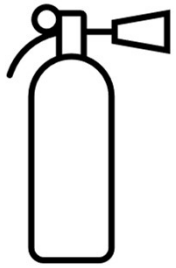
# SW PBM Group Meeting

24th September 2024

Oake Manor, Taunton


Chair - Elmarie Cairns
Clinical Lead: Dr Oliver Pietroni
Support - Jackie McMahon RTC administrator

# Housekeeping



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

# Agenda

South West Patient Blood Management Group
Date: 24 September 2024
10.30-15.30, Oake Manor, Taunton

| AGENDA | | | |
|---|---|---|---|
| Minute No. | | App No: | Lead |
| 1. | Apologies for Absence | | |
| 2. | Freedom of Information<br>This group will observe the requirements of the Freedom of Information Act 2000 which allows a general right of access to recorded information including minutes of meetings, subject to specific exemptions. No one present today had any objections to their names being distributed in the minutes. | | |
| 3. | Declaration of Any Other Business | | |
| | | | |
| 4. | Summary of Previous Meeting and Matters Arising | | EC |
| | | | |
| 5. | RTC & PBM Update | | OP/ST |
| | | | |
| 6. | UKCSAG Update<br>Withdrawal of Haemonetics LDFs | | EC |
| | | | |
| 7. | Implications of Infected Blood Inquiry Report | | ST |
| | | | |
| 8. | Amber Alert Discussion | | All |
| | | | |
| | Lunch | | |
| | | | |
| 9. | Routine use of Cell Salvage During Caesarean Section: Practice Evaluation | | MJ |
| | | | |
| | | | |
| 10. | Setting up the Royal Marsden Hospital Anaemia Clinic | | CD |
| | | | |
| | | | |
| 11. | AoB / Future Meeting Dates | | |
| | | | |

# Declaration of Any Other Business

# Summary of Previous Meeting and Matters Arising:

- Last formal meeting via Teams on 23 January 2024
- Draft ToRs and proposed amendments discussed
- Business updates from RTC, PBM and UKCSAG
- Future direction of cell salvage data collection discussed and draft cell salvage KPIs presented
- Presentation
- Excellent presentations from Issie Gardner, on the cell salvage service at St Michael's Hospital, Bristol and Sophie Scutt on an amniotic embolism with DIC

Minutes/Action plan and presentations from previous meetings are available via the SW PBMG SharePoint and the SW RTC website

| SW PBM Meeting, 23.01.24: Actions | | |
|---|---|---|
| | **Actioner** | **Comments** |
| Share Business Cases, MSBOS, PILs, etc with the group | All | Send to JM for uploading to SharePoint |
| Amend ToRs in line with discussion | EC | Re-circulate to group for comment and send to RTC Chair |
| Contact EC if interested in UKCSAG Chair role | | |
| Send any further feedback around the Standards and KPIs | All | |
| Amend Standards and KPIs in line with feedback | EC | Forward amended version to RTC Chair for RTC sign-off |
| Upload vaginal cell salvage data to database on SharePoint | All that use | |
| Contact EC if interested in presenting at the F2F meeting in September | | |

# RTC/RTT Update

Oliver Pietroni

## Regional Transfusion Survey:

We are  currently working on a further restructure of regional survey activity, which will also support the recent TACO CAS alert recommendations.
We will continue to maintain a database of basic trust transfusion and PBM information via a Forms survey to be carried out 3-yearly.
Hospitals are requested to input data biannually into the QS138 quality improvement tool.
A rolling programme of surveys, no more than one additional survey per year, to provide further information and support for key data from the QS138 Quality improvement tool, and cover the outstanding CAS alert audit requirements of TACO risk assessment, chronic severe anaemia management and discharge information.

## Objectives:

Maternal Anaemia
- Verbal update given

## Education:

- The regional BMS education programme, designed to support the national BTEDG, by covering core topics continues to roll out.

# PBM Update

Sam Timmins

Patient Blood Management

# Patient Blood Management Update

- The 'receiving Anti-D immunoglobulin during pregnancy' patient information leaflet is now live

- A new CMV negative component infographic is now available on the hospitals and science website
- Updated Cell Salvage fact sheets from UKCSAG

Factsheet 1 - Blood Collection & Processing (version 1)
- this replaces previous factsheets 1 (swab washout, 2 anticoagulation), and 3 (collection of blood)
Factsheet 2 - Reinfusion of Salvaged Blood (version 5)
- this now incorporates previous factsheet 5 (administration of salvaged blood)

- There is a new quick reference poster to improve access to our PBM resources in light of the recent Amber Alert

- Transfusion training hub- Your one stop educational website for transfusion training. Suitable for all the MDT and all levels of experience and knowledge

Patient Blood Management

**Do you want to promote PBM in your trust?**

Whether you want to highlight a specific initiative or PBM in general, book a PBM pop up stand for your trust to support engagement and awareness.

samantha.timmins@nhsbt.nhs.uk

**What's next....**

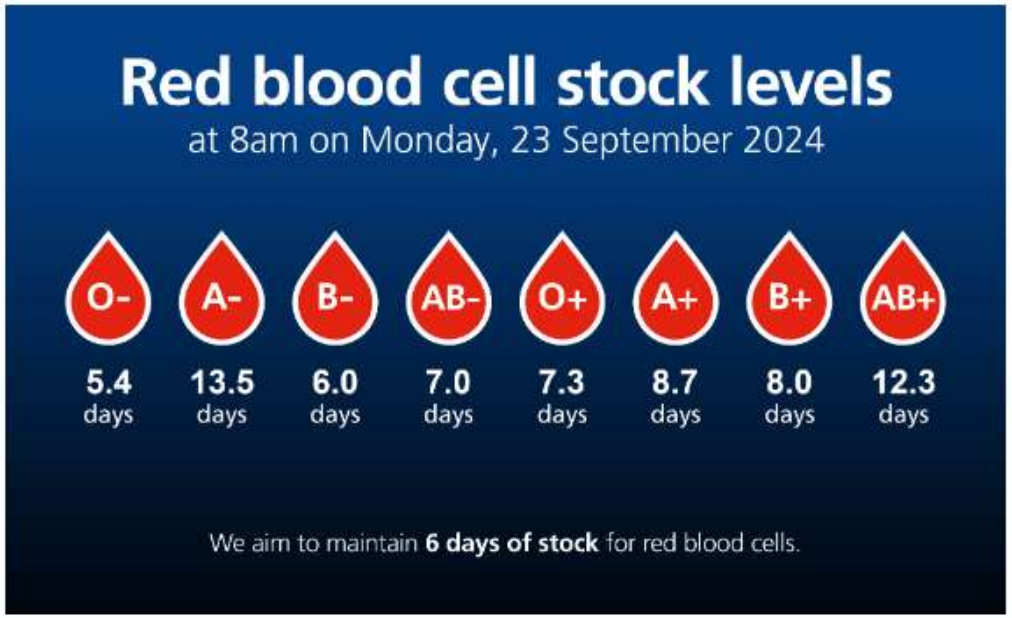
Some exciting projects are underway, with work starting on the paediatric version of baby blood assist, exploration of evidence to develop resources supporting reduction of Iatrogenic anaemia, and representation on a newly formed UK&I anaemia focus group. Watch this space.....

- **RAD Tag -** We are working through our resources to ensure they all reflect the new RAD tags for irradiated components.
- **Blood Essentials 6 month post launch review**- Thank you for your feedback!

- Genotyping project update- testing is now underway- all samples received prior too or on the day that funding closes will be processed even if testing occurs after this date. Formal comm's are being organised

Patient Blood Management

# Blood Stocks





The stock status is Amber for group O red cells, positive and negative.

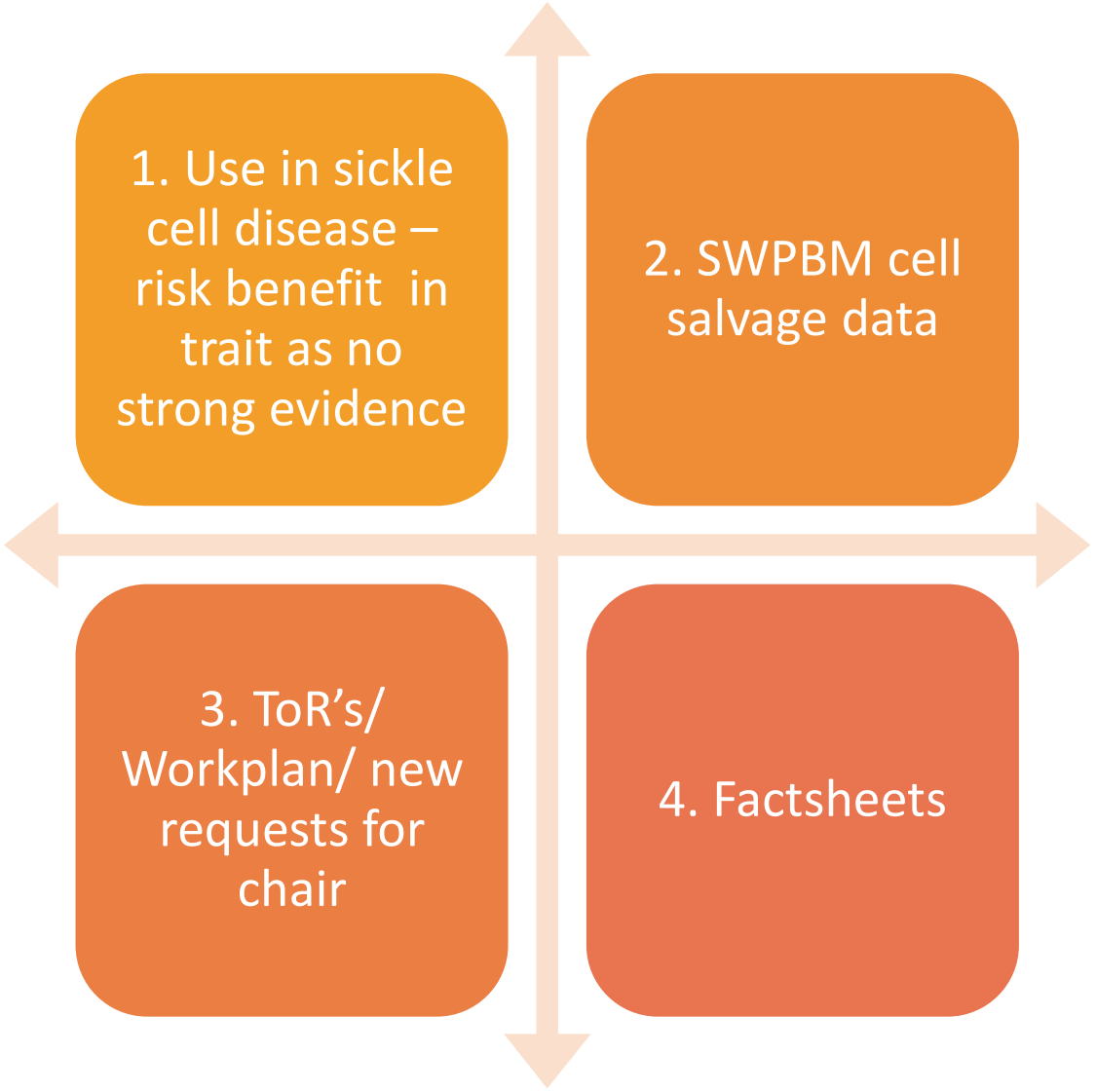
The stock status is Pre-amber for A negative platelets.

# UKCSAG Update

Elmarie Cairns

UK CELL SALVAGE ACTION GROUP

# June Meeting key points:



# September meeting key points:

1. RTC to identify interested cell salvage expert to attend UKCSAG – proposed at RTC meeting 23rd Sept

2. Google health pilot – animation for patients on ICS

3. Manufacturers meeting

4. Use of cell salvage in other specialisms

5. Annual newsletter currently being produced.

6. Plan for 2025 engagement webinar for cell salvage users

7. Mandatory use of OPCS codes

8. Propose national dataset

# Leucocyte Depletion Filter Update


Elmarie Cairns

Sept 2024

# Situation

The RS1VAE LDF filter will not be available in Europe and UK after May 2027.

# Background

Malignancy Surgery

Cardiac surgery

Heavy bacterial contamination

Association of Anaesthetists

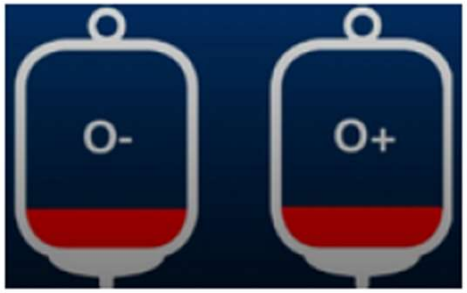
# Assessment: RS1 product spec

WBC REDUCTION (AVERAGING 99%)

LIPID PARTICULATE REDUCTION (AVERAGING 84%)

# Infected Blood Inquiry

## Timeline and Recommendations




# Amber Alert Discussion

# PBM Case study: A Rare blood group

DR OLIVER PIETRONI - SW PBMG

# Corridor Conversation

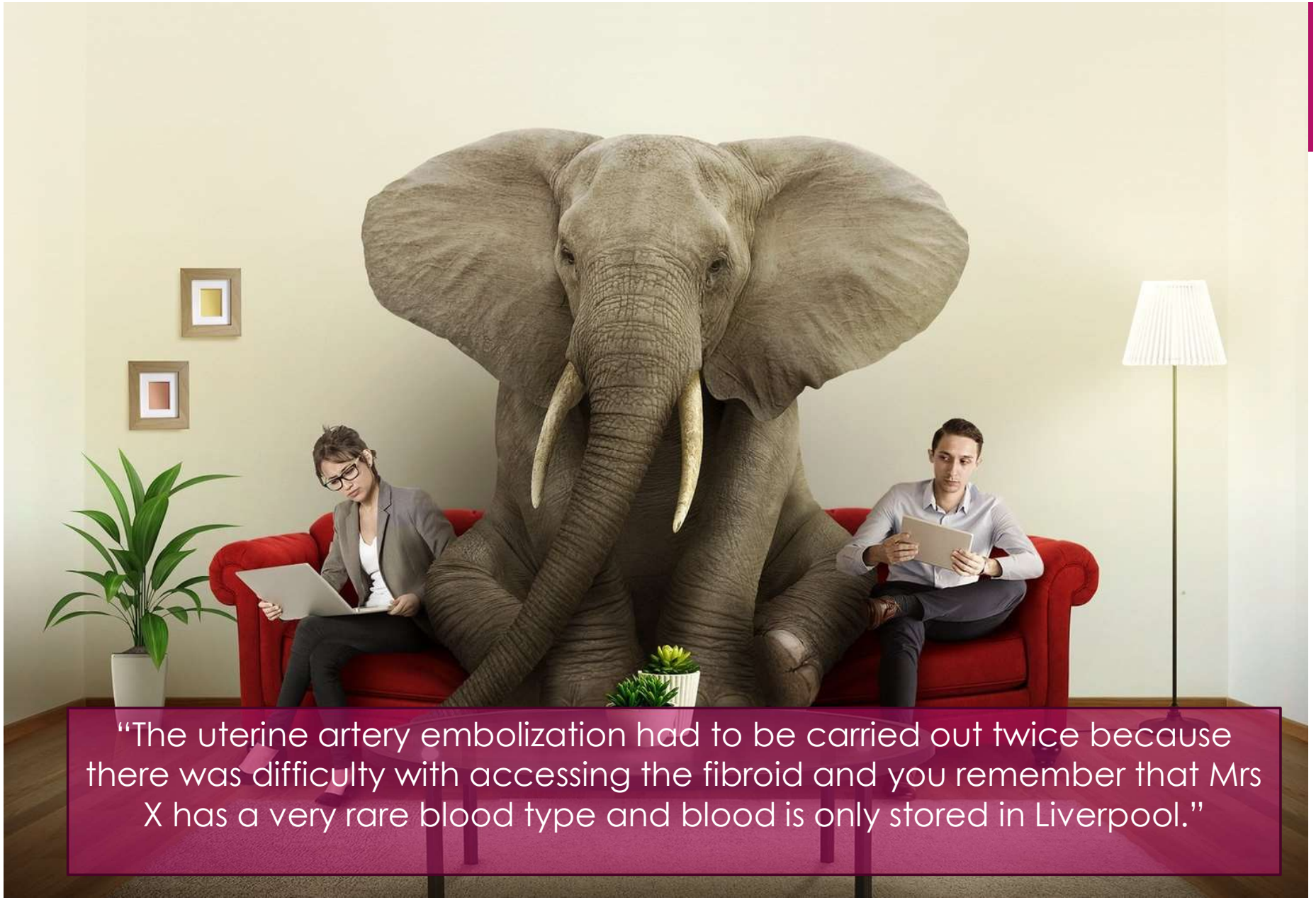
- 57 yr Female
- Open myomectomy
- "rare blood group"

- *"The patient is a regular blood donor, and would like to receive her own blood in the event she needed a transfusion –* ***Is this something we can do?"***


COMPUTER SAYS NO

# Further information gathering

- A positive
- No atypical red cell antibodies
- Hb 144g/L, Ferritn 26 ug/L
- Not known to Haematologists


"The uterine artery embolization had to be carried out twice because there was difficulty with accessing the fibroid and you remember that Mrs X has a very rare blood type and blood is only stored in Liverpool."

# Lab manager & Haematologist

- Rh17 negative (D - -)
- Lack of Rhesus antigens C & E
- < 1 in 100,000
- Risk of alloimmunisation with  ABO D matched blood
  - Remove from donor list
  - Subsequent matching very difficult

# NHSBT

- This patient is also a highly valued rare blood donor who has donated multiple units of blood, which are stored in the National Frozen Blood Bank (NFBB).

- It is rare to find British blood donors with this blood group, making supply of allogeneic donor red cells of this blood group unusually challenging.

# NHSBT

- We have considered the benefits of making autologous units available on standby
- These units can be provided for a planned date. We ask for several working days' notice to facilitate thawing and transport. If possible, we ask that the units be requested for use Tuesday – Friday, as this enables us to thaw them during normal working hours
- **This would also allow her to continue as a blood donor in future**

# PBM interventions

- Hb 144g/L
- Ferritin 26 ug/L

- Surgery originally planned for Monday, but moved to Wednesday

- 1g IV Ferric Carboxy-Maltose 2 weeks pre-op
- Cell Salvage used – collection only
- TXA 1g intra-operatively
- 24 hours of post-op TXA post-op

# Summary

- Good planning = no intervention!
- It was great to have friends
- NHSBT super helpful
  - Value their donors
  - Advice about emergency transfusion
  - Advice regarding role of steroids & Ig
  - Offered to council patient
- Role of PBM in maintaining donor pool

# Lunch.....

# ROUTINE USE OF CELL SALVAGE DURING CAESAREAN SECTION: A PRACTICE EVALUATION


DR MOLLY JONES[1]

ST1 OBSTETRICS AND GYNAECOLOGY
GREAT WESTERN HOSPITALS NHS FOUNDATION TRUST
MOLLY.JONES17@NHS.NET

(Dr Charlotte Leeson[1], Dr Joshua Odendaal[1,2], Dr Falguni Choksey[2], Professor Siobhan Quenby[1,2])

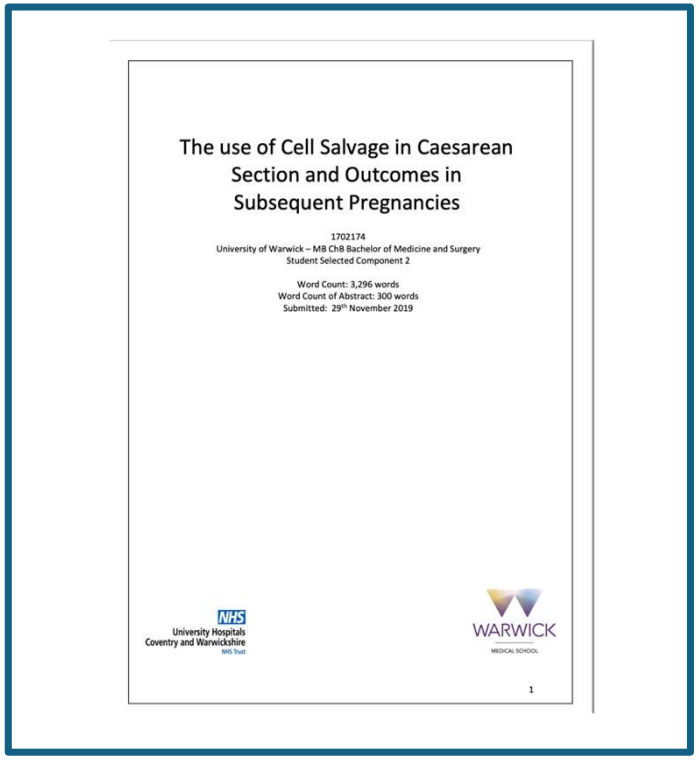
1Division of Biomedical Sciences, Clinical Sciences Research Laboratories, Warwick Medical School, University of Warwick, Coventry, UK
2University Hospitals Coventry & Warwickshire, Coventry, UK

# BACKGROUND

- Haemorrhage is still a leading cause of maternal death
- Risks of intra-operative cell salvage
  - Fetal cell alloimmunisation
  - AFE
- PPH score – 60% of patients had no risk factors.

MBRRACE-UK, (2023)
Sullivan IJ and Ralph CJ, (2018)
Goucher *et al.*, (2015)
Benson, (2017)
Surbek et al, (2020)

# BACKGROUND



The use of Cell Salvage in Caesarean Section and Outcomes in Subsequent Pregnancies

1702174
University of Warwick – MB ChB Bachelor of Medicine and Surgery
Student Selected Component 2

Word Count: 3,296 words
Word Count of Abstract: 300 words
Submitted: 29th November 2019

NHS University Hospitals Coventry and Warwickshire NHS Trust

WARWICK MEDICAL SCHOOL

1

- Student Selected service evaluation
- Tertiary Obstetric Centre
- Assessed need for additional blood products at time of delivery, antibodies at subsequent pregnancy and antenatal and neonatal outcomes
- No adverse outcomes were identified

# IS CELL SALVAGE SAFE?

- Multiple studies have been performed investigating the ”safety” of intraoperative cell salvage during LSCS
- However, very limited data on rates of antibody formation and outcomes in subsequent pregnancies

Khan et al, (2018)
Liu *et al.*, (2020)
Lei *et al.*, (2022)
Sullivan and ralph, (2019)

# DEVELOPING OUR PROJECT

Received: 4 September 2023 | Revised: 4 November 2023 | Accepted: 1 December 2023
DOI: 10.1111/aogs.14753

ORIGINAL RESEARCH ARTICLE

**Routine use of cell salvage during cesarean section: A practice evaluation**

Charlotte Leeson[1] | Molly Jones[1] | Joshua Odendaal[1,2] | Falguni Choksey[2] | Siobhan Quenby[1,2]

[1]Division of Biomedical Sciences, Clinical Sciences Research Laboratories, Warwick Medical School, University of Warwick, Coventry, UK
[2]University Hospitals Coventry & Warwickshire, Coventry, UK

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Charlotte Leeson, Division of Biomedical Sciences, Clinical Sciences Research Laboratories, Warwick Medical School, University of Warwick, Coventry CV2 2DX, UK.
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**Abstract**

**Introduction:** Intraoperative cell salvage is a well-documented alternative to donor blood transfusion given the scarcity of donor blood pools and the incumbent risk of allogenic blood transfusion. Its use in obstetrics has been limited by concern over fetal alloimmunization due to the risk of fetomaternal hemorrhage. However, there are a paucity of studies reporting on outcome. The aim of this study was to report on a four-year experience of routine use of intraoperative cell salvage and the impact on subsequent pregnancy outcomes.

**Material and methods:** This was a tertiary center retrospective service evaluation cohort study and included all women undergoing cesarean section between December 2014 and November 2018 in a tertiary obstetric unit, identifying women who had re-infusion of intraoperative cell salvage. Data regarding index pregnancy as well as subsequent pregnancies at the hospital were extracted from hospital electronic records. Subsequent pregnancy outcome and maternal antibody status in that pregnancy were collected up until November 2022.

**Results:** During the study period, 6656 cesarean sections were performed, with 436 (6.6%) receiving reinfusion of salvaged blood. The mean volume of reinfused blood was 396 mL. A total of 49 (0.7%) women received donor blood transfusion. Of those who received reinfusion of salvaged blood, 79 (18.1%) women had subsequent pregnancies over the eight-year follow-up period. There was one case (0.23%) of fetal cell alloimmunization demonstrated by the presence of anti-D antibodies on the subsequent pregnancy booking bloods.

**Conclusions:** Routine intraoperative cell salvage may be used to reduce the need for blood transfusion during cesarean section. The risk of fetal cell alloimmunization in a future pregnancy following reinfusion of intraoperative cell salvage is one in 436. Given an apparent small risk of fetal cell alloimmunization, further work is required to establish the safety profile of intraoperative cell salvage in pregnancy.

- Expanded the study to a retrospective cohort study over a 4 year period
- Examined rates of isoimmunisation in subsequent pregnancies as well as maternal and fetal complications over an 8-year follow up period

# CELL SALVAGE AT UHCW

- UHCW – SORIN XTRA
- Cell salvage is set up with suction and reservoir for every LSCS performed at UHCW
- Blood processed if hit 1000ml in reservoir
- No leukocyte depletion filter utilised
- Rolling cell salvage dataset.
  - EBL, reinfusion volume, hct of reinfused blood and total EBL.
  - Reason for not reinfusion
  - Adverse events
- **One of two centres known to wash cells twice**

Sullivan IJ and Ralph CJ, (2018)

# METHODS CONTINUED

- Recorded donor blood use up to 3/7 of delivery
- Identified patients who had undergone a subsequent pregnancy to index cell salvage reinfusion up until 01/11/2022

| | |
|---|---|
| Index pregnancy | Parity at index pregnancy |
| | Gestation at index delivery |
| | Category of LSCS<br>Indication for LSCS |
| | Date of reinfusion |
| | EBL in reservoir |
| | Volume of washed RBC in reinfusion bag |
| | Hct |
| | Total EBL at index delivery |
| | Was a blood transfusion needed if so how many units? |
| | Pre-delivery Hb |
| | Post-delivery Hb – if PPH was it repeated and if Y – value |
| Subsequent pregnancy | Rhesus status |
| | Were antibodies present at booking – if Y what ones |
| | Booking Hb |
| | Antenatal complications |
| | Gestation at delivery |
| | Mechanism of onset of labour |
| | Mode of delivery |
| | EBL |
| | Repeat cell salvage – if Y what volume was reinfused |
| | Blood transfusion? |
| | Pre-delivery Hb |
| | Post-delivery Hb |
| | Neonatal outcome |

# RESULTS: INDEX PREGNANCY REINFUSION

6656 LSCS performed Dec 2014-Nov 2018

IOCS routinely set up for all cases

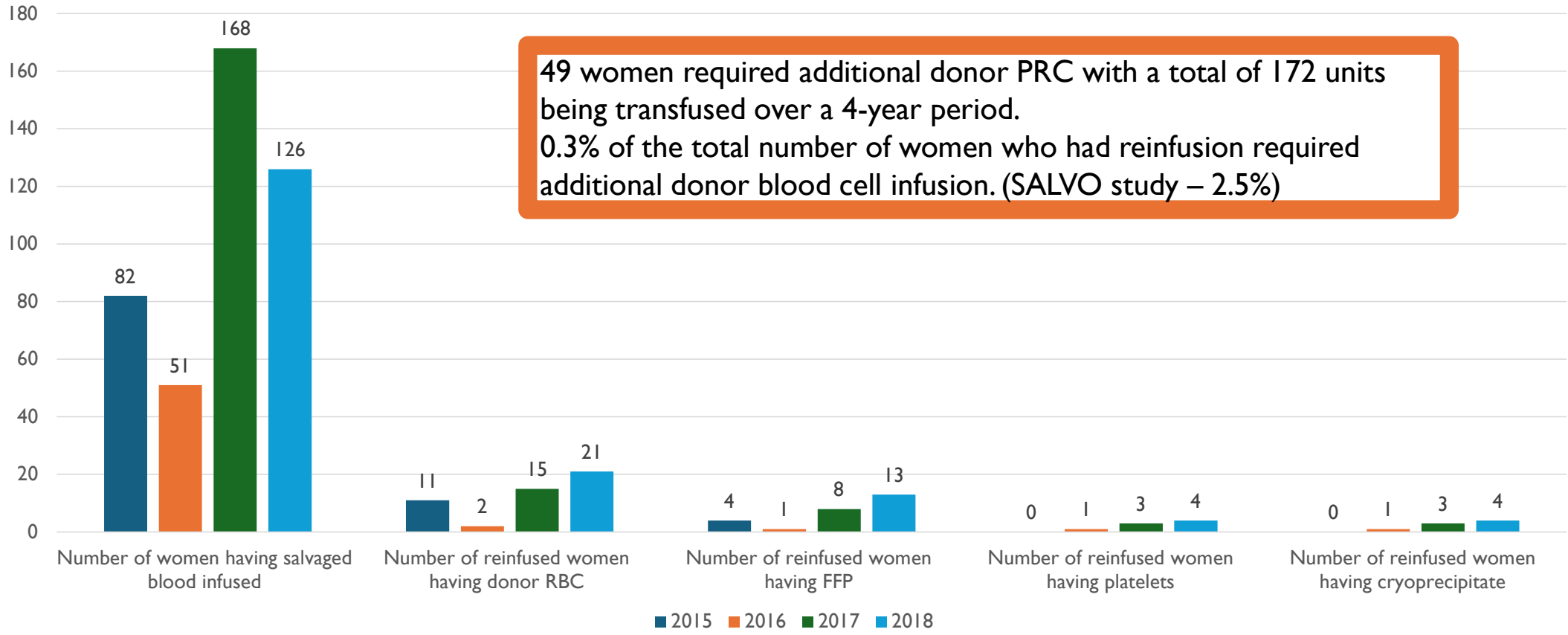
6.6% of patients received reinfusion of salvaged blood at index delivery

Mean EBL in reservoir – 1074ml with mean reinfusion volume – 397ml

173,070ml of salvaged blood reinfused – 577 units of PRC – 1.32 units a patient

No AFE's secondary to reinfusion were identified

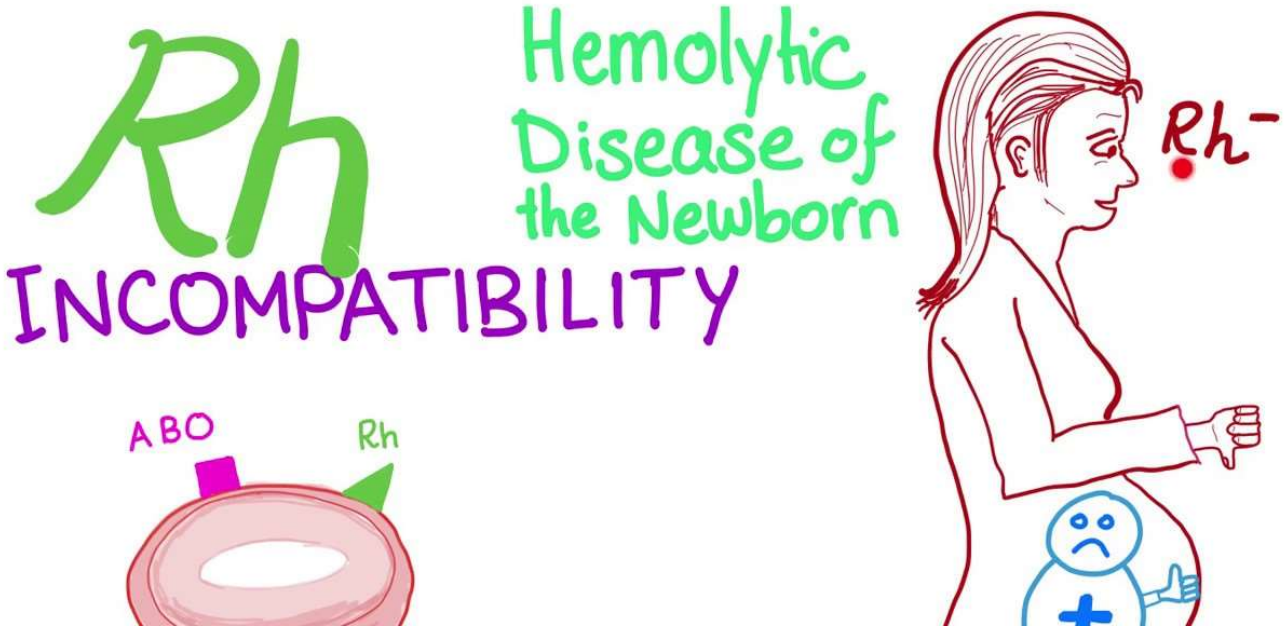
# RESULTS: DONOR BLOOD PRODUCTS AT INDEX DELIVERY




49 women required additional donor PRC with a total of 172 units being transfused over a 4-year period.
0.3% of the total number of women who had reinfusion required additional donor blood cell infusion. (SALVO study – 2.5%)

# RESULTS: DONOR BLOOD PRODUCTS AT INDEX DELIVERY 2

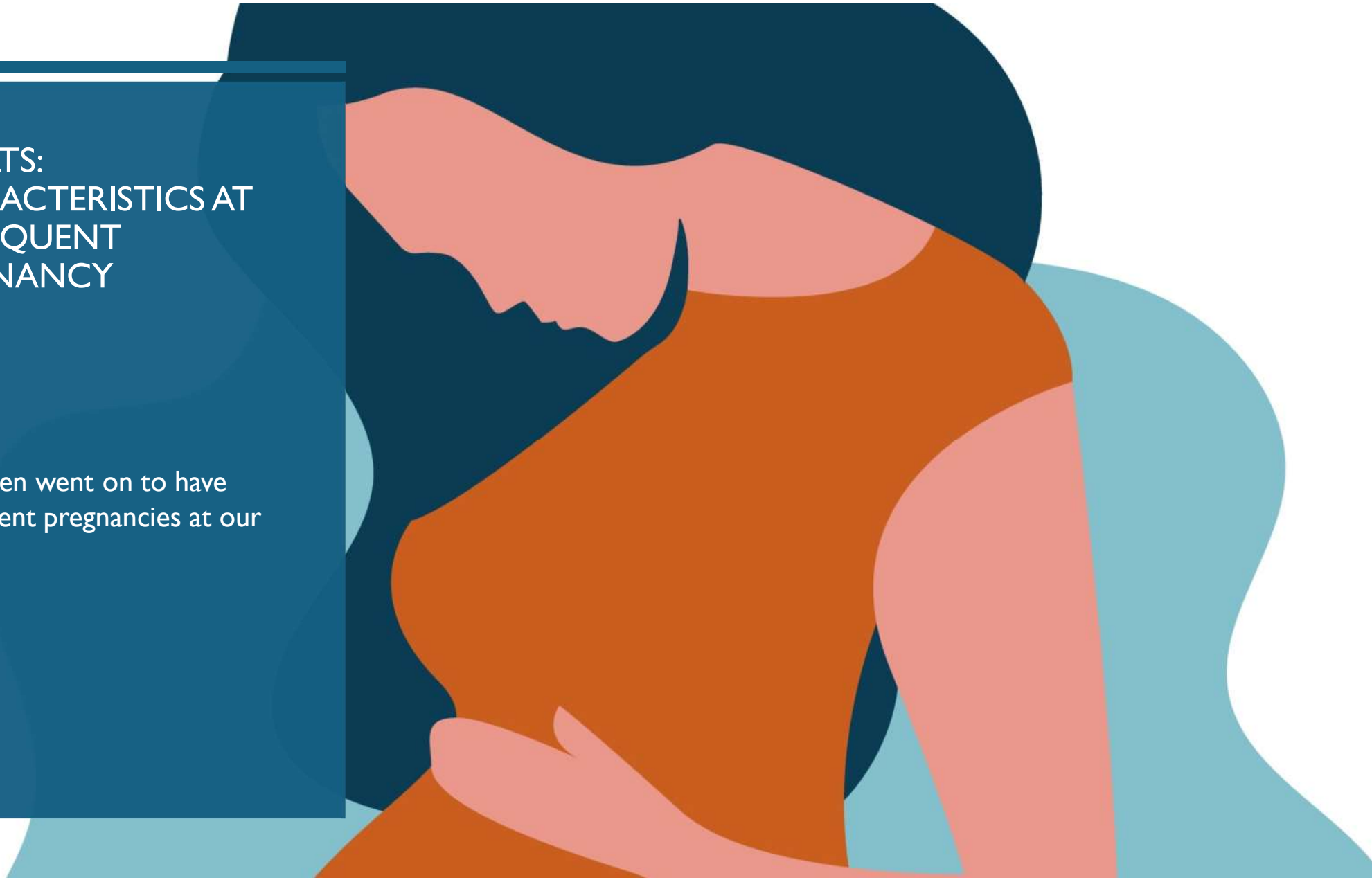
- We had no s donor transfusion.
- Significant di einfusion of salvaged blo those who had reinfusion o




# HOW CAN WE COUNSEL PATIENTS?

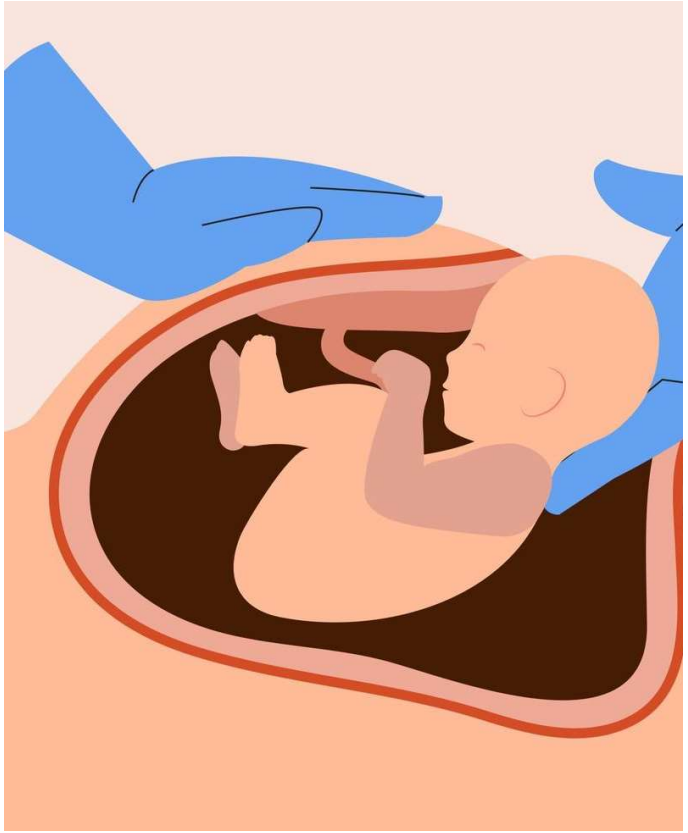
# RESULTS: CHARACTERISTICS AT SUBSEQUENT PREGNANCY

79 women went on to have subsequent pregnancies at our centre

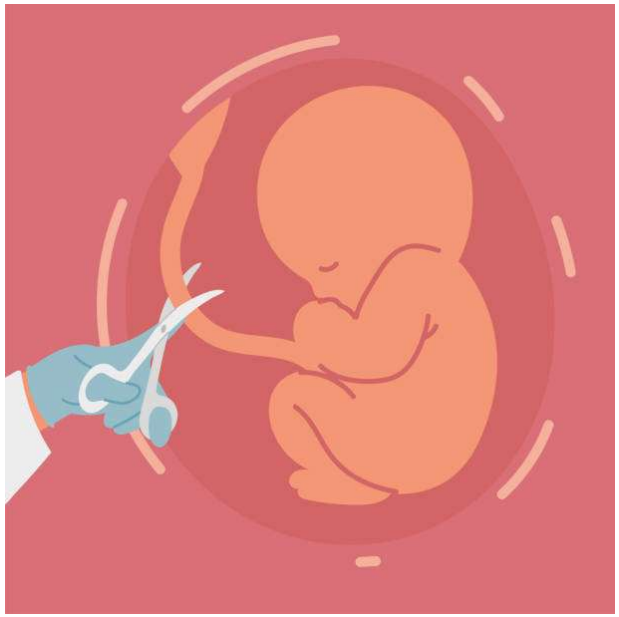


# RESULTS: CHARACTERISTICS AT SUBSEQUENT PREGNANCY 2

- Seven pregnancies very sadly resulted in miscarriage after the booking bloods, none of which had any antibodies present
- All pregnancies were singleton pregnancies except one – DCDA twins by EMCS following pre-term premature rupture of membranes
- Mean gestation at delivery was 37+6
- A total of 85% of women underwent a LSCS for subsequent delivery



# RESULTS: CHARACTERISTICS AT SUBSEQUENT PREGNANCY 3



## One case of fetal cell alloimmunisation identified

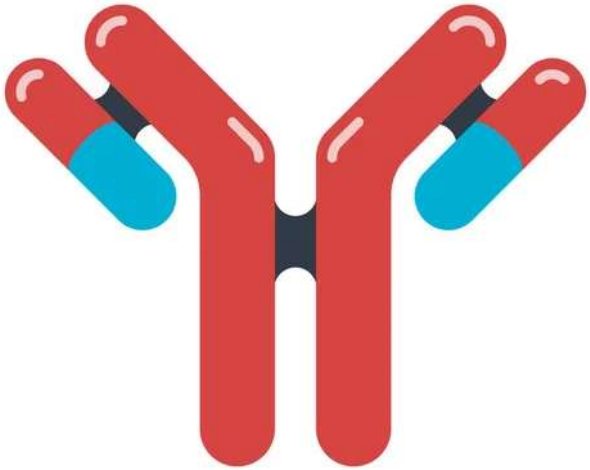
- No donor blood products at index delivery (reinfusion of salvaged blood only)
- Initial anti-D antibody titre was 9.2 (moderate risk of haemolytic disease) – referred to FMU and no features of anaemia
- Expedited delivery at 36/40 due to increased MCA blood flow – LSCS
- No neonatal complications
- Multiple small bleeds in pregnancy so difficult to determine if cell salvage was the sole cause.

# ALLOIMMUNISATION IN THE LITERATURE

Two other identified cases of fetal cell alloimmunisation

**Anti-S positive**
significant placental abruption at 33/40 – LSCS. Multiple antenatal bleeds.

**Anti-E positive**
unable to determine if this was naturally occurring



Ralph, Sullivan and Faulds, (2011)
Sullivan and Ralph, (2018)

# ALLOIMMUNISATION IN THE LITERATURE 2

- Study concluded that 83% of cases were due to previous pregnancy and only 3% were due to previous transfusion
- Evidence suggests that up to 5% of patients undergoing blood transfusions may develop antibody formation

**Our study comparatively found that IOCS may lead to a lower development in antibody formation compared to donor blood transfusions**

Delaney *et al.*, (2017)
Koelewijn *et al.*, (2008)
Webb and Delaney, (2018)

# SUGGESTIONS FOR THE FUTURE

# SUGGESTIONS FOR THE FUTURE 2

- Cost analysis – SALVO did perform a cost analysis – additional member of staff needed and included PPH in that.
- Standby cell salvage
- Vaginal cell salvage
- Where possible isolation of cases of fetal cell isoimmunisation
- Comparison of patients who had scored for PPH if a risk matrix is used and who needed cell salvage

**We feel that creating a central database, combined with the establishment of routine IOCS during LSCS at other hospital trusts would help support and develop understanding of the risks of IOCS in obstetrics to subsequent fetal outcome.**

# SUMMARY/ CONCLUSIONS

- Routine use of IOCS may be a viable alternative to donor blood transfusion at CS and can reduce the need for transfusion.
- In the present study, the risk of fetal cell alloimmunization in a future pregnancy following reinfusion of IOCS is one in 436 (0.23%).

# REFERENCES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# ACKNOWLEDGEMENTS AND ETHICS STATEMENT

Composition of this study would not have been possible without the support of the Blood Transfusion team and the performance and informatics service at University Hospital Coventry and Warwickshire

## ETHICS STATEMENT

- Local research and development approval was obtained from the Biomedical and Scientific Research Ethics Committee (BSREC) at The University of Warwick for this service evaluation on September 23, 2019 (BSREC-CDA-SSC2-2019-09). This was also approved at trust level as a service evaluation and updated for further data collection on April 28, 2022 (reference SE0199).

# ANY QUESTIONS?

# The RMH Anaemia Service

A novel service in patient blood management

Chantal Picaso Dormido
RMH Anaemia Nurse Specialist
RN, Bsc in Nursing, NCLEX, MBA,
Bsc Hons in Clinical Nursing, V300

## How did we start?

- PREVENTT
- CQUIN Guidelines 2020-2021
- BUSINESS PLAN
- Creating the Anaemia Service

## The Challenges Initial Year (2020)

1. Resistance to change
2. Pandemic clinic closures
3. Increased number of patients (surgical hub)
4. Reduced pre-assessment time and limited patient f2f clinics.
5. CQUIN aborted
6. Coding

## Tools for Paradigm Shift

1. The RMH Anaemia Guidelines 2020
2. SUNK COST - Maximising existing manpower and space in clinics
3. The Covid19 Pandemic challenge (The silver lining)
4. Virtual Anaemia Triage (VAT)/ automation
5. Post-op Anaemia management (Pioneer)

# Strategies Applied

1. Training and education of clinicians
2. One-stop treatments
3. Optimise existing/building new clinics outpatients' clinics
4. Go virtual, go hybrid!
5. Post-op PBM and daily WR
6. Coding set-up enquiry
7. Embedding practice in EPIC/EPR
8. Maximising use of database
9. Networking with PBM enthusiast

# Problems Encountered

1. Opposing prescriber views
2. Capacity Constraints (inpatients/outpatients)
3. Training Issues (understaffing)
4. System Integration (from EPR to EPIC)
5. Coding set-up/ Income?
6. Managing HSR to iron
7. Iron Staining

# Iron in the times of COVID

S Abeysiri, E.Black, R Agarwala, J Patel, K Joshi, M Raja, C Dormido, R Rao Baikady
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## Introduction

Many healthcare services have been affected by the SARS-Cov-2 Pandemic, including cancer services. Anaemia not only has poor outcomes in the perioperative setting, but also can delay further cancer therapy such as chemo or radiotherapy.

OP iron services were among the many elective services restricted, limiting opportunities for these patients to receive treatment for iron deficiency. Our peri-operative anaemia management service had to adapt in order to meet this challenge and continue providing treatment for patients.

**AIM – we review how our practice has changed in 2020 and assess whether we are successfully able to provide a suitable IV Iron service**

## Methods

We performed a retrospective audit of 2019 (1st Jan – 31st Dec) and 2020 (1st Jan – 31st Dec).

Patients were identified by through pharmacy records of intravenous iron prescription dispensed and data collected from electronic patient records (EPR) including – Pre-op Hb and haematinic levels; age; type of surgery; iron preparation; post-infusion Hb levels at intervals.

## Results – Part 1

In 2019 a total of 305 infusions were given – of which 228 had accessible EPR records (see Chart 1)
In 2020 a total of 735 infusions were given – of which 474 had accessible EPR records (see Chart 1)

| Year | Male | Female | Med Age | IQR |
|---|---|---|---|---|
| 2019 | 34.6% (n=79) | 64.5% (n=147) | 61 | 49-70 |
| 2020 | 39.5% (n=187) | 56.7% (n=268) | 60 | 50-72 |

Chart 1 Showing an overall breakdown of patient demographics for 2019 and 2020.

## Results – Part 2

**There was a significant increase in post-op infusions in 2020 – (Chi - 10.55; p= 0.001) – Fig 1.**
**There was also a significant increase in overall IV iron administered in 2020 – (Chi – 15.42; p= 0.0004)**

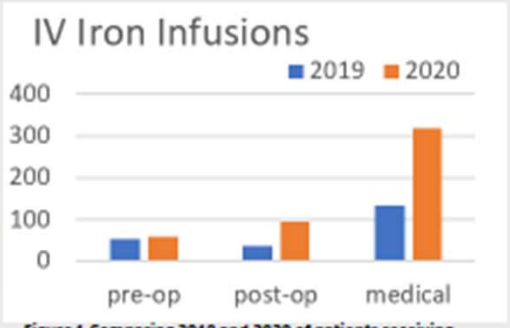



Figure 1 Comparing 2019 and 2020 of patients receiving iron, with a shift towards post-op infusions.

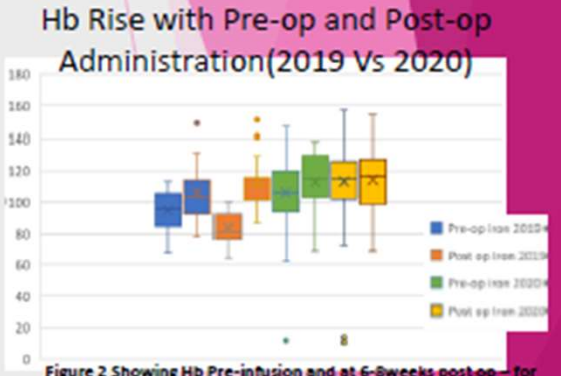



Figure 2 Showing Hb Pre-infusion and at 6-8weeks post-op – for Pre-op iron in 2019 (blue); Post-op iron 2019 (orange); Pre-op Iron 2020 (green); Post-op iron 2020 (yellow)

**Importantly the Hb increase following post-op administration of iron did not show significantly lower levels of Hb at 6-8 weeks post-op compared with pre-op administration (See Fig 2).**

## Conclusions

- A good service was maintained through flexibility in clinical practice, with a pragmatic shift towards post-op infusions, where pre-op capacity was limited due to COVID
- This has also led to an increase in awareness of the service by the various surgical specialties – thus increasing demand further
- Administration in the ward setting provides a safe and effective environment for IV Iron therapy

SABM VIRTUAL ANNUAL MEETING 2021 SEPT 22-25

# Pre to post-operative IV iron infusion service : A paradigm shift in a post-COVID era

J Patel, K Joshi, S Abeysiri, R Agarwala, M Raja, A Sahni, E Black C Dormido, R Rao Baikady

The Royal Marsden Hospital, UK

## Background

Preoperative anaemia affects a high proportion of patients undergoing major elective surgery and is associated with poor outcomes[1]. At our centre a pre-operative intravenous iron service was the established practice before the COVID-19 pandemic. However, the effects of the pandemic, social distancing and requirements for patient shielding resulted in a shift of our service to post-operative iron infusions.

## Methods

A trust quality improvement service evaluation form was submitted for a retrospective analysis. We identified patients who had received IV iron infusion in the year 2020 via the patient electronic health records system. We aimed to look at the feasibility of a post-operative IV iron infusion service.

## Results

We retrieved data for 733 patients. The distribution of Iron infusions across our patient cohort is shown below in image 1. 594 ( 81%) infusions were for patients undergoing surgical procedures, whilst 139 (19%) were delivered for medical reasons in the outpatient setting. Image 2 shows the iron infusion distribution by surgical sub-specialities. The highest number of infusions were given to patients undergoing major intra-abdominal surgery (43.4%). In the surgical patient group, 171 received iron pre-operatively, and 423 received iron post-operatively (Image 3). Increments in Transferrin saturations and ferritin in both the pre and post-operative iron infusion groups were comparable. The increments in Haemoglobin (Hb) in both the groups were not significantly different ( P= 0.79)

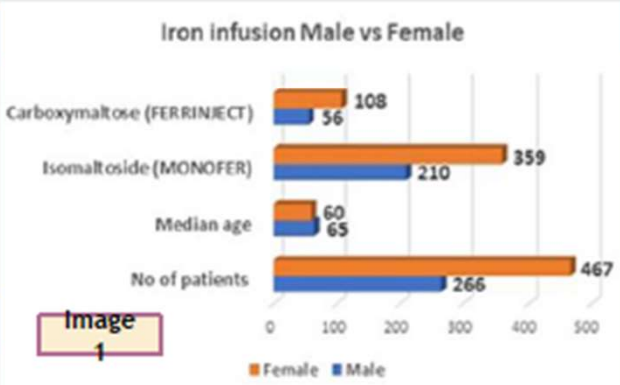



Image 1

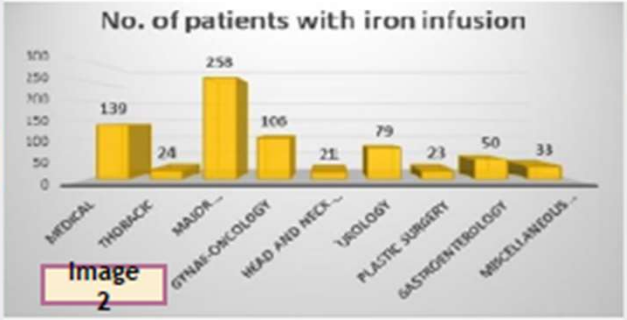



Image 2

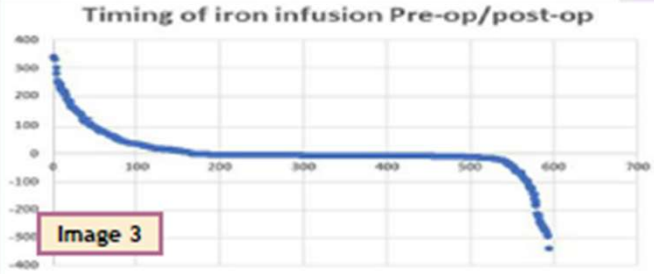


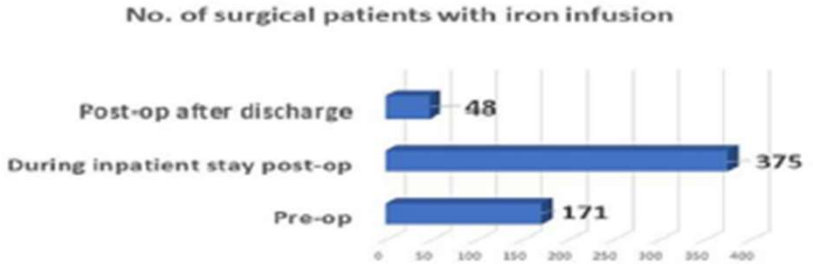

Image 3

## Discussion

There is limited evidence to show the benefits of post-operative IV iron infusion[2]. Although our data did not reveal any significant difference in Hb increments in the pre or post-operative iron infusion groups, this demonstrates that a post-operative iron infusion service is feasible. Iron infusions can be successfully delivered to patients when it is not possible to do so pre-operatively. The non-significant increments could also be due to post-operative test values taken at discharge and not allowing enough time to have elapsed between blood test and an increment to have occurred. We noted that greater iron transfusions were administered in female patients and this could potentially be attributed to a lower starting Hb in this group. In the current climate, the benefits of post-operative iron infusion are favourable to prevent an additional patient visit, particularly when the demonstrated Hb increments are comparable to the pre-operative setting.

## References

1. Richards T et al. Preoperative intravenous iron to treat anaemia before major abdominal surgery (PREVENTT): a randomised, double-blind, controlled trial. Lancet. 2020 Sep 4;396(10259):1353-61.
2. Laso-Morales MJ, Vives R, Gómez-Ramírez S, Pallisera-Lloveras A, Pontes C. Intravenous iron administration for post-operative anaemia management after colorectal cancer surgery in clinical practice: a single-centre, retrospective study. Blood Transfus. 2018 Jul;16(4):338-342.



# Perioperative Management of Iron Deficiency Anaemia in Female Cancers

Dormido Chantal, Abeysiri Sandy, Patel Jaishel, Raja Meera, Nawoor-Quinn Zeenat, Black Ethel, Roabaikady Ravi.

The Royal Marsden NHS Foundation Trust

## Background

Iron deficiency anaemia (IDA) is common in cancer patients, as well as women.

Aim: We wanted to better understand the population of female cancer patients with IDA receiving treatment as part of our new Perioperative Anaemia Management Service (PAMS).

## Method

Data (anonymised) was collected as part of routine annual audits of our newly implemented PAMS from 1st Jan 2020 – 31st Dec 2021:

This included: Surgical specialty (procedure), sex, details of iron treatment, baseline Hb and Hb at intervals of 2 weeks post-operatively up to 2months.

## Results

1562 surgical patients were treated for IDA in 2020 & 2021:

| Year | N | M (%) | F (%) |
|---|---|---|---|
| 2020 | 734 | 267 (37%) | 467 (64%) |
| 2021 | 828 | 265 (32%) | 563 (68%) |

Fig 1. Showing M vs F Surgical Pts treated for IDA

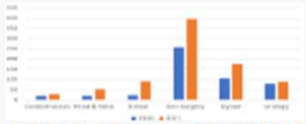


Fig 2. Surgical Specialties of Pts treated for IDA

**Data from 389 (of 393) gynae and breast Ca pts were identified.**

**62(16%) pts received IV Iron pre-op**. Base Ferritin - 98 (+/-117)ng/L (mean,sd) and base Hb – 114(+/-14) g/L (mean,sd).

**327(84%) pts received IV Iron post-op.** Base Ferritin – 104(+/-104)ng/L (mean,sd) and base Hb – 114(+/-20) g/L (mean,sd).

## Results

27%(n=17) had transfusions from the pre-op iron group (1 massive transfusion pt was excluded from further analysis).

31%(n=102) had transfusions form the post-op group (13 with massive transfusion pts were excluded from further analysis).

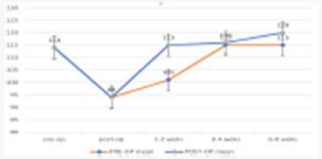


Fig 3. Shows mean Hb comparison between Pre-op and post-op iron patients over time.

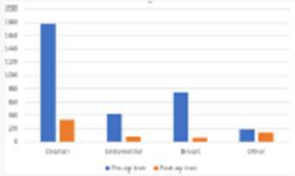


Fig 4. Shows underlying pathology of pts receiving iron.

Of those pts with complete follow up data, final Hbs were similar for both groups by 4 weeks.

We found most of the pts requiring iron had ovarian pathology.

## Discussion

While our initiative to give post-op iron was largely a practice for COVID times, it has persisted even after easing of pandemic measures, supported by the clinical teams and patients.

Our analyses found post-op iron was safe and effective in treating IDA in women undergoing surgery for female cancers.

Further comparative data and long term follow up is needed.

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- **Results**

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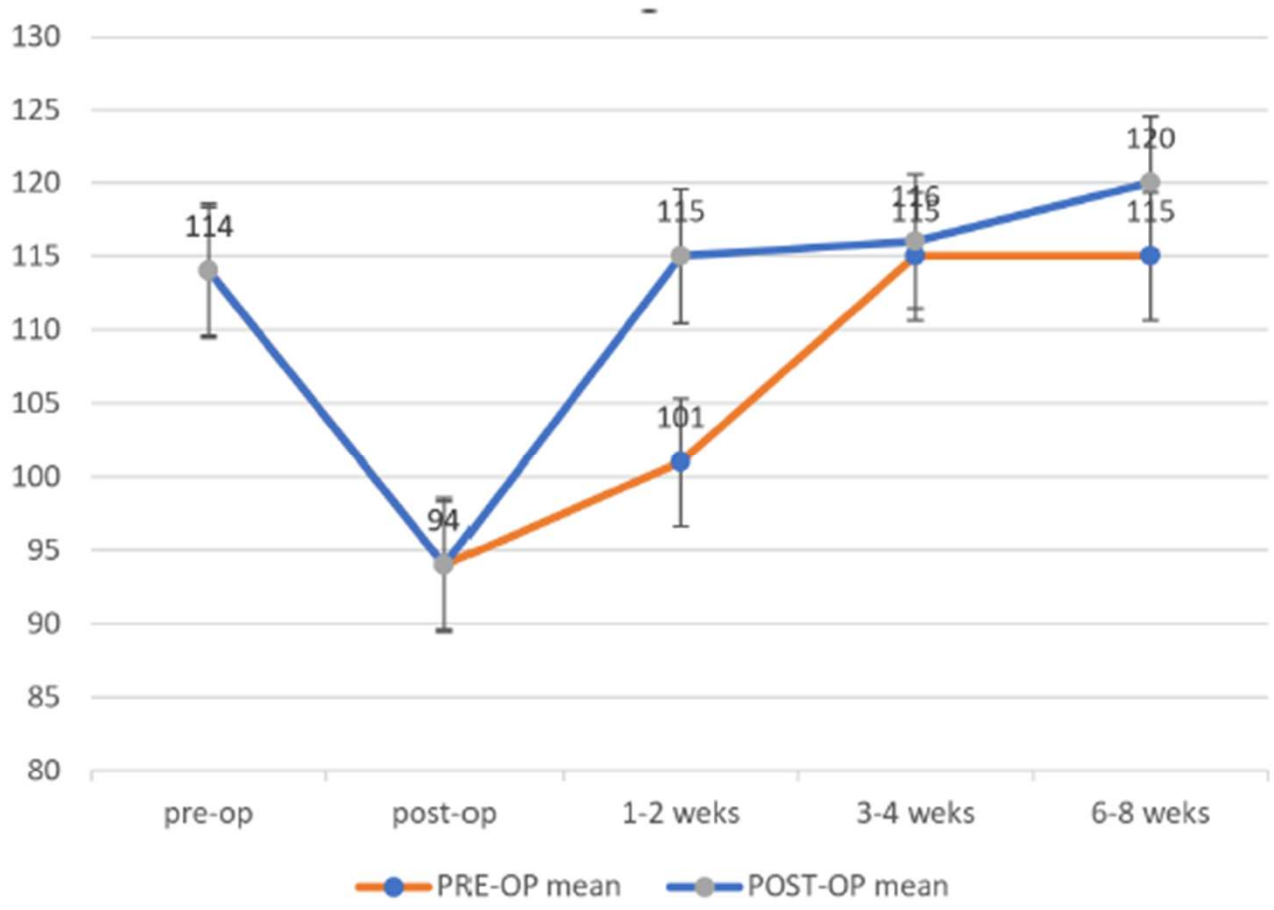

# Reaching the SUMMIT: Anaemia Management in a Perioperative Pathway

T, Pirotta, S Abeysiri, C Dormido, E Black, S Uren, S Kumar, R Rao Baikaddy
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## Introduction

The SUMMIT Program is an innovative preoperative pathway, that provides patient-centered multidisciplinary review towards optimizing patients prior to major upper GI onco-surgery.

The team consists of Surgeons, Anaesthetists, Dieticians, Physiotherapists, Anaeamia Nurse and Mental Health Liaison Nurse, with input from all other specialties depending on the individual needs of the patient.

The pathway consists of two key elements – early anaesthetic assessment and referral to the 'MILE' prehabilitation programme, with regular Multidisciplinary Team (MDT) review.

This includes timely investigation and management of iron deficiency anaemia (IDA) well in advance of surgery. We present outcomes for the past year.

## Methods

We performed a retrospective service evaluation from October 2021 – October 2022 collecting data available on the patients included in SUMMIT.

**Our aim was to better understand the patient population and their clinical demands.**

Patients were identified by through MDT records and data collected from electronic patient records (EPR) anonymously.

We present our preliminary findings.

## Results – Part 1

A total of 72 patients were reviewed as part of the SUMMIT programme. ALL patients were investigated with a baseline Full Blood Count (FBC).

32 (44/4%) were female and 40 (55.6%) were male.
32 (44.4%) patients were anaemic (Hb<130 g/l) at baseline.
**Mean Baseline Hb was 126 g/l (+/- 18.6 g/l SD).**
**Of these 32 Anaemic patients – 27 (84.4%) had iron studies.**
**18 non-anaemic patients (Hb> 130g/l) also had iron studies.**

## Results – Part 2

**The majority, 50% (n=36) had osoephageal tumours,** followed by GIST 36% (n=26), then gastric tumours 22% (n=16) - see Fig 1.

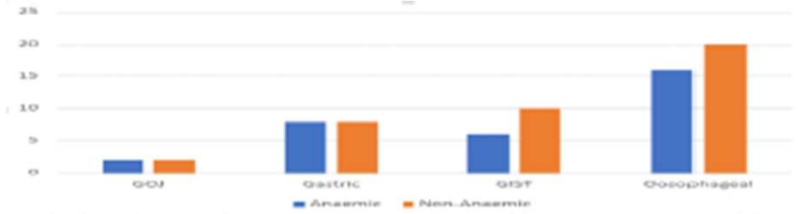


**Figure 1 .Showing numbers of patient categorised by tumour type and found to be anaemic at baseline.**

Of the 27 anaemic patients who underwent iron studies – **88.9% (n=24) were iron deficient** (Ferritin <100mcg/l or TSAT <25 TSAT%).

**Interestingly, 55.6% (n=10) of 18 non-anaemic patients who underwent iron studies were also iron deficient (see Fig 2)**

47.2% (n=34) were ASA Grade 2;
and 25% (n=18) were ASA Grade 3

| | Total | Iron Studies checked | Iron Deficient |
|---|---|---|---|
| Anaemics (n) | 32 | 27 (84.4%) | 24 (88.9%) |
| Non-Anaemics (n) | 40 | 18 (45%) | 10 (55.6%) |

**Figure 2. Showing numbers of anaemic and non-anaemic patients found iron deficient.**

## Conclusions

The SUMMIT programme highlighted the importance of early assessment of cancer awaiting upper GI Surgery – over half of the patients were assessed in advance of becoming severely anaemic.

**An important finding was the number of patients noted to be iron deficient (but non-anaemic) prior to surgery.**

**This raises the important question of what stage to treat iron deficiency in cancer patients and further research is vital to better support clinical decision making on this.**

# The Marsden's Virtual Anaemia Triage (VAT)

## Enhancing The Power of AI and Automation

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Affiliations: The Royal Marsden Hospital, NHS Foundation Trust London, UK

## Introduction

Virtual Anaemia Triage (VAT) is a unique process of Anaemia diagnostics in post-surgical patients at Royal Marsden Hospital (RMH). It was started in year 2020 as a strategic response to the pandemic. VAT became a breakthrough as it expedited the triage process. This embedded system in our electronic patients' record was designed by the Anaemia Nurse Specialist through a collaboration with information technology department.

### Methodology

This analytic system is run daily by the Anaemia Team before a multidisciplinary meeting and ward rounds. The actual rounds involves physical assessment of patients, disseminating information about the treatment, and gaining consent.

### Advantages of VAT

- Maximise the power of spreadsheets through an automated report generation using the hospital electronic patient records
- Quicker triage (shortens the process by 3-4 hours); average patients reviewed 100 per day, average inpatients treated is 20-30 per week
- Easy identification of anaemia patients through data filtering
- Easy-mapping of patients. Equipped the clinicians' knowledge of patient location, discharge date, contra-indications, and current blood results for quick decision-making
- Promotes wider reach to our off-site patients in collaboration with clinical treating teams

Result:

Anaemia Inpatient Surgical Triage 9/4/24

| Date | Patient Name | MRN | Weight | Allergies | Ward | WD | EDD | Hb | PLR | TSAT | WBC | CRP | PHOS | B12 | FOL | ALT | Case Procedures | Specialty | Anaemia Plan |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 14.3.24 | | | 94.9 kg | NKA | | 2 | 6.4.24 | 104 | 155 | 24 | 7.9 | 55 | 1.09 | 296 | 3.5 | 76 | Open extralevator abdominoperineal excision (ELAPE) | UGI | IV iron |
| 3.4.24 | | | 89.3 kg | NKA | | 5 | 6.4.24 | 124 | 113 | 38 | 5.8 | 26 | 1.43 | 431 | 5.3 | 21 | Resection of right chest wall sarcoma and plastic surgical reconstruction? Rg LD flap reconstruction | Plastics | Nothing to do (NTD) |
| 14.3.24 | | | 100 kg | NKA | | 15 | 6.4.24 | 99 | 360 | 25 | 6.6 | 27 | 1.00 | 177 | 7.0 | 90 | Open Bilateral RE sbo RPLND + Aortic Graft | Uro | 28/3/2024 |
| 27.3.24 | | | 70 kg | NKA | | 6 | 6.4.24 | 101 | 97 | 77 | 4.2 | 92 | 1.18 | 930 | | 69 | Posterior pelvic exenteration,TAH with flap reconstruction + possible ureteric implantation +/?Cystectomy | GM | IV iron |
| 28.3.24 | | | 86.2 kg | NKA | | 7 | 6.4.24 | 117 | 72 | 15 | 5.8 | 27 | 1.84 | 740 | 5.5 | 24 | Excision of seminal vesicle ,Open anterior resection of rectum and anastomosis, Creation of defunctioning ileostomy | UGI | IV iron |
| 24.3.24 | | | 87.8 kg | NKA | | 6 | 6.4.24 | 96 | 30 | 13 | 5.4 | 22 | 1.41 | 657 | 16.4 | 23 | Total gastrectomy | UGI | 16/2/2024 / DNA DPA |
| 29.3.24 | | | 87.4 kg | various | | 3 | 6.4.24 | 96 | 142 | 27 | 5.1 | 40 | 1.16 | 667 | 11.9 | 23 | Palliative anterior resection + left Kruckenberg +/- right Kruckenberg,left paravesilla gutter met removal, mesenteric nodule excision, +/- small bowel resection and end ileostomy formation | UGI | 16/3/2024 |
| 28.3.24 | | | 72.6 kg | various | | 6 | 6.4.24 | 124 | 100 | 19 | 6.8 | 18 | 1.09 | 938 | 4.0 | 143 | Creation of defunctioning ileostomy | UGI | oral iron |
| 28.3.24 | | | 93.7 kg | Ertapenem | | 6 | 6.4.24 | 109 | 469 | 14 | 5.8 | 41 | 0.90 | 206 | 4.4 | 14 | Resection of pelvic tubigs , left to right trans ureteroureterostomy | GM | IV iron |
| 22.3.24 | | | 94.5 kg | various | | 6 | 6.4.24 | 97 | 168 | 24 | 10.9 | 56 | 1.28 | 566 | 5.4 | 19 | Open insertion of feeding jejunostomy | UGI | repeat bloods ordered |
| 26.3.24 | | | 119 kg | various | | 9 | 6.4.24 | 92 | 148 | 50 | 6.8 | 47 | 1.45 | 438 | 6.0 | 60 | Midline staging laparotomy with plastics closure with mesh | Gynae | 27/3/2024 |
| 27.3.24 | | | 76 kg | NKA | | 11 | 10.4.24 | 119 | 45 | 18 | 17.4 | 96 | 0.74 | 775 | | 58 | Open Whipple's procedure | HPB | review tom |
| 26.3.24 | | | 81 kg | NKA | | 13 | 6.4.24 | 118 | 99 | 24 | 23.4 | 167 | 1.11 | 298 | 5.7 | 54 | Open radical nephrectomy | Uro | review tom |

Legend:
- consultant but not initiated
- new bloods ordered
- iron prescribed today
- DNA outpatient/ iron no prescribed

## Conclusion

**Benefits to patients:**

- Anaemia patients are easily identified
- Timely treatment and diagnosis
- Saves travel time and extra hospital visit
- Optimized patients: Avoid blood transfusion, reduce re-admission rates, improve return to intended oncological therapy (RIOT) attendance, and enhance quality of life

**Benefits to clinicians:**

- Scalability
- Cost-effective (time, manpower, supply expense)
- Automation/ wider reach/ lean manpower
- Wealth of database/ Research insights

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## Conclusions: We are Anaemia Team Possible!

1. Bloodless PBM is possible with enough time for Onco-surgery.
2. Virtual Triage/ Virtual Clinics is possible
3. Centralised or De-centralised iron clinics both doable
4. Post-op PBM and daily WR is as effective as pre-operative treatment
5. Coding set-up whether centralised or de-centralised is important and earnings come in two ways diagnosis codes and OPCS codes. Efficient finance managers can help determine what tariff to negotiate and trace correct coding income.
6. Embedding practice in EPIC/EPR can lead to a wealth of data information that could support further research and business development.

Awards and Achievements:

1. Industry Grant for Development of Service 22020, 2022
2. Anaemia Lead Consultant won Staff Achievement Award for Pioneering Change in PBM.
3. Anaemia Fellow won best poster in SABM 2022
4. Anaemia Lead Consultant invited as SABM 2022 Speaker “Managing Anaemia in Oncology”
5. Best Abstract NATA 2022
6. Anaemia Lead Consultant becomes NATA Director since 2022
7. Anaemia Nurse Specialist qualified as Non-medical Prescriber 2023
8. Anaemia Fellow qualified for a grant for “Gynaemia in Cancer”
9. Swift integration of VAT to EPIC, currently after 1.5 years in EPIC we have logged more than 11,000 surgical inpatients reviewed and we have recorded 1,943 iron treatments.
10. Higher patient satisfaction rating in surgical management
11. Reduction in surgical RBC BT - from 30% to 3% as reported by Anaemia Lead
12. More teaching and networking opportunities

# Any Other Business/Future Meeting Dates