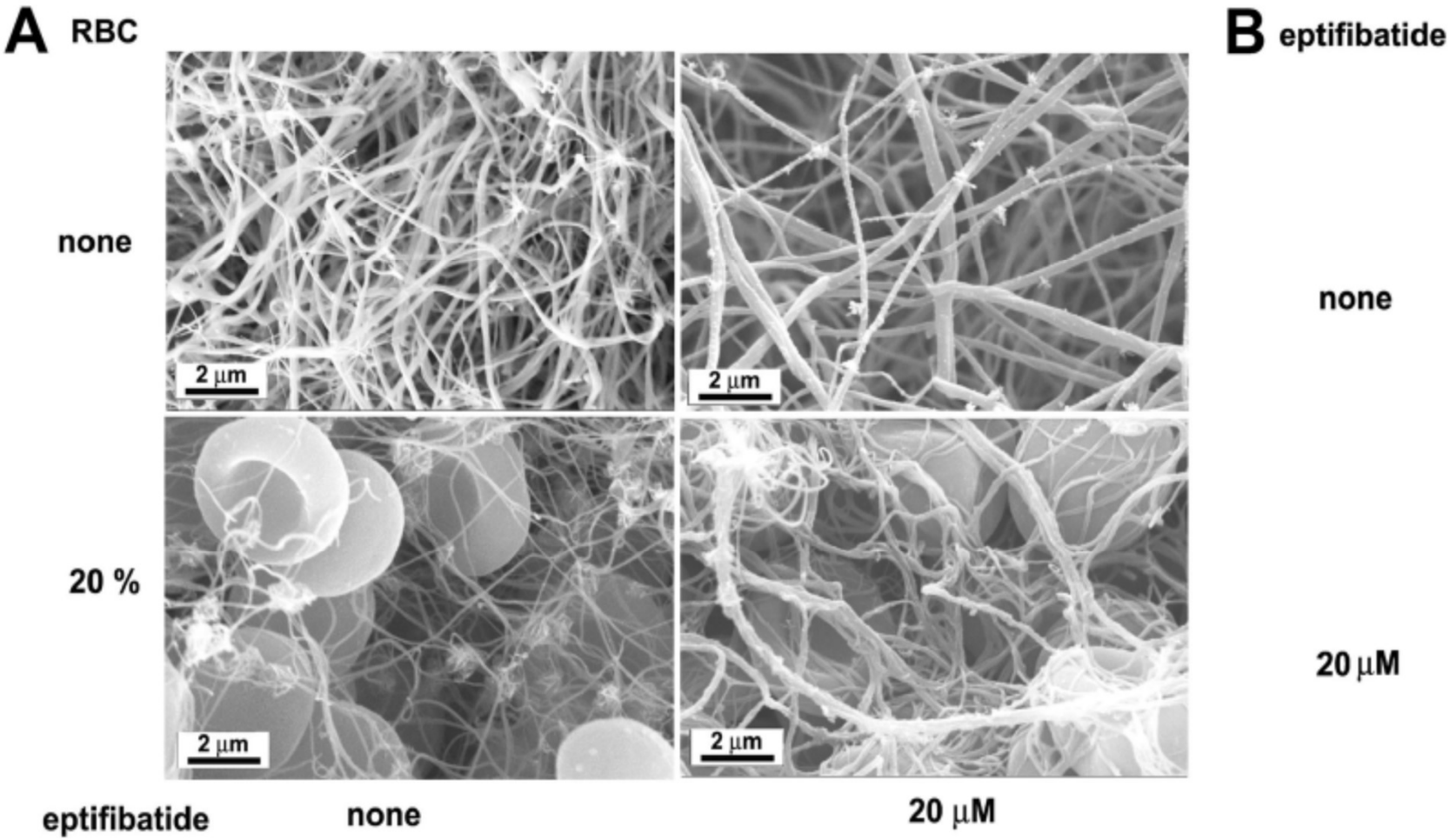
***Conclusion***—RBCs confer lytic resistance to fibrin resulting from modified fibrin structure and impaired plasminogen activation through a mechanism that involves eptifibatide-sensitive fibrinogen-RBC interactions. (***Arterioscler Thromb Vasc Biol.* 2011;31:2306-2313.)**

**Key Words:** blood cells ■ fibrin ■ fibrinolysis ■ plasminogen activators ■ platelet receptor blockers

**RBCs decrease fibrin fiber diameter from 150 to 96 nm (blocked by eptifibatide)**

**RBCs prolong clot lysis time**

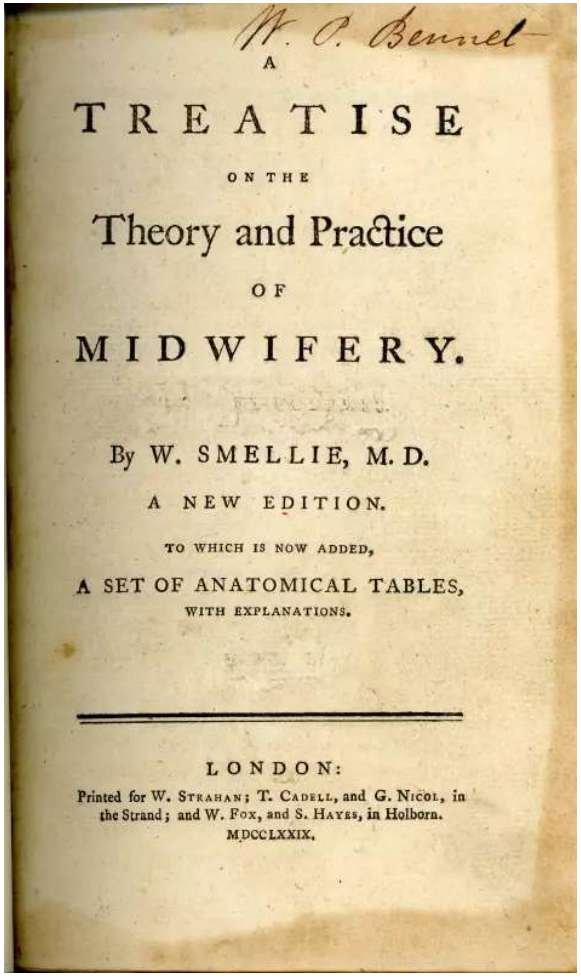
**RBCs reduce plasminogen activation**


A
RBC
B
eptifibatide
none
none
20 %
20 μM
2 μm
2 μm
2 μm
2 μm
eptifibatide
none
20 μM

*`The dangerous efflux is occasioned by everything that hinders the emptied uterus from contracting . . .'.*

*` . . . in these cases such things must be used as will assist the contractile power of the uterus, and hinder the blood from flowing so fast.. . .*

*William Smellie 1752*



W. O. Bennet

A

TREATISE

ON THE

Theory and Practice

OF

MIDWIFERY.

By W. SMELLIE, M. D.

A NEW EDITION.

TO WHICH IS NOW ADDED,

A SET OF ANATOMICAL TABLES,

WITH EXPLANATIONS.

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Printed for W. STRAHAN; T. CADELL, and G. NICOL, in the Strand; and W. FOX, and S. HAYES, in Holborn.

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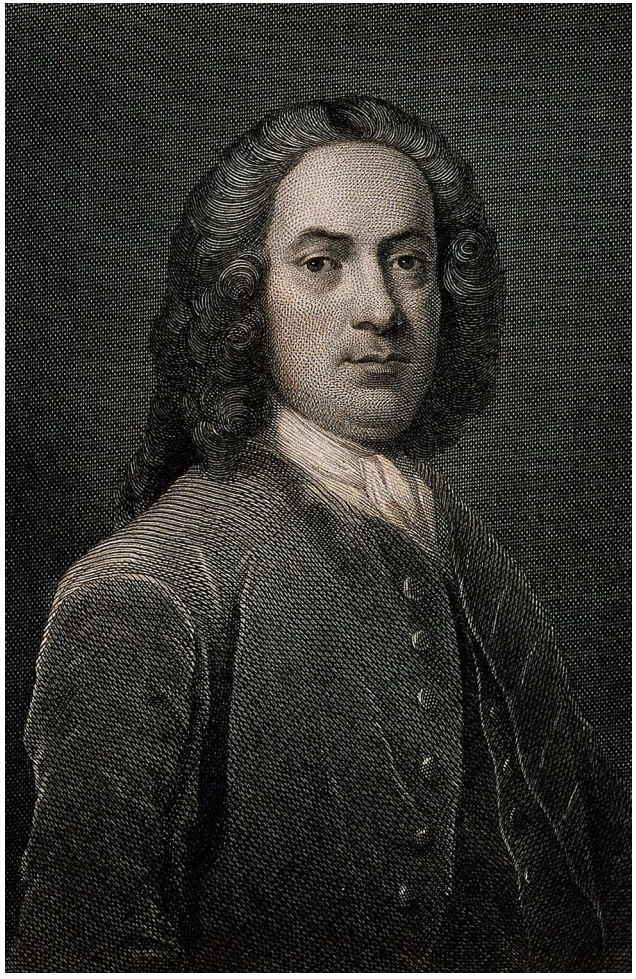
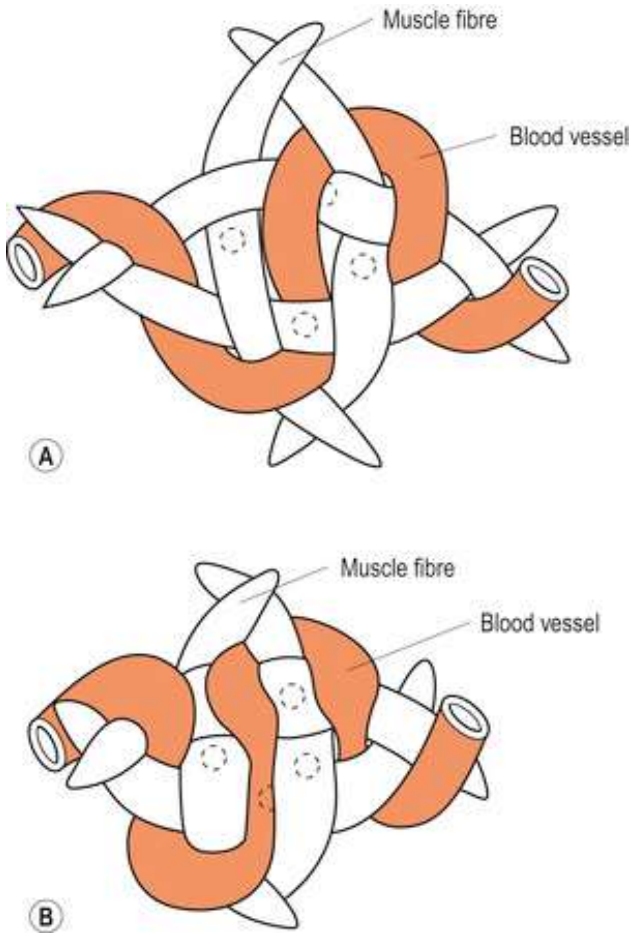
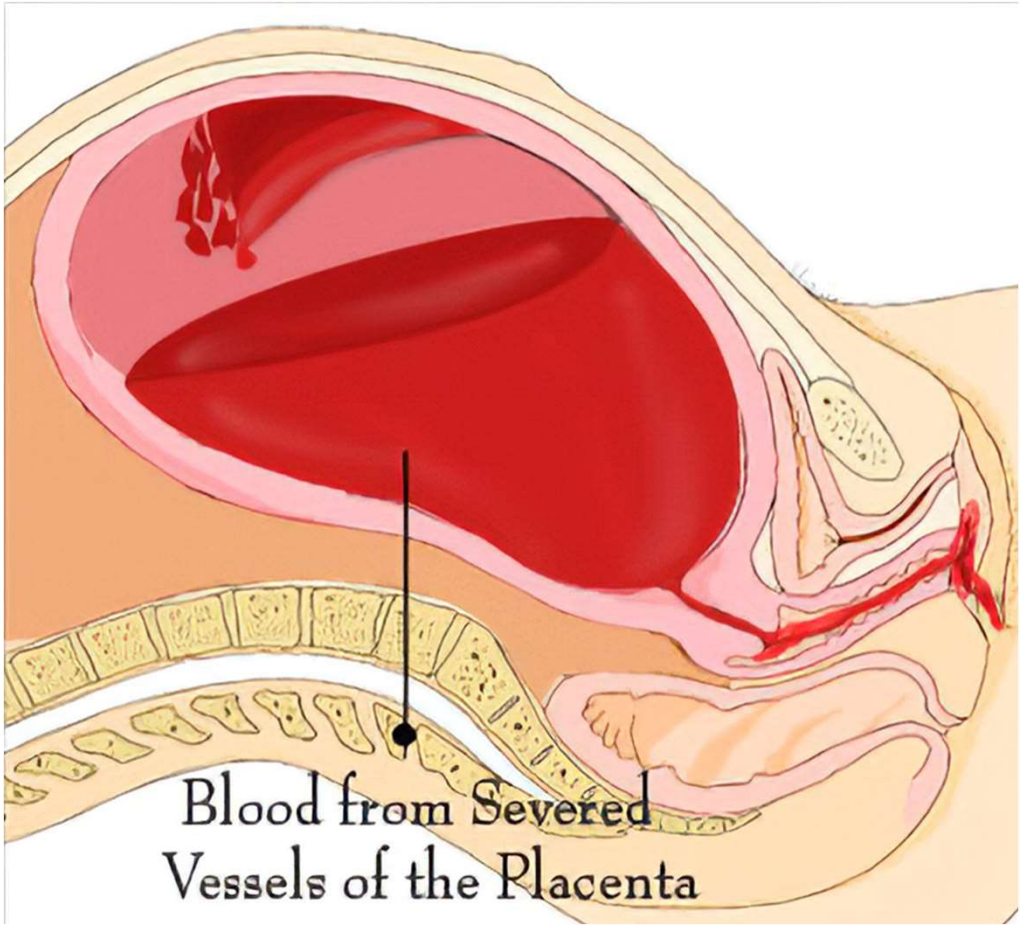


# Blame the uterus: living ligatures theory?



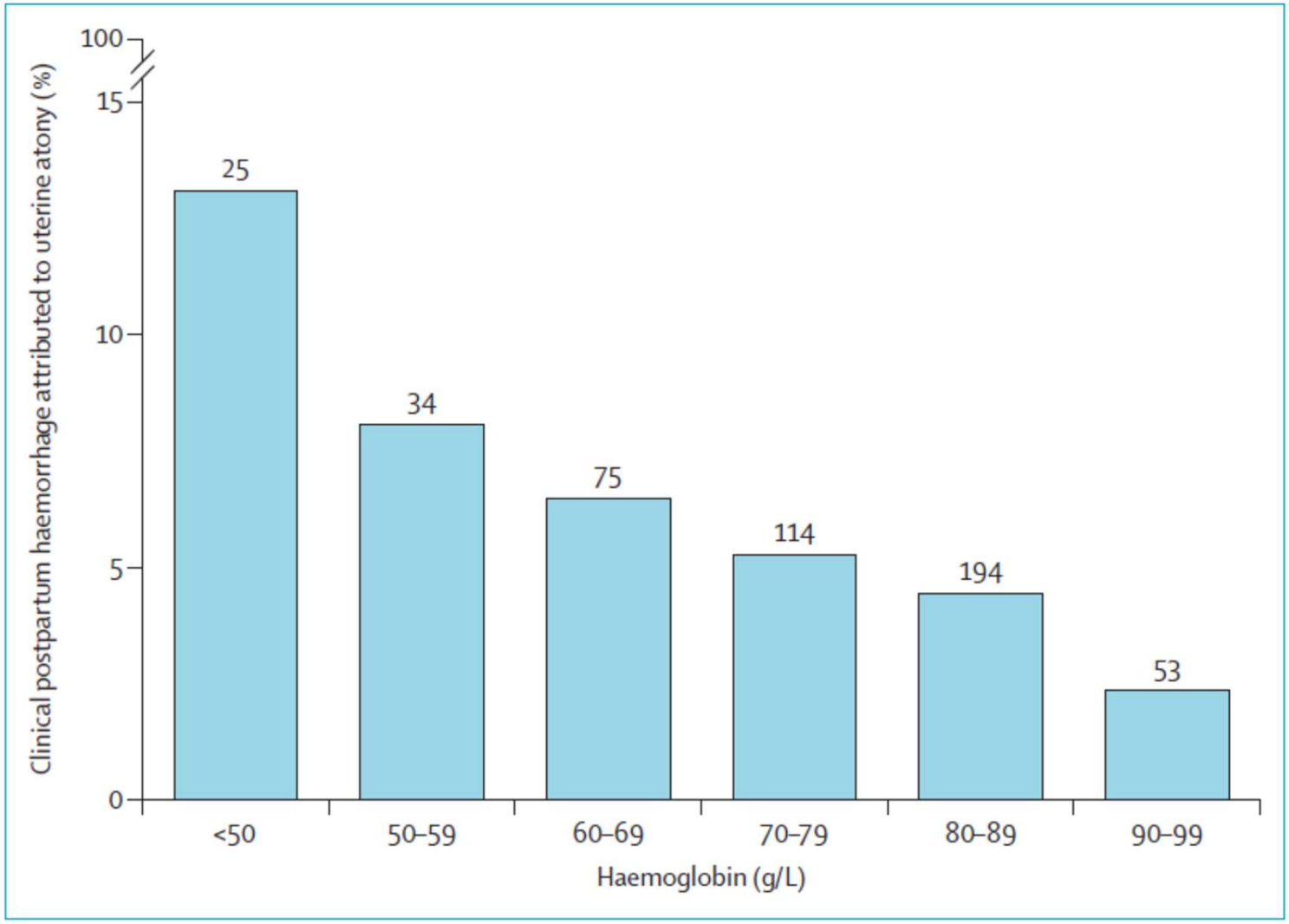



*Figure*: Percentage of women with clinical postpartum haemorrhage attributed to uterine atony versus prebirth haemoglobin (n=10 561)

# Anaemia ‘overlooked’ as a cause of PPH

| | Moderate anaemia (n=544) | Severe anaemia (n=198) |
|---|---|---|
| Atony | 361 (66%) | 134 (68%) |
| Tears | 101 (19%) | 23 (12%) |
| Retained placenta tissue | 58 (11%) | 20 (10%) |
| Placenta implantation abnormalities | 3 (1%) | 7 (4%) |
| Uterine rupture | 1 (<1%) | 0 |
| Other | 8 (1%) | 9 (5%) |
| Unknown | 12 (2%) | 5 (3%) |

Data are n (%).

***Table 2:*** **Primary cause of postpartum haemorrhage**

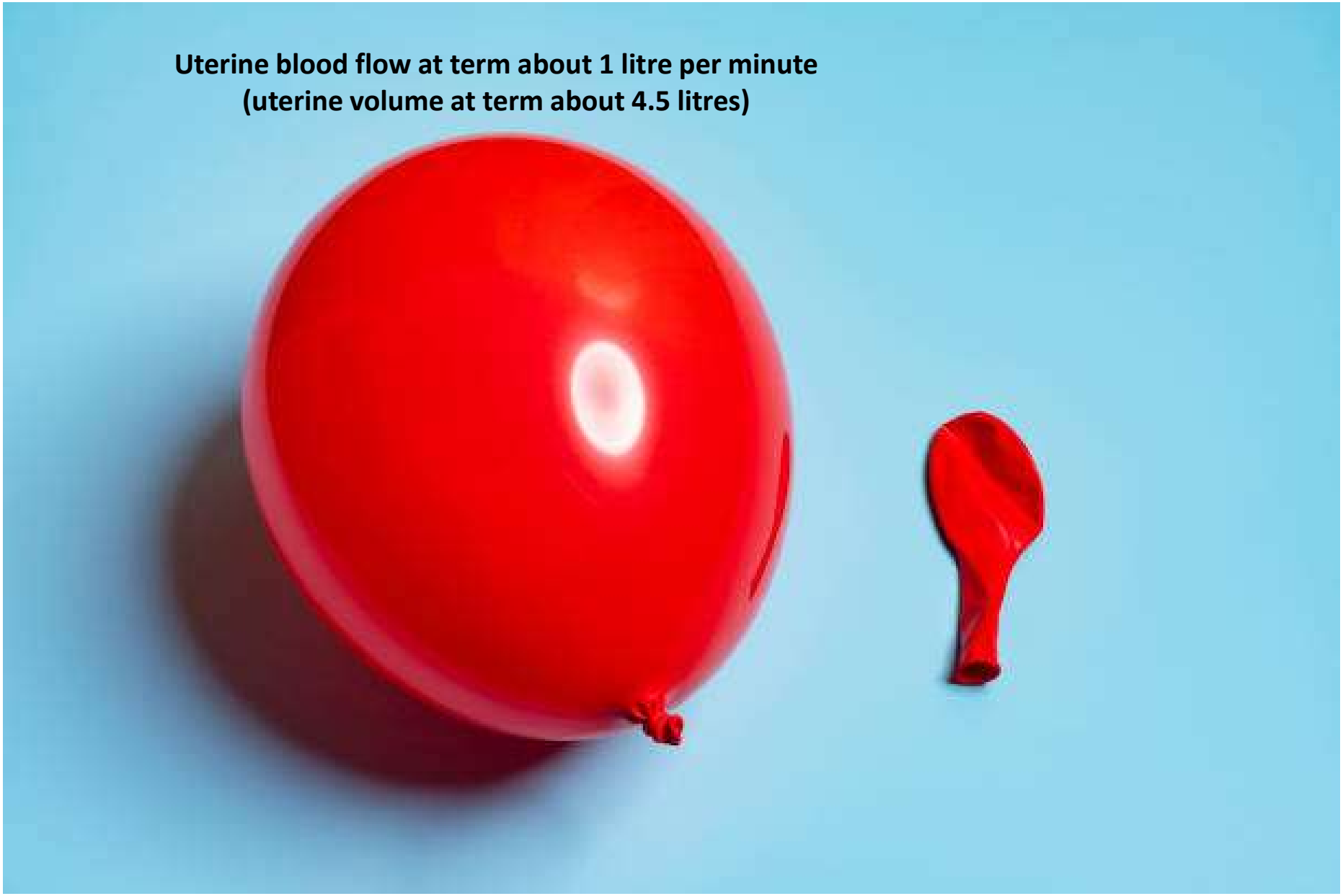
Uterine Atony: ‘The diagnosis of atony is based on the presence of a ‘boggy’ enlarged uterus in the context of severe bleeding.’

enlarged uterus → severe bleeding

or

severe bleeding → enlarged uterus

**Uterine blood flow at term about 1 litre per minute**
**(uterine volume at term about 4.5 litres)**

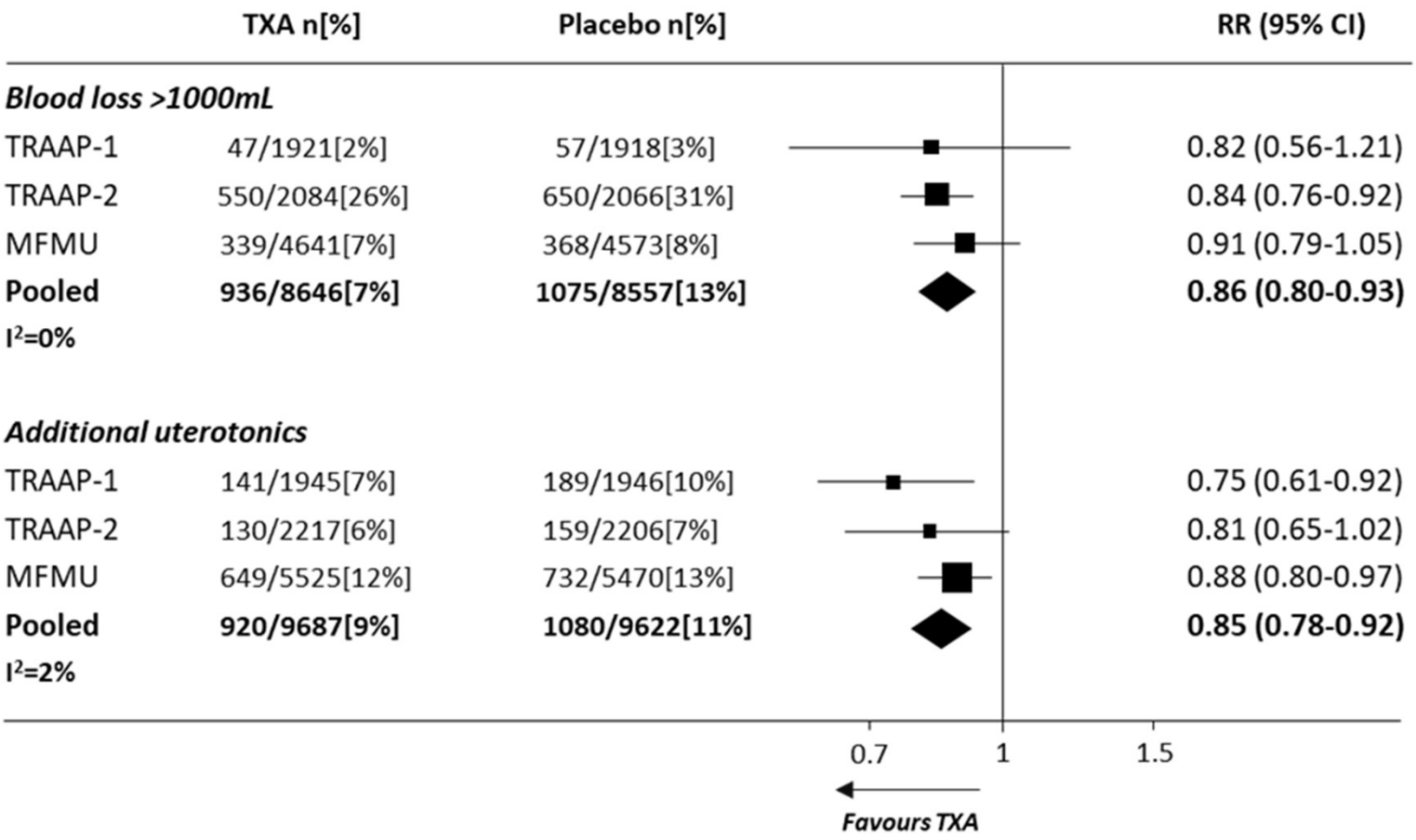


# Effect of early tranexamic acid administration on mortality, hysterectomy, and other morbidities in women with post-partum haemorrhage (WOMAN): an international, randomised, double-blind, placebo-controlled trial

WOMAN Trial Collaborators*

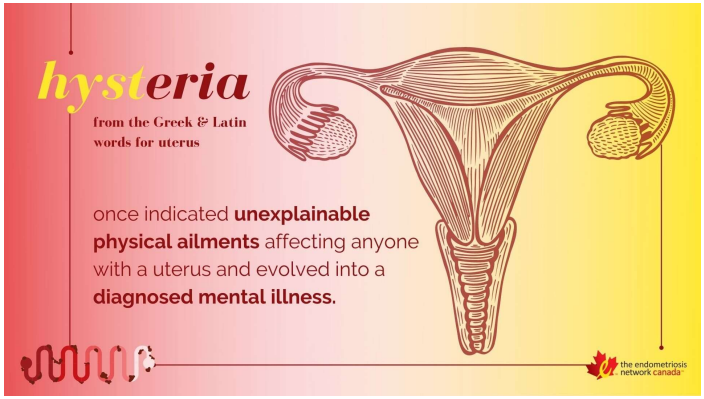
| | Tranexamic acid | Placebo | RR (95%CI) |
|---|---|---|---|
| **Uterine atony PPH death** | 77/6428 (1.2%) | 103/6333 (1.6%) | 0.74 (0.55 – 0.99) |

**Meta-analyses of the effect of TXA on risk of postpartum blood loss >1000mL and receipt of additional uterotonics. Data from large (>500 patients), prospectively registered, placebo-controlled, randomised, well concealed trials. Prepared by Dr Katharine Ker from LSHTM.**



# Post-partum haemorrhage

## Blame the uterus?




Uterine atony - vague and unmeasurable

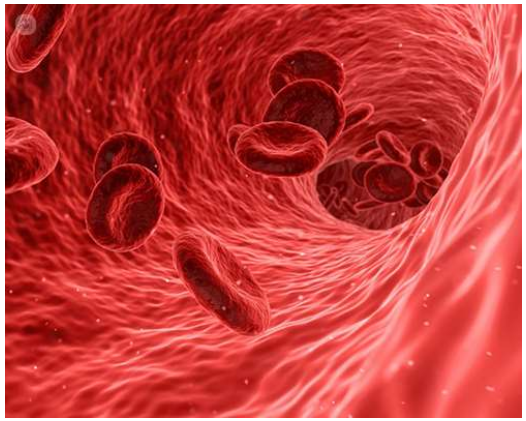
Uterus is responsible for PPH

Weak evidence base as a cause

Weak evidence base for intervention

Strong corporate interest (patented drugs)

## Blame the blood?



Anaemia - precise and measurable

Society responsible (nutrition, health care and menstrual taboo)

Strong evidence base as a cause

Strong evidence base for intervention (mortality benefit)

Weak corporate interest (generic drugs)

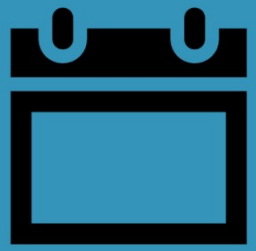
# Conclusions

Anaemia is a strong (causal) risk factor for bleeding

There are several well documented biological mechanisms

Red cells and TXA appear to act synergistically to inhibit fibrinolysis.

Important implications for health care especially in older adults.



# Date of Next Meeting

May 2024
Oake Manor